Innovative Technologies, Creative Solutions

FMC Technologies
Material Handling Solutions

Link-Belt Screw Conveyors

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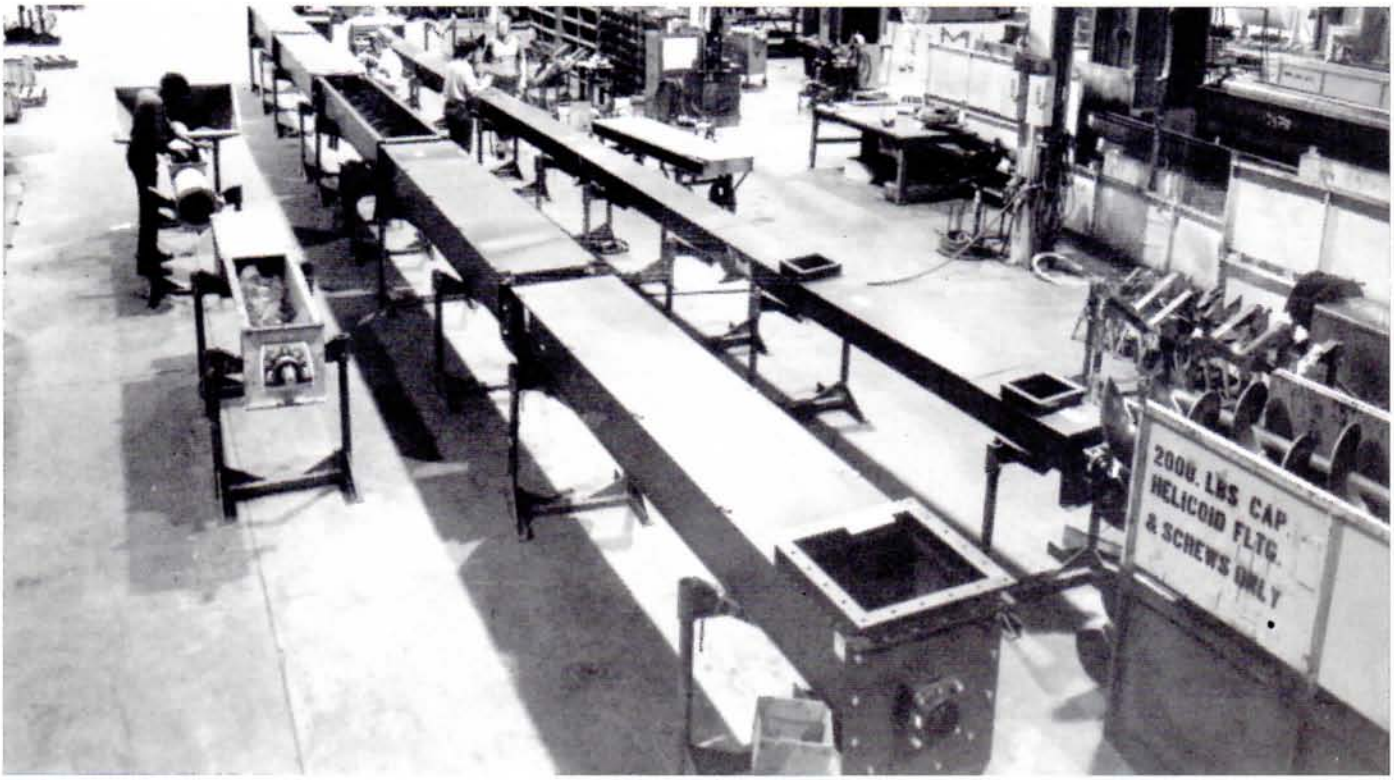


Link-Belt® Conveyor Equipment Sets the Standard for a Demanding Industry

For 125 years, FMC Technologies and its predecessor Link-Belt® have designed and built conveyors and components which have set the standard of excellence in the bulk material handling industry.

FMC pioneered the development of bucket conveyors, screw conveyors and feeders, bucket elevators and related conveyor components.

While your requirements are special to you, our engineers probably have faced similar situations and are intimately familiar with the challenges of handling bulk materials.

Our design engineering and production experience are the difference which sets FMC Technologies' conveyor equipment apart in reliability and dependability. We want to be our customers' most valuable supplier. Put us to work for you.

FMC TECHNOLOGIES, MATERIAL HANDLING SOLUTIONS OPERATION

FMC Technologies Material Handling Solutions Operation in Tupelo, Mississippi, is one of the most modern conveyor equipment plants in the industry.

Our 330,000 square foot plant and office complex houses our sophisticated computer-aided design group adjacent to this very modern manufacturing facility.

Administration, sales, engineering and manufacturing interface daily in this excellent operating environment. The result is product quality and efficiency that result in both performance and price advantages for you.

ABOUT OUR PRODUCTS

Belt conveyor idlers, underground belt conveyors & equipment, engineered screw conveyors, flighting augers and feeders and bucket elevators are the principal products manufactured at our Tupelo location. In addition, we produce Pull-Pak units, which is a line of compact rope capstans used to move rail cars and marine barges.

All FMC Link-Belt conveyor products meet or exceed CEMA standards, and all Link-Belt equipment is produced to conform with OSHA operational safety requirements.

CUSTOMER SERVICE

Prompt shipment, on-time delivery and after-the-sale service are FMC Technologies trademarks. Response to your inquiries, sensitivity to your installation critical path, reliable delivery and follow-through have built our reputation as a service oriented company.

Our customer service specialists understand your needs and are experienced in meeting them. In addition to the substantial inventory of Link-Belt equipment and replacement parts at our Tupelo plant, you can look to hundreds of authorized stocking distributors located throughout the United States (and Canada) to provide you prompt local service.

LOOK TO LINK-BELT! COUNT ON US!

Link-Belt® Screw Conveyors and Screw Feeders

Quality Bulk Handling Equipment that Pays Its Way

Greek mathematician and physicist Archimedes is acknowledged as the inventor of the screw conveyor in 235-240 B.C., and essentially his design has not changed since then.

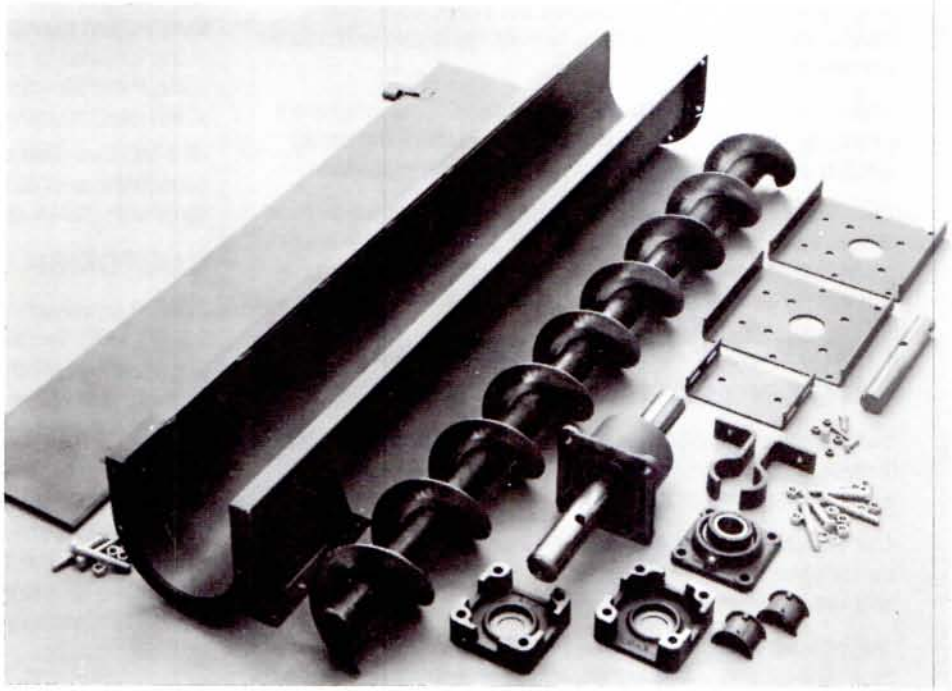
FMC and Link-Belt added the new and innovative applications which make the Archimedian screw the indispensable tool it is. Plus, FMC's conveyor equipment specialists improved materials and fabrication techniques and added electricity as a power source in the 125 years we have specialized in manufacturing screw and conveyor components.

To the basic Archimedian screw Link-Belt and FMC added conveyor systems and screw feeders, designed them for every conceivable application and manufactured them so well we have become the standard for the industry.

Application engineering is a major reason for the industry's wide acceptance of the Link-Belt screw conveyor. Studied attention to detail during this phase eliminates costly installation and operation errors.

Close tolerance machining and fabrication in our state-of-the-art manufacturing facility assure equipment quality and performance.

Our ability to meet your needs with a broad selection of screw conveyors and components is important to you, plus your confidence that the equipment you purchase from FMC's Conveyor Equipment Division will earn its stripes and pay its own way, giving you a good return on your investment.



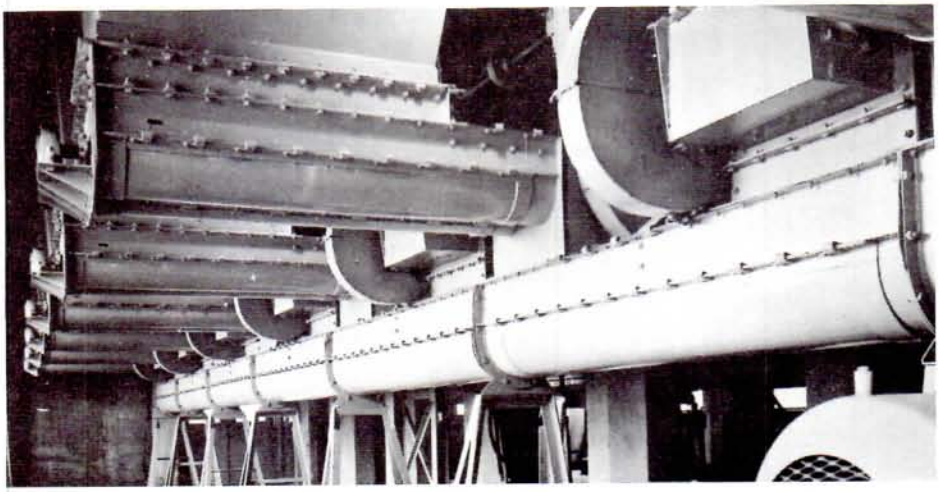
Unmatched versatility.

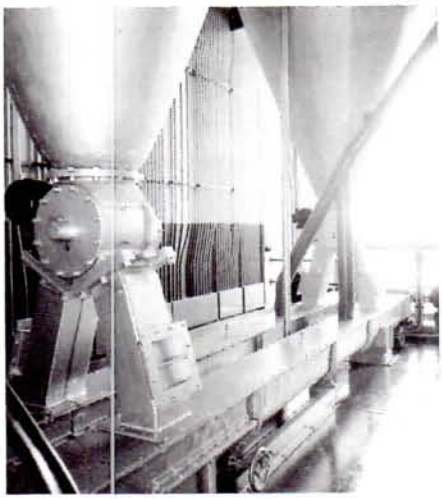
FMC Material Handling Systems Division is industry's largest supplier of screw conveyors, feeders and components. You'll find hard-working Link-Belt Screw Conveyors in a broad range of applications, handling everything from alfalfa meal to zinc oxide—over 250 types of materials. And it doesn't matter whether the material is light or heavy, fine or coarse, granular or flaky, hot or cold, wet or dry, sluggish or free-flowing. FMC's Link-Belt Screw Conveyors can handle it effectively and economically.

There is a wide selection of Link-Belt Screw Conveyor types to choose from. We make a complete line of screw feeders, conveyor screws, troughs, trough ends, hangers, bearings, shafts, seals and drives.

Link-Belt Screw Conveyors serve modern industry in a wide variety of ways:

- Conveying • Distributing
- Collecting • Mixing • Heating
- Cooling • Elevating • Batching
- Blending • Aerating • Providing crystallization or coagulant action and more.





Top Left: Granular feed supplement being conveyed into storage at a poultry processing facility.

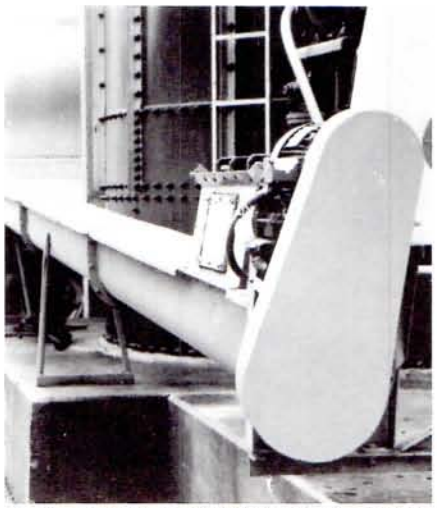
Top Right: Conveyor screws are used extensively in the farm implement industry as header augers, internal augers and unloading augers on combines and other harvesting equipment.

Center Left: Helicoid flight conveyor screws perform efficiently on many snow thrower models.

Center Right: Twin 12-inch diameter screw conveyors with fully enclosed dust-tight troughs handling pulverized boiler fuel in power generating plant.

Bottom: Helicoid screw conveyors are essential components in this flour collecting system located in a large bakery.

Engineered for every type of service.



Top: Sugar is handled by twin screw feeders and helicoid conveyors in this large bakery. Drop-bottom troughs permit easy access and quick cleaning of all parts.

Center: Screw conveyor augers are used throughout this combine for gathering, conveying, elevating and distributing the harvest.

Bottom Left: Heavy-duty sectional flight conveyor augers installed on boring machine.

Bottom Right: Totally enclosed screw conveyors can assure a clean, safe operation.

No one can match our ability to give you the right equipment for your application. FMC engineers pioneered the development of screw conveyors and components for the widest range of materials, purposes and applications. Whether the job involves light-duty service—conveying egg powder, for example—or severe operating conditions—like round-the-clock coal delivery to a power plant—we have the in-depth knowledge and experience to provide just what you need.

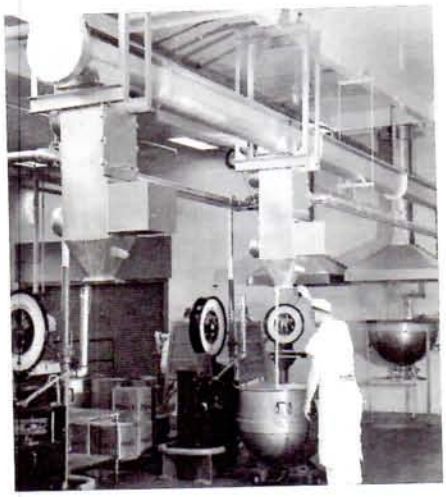
Link-Belt Screw Conveyors are ruggedly built, accurately manufactured and performance proven. And our unequalled field experience is your assurance of the best in service and recommendations.

Clean, compact design saves space, simplifies installation.
Link-Belt Screw Conveyors adapt readily to tight quarters and congested locations. No matter how many twists and turns your operation takes, there is a Link-Belt space saving Screw Conveyor to fit. Our conveyors operate effectively in horizontal, vertical or inclined positions. Their compact design permits easy installation. And they're simple to support.

If you should need replacement parts, you can count on controlled-tolerance standardized parts that meet CEMA specifications. They're interchangeable for fast, easy assembly, and they don't require special tools.

So if space is at a premium, or if you want simple installation and maintenance for better on-line performance, dependable Link-Belt Screw Conveyors are your best choice.

Nearby service when you need it.



When you buy from FMC, you can rely on our factory-stocked equipment and parts inventories which are complemented by more than 140 North American distributors with over 400 branches. So you're guaranteed a timely response to your parts and service needs. You keep downtime to a minimum because you get fast turnaround—from order entry to parts delivery at your plant or jobsite.

When it comes to bulk material handling, come to FMC.
FMC has the uncommon ability to solve any screw conveying problem you might face. We've got the equipment selection, the fund of experience and the kind of service you need to speed your material handling operation and save you money.

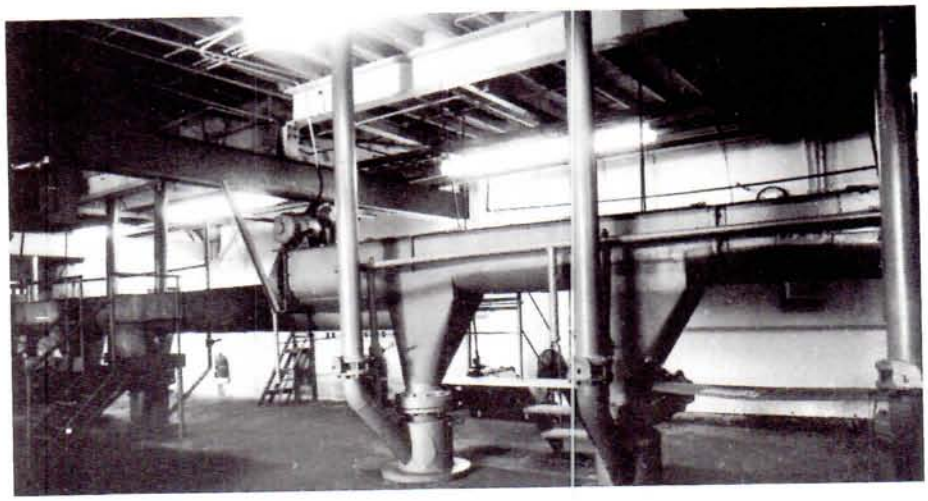
Top Left: Totally enclosed screw conveyors, compact in design, are located in many food processing plants.

Top Right: Over 40 feet of screw conveyors carry malt and rice from storage to mills in this factory.

Center Left: Typical installation provides close fitting gates and connections.

Center Right: Helicoid screw conveyor delivers 50 tons of coal per hour to boiler room bunkers.

Bottom: Granular shell lime distribution system at a large chemical facility.



Component Description

Screw conveyors are one of the oldest and simplest methods for moving bulk materials and consist primarily of a conveyor screw rotating in a stationary trough. Material placed in the trough is moved along its length by rotation of the screw which is supported by hanger bearings. Inlets, outlets, gates and other accessories control the material and its disposition.

Screw conveyors are compact, easily adapted to congested locations and can be mounted horizontal, vertical, and in inclined configurations. Their supports are simple and easily installed.

These versatile conveyors can be used to control the flow of material in processing operations which depend upon accurate batching . . . or as a mixer, agitator or stirrer to mix and blend dry or fluid ingredients, provide crystallization or coagulant action, or maintain solutions in suspension.

Screw conveyors can be effectively sealed to prevent dust or fumes from escaping or dirt or moisture from entering. They can be jacketed to serve as a dryer or cooler, or furnished in a wide variety of materials to resist corrosion, abrasion or heat.

Screw conveyors are used as earth augers to dig post holes or to bore under highways for installation of culverts. They are also used extensively on combines, threshing machines, hay balers, fodder blowers and many other farm machines.

Screw feeders are modified screw conveyors used to control the flow of material at a constant or variable rate from track hoppers, storage hoppers, bins or tanks. They are suitable for handling a wide variety of materials ranging from fines to a combination of fines and lumps. Under many conditions, feeders are also used as a valve.

Screw feeders are totally enclosed, compact, simple in design and dust-tight. They are economical to install, operate and maintain.

Conveyor Screw

The conveyor screw is the rotating portion of a screw conveyor which imparts smooth and positive motion to the bulk material being conveyed. It consists of spiral flighting mounted on a pipe and is made either right or left hand to suit the screw rotation and the desired direction of material travel.

Conveyor Screw with Drive Shaft

The conveyor drive shaft connects the conveyor screw to the driving unit and transmits rotary motion to the screw. Coupling bolts secure the drive shaft in the conveyor screw.

Conveyor Screw With Drive Shaft, End Shaft and Coupling

The conveyor drive shaft, end shaft and coupling support the conveyor screw sections and keep them in alignment. The end shaft is located at the end opposite the drive shaft. Couplings are used to connect successive conveyor screw sections when more than one section is necessary to make up the total length of conveyor. The shafts and coupling are secured in the conveyor screws by coupling bolts.

component description

Trough Ends and Hangers

The trough ends support the conveyor drive and end shafts while the hangers support the conveyor couplings, thereby maintaining proper alignment and clearance between the conveyor screw and trough.

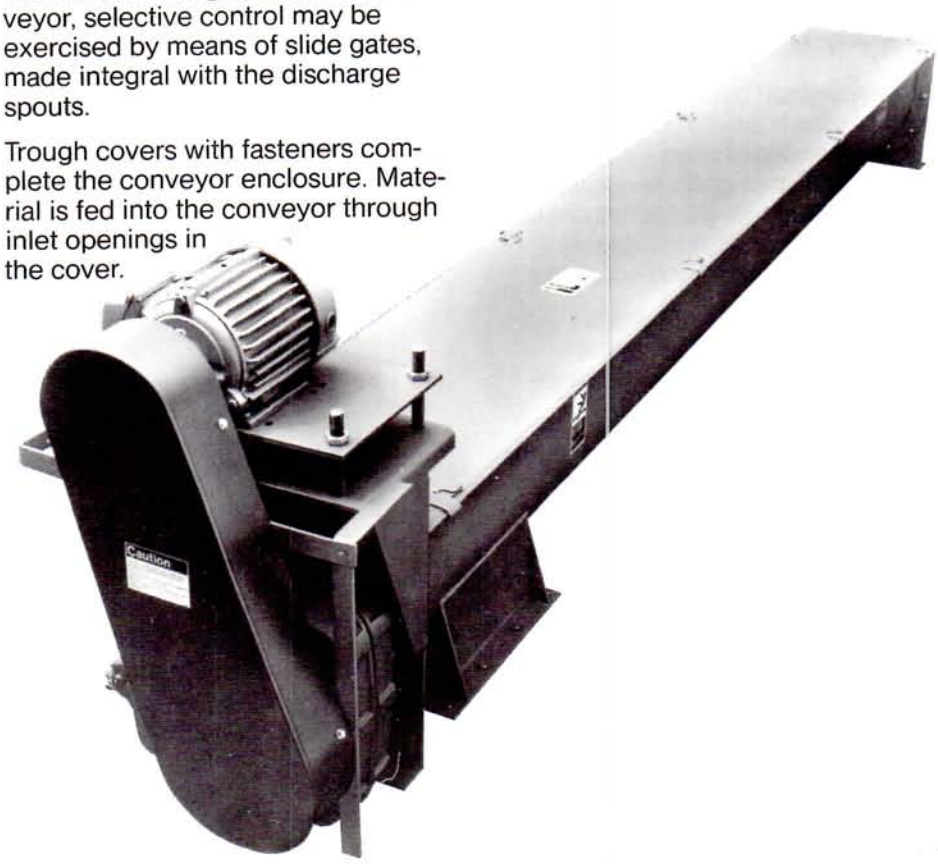
To provide additional protection for the drive shaft and end shaft bearings, for or against the material being handled, trough end seals are assembled between the flanged blocks and the trough end plates.

Conveyor Trough with Inlet Opening and Discharge Spout

The trough is the enclosure in which the material is confined and guided in its movement. Trough end flanges preserve the contour of the trough, facilitate assembly of adjoining sections, and insure accurate alignment. Supporting feet at the trough joints or saddles located between the joints, support the intermediate trough sections.

Discharge spouts provide outlets for the material and direct its flow to bins or succeeding equipment: With more than one discharge point in a conveyor, selective control may be exercised by means of slide gates, made integral with the discharge spouts.

Trough covers with fasteners complete the conveyor enclosure. Material is fed into the conveyor through inlet openings in the cover.



Typical Screw Conveyor Complete With Drive

A shaft mounted speed reducer makes a simple and compact drive combination. The drive consists of a standard shaft-mounted speed reducer with adapter having a built-in seal and mounted on a steel plate trough end. A welded steel adjustable motor support bracket is rigidly mounted on the adapter and provides ample clearance over the trough end for easy trough cover removal.

component description

Conveyor Screws

Helicoid Flight Conveyor Screws

The helicoid flight conveyor screw is made of a helix, formed from a flat steel bar or coil strip and mounted on a pipe or shaft. The helix, formed by special rolling equipment to the required diameter, pitch and thickness, is a smooth, continuous one-piece flight.

By virtue of its one-piece construction, it possesses superior strength. The absence of laps, rivets or welds on the carrying face of the flight promotes and maintains cleanliness and reduces wear. The rolling process effects a hardening and smoothing of the flight surface which increases resistance to wear and reduces friction and power consumption.

The flight is fastened to the pipe, or shaft, by intermittent or continuous welds and with or without formed steel end lugs. The pipe, of a size carefully selected for adequate torsional strength and resistance to excessive deflection, has internal collars at each end. These collars are permanently inserted and have appropriate inside diameters to accept coupling or end shafts.

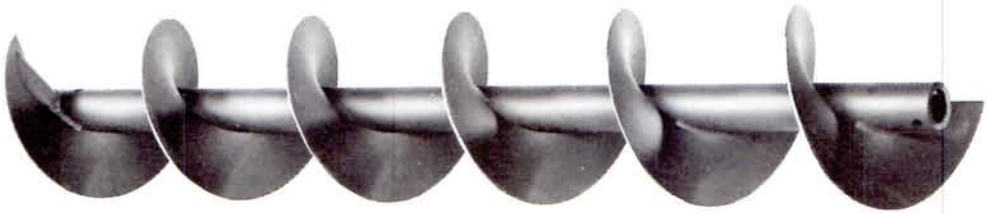
The assembled helicoid flight conveyor screw is solidly constructed and exceptionally sturdy, and its inherent balance permits operation at high speeds. Its distinctive characteristics contribute to maximum efficiency, durability and economy.

Helicoid flight conveyor screws are interchangeable with sectional flight conveyor screws of the same diameter and shaft size.

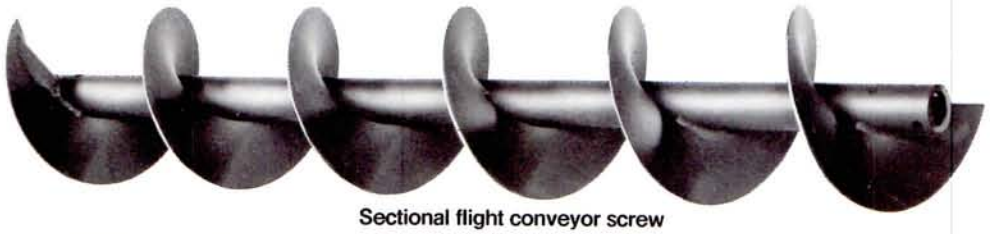
Helicoid flighting is made with regular pitch approximately equal to the diameter. It can also be furnished with other than regular pitch and in a wide range of diameters, thicknesses and lengths to meet the most exacting requirements.

For extremely heavy duty the flighting may be continuously welded to the pipe or shaft on one or both sides.

Consult FMC for information on special requirements.



Helicoid flight conveyor screw



Sectional flight conveyor screw

Sectional Flight Conveyor Screws

Sectional flight conveyor screws are made of individual flights, each blanked from a flat steel plate and formed into a helix. The flights are butt welded together and fastened to the pipe or shaft by intermittent or continuous welds and with or without formed steel end lugs. Sectional flights are formed with regular pitch approximately equal to the diameter.

Sectional flight conveyor screws are interchangeable with helicoid flight conveyor screws of the same diameter and shaft size.

Sectional flights afford flexibility in choice of diameters, pitches and thicknesses. The sectional flight conveyor screw is a sturdily constructed assembly, carefully designed to render efficient, economical and lasting service.

When desired, sectional flights may be lap welded together, or flights may be continuously welded to the pipe on one or both sides, thus providing exceptionally rugged construction for the most severe conveying applications.

Many variations of sectional flight conveyor screws can be furnished to meet specific needs. Some of these are listed on the following pages.

Quik-Link Conveyor Screws

The Quik-Link conveyor screw is designed for easy removal from the conveyor trough. Each section of screw is provided with a Quik-Link key located at one end of the pipe. By removing this key, a conveyor screw section and coupling with hanger can be quickly and conveniently disassembled without disturbing other components. Quik-Link conveyor screws are available in both the helicoid flight and sectional flight construction.

component description

Conveyor Screws

Cut flight conveyor screws have notches cut in the periphery of either helicoid or sectional flights. These notches supplement the conveying action with a moderate mixing action. They are used for light, fine, granular or flaky materials.

Ribbon flight conveyor screws consist of continuous helical flighting formed from steel bar and secured to the pipe by supporting lugs. They are used for conveying sticky, gummy or viscous substances, or where the material tends to stick to flighting at the pipe.

Conveyor screws with paddles have paddles spaced at intervals and set to partially oppose the forward flow, to provide a moderate mixing or stirring of materials being conveyed. Paddles are adjustable and may be set at any angle to produce the desired degree of agitation. They are used for light or medium weight, fine, granular or flaky materials.

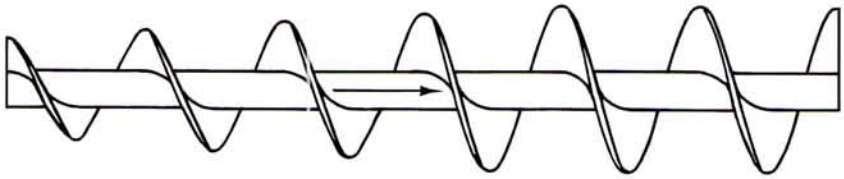
Cut and folded flight conveyor screws provide folded segments which act as lifting vanes to produce a cascading effect. This promotes agitation and aeration, resulting in better mixing. They are used for light or medium weight, fine, granular or flaky materials.

Short pitch conveyor screws are of regular construction except that the pitch of the flights is reduced. They are recommended for use in inclined conveyors of 20 degrees slope and over, including vertical conveyors and are extensively used as feeder screws. They retard flushing of materials of a fluid nature.

Cut flight conveyor screws with paddles have paddles mounted at intervals and set to counteract the flow of materials, considerably increases the agitation and mixing action produced by the cut flights.

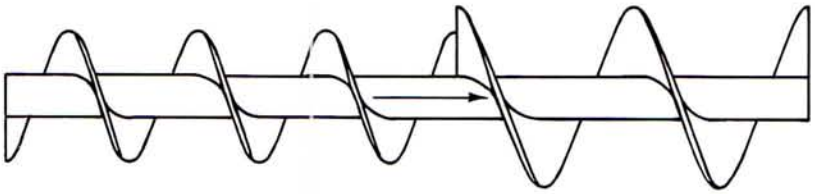
Paddle conveyor screws have formed steel blades mounted on rod shanks inserted through the pipe. Conveying action can be controlled by adjusting the angle of the paddles. They are used for mixing, blending or stirring dry or fluid materials.

Conveyor Screws



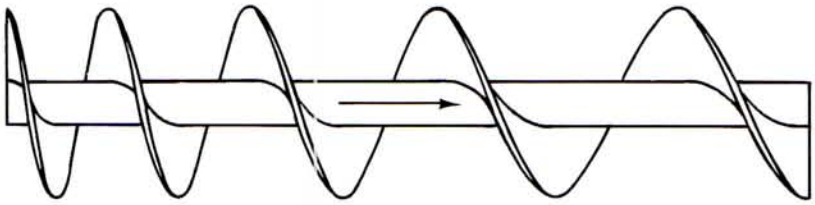
Tapering flight conveyor screw

Tapering flight conveyor screws are frequently used as feeder screws for handling friable lumpy material from bins or hoppers and also to draw the material uniformly from the entire length of the feed opening.



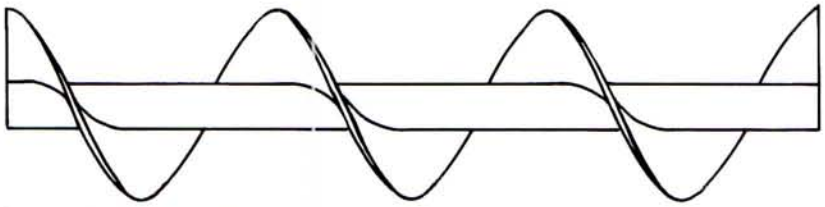
Stepped diameter conveyor screw

Stepped diameter conveyor screws consist of flights of different diameters, each with its regular pitch, mounted in tandem on one pipe or shaft. They are frequently used as feeder screws, with the smaller diameter located under bins or hoppers to regulate the flow of material.



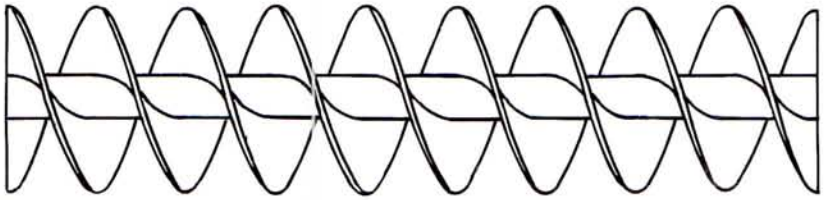
Stepped pitch conveyor screw

Stepped pitch conveyor screws are screws with succeeding single or groups of sectional flights increasing in pitch and are used as feeder screws to draw fine free-flowing materials uniformly from the entire length of the feed opening.



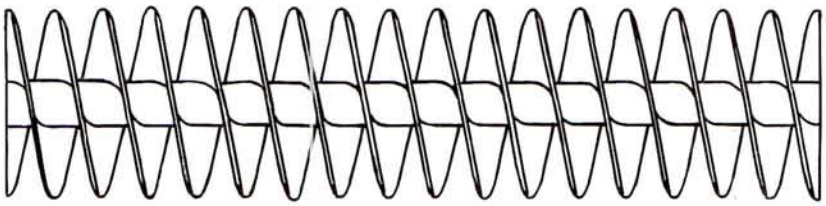
Long pitch conveyor screw

Long pitch conveyor screws are occasionally used as agitators for liquids or rapid conveying of very free-flowing materials.



Double flight conveyor screw

Double flight conveyor screws of regular pitch promote a smooth gentle flow and discharge of certain materials.



Double flight short pitch conveyor screw

Double flight short pitch conveyor screws assure more accurate regulation of feed and flow in screw feeders and effectively deter flushing action of fluid materials.

component description

Conveyor Screws

Ribbon Flight Conveyor Screws

consist of sectional flights, butt welded together to form a continuous helix. Flights are secured to the pipe by supporting lugs.

Variations of diameter, pitch, flight width or thickness can be furnished. Also, these screws can be furnished with either continuous or sectional flights, lap or butt welded together.

Ribbon flight conveyor screws are the solution to most conveying problems encountered in the handling of sticky, gummy or viscous materials. The tendency of materials of this nature to adhere and build up at the juncture of solid flight with the pipe is overcome by the open construction of the ribbon flight. Raw sugar, molasses, asphalt, hot tar, sticky feed mixes, and similar products are typical of the many materials successfully handled by ribbon flight conveyor screws.

Providing the periphery of ribbon flights with a beveled edge improves operation and reduces power consumption when handling materials which tend to pack or trowel between flights and trough. Consequently, beveled edge ribbon flight conveyor screws are usually subjected to extremely heavy loads, and construction is accordingly heavy and rugged. The ribbon flights are supported on the pipe or shaft by steel lugs, generously proportioned to resist bending.

Where the material handled moves virtually en masse, there is but very slight difference in capacity between ribbon and solid flight conveyor screws of the same size. Mixing action without supplementary means of agitation is negligible.

Ribbon flight conveyor screw

Ribbon flight conveyor screw with paddles

Ribbon Flight Conveyor Screw With Paddles

To provide moderate mixing or stirring of materials being conveyed, paddles can be furnished, spaced at intervals and set to partially oppose the forward flow. Paddles are adjustable and may be set at any angle to produce the desired degree of agitation. They are used for light or medium weight, fine, granular or flaky materials.

Multiple Ribbon Flight Conveyor Screws

This type of screw consists of two or more ribbon flights of different diameters and opposite hand, mounted one within the other on the same pipe or shaft by rigid supporting lugs. Material is moved forward by one flight and backward by the other, thereby including positive and thorough mixing.

Abrasion-Resistant Conveyor Screws

The particularly severe service encountered when conveying abrasive materials has prompted many attempts to overcome excessive wear on flights. Several successful methods have been developed.

Each of these methods offers specific advantages depending on the nature of the material handled and the application. For a careful analysis and recommendation, consult FMC Conveyor Equipment Division.

Hard surfacing by application of a special compound, by arc or torch, to the flight periphery or face, or both, provides an exceptionally hard surface at the points of greatest wear.

For severe applications, conveyors with high alumina ceramic tile bonded to the flight periphery or face are also available.

Corrosion-Resistant Conveyor Screws

Corrosion is manifested in so many different ways that no one choice of material will suit all requirements. To withstand the effects of corrosion encountered in many fields of industry, conveyor screws are fabricated of stainless steel, Monel metal, aluminum, and other materials.

Galvanizing and other coating methods have proved effective under mildly corrosive conditions. Vulcanized or bonded rubber covering of the entire conveyor is frequently satisfactory for resistance to extremely corrosive action.

Heat-Resistant Conveyor Screws

Conveyor screws for high temperature applications are made of many of the available heat-resistant alloys. Several of the stainless steels and other high-chrome alloys are particularly suitable for this service.

component description

Drive Shafts, End Shafts and Couplings

The conveyor drive shaft delivers the driving power, and is therefore carefully designed of quality steel of the proper characteristics to provide adequate torque, bending and shear strength, and with closely controlled tolerances for correct bearing clearances.

For conveyors of unusual length or for severely heavy loads, alloy steels, heat-treated high carbon steels or 3-bolt connections, are used.

Jig-drilled coupling bolt holes and accurately cut keyways contribute to ease of assembly.

The conveyor end shaft supports the last section of conveyor screw and is furnished with close tolerances for proper operation in end bearing. Coupling bolt holes are jig drilled for interchangeability and ease of assembly.

Conveyor couplings connect and space adjoining sections of conveyor screw and transmit rotation.

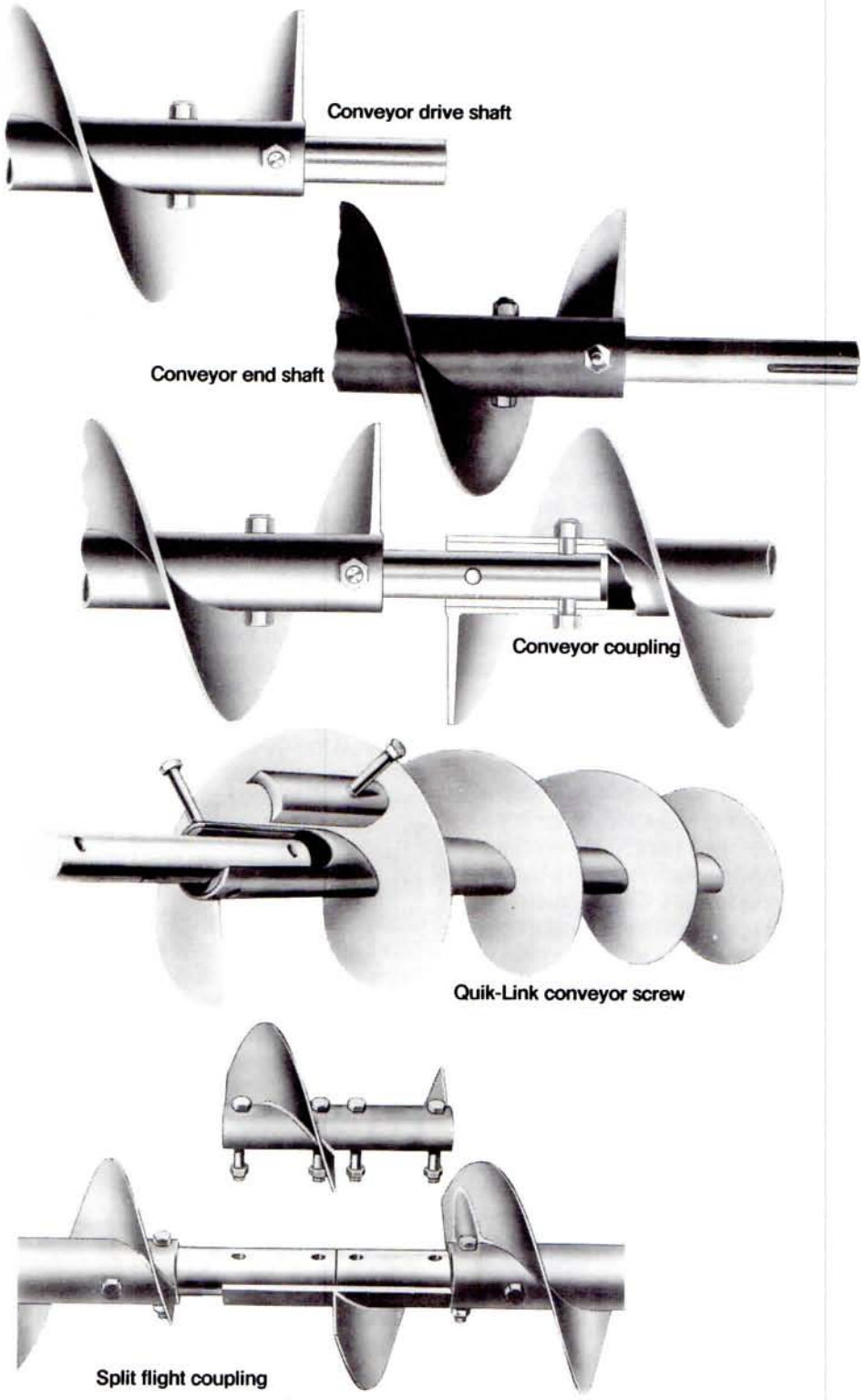
Carefully selected steels, with accurate heat-treating or hard surfacing when required, insure ample strength and resistance to wear for the kind of service specified.

For conveyors of unusual length or for severely heavy loads, alloy steels, heat-treated high carbon steels or 3-bolt connections are used.

Close tolerances on diameters and jig-drilled coupling bolt holes assure interchangeability and ease of assembly.

Quik-Link conveyor screws provide an easy means for the quick removal of a conveyor screw section and coupling with hanger without disturbing other components. Regular couplings are used with these screws.

Split flight couplings permit installing or removing individual conveyor screws without disturbing adjoining sections. With split flight couplings installed on both sides of each hanger, conveyor screws can be removed without disturbing the hangers. The Link-Belt split flight coupling is sturdily constructed and jig drilled for coupling bolts.



component description

Hangers

No. 216 hangers

No. 216 hangers have formed steel box frames of superior strength and rigidity and are excellent for heavy service. They are mounted within the conveyor trough. Mounting holes are slotted parallel with the conveyor to permit adjustment and alignment. These hangers are normally furnished with hard iron, babbitted, bronze, oil impregnated wood or molded fabric bearings, but can also be furnished with special bearings.

No. 216F hangers

No. 216F hangers are similar in construction to No. 216 hangers except they are designed to mount in a flared trough.

No. 220 hangers

No. 220 hangers are similar in construction to No. 226 hangers, except they are mounted on top of the trough flanges. Mounting holes are slotted parallel with the conveyor to provide adjustment and alignment. These hangers are normally furnished with hard iron, babbitted, bronze, oil impregnated wood or molded fabric bearings, but can also be furnished with special bearings.

No. 226 hangers

No. 226 hangers have a rigid, formed-steel box frame with clearance for passage of material in large volume. They are mounted within the conveyor trough. Mounting holes are slotted parallel with the conveyor to permit adjustment and alignment. These hangers are normally furnished with hard iron, babbitted, bronze, oil impregnated wood or molded fabric bearings, but can also be furnished with special bearings.

No. 270 ball bearing hangers

No. 270 ball bearing hangers have self-aligning ball bearings. The frame is a box-member top-bar with a pipe stem support for the bearing. The bearing is factory adjusted for the proper length from the top-bar and locked with a sealant and a lock nut. The frame is designed for mounting inside the trough and slotted mounting holes parallel to the conveyor permit adjustment and alignment.

No. 316 hangers

No. 316 hangers have formed steel frames of superior strength and rigidity and are excellent for heavy service. They are mounted within the conveyor trough, are self-adjusting and will accommodate operating variations which may exist between the conveyor screw and trough. Mounting holes are slotted parallel with the conveyor to permit adjustment and alignment. These hangers are normally furnished with hard iron, babbitted, bronze, oil impregnated wood or molded fabric bearings, but can also be furnished with special bearings.

No. 326 hangers

No. 326 hangers have a rigid, formed steel frame with clearance for passage of material in large volume. They are mounted within the conveyor trough, are self-adjusting and will accommodate operating variations which may exist between the conveyor screw and the trough. Mounting holes are slotted parallel with the conveyor to permit adjustment and alignment. These hangers are normally furnished with hard iron, babbitted, bronze, oil impregnated wood or molded fabric bearings, but can also be furnished with special bearings.

component description

Trough End Plates

Trough end plates for either U-trough or flared trough are made of heavy gauge steel plate with the top flanged to support the trough cover. They are furnished with or without supporting feet.

Trough end plates can be made of stainless steel or nonferrous metals for corrosive or high temperature applications. They can also be furnished with protective coatings such as galvanizing.

They may be equipped with either sleeve, bolt, or roller bearing flange blocks, or with the addition of a mounting shelf, pillow block bearings.

Drive Shaft Trough Ends are of the double ball bearing and double roller bearing types. Each consists of a rigid shaft, operating in double bearings and designed to accommodate both radial and thrust loads. The radial or overhung load is usually a chain drive connected to a power source. Since the bearings will also accept thrust loads in either direction, the need for auxiliary thrusts is eliminated.

Drive shaft trough ends with double ball bearings consist of double ball bearing flanged blocks rigidly attached to heavy steel plate trough ends for either U-troughs or flared troughs. The gray iron housings are of one-piece construction and are precision machined for accurate alignment. Effective seals are provided in the flanged blocks to exclude dirt and moisture and retain lubricant.

Drive shaft trough ends with double roller bearings consist of heavy duty double roller bearing flanged blocks mounted by means of machined surfaces into extra heavy steel plate trough ends for either U-troughs or flared troughs. The gray iron housings are accurately machined and fitted with roller bearings of high radial and thrust capacity. The blocks have effective seals and are arranged for easy lubrication.

Countershaft trough ends are used on screw conveyors where application of right angle drives is necessary due to space limitations, interference of adjoining equipment or for better service and maintenance accessibility.

Application of countershaft trough ends permits drive installations alongside, above or below the conveyor and permits using horizontal drives for inclined conveyors. A common drive for two conveyors intersecting at right angles, or a battery of parallel conveyors driven from a common source, can be readily arranged.

Trough end with feet

Trough end without feet

Tubular trough end

Flared trough end

Trough end with double roller bearing

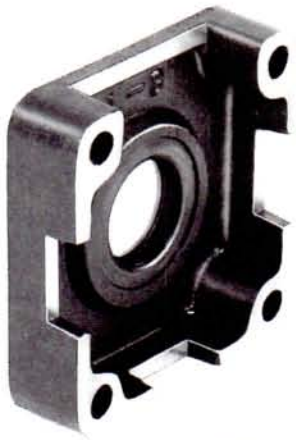
component description

Seal Glands, Trough End Seals and Trough End Bearings

Seal glands and trough end seals are used to provide additional bearing protection against dust or fumes from within the trough and prevent entrance, along the shaft, of dirt, moisture or lubricant.

The trough end seal housings are made of gray iron and are designed for assembly between babbitted, bronze or ball bearing flanged blocks and the trough end plates. They can be provided with lip-type seals for effective protection for or against the materials being handled, with felt seals when handling dusty materials, or with waste packing when handling abrasive materials.

Seal glands consist of gray iron, split flanges into which packing materials are compressed against machined steel collars. They are used internally on all trough ends except the outboard bearing type on which they are externally mounted. These seals provide maximum protection for or against the materials being handled.



Trough end seal

Internal mounting seal gland

Trough end bearings

Babbitted and bronze bearing flanged blocks are made with one-piece gray iron housings. Babbitted bearing blocks are for general use where loads and speeds are moderate. Bronze bearing blocks are used where heavy bearing pressures, impact loads or temperature conditions are involved.

Ball bearing flanged blocks consist of single row, deep groove, self-aligning ball bearings, which are effectively sealed, mounted in one-piece gray iron housings. Spring locking collars with two set screws hold the bearings firmly on the shafts.

Ball bearing Flanged block

Troughs

The trough not only confines and guides the flow of material, but also serves as the housing in which all operating components are supported and held together in their proper functional relationship. Accuracy in manufacturing and inherent strength to maintain this accuracy are therefore, essential.

Link-Belt designs, and manufacturing methods, are constantly being improved to provide these qualities to the fullest extent while at the same time affecting economies in weight and space requirements.

Corrosive or high temperature applications may require the specific qualities that make stainless steel and non-ferrous metals well adapted to these services. In general, any type of trough that can be fabricated of mild steel can also be made of stainless steel or aluminum, brass, bronze, copper, Monel metal, nickel, etc. For resistance to corrosion there are numerous protective coatings that are applied to steel troughs and covers. Galvanizing, tinning, chrome plating, etc., are all effective for certain applications. Vulcanized or bonded rubber coatings resist abrasion and corrosion.

Flanged trough - By forming the top flanges integrally with the trough sides from a single steel sheet, adequate strength and rigidity is obtained without superfluous bulk or weight. Steel connecting flanges, securely welded at each end in special welding fixtures to assure square, true ends, facilitate assembly, insure proper alignment and preserve the contour of the trough.

Flanged trough

Angle Flanged trough - This trough is identical in construction to the flanged trough, except that top flanges are obtained by securely welding structural steel angles to the trough.

Angle flanged trough

Flared trough - This trough is of conventional construction except that trough sides are flared outward to afford a wider top opening. This results in improved feed and conveying action with sticky materials or materials which are not entirely free flowing. It is customarily used with ribbon flight conveyor screws.

Flared trough

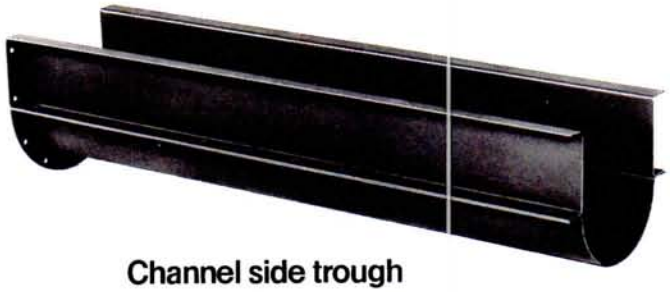
component description

Troughs

Drop bottom troughs are equipped with a drop bottom usually hinged, held in place by spring clamps of various types for ready access to trough interior, conveyor screws and hangers.

This design facilitates quick, thorough, and frequent cleaning of the trough, screw and other parts and is particularly useful to combat infestation and promote sanitation.

Drop bottom trough



Channel side trough

Channel side troughs are made with separate detachable trough bottoms, bolted or clamped to formed or rolled steel channels. The channels may be of any reasonable length to span widely spaced supports. Trough bottoms are made in lengths up to 12 feet.

This trough is occasionally selected for ease of replacement of trough bottoms subject to unusually severe abrasive or corrosive wear.

Trough Support

Supporting feet are of formed steel for use with end flanges and provide a convenient means of aligning and supporting conveyors from floors, and supporting structures.

Support feet

Supporting saddles are used when location of support points does not coincide with the spacing of joint flanges or when troughs with butt strapped connections are used.

Support saddle

Trough Covers

Covers are used for protection of operating personnel, dust control or protection for or against the material being handled. When required, protective seals can be furnished.

Plain covers consist of flat steel sheets and can be furnished with spring clamps, screw clamps or bolts.

Semiflanged covers are flanged 30 degrees along the sides and provided with spring clamps attached to the top side of the cover. These covers can also be furnished with screw clamps or bolts.

Flanged covers have right angle flanges along the sides to provide a stiffer cover for more convenient handling. They are normally attached to the trough with screw clamps or bolts.

Hip Roof covers are peaked to form a longitudinal ridge. They are normally furnished for use in outdoor applications because of their ability to shed water.

Shrouds are used in U-trough sections of screw feeders to decrease the clearance between the cover and feeder screw to obtain proper feed regulation.

between the covers and troughs. Covers are made in three general types: plain, semiflanged and flanged.

Plain Cover

Semiflanged Cover

Flanged Cover

Shroud

component description

Trough Discharge Spouts and Gates

Discharge spouts and gates afford the means for discharging material from the trough and for connection to succeeding equipment to which material is delivered. Gates provide for selective control of multiple spouts.

All spouts and gates are of welded steel construction with connecting flanges punched with accurately spaced holes for interchangeability and ease of assembly.

Spouts and gates can be fabricated of stainless steel and nonferrous metals. Spouts of special design can be furnished to accommodate unusual conditions.

Plain discharge openings are cut in the bottom of the trough at the desired location to provide free discharge of material. They are used for delivering to open or closed storage or similar applications.

Discharge Spouts are welded in place when furnished with a complete conveyor. They are furnished in thicknesses proportioned for the size and thickness of trough.

Flush end discharge spouts are furnished welded in place on flanged or angle flanged trough. They are furnished in thicknesses proportioned for the size and thickness of the trough.

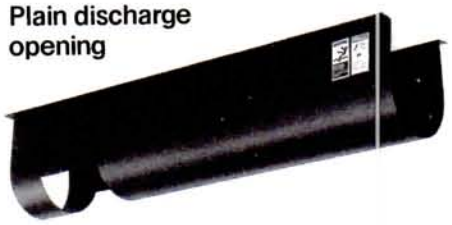
Hand Slide Gates are made to attach to discharge spouts and can be operated from any one of the four sides, provided there is sufficient clearance for the gate in its open position.

Rack and Pinion slide gates have cut tooth racks welded to the slide plates and actuated by cut tooth pinions mounted on pinion shafts operated by hand wheels or chain wheels. These are available with either flat slide plates or curved slide plates.

Air Operated gates are high quality units designed for low-friction performance in applications requiring frequent gate operation. These gates are built to accept a flange-faced air cylinder and have a roller-mounted slide plate operating in a formed steel housing. The cylinder can be furnished with the gate or supplied by the user for field installation. No air piping or controls are provided with these gates.

Slide gates, either hand or rack and pinion operated, may be installed in practically all applications for operation either parallel or at right angles to the conveyor axis. Rack and pinion operated gates may be furnished with chain wheels and chains for remote control. Pinion shafts may be extended to accommodate various operating arrangements.

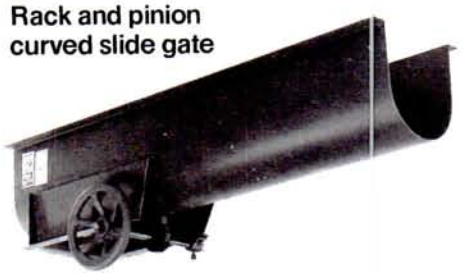
Plain discharge opening



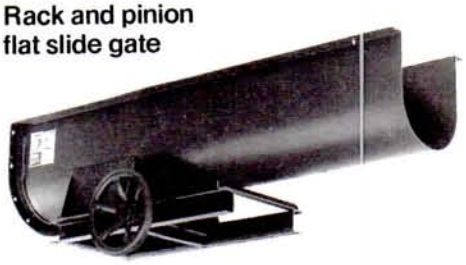
Discharge Spout

Flush end discharge spout

Rack and pinion curved slide gate



Rack and pinion flat slide gate



Technical Data

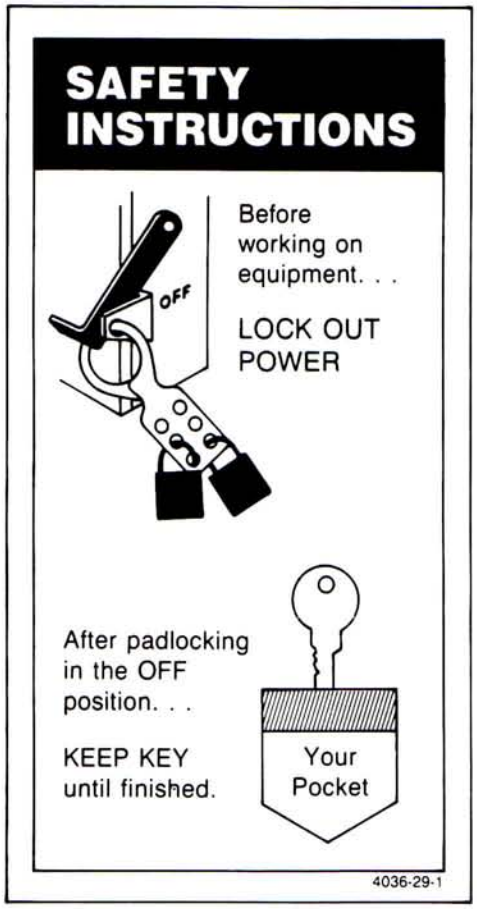
The Link-Belt screw conveyor layout, engineering and component selection information in this section is provided to assist you in the selection of the proper conveyor components for your particular material handling requirement. It has been compiled during the many years of experience designing numerous and varied screw conveyor installations, and includes detailed information on all Link-Belt standard screw conveyor components and accessories.

The data and formulas presented permit easy selection of the necessary components for handling materials under normal operating conditions by horizontal screw conveyors and screw feeders.

Where unusual applications or severe operating conditions are a factor or where there is doubt concerning the correct selection, contact FMC Conveyor Equipment Division, Tupelo, MS to assist you with additional information.

For prompt delivery, many of these components are carried in inventory at our authorized FMC Stocking Distributor locations and at our manufacturing facility in Tupelo, Mississippi.

Portions of Engineering and Component Selection sections are reproduced from Conveyor Equipment Manufacturers Association CEMA books 300 and 350. CEMA Book 350 contains comprehensive screw conveyor reference material. Book 300 contains screw conveyor dimensional standards.



CAUTION: Link-Belt Screw Conveyors and components must be installed, operated and maintained in accordance with accompanying FMC Service Instructions. Failure to follow these instructions can result in serious personal injury, property damage or both.

FMC Service Instructions accompany the shipment of equipment. If additional copies of Service Instructions are required, they are available free of charge from FMC Corporation, Conveyor Equipment Division, Box 1370, Tupelo, Mississippi 38802.

layout information

Layout Data

Use the conveyor layout on page 22 when selecting components. This layout is based on using regular, or odd length screws and troughs at the tail end of the conveyor and regular length screws and troughs for the drive and intermediate sections. Hangers are located at the trough joints.

The drive shafts that provide a nominal clearance between the ends of the conveyor screws and the trough end are designated as Type A shafts.

The drive and tail end shafts that are long enough to permit a clearance between the ends of the conveyor screws and the trough ends equal to approximately one-half the hanger bearing length are designated as Type B shafts.

Conveyor screws • Regular and half length conveyor screws, listed in Table 1 on page 22, should be used to obtain the required total screw length. The face of the screw, which moves the material being conveyed, is free of lugs for unimpeded flow. To maintain this condition , do not reverse rotation without turning the conveyor screws end for end, or conversely, do not turn the conveyor screws end for end without reversing rotation. Conveyor screws for reversible operation can be furnished for specific requirements. Flighting should be omitted over the last discharge opening. Flight ends at hanger locations should be set opposite to each other for continuous flow of material across the hanger space.

Selection of hand of screw • Refer to Figure A for selection of right or left hand conveyor screws. This drawing indicates the hand of conveyor screw to use when direction of rotation and material travel are known. If the edge of the flight on the near side of the conveyor screw slopes downward to the right, the conveyor screw is right hand, and if it slopes downward to the left, the conveyor screw is left hand.

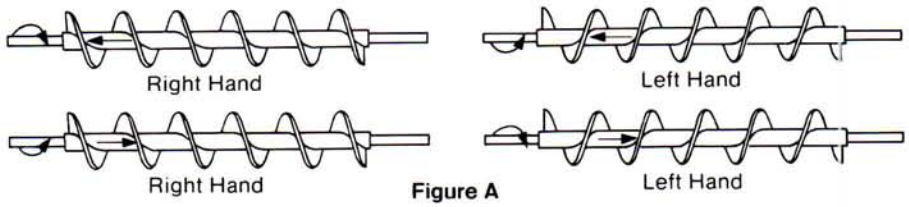


Figure A

Screw Conveyors

Screw conveyors are made with either helicoid or sectional flighting of various thicknesses in a wide range of sizes in both right-hand and left-hand assemblies. The conveyor screws and troughs are made in regular lengths, but can also be furnished in odd lengths to suit requirements.

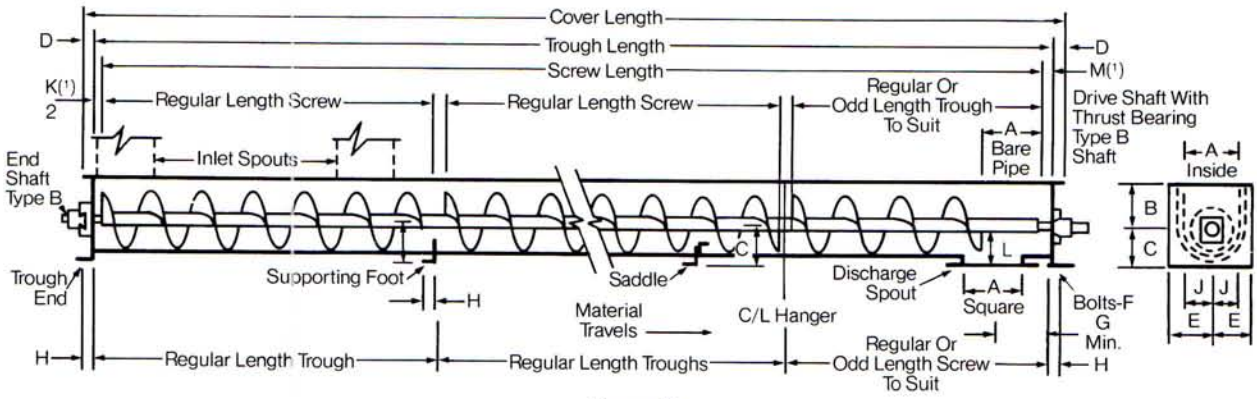


Figure B

Table 1 Layout Using No. 216, 220, 226, 270, 316, or 326 Hangers

Screw Dia.	Shaft and Coupling, Dia.	Conveyor Screw				Conveyor Trough		A	B	C	D	E	F (2)	G	H	J (2)	K	L	M(1)			
		Regular Length		Half Length															Steel Plate Trough End		Drive Shaft Trough End	
		Screw Length	Hanger Centers	Screw Length	Hanger Centers	Reg. Length	Half Length												Plain Drive Shaft	Drive Shaft With Bronze Thrust Bearing	Ball Bearing	Roller Bearing
Inches		Feet and Inches						Inches														
4	1	9-10½	10-0	4-10½	5-0	10-0	5-0	5	3⅜	4⅝	1½	3⅞	⅜	6	1	2⅞	1½	3¾	¾	—	—	—
6	1½	9-10	10-0	4-10	5-0	10-0	5-0	7	4½	5⅝	1½	4⅞	⅜	7½	1	4 1/16	2	5	1	1	1	1
9	1½	9-10	10-0	4-10	5-0	10-0	5-0	10	6⅛	7⅞	1⅝	6⅞	½	10	1½	4 11/16	2	7⅛	1	1	1	1
	2	9-10	10-0	4-10	5-0	10-0	5-0	10	6⅛	7⅞	1⅝	6⅞	½	10	1½	4 11/16	2	7⅛	1	1	1	1
10	1½	9-10	10-0	4-10	5-0	10-0	5-0	11	6⅜	8⅞	1¾	7⅜	½	11	1¾	4¾	2	7⅞	1	1	1	1
	2	9-10	10-0	4-10	5-0	10-0	5-0	11	6⅜	8⅞	1¾	7⅜	½	11	1¾	4¾	2	7⅞	1	1	1	1
12	2	11-10	12-0	5-10	6-0	12-0	6-0	13	7¾	9⅝	2	8⅝	⅝	12½	1⅝	6⅛	2	8⅞	1	1	1	1
	2 7/16	11-9	12-0	5-9	6-0	12-0	6-0	13	7¾	9⅝	2	8⅝	⅝	12½	1⅝	6⅛	3	8⅞	1½	1½	1½	1½
	3	11-9	12-0	5-9	6-0	12-0	6-0	13	7¾	9⅝	2	8⅝	⅝	12½	1⅝	6⅛	3	8⅞	1½	1½	1½	1½
14	2 7/16	11-9	12-0	5-9	6-0	12-0	6-0	15	9¼	10⅞	2	9⅝	⅝	13½	1⅝	6¾	3	10⅛	1½	1½	1½	1½
	3	11-9	12-0	5-9	6-0	12-0	6-0	15	9¼	10⅞	2	9⅝	⅝	13½	1⅝	6¾	3	10⅛	1½	1½	1½	1½
16	3	11-9	12-0	5-9	6-0	12-0	6-0	17	10⅝	12	2½	10⅝	⅝	14½	2	7 7/16	3	11⅛	1½	1½	1½	1½
18	3	11-9	12-0	5-9	6-0	12-0	6-0	19	12⅛	13⅜	2½	12⅛	⅝	16½	2	8	3	12⅜	1½	1½	1½	1½
	3 7/16	11-8	12-0	5-8	6-0	12-0	6-0	19	12⅛	13⅜	2½	12⅛	⅝	16½	2	8	4	12⅜	2	2	2	2
20	3	11-9	12-0	5-9	6-0	12-0	6-0	21	13½	15	2½	13⅛	¾	17½	2¼	9⅝	3	13⅜	1½	1½	1½	1½
	3 7/16	11-8	12-0	5-8	6-0	12-0	6-0	21	13½	15	2½	13⅛	¾	17½	2¼	9⅝	4	13⅜	2	2	2	2
24	3 7/16	11-8	12-0	5-8	6-0	12-0	6-0	25	16½	18⅛	2½	15⅛	¾	20	2½	10	4	15⅜	2	2	2	2

(1) Varies slightly when drive shaft assemblies with thrust provisions are provided.
(2) Dimensions same for trough ends, supporting feet and saddles.

layout information

Hangers • Hangers are located between conveyor screw sections. No. 216, 220, 226, 270, 316 and 326 hangers are located at trough joints in Figure B, page 22. All hangers should clear inlet and discharge openings.

Trough ends • The drive shaft or end shaft, depending on the direction of material travel, should have a thrust bearing to maintain clearance between the conveyor screws and hangers, and the conveyor screws and trough ends. This prevents excessive wear of operating parts and reduces power consumption. The preferred location for the thrust bearing is at the end of the conveyor, because the conveyor pipes and couplings will then be in tension during operation.

Drive shaft trough ends of either the double ball bearing or double roller bearing type will accommodate radial loads and thrust loads in either direction. The radial or overhung load usually consists of a shaft-mounted speed reducer drive or a chain drive connected to a power source.

Plain trough ends require auxiliary end thrust provision. Depending upon the direction of the thrust, either the drive or end shaft should have a bronze thrust bearing.

Seals • Trough end seals are used for additional protection for or against the material being handled, or to protect and preserve the trough end bearings and shafts when handling abrasive or corrosive materials.

Troughs • Regular and half length troughs, listed in Table 1, page 22, should be used to obtain the required total trough length. Whenever possible, supporting feet should be used at the trough joints, otherwise, use saddles as needed. Supporting feet located at the ends of the conveyor will allow removal of the trough ends without disturbing trough alignment.

Covers • Covers are made with joints located at the hangers. Protective seals between the troughs and covers are easily applied when No. 216, 226, 270, 316, and 326 hangers are used. Inlet openings in the covers should clear hangers.

Drives • Drives should preferably be located at the discharge end of the conveyor in order to keep the conveyor screws and couplings in tension.

Assembly Bolts • Table 2 provides a guide to the quantities and sizes of bolts required to assemble a screw conveyor. Bolts are listed for each type of hanger, for each shroud, for each trough joint or trough end, and for 10 foot and 12 foot long sections of bolted cover.

Assembly bolts for No. 316 and No. 326 hangers are furnished with hanger assemblies.

Screw Conveyors

Many bulk materials are handled easily and efficiently in screw conveyors. However, to insure the best possible selection of components, it is recommended that consideration be given to the physical, chemical and handling characteristics of all materials.

The essential characteristics include size, flowability and abrasiveness of the materials. Other characteristics, such as contamination, corrosiveness, degradability, fluffiness, etc., may influence the handling and should be given consideration. Consideration should also be given to materials which may assume different characteristics under certain conditions of processing, atmosphere, age or storage. Many of the more common materials are classified in the Material Characteristics Table 4, pages 26 thru 34, and are given as a guide in selecting the proper components. Materials not appearing in the list can be classified by comparison with similar materials or by establishing a classification using the Material Classification Code Chart Table 3, page 25.

The delivery of material to a screw conveyor must be at a controlled and fairly uniform rate.

Table 2 Assembly Bolts for Installing Screw Conveyor Components

Screw Diameter, Inches	Bolt Sizes, Inches								
	No. 216 Hanger(1)	No. 220 Hanger(1)	No. 226 Hanger(1)	No. 270 Hanger(1)	Trough Assembly	Shroud	Trough End Assembly	Cover 10 Foot (4)	Cover 12 Foot (5)
4	—	—	¼ x ¾	—	⅜ x 1(2)	⅜ x ¾(1)	⅜ x 1(2)	⅜ x ¾	—
6	⅜ x 1	⅜ x 1	⅜ x 1	⅜ x 1	⅜ x 1(2)	⅜ x ¾(2)	⅜ x 1(2)	⅜ x ¾	—
9	⅜ x 1¼	⅜ x 1	⅜ x 1¼	⅜ x 1¼	⅜ x 1(3)	⅜ x 1(2)	⅜ x 1(3)	⅜ x ¾	—
10	⅜ x 1¼	⅜ x 1	⅜ x 1¼	⅜ x 1¼	⅜ x 1(3)	⅜ x 1(3)	⅜ x 1(3)	⅜ x ¾	—
12	½ x 1½	½ x 1¼	½ x 1½	½ x 1½	½ x 1¼(3)	⅜ x 1(3)	½ x 1¼(3)	—	⅜ x ¾
14	½ x 1½	½ x 1¼	½ x 1½	½ x 1½	½ x 1¼(10)	⅜ x 1(8)	½ x 1¼(10)	—	⅜ x ¾
16	½ x 1½	½ x 1¼	½ x 1½	½ x 1½	⅝ x 1¼(10)	⅜ x 1(7)	⅝ x 1¼(10)	—	⅜ x ¾
18	⅝ x 1¾	⅝ x 1½	⅝ x 1¾	⅝ x 1¾	⅝ x 1¼(4)	⅜ x 1(7)	⅝ x 1¼(4)	—	½ x 1
20	⅝ x 1¾	—	—	⅝ x 1¾	⅝ x 1¼(4)	⅜ x 1(8)	⅝ x 1¼(4)	—	½ x 1
24	⅝ x 1¾	—	—	⅝ x 1¾	⅝ x 1¼(5)	⅜ x 1(9)	⅝ x 1¼(5)	—	½ x 1

(1) Four bolts
(2) Six bolts
(3) Eight bolts
(4) Ten bolts
(5) Twelve bolts
(6) Fourteen bolts
(7) Sixteen bolts
(8) Eighteen bolts
(9) Twenty bolts
(10) Eight bolts for U-Trough & ten bolts for Flared Trough

Special applications
Occasionally the characteristics of the material being handled are such that other than conventional or regular equipment is required for the purpose, such as:

1. When the materials are extremely hot, the screws and troughs may be made of high temperature alloy metals.
2. If the materials are sticky or viscous, ribbon flight conveyor screws may be the choice. Furthermore, special coatings applied to the screws and troughs may also aid the flow of the material.
3. Extremely abrasive materials may require screws and troughs made of abrasion resistant metals or the screws may be provided with hard surfaced flights.
4. When the materials are corrosive, it may be desirable to make the conveyor screws and troughs of stainless steel, Monel metal, nickel, aluminum, etc.
5. If the materials are to be mixed or aerated, a conveyor screw of ribbon flights or cut flights, or one of these combined with paddles may be used to obtain the desired results.
6. Materials which are to be heated or cooled may require jacketed troughs arranged for circulating heating or cooling media.
7. Contaminable materials may require self-lubricated bearings and screw and trough construction which will eliminate pockets, cracks, etc. Such screws and troughs will prevent the accumulation of the material and facilitate easy cleaning.

How to select a horizontal screw conveyor
Consider the following factors when selecting a horizontal screw conveyor:

Kind and character of material being handled, such as: size, flowability, abrasiveness, etc.

Weight of material in pounds per cubic foot.

Maximum rate at which material is handled in cubic feet per hour.

Maximum size of lumps in inches, average size of material and percentage of lumps in total volume.

Length of conveyor in feet.

material classification

Preface to Material Table

The Material Characteristics Table 4 lists a wide range of bulk materials that can be handled in screw conveyors. The table shows in the first column the range of density that can be experienced in handling that material. The "as conveyed" density is not specifically shown but is often assumed to be at or near the minimum.

The next column shows the material code number. This consists of the average density, the usual size designation, the flowability number, the abrasive number followed by those material characteristics which are termed conveyability hazards.

The component series column refers to selection of conveyor components as used in Tables 9, 10, 11, & 12 on pages 39 and 40.

A very fine 100 mesh material with an average density of 50 lbs. per cubic foot that has average flowability and is moderately abrasive would have a material code $50A_{100}36$. If this material was very dusty and mildly corrosive the number would be $50\ A_{100}36LT$.

The Material Factor is used in the horsepower formula to determine the horsepower to operate a horizontal screw conveyor. The calculation of horsepower is described on page 41.

The Material Characteristics Table is a guide only. The material code, and the material factor Fm are based on experience. A specific material sample may have properties that vary from those shown in the table. The range of densities will also vary depending on moisture content as well as its source.

Table 3 Material Classification Code Chart

Major Class	Material Characteristics Included		Code Designation
Density	Bulk Density, Loose		Actual lbs/ft³
Size	Very Fine	No. 200 Sieve (.0029") And Under	A_{200}
		No. 100 Sieve (.0059") And Under	A_{100}
		No. 40 Sieve (.016") And Under	A_{40}
	Fine	No. 6 Sieve (.132") And Under	B_6
	Granular	½" And Under	$C_{½}$
	Granular	3" And Under	D_3
	(1)Lumpy	Over 3" To Be Special X = Actual Maximum Size	D_x
	Irregular	Stringy, Fibrous, Cylindrical, Slabs, etc.	E
Flowability	Very Free Flowing—Flow Function > 10		1
	Free Flowing—Flow Function > 4 But < 10		2
	Average Flowability—Flow Function > 2 But < 4		3
	Sluggish—Flow Function < 2		4
Abrasiveness	Mildly Abrasive—Index 1-17		5
	Moderately Abrasive—Index 18-67		6
	Extremely Abrasive— Index 68—416		7
Miscellaneous Properties Or Hazards	Builds Up and Hardens		F
	Generates Static Electricity		G
	Decomposes—Deteriorates in Storage		H
	Flammability		J
	Becomes Plastic or Tends to Soften		K
	Very Dusty		L
	Aerates and Becomes Fluid		M
	Explosiveness		N
	Stickiness-Adhesion		O
	Contaminable, Affecting Use		P
	Degradable, Affecting Use		Q
	Gives Off Harmful or Toxic Gas or Fumes		R
	Highly Corrosive		S
	Mildly Corrosive		T
	Hygroscopic		U
	Interlocks, Mats or Agglomerates		V
	Oils Present		W
	Packs Under Pressure		X
	Very Light and Fluffy—May Be Windswept		Y
	Elevated Temperature		Z

(1) Refer to page 36 for lump size limitations.

Table 4 Material Characteristics

Material	Weight lbs/ft³	Material Code	Component Series	Mat'l. Factor Fm
Adipic Acid	45	$45A_{100}35$	2B	.5
Alfalfa Meal	14-22	$18B_{6}45WY$	2D	.6
Alfalfa Pellets	41-43	$42C_{½}25$	2D	.5
Alfalfa Seed	10-15	$13B_{6}15N$	1A-1B-1C	.4
Almonds, Broken	27-30	$29C_{½}35Q$	2D	.9
Almonds, Whole Shelled	28-30	$29C_{½}35Q$	2D	.9
Alum, Fine	45-50	$48B_{6}35U$	1A-1B-1C	.6
Alum, Lumpy	50-60	$55B_{6}25$	2A-2B	1.4
Alumina	55-65	$58B_{6}27MY$	3D	1.8
Alumina Fines	35	$35A_{100}27MY$	3D	1.6
Alumina Sized or Briquette	65	$65D_{3}37$	3D	2.0
Aluminate Gel (Aluminate Hydroxide)	45	$45B_{6}35$	2D	1.7
Aluminum Chips, Dry	7-15	11E45V	2D	1.2
Aluminum Chips, Oily	7-15	11E45V	2D	.8
Aluminum Hydrate	13-20	$17C_{½}35$	1A-1B-1C	1.4
Aluminum Ore (See Bauxite)	—	—	—	—
Aluminum Oxide	60-120	$90A_{100}17M$	3D	1.8
Aluminum Silicate (Andalusite)	49	$49C_{½}35S$	3A-3B	.8
Aluminum Sulfate	45-58	$52C_{½}25$	1A-1B-1C	1.0
Ammonium Chloride, Crystalline	45-52	$49A_{100}45FRS$	3A-3B	.7
Ammonium Nitrate	45-62	$54A_{40}35NTU$	3D	1.3
Ammonium Sulfate	45-58	$52C_{½}35FOTU$	1A-1B-1C	1.0
Antimony Powder	—	$A_{100}35$	2D	1.6
Apple Pomace, Dry	15	$15C_{½}45Y$	2D	1.0
Arsenate of Lead (See Lead Arsenate)	—	—	—	—
Arsentic Oxide (Arsenolite)(1)	100-120	$110A_{100}35R$	—	—
Arsentic Pulverized	30	$30A_{100}25R$	2D	.8
Asbestos-Rock (Ore)	81	$81D_{3}37R$	3D	1.2
Asbestos-Shredded	20-40	30E46XY	2D	1.0
Ash, Black Ground	105	$105B_{6}35$	1A-1B-1C	2.0
Ashes, Coal, Dry—½"	35-45	$40C_{½}46TY$	3D	3.0
Ashes, Coal, Dry—3"	35-40	$38D_{3}46T$	3D	2.5
Ashes, Coal, Wet—½"	45-50	$48C_{½}46T$	3D	3.0
Ashes, Coal, Wet—3"	45-50	$48D_{3}46T$	3D	4.0
Ashes, Fly (See Fly Ash)	—	—	—	—
Ashphalt, Crushed—½"	45	$45C_{½}45$	1A-1B-1C	2.0
Bagasse	7-10	9E45RVXY	2A-2B-2C	1.5
Bakelite, Fine	30-45	$38B_{6}25$	1A-1B-1C	1.4
Baking Powder	40-55	$48A_{100}35$	1B	.6
Baking Soda (Sodium Bicarbonate)	40-55	$48A_{100}25$	1B	.6
Barite (Barium Sulfate) + ½" —3"	120-180	$150D_{3}36$	3D	2.6
Barite, Powder	120-180	$150A_{100}35X$	2D	2.0
Barium Carbonate	72	$72A_{100}45R$	2D	1.6
Bark, Wood, Refuse	10-20	15E45TVY	3D	2.0
Barley, Fine, Ground	24-38	$31B_{6}35$	1A-1B-1C	.4
Barley, Malted	31	$31C_{½}35$	1A-1B-1C	.4
Barley, Meal	28	$28C_{½}35$	1A-1B-1C	.4
Barley, Whole	36-48	$42B_{6}25N$	1A-1B-1C	.5
Basalt	80-105	$93B_{6}27$	3D	1.8
Bauxite, Dry, Ground	68	$68B_{6}25$	2D	1.8
Bauxite, Crushed—3"	75-85	$80D_{3}36$	3D	2.5
Beans, Castor, Meal	35-40	$38B_{6}35W$	1A-1B-1C	.8
Beans, Castor, Whole Shelled	36	$36C_{½}15W$	1A-1B-1C	.5
Beans, Navy, Dry	48	$48C_{½}15$	1A-1B-1C	.5
Beans, Navy, Steeped	60	$60C_{½}25$	1A-1B-1C	.8

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Table 4 (cont'd) Material Characteristics

Material	Weight lbs/ft³	Material Code	Component Series	Mat'l. Factor Fm
Bentonite, Crude	34-40	$37D_3 45X$	2D	1.2
Bentonite, —100 Mesh	50-60	$55A_{100} 25MXY$	2D	.7
Benzene Hexachloride	56	$56A_{100} 45R$	1A-1B-1C	.6
Bicarbonate of Soda (Baking Soda)	—	—	1B	.6
Blood, Dried	35-45	$40D_3 45U$	2D	2.0
Blood, Ground, Dried	30	$30A_{100} 35U$	1A-1B	1.0
Bone Ash (Tricalcium Phosphate)	40-50	$45A_{100} 45$	1A-1B	1.6
Boneblack	20-25	$23A_{100} 25Y$	1A-1B	1.5
Bonechar	27-40	$34B_6 35$	1A-1B	1.6
Bonemeal	50-60	$55B_6 35$	2D	1.7
Bones, Whole(1)	35-50	43E45V	2D	3.0
Bones, Crushed	35-50	$43D_3 45$	2D	2.0
Bones, Ground	50	$50B_6 35$	2D	1.7
Borate of Lime	60	$60A_{100} 35$	1A-1B-1C	.6
Borax. Fine	45-55	$50B_6 25T$	3D	.7
Borax Screening — ½"	55-60	$58C_{½} 35$	2D	1.5
Borax, 1½"-2" Lump	55-60	$58D_3 35$	2D	1.8
Borax, 2"-3" Lump	60-70	$65D_3 35$	2D	2.0
Boric Acid, Fine	55	$55B_6 25T$	3D	.8
Boron	75	$75A_{100} 37$	2D	1.0
Bran, Rice-Rye-Wheat	16-20	$18B_6 35NY$	1A-1B-1C	.5
Braunite (Manganese Oxide)	120	$120A_{100} 36$	2D	2.0
Bread Crumbs	20-25	$23B_6 35PQ$	1A-1B-1C	.6
Brewer's Grain, spent, dry	14-30	$22C_{½} 45$	1A-1B-1C	.5
Brewer's Grain, spent, wet	55-60	$58C_{½} 45T$	2A-2B	.8
Brick, Ground — ⅛"	100-120	$110B_6 37$	3D	2.2
Bronze Chips	30-50	$40B_6 45$	2D	2.0
Buckwheat	37-42	$40B_6 25N$	1A-1B-1C	.4
Calcine, Flour	75-85	$80A_{100} 35$	1A-1B-1C	.7
Calcium Carbide	70-90	$80D_3 25N$	2D	2.0
Calcium Carbonate (See Limestone)	—	—	—	—
Calcium Fluoride (See Fluorspar)	—	—	—	—
Calcium Hydrate (See Lime, Hydrated)	—	—	—	—
Calcium Hydroxide (See Lime, Hydrated)	—	—	—	—
Calcium Lactate	26-29	$28D_3 45QTR$	2A-2B	.6
Calcium Oxide (See Lime, unslaked)	—	—	—	—
Calcium Phosphate	40-50	$45A_{100} 45$	1A-1B-1C	1.6
Calcium Sulfate (See Gypsum)	—	—	—	—
Carbon, Activated, Dry, Fine(1)	—	—	—	—
Carbon Black, Pelleted(1)	—	—	—	—
Carbon Black, Powder(1)	—	—	—	—
Carborundum	100	$100D_3 27$	3D	3.0
Casein	36	$36B_6 35$	2D	1.6
Cashew Nuts	32-37	$35C_{½} 45$	2D	.7
Cast Iron, Chips	130-200	$165C_{½} 45$	2D	4.0
Caustic Soda	88	$88B_6 35RSU$	3D	1.8
Caustic Soda, Flakes	47	$47C_{½} 45RSUX$	3A-3B	1.5
Celite (See Diatomaceous Earth)	—	—	—	—
Cement, Clinker	75-95	$85D_3 36$	3D	1.8
Cement, Mortar	133	$133B_6 35Q$	3D	3.0
Cement, Portland	94	$94A_{100} 26M$	2D	1.4
Cement, Aerated (Portland)	60-75	$68A_{100} 16M$	2D	1.4

(1)Consult FMC

Table 4 (cont'd) Material Characteristics

Material	Weight lbs/ft³	Material Code	Component Series	Mat'l. Factor Fm
Cerrusite (See Lead Carbonate)	—	—	—	—
Chalk, Crushed	75-95	$85D_3 25$	2D	1.9
Chalk, Pulverized	67-75	$71A_{100} 25MXY$	2D	1.4
Charcoal, Ground	18-28	$23A_{100} 45$	2D	1.2
Charcoal, Lumps	18-28	$23D_3 45Q$	2D	1.4
Chocolate, Cake Pressed	40-45	$43D_3 25$	2B	1.5
Chrome Ore	125-140	$133D_3 36$	3D	2.5
Cinders, Blast Furnace	57	$57D_3 36T$	3D	1.9
Cinders, Coal	40	$40D_3 36T$	3D	1.8
Clay (See Bentonite, Diatomaceous Earth, Fuller's Earth, Kaolin & Marl)	—	—	—	—
Clay, Ceramic, Dry, Fines	60-80	$70A_{100} 35P$	1A-1B-1C	1.5
Clay, Calcined	80-100	$90B_6 36$	3D	2.4
Clay, Brick, Dry, Fines	100-120	$110C_{½} 36$	3D	2.0
Clay, Dry, Lumpy	60-75	$68D_3 35$	2D	1.8
Clinker, Cement (See Cement Clinker)	—	—	—	—
Clover Seed	45-48	$47B_6 25N$	1A-1B-1C	.4
Coal, Anthracite (River & Culm)	55-61	$60B_6 35TY$	2A-2B	1.0
Coal, Anthracite, Sized – ½"	49-61	$55C_{½} 25$	2A-2B	1.0
Coal, Bituminous, Mined	40-60	$50D_3 35LNXY$	1A-1B	.9
Coal, Bituminous, Mined, Sized	45-50	$48D_3 35QV$	1A-1B	1.0
Coal, Bituminous, Mined, Slack	43-50	$47C_{½} 45T$	2A-2B	.9
Coal, Lignite	37-45	$41D_3 35T$	2D	1.0
Cocoa Beans	30-45	$38C_{½} 25Q$	1A-1B	.5
Cocoa, Nibs	35	$35C_{½} 25$	2D	.5
Cocoa, Powdered	30-35	$33A_{100} 45XY$	1B	.9
Cocoanut, Shredded	20-22	21E45	2B	1.5
Coffee, Chaff	20	$20B_6 25MY$	1A-1B	1.0
Coffee, Green Bean	25-32	$29C_{½} 25PQ$	1A-1B	.5
Coffee, Ground, Dry	25	$25A_{40} 35P$	1A-1B	.6
Coffee, Ground, Wet	35-45	$40A_{40} 45X$	1A-1B	.6
Coffee, Roasted Bean	20-30	$25C_{½} 25PQ$	1B	.4
Coffee, Soluble	19	$19A_{40} 35PUY$	1B	.4
Coke, Breeze	25-35	$30C_{½} 37$	3D	1.2
Coke, Loose	23-35	$30D_7 37$	3D	1.2
Coke, Petrol, Calcined	35-45	$40D_7 37$	3D	1.3
Compost	30-50	$40D_7 45TV$	3A-3B	1.0
Concrete, Pre-Mix Dry	85-120	$103C_{½} 36U$	3D	3.0
Copper Ore	120-150	$135D_X 36$	3D	4.0
Copper Ore, Crushed	100-150	$125D_3 36$	3D	4.0
Copper Sulphate, (Bluestone)	75-95	$85C_{½} 35S$	2A-2B-2C	1.0
Copperas (See Ferrous Sulphate)	—	—	—	—
Copra, Cake Ground	40-45	$43B_6 45HW$	1A-1B-1C	.7
Copra, Cake, Lumpy	25-30	$28D_3 35HW$	2A-2B-2C	.8
Copra, Lumpy	22	22E35HW	2A-2B-2C	1.0
Copra, Meal	40-45	$42B_6 35HW$	2D	.7
Cork, Fine Ground	5-15	$10B_6 35JNY$	1A-1B-1C	.5
Cork, Granulated	12-15	$14C_{½} 35JY$	1A-1B-1C	.5
Corn, Cracked	40-50	$45B_6 25P$	1A-1B-1C	.7
Corn Cobs, Ground	17	$17C_{½} 25Y$	1A-1B-1C	.6
Corn Cobs, Whole(1)	12-15	14E35	2A-2B	—
Corn Ear(1)	56	56E35	2A-2B	—
Corn Germ	21	$21B_6 35PY$	1A-1B-1C	.4
Corn Grits	40-45	$43B_6 35P$	1A-1B-1C	.5
Cornmeal	32-40	$36B_6 35P$	1A-1B	.5
Corn Oil, Cake	25	$25D_7 45HW$	1A-1B	.6

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Table 4 (cont'd) Material Characteristics

Material	Weight lbs/ft³	Material Code	Component Series	Mat'l. Factor Fm
Corn Seed	45	$45C_{½}25PQ$	1A-1B-1C	.4
Corn Shelled	45	$45C_{½}25$	1A-1B-1C	.4
Corn Sugar	30-35	$33B_{6}35PU$	1B	1.0
Cottonseed, Cake, Crushed	40-45	$43C_{½}45HW$	1A-1B	1.0
Cottonseed, Cake, Lumpy	40-45	$43D_{7}45HW$	2A-2B	1.0
Cottonseed, Dry, Delinted	22-40	$31C_{½}25X$	1A-1B	.6
Cottonseed, Dry, Not Delinted	18-25	$22C_{½}45XY$	1A-1B	.9
Cottonseed, Flakes	20-25	$23C_{½}35HWY$	1A-1B	.8
Cottonseed, Hulls	12	$12B_{6}35Y$	1A-1B	.9
Cottonseed, Meal, Expeller	25-30	$28B_{6}45HW$	3A-3B	.5
Cottonseed, Meal, Extracted	35-40	$37B_{6}45HW$	1A-1B	.5
Cottonseed, Meats, Dry	40	$40B_{6}35HW$	1A-1B	.6
Cottonseed, Meats, Rolled	35-40	$38C_{½}45HW$	1A-1B	.6
Cracklings, Crushed	40-50	$45D_{3}45HW$	2A-2B-2C	1.3
Cryolite, Dust	75-90	$83A_{100}36L$	2D	2.0
Cryolite, Lumpy	90-110	$100D_{16}36$	2D	2.1
Cullet, Fine	80-120	$100C_{½}37$	3D	2.0
Cullet, Lump	80-120	$100D_{16}37$	3D	2.5
Culm (See Coal, Anthracite)	—	—	—	—
Cupric Sulphate (Copper Sulfate)	—	—	—	—
Detergent (See Soap Detergent)	—	—	—	—
Diatomaceous Earth	11-17	$14A_{40}36Y$	3D	1.6
Dicalcium Phosphate	40-50	$45A_{40}35$	1A-1B-1C	1.6
Disodium Phosphate	25-31	$28A_{40}35$	3D	.5
Distiller's Grain, Spent Dry	30	$30B_{6}35$	2D	.5
Distiller's Grain, Spent Wet	40-60	$50C_{½}45V$	3A-3B	.8
Dolomite, Crushed	80-100	$90C_{½}36$	2D	2.0
Dolomite, Lumpy	90-100	$95D_{X}36$	2D	2.0
Earth, Loam, Dry, Loose	76	$76C_{½}36$	2D	1.2
Ebonite, Crushed	63-70	$67C_{½}35$	1A-1B-1C	.8
Egg Powder	16	$16A_{40}35MPY$	1B	1.0
Epsom Salts (Magnesium Sulfate)	40-50	$45A_{40}35U$	1A-1B-1C	.8
Feldspar, Ground	65-80	$73A_{100}37$	2D	2.0
Feldspar, Lumps	90-100	$95D_{7}37$	2D	2.0
Feldspar, Powder	100	$100A_{200}36$	2D	2.0
Feldspar, Screenings	75-80	$78C_{½}37$	2D	2.0
Ferrous Sulfide — ½"	120-135	$128C_{½}26$	1A-1B-1C	2.0
Ferrous Sulfide — 100M	105-120	$113A_{100}36$	1A-1B-1C	2.0
Ferrous Sulphate	50-75	$63C_{½}35U$	2D	1.0
Fish Meal	35-40	$38C_{½}45HP$	1A-1B-1C	1.0
Fish Scrap	40-50	$45D_{7}45H$	2A-2B-2C	1.5
Flaxseed	43-45	$44B_{6}35X$	1A-1B-1C	.4
Flaxseed Cake (Linseed Cake)	48-50	$49D_{7}45W$	2A-2B	.7
Flaxseed Meal (Linseed Meal)	25-45	$35B_{6}45W$	1A-1B	.4
Four Wheat	33-40	$37A_{40}45LP$	1B	.6
Flue Dust, Basic Oxygen Furnace	45-60	$53A_{40}36LM$	3D	3.5
Flue Dust, Blast Furnace	110-125	$118A_{40}36$	3D	3.5
Flue Dust, Boiler H. Dry	30-45	$38A_{40}36LM$	3D	2.0
Fluorspar, Fine (Calcium Fluoride)	80-100	$90B_{6}36$	2D	2.0
Fluorspar, Lumps	90-110	$100D_{7}36$	2D	2.0
Flyash	30-45	$38A_{40}36M$	3D	2.0
Foundry Sand, Dry (See Sand)	—	—	—	—
Fuller's Earth, Dry, Raw	30-40	$35A_{40}25$	2D	2.0
Fuller's Earth, Oily, Spent	60-65	$63C_{½}45OW$	3D	2.0
Fuller's Earth, Calcined	40	$40A_{100}25$	3D	2.0
Galena (See Lead Sulfide)	—	—	—	—
Gelatine, Granulated	32	$32B_{6}35PU$	1B	.8

Table 4 (cont'd) Material Characteristics

Material	Weight lbs/ft³	Material Code	Component Series	Mat'l. Factor Fm
Gilsonite	37	$37C_{\frac{1}{2}}35$	3D	1.5
Glass, Batch	80-100	$90C_{\frac{1}{2}}37$	3D	2.5
Glue, Ground	40	$40B_{6}45U$	2D	1.7
Glue, Pearl	40	$40C_{\frac{1}{2}}35U$	1A-1B-1C	.5
Glue, Veg. Powdered	40	$40A_{40}45U$	1A-1B-1C	.6
Gluten, Meal	40	$40B_{6}35P$	1B	.6
Granite, Fine	80-90	$85C_{\frac{1}{2}}27$	3D	2.5
Grape Pomace	15-20	$18D_{3}45U$	2D	1.4
Graphite Flake	40	$40B_{6}25LP$	1A-1B-1C	.5
Graphite Flour	28	$28A_{100}35LMP$	1A-1B-1C	.5
Graphite Ore	65-75	$70D_{X}35L$	2D	1.0
Guano Dry(1)	70	$70C_{\frac{1}{2}}35$	3A-3B	2.0
Gypsum, Calcined	55-60	$58B_{6}35U$	2D	1.6
Gypsum, Calcined, Powdered	60-80	$70A_{100}35U$	2D	2.0
Gypsum Raw—1"	70-80	$75D_{3}25$	2D	2.0
Hay, Chopped(1)	8-12	$10C_{\frac{1}{2}}35JY$	2A-2B	1.6
Hexanedioic Acid (See Adipic Acid)	—	—	—	—
Hominy, Dry	35-50	$43C_{\frac{1}{2}}25D$	1A-1B-1C	.4
Hops, Spent, Dry	35	$35D_{3}35$	2A-2B-2C	1.0
Hops, Spent, Wet	50-55	$53D_{3}45V$	2A-2B	1.5
Ice, Crushed	35-45	$40D_{3}350$	2A-2B	.4
Ice, Flaked(1)	40-45	$43C_{\frac{1}{2}}350$	1B	.6
Ice, Cubes	33-35	$34D_{3}350$	1B	.4
Ice, Shell	33-35	$34D_{3}450$	1B	.4
Ilmenite Ore	140-160	$150D_{3}37$	3D	2.0
Iron Ore Concentrate	120-180	$150A_{40}37$	3D	2.2
Iron Oxide Pigment	25	$25A_{100}36LMP$	1A-1B-1C	1.0
Iron Oxide, Millscale	75	$75C_{\frac{1}{2}}36$	2D	1.6
Iron Pyrites (See Ferrous Sulfide)	—	—	—	—
Iron Sulphate (See Ferrous Sulfate)	—	—	—	—
Iron Sulfide (See Ferrous Sulfide)	—	—	—	—
Iron Vitriol (See Ferrous Sulfate)	—	—	—	—
Kafir (Corn)	40-45	$43C_{\frac{1}{2}}25$	3D	.5
Kaolin Clay	63	$63D_{3}25$	2D	2.0
Kaolin Clay-Tale	42-56	$49A_{40}35LMP$	2D	2.0
Kryalith (See Cryolite)	—	—	—	—
Lactose	32	$32A_{40}35PU$	1B	.6
Lamp Black (See Carbon Black)	—	—	—	—
Lead Arsenate	72	$72A_{40}35R$	1A-1B-1C	1.4
Lead Arsenite	72	$72A_{40}35R$	1A-1B-1C	1.4
Lead Carbonate	240-260	$250A_{40}35R$	2D	1.0
Lead Ore—⅛"	200-270	$235B_{6}35$	3D	1.4
Lead Ore—½"	180-230	$205C_{\frac{1}{2}}36$	3D	1.4
Lead Oxide (Red Lead) —100 Mesh	30-150	$90A_{100}35P$	2D	1.2
Lead Oxide (Red Lead) —200 Mesh	30-180	$105A_{200}35LP$	2D	1.2
Lead Sulphide—100 Mesh	240-260	$250A_{100}35R$	2D	—
Lignite (See Coal Lignite)	—	—	—	—
Limanite, Ore, Brown	120	$120C_{\frac{1}{2}}47$	3D	1.7
Lime, Ground, Unslaked	60-65	$63B_{6}35U$	1A-1B-1C	.6
Lime Hydrated	40	$40B_{6}35LM$	2D	.8
Lime, Hydrated, Pulverized	32-40	$36A_{40}35LM$	1A-1B	.6
Lime, Pebble	53-56	$55C_{\frac{1}{2}}25HU$	2A-2B	2.0
Limestone, Agricultural	68	$68B_{6}35$	2D	2.0
Limestone, Crushed	85-90	$88D_{x}36$	2D	2.0
Limestone, Dust	55-95	$75A_{40}46MY$	2D	1.6-2.0
Lindane (Benzene Hexachloride)	—	—	—	—
Linseed (See Flaxseed)	—	—	—	—

(1)Consult FMC

material classification

Table 4 (cont'd) Material Characteristics

Material	Weight lbs/ft³	Material Code	Component Series	Mat'l. Factor Fm
Litharge (Lead Oxide)	—	—	—	—
Lithopone	45-50	$48A_{325}35MR$	1A-1B	1.0
Maize (See Milo)	—	—	—	—
Malt, Dry, Ground	20-30	$25B_{6}35NP$	1A-1B-1C	.5
Malt, Meal	36-40	$38B_{6}25P$	1A-1B-1C	.4
Malt, Dry Whole	20-30	$25C_{½}35N$	1A-1B-1C	.5
Malt, Sprouts	13-15	$14C_{½}35P$	1A-1B-1C	.4
Magnesium Chloride (Magnesite)	33	$33C_{½}45$	1A-1B	1.0
Manganese Dioxide(1)	70-85	$78A_{100}35NRT$	2A-2B	1.5
Manganese Ore	125-140	$133D_{x}37$	3D	2.0
Manganese Oxide	120	$120A_{100}36$	2D	2.0
Manganese Sulfate	70	$70C_{½}37$	3D	2.4
Marble, Crushed	80-95	$88B_{6}37$	3D	2.0
Marl, (Clay)	80	$80D_{x}36$	2D	1.6
Meat, Ground	50-55	53E45HQTX	2A-2B	1.5
Meat, Scrap (W/bone)	40	40E46H	2D	1.5
Mica, Flakes	17-22	$20B_{6}16MY$	2D	1.0
Mica, Ground	13-15	$14B_{6}36$	2D	.9
Mica, Pulverized	13-15	$14A_{100}36M$	2D	1.0
Milk, Dried, Flake	5-6	$6B_{6}35PUY$	1B	.4
Milk, Malted	27-30	$29A_{40}45PX$	1B	.9
Milk, Powdered	20-45	$33B_{6}25PM$	1B	.5
Milk Sugar	32	$32A_{100}35PX$	1B	.6
Milk, Whole, Powdered	20-36	$28B_{6}35PUX$	1B	.5
Mill Scale (Steel)	120-125	123E46T	3D	3.0
Milo, Ground	32-36	$34B_{6}25$	1A-1B-1C	.5
Milo Maize (Kafir)	40-45	$43B_{6}15N$	1A-1B-1C	.4
Molybdenite Powder	107	$107B_{6}26$	2D	1.5
Monosodium Phosphate	50	$50B_{6}36$	2D	.6
Mortar, Wet(1)	150	150E46T	3D	3.0
Mustard Seed	45	$45B_{6}15N$	1A-1B-1C	.4
Naphthalene Flakes	45	$45B_{6}35$	1A-1B-1C	.7
Niacin (Nicotinic Acid)	35	$35A_{40}35P$	2D	.8
Oats	26	$26C_{½}25MN$	1A-1B-1C	.4
Oats, Crimped	19-26	$23C_{½}35$	1A-1B-1C	.5
Oats, Crushed	22	$22B_{6}45NY$	1A-1B-1C	.6
Oats, Flour	35	$35A_{100}35$	1A-1B-1C	.5
Oat Hulls	8-12	$10B_{6}35NY$	1A-1B-1C	.5
Oats, Rolled	19-24	$22C_{½}35NY$	1A-1B-1C	.6
Oleo Margarine (Margarine)	59	59E45HKPWX	2A-2B	.4
Orange Peel, Dry	15	15E45	2A-2B	1.5
Oxalic Acid Crystals—Ethane Diacid Crystals	60	$60B_{6}35QS$	1A-1B	1.0
Oyster Shells, Ground	50-60	$55C_{½}36T$	3D	1.6-2.0
Oyster Shells, Whole	80	$80D_{3}36TV$	3D	2.1-2.5
Paper Pulp (4% or less)	62	62E45	2A-2B	1.5
Paper Pulp (6% to 15%)	60-62	61E45	2A-2B	1.5
Paraffin Cake—½"	45	$45C_{¼}45K$	1A-1B	.6
Peanuts, Clean, in shell	15-20	$18D_{3}35Q$	2A-2B	.6
Peanut Meal	30	$30B_{6}35P$	1B	.6
Peanuts, Raw, Uncleaned (unshelled)	15-20	$18D_{3}36Q$	3D	.7
Peanuts, Shelled	35-45	$40C_{½}35Q$	1B	.4
Peas, Dried	45-50	$48C_{½}15NQ$	1A-1B-1C	.5
Perlite-Expanded	8-12	$10C_{¼}36$	2D	.6
Phosphate Acid Fertilizer	60	$60B_{6}25T$	2A-2B	1.4
Phosphate Disodium (See Sodium Phosphate)	—	—	—	—

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Table 4 (cont'd) Material Characteristics

Material	Weight lbs/ft³	Material Code	Component Series	Mat'l. Factor Fm
Phosphate Rock, Broken	75-85	$80D_x36$	2D	2.1
Phosphate Rock, Pulverized	60	$60B_636$	2D	1.7
Phosphate Sand	90-100	$95B_637$	3D	2.0
Plaster of Paris (See Gypsum)	—	—	—	—
Plumbago (See Graphite)	—	—	—	—
Polystyrene Beads	40	$40B_635PQ$	1B	.4
Polyvinyl, Chloride Powder	20-30	$25A_{100}45KT$	2B	1.0
Polyvinyl, Chloride Pellets	20-30	25E45KPQT	1B	.6
Polyethelene, Resin Pellets	30-35	$33C_{½}45Q$	1A-1B	.4
Potash (Muriate) Dry	70	$70B_637$	3D	2.0
Potash (Muriate) Mine Run	75	$75D_x37$	3D	2.2
Potassium Carbonate	51	$51B_636$	2D	1.0
Potassium Chloride Pellets	120-130	$125C_{½}25TU$	3D	1.6
Potassium Nitrate—½"	76	$76C_{½}16NT$	3D	1.2
Potassium Nitrate—⅛"	80	$80B_626NT$	3D	1.2
Potassium Sulfate	42-48	$45B_646X$	2D	1.0
Potato Flour	48	$48A_{200}35MNP$	1A-1B	.5
Pumice—⅛"	42-48	$45B_646$	3D	1.6
Pyrite, Pellets	120-130	$125C_{½}26$	3D	2.0
Quartz, —100 Mesh	70-80	$75A_{100}27$	3D	1.7
Quartz, —½"	80-90	$85C_{½}27$	3D	2.0
Rice, Bran	20	$20B_635NY$	1A-1B-1C	.4
Rice, Grits	42-45	$44B_635P$	1A-1B-1C	.4
Rice, Polished	30	$30C_{½}15P$	1A-1B-1C	.4
Rice, Hulled	45-49	$47C_{½}25P$	1A-1B-1C	.4
Rice, Hulls	20-21	$21B_635NY$	1A-1B-1C	.4
Rice, Rough	32-36	$34C_{½}35N$	1A-1B-1C	.6
Rosin—½"	65-68	$67C_{½}45Q$	1A-1B-1C	1.5
Rubber, Reclaimed Ground	23-50	$37C_{½}45$	1A-1B-1C	.8
Rubber, Pelleted	50-55	$53D_345$	2A-2B-2C	1.5
Rye	42-48	$45B_615N$	1A-1B-1C	.4
Rye Bran	15-20	$18B_635Y$	1A-1B-1C	.4
Rye Feed	33	$33B_635N$	1A-1B-1C	.5
Rye Meal	35-40	$38B_635$	1A-1B-1C	.5
Rye Middlings	42	$42B_635$	1A-1B	.5
Rye, Shorts	32-33	$33C_{½}35$	2A-2B	.5
Safflower, Cake	50	$50D_326$	2D	.6
Safflower, Meal	50	$50B_635$	1A-1B-1C	.6
Safflower Seed	45	$45B_615N$	1A-1B-1C	.4
Saffron (See Safflower)	—	—	—	—
Sal Animoniac (Ammonium Chloride)	—	—	—	—
Salt Cake, Dry Coarse	85	$85B_636TU$	3D	2.1
Salt Cake, Dry Pulverized	65-85	$75B_636TU$	3D	1.7
Salicylic Acid	29	$29B_637U$	3D	.6
Salt, Dry Coarse	45-60	$53C_{½}36TU$	3D	1.0
Salt, Dry Fine	70-80	$75B_636TU$	3D	1.7
Saltpeter— (See Potassium Nitrate)	—	—	—	—
Sand Dry Bank (Damp)	110-130	$120B_647$	3D	2.8
Sand Dry Bank (Dry)	90-110	$100B_637$	3D	1.7
Sand Dry Silica	90-100	$95B_627$	3D	2.0
Sand Foundry (Shake Out)	90-100	$95D_337Z$	3D	2.6
Sand (Resin Coated) Silica	104	$104B_627$	3D	2.0
Sand (Resin Coated) Zircon	115	$115A_{100}27$	3D	2.3
Sawdust, Dry	10-13	$12B_645UX$	1A-1B-1C	.7
Sea-Coal	65	$65B_636$	2D	1.0
Sesame Seed	27-41	$34B_626$	2D	.6

material classification

Table 4 (cont'd) Material Characteristics

Material	Weight lbs/ft³	Material Code	Component Series	Mat'l. Factor Fm
Shale, Crushed	85-90	$88C_{\frac{1}{2}}36$	2D	2.0
Shellac, Powdered or Granulated	31	$31B_{6}35P$	1B	.6
Silicon Dioxide (See Quartz)	—	—	—	—
Silica, Flour	80	$80A_{40}46$	2D	1.5
Silica Gel + ½"-3"	45	$45D_{3}37HKQU$	3D	2.0
Slag, Blast Furnace Crushed	130-180	$155D_{3}37Y$	3D	2.4
Slag, Furnace Granular, Dry	60-65	$63C_{\frac{1}{2}}37$	3D	2.2
Slate, Crushed, −½"	80-90	$85C_{\frac{1}{2}}36$	2D	2.0
Slate, Ground, −⅛"	82-85	$84B_{6}36$	2D	1.6
Sludge, Sewage, Dried	40-50	45E47TW	3D	.8
Sludge, Sewage, Dry Ground	45-55	50B46S	2D	.8
Soap, Beads or Granules	15-35	$25B_{6}35Q$	1A-1B-1C	.6
Soap, Chips	15-25	$20C_{\frac{1}{2}}35Q$	1A-1B-1C	.6
Soap Detergent	15-50	$33B_{6}35FQ$	1A-1B-1C	.8
Soap, Flakes	5-15	$10B_{6}35QXY$	1A-1B-1C	.6
Soap, Powder	20-25	$23B_{6}25X$	1A-1B-1C	.9
Soapstone, Talc, Fine	40-50	$45A_{200}45XY$	1A-1B-1C	2.0
Soda Ash, Heavy	55-65	$60B_{6}36$	2D	1.0
Soda Ash, Light	20-35	$28A_{40}36Y$	2D	.8
Sodium Aluminate, Ground	72	$72B_{6}36$	2D	1.0
Sodium Aluminum Fluoride (See Kryolite)	—	—	—	—
Sodium Aluminum Sulphate(1)	75	$75A_{100}36$	2D	1.0
Sodium Bentonite (See Bentonite)	—	—	—	—
Sodium Bicarbonate (See Baking Soda)	—	—	—	—
Sodium Chloride (See Salt)	—	—	—	—
Sodium Carbonate (See Soda Ash)	—	—	—	—
Sodium Hydrate (See Caustic Soda)	—	—	—	—
Sodium Hydroxide (See Caustic Soda)	—	—	—	—
Sodium Borate (See Borax)	—	—	—	—
Sodium Nitrate	70-80	$75D_{3}25NS$	2A-2B	1.2
Sodium Phosphate	50-60	55A35	1A-1B	.9
Sodium Sulfate (See Salt Cake)	—	—	—	—
Sodium Sulfite	96	$96B_{6}46X$	2D	1.5
Sorghum, Seed (See Kafir or Milo)	—	—	—	—
Soybean, Cake	40-43	$42D_{3}35W$	2A-1B-1C	1.0
Soybean, Cracked	30-40	$35C_{\frac{1}{2}}36NW$	2D	.5
Soybean, Flake, Raw	18-25	$22C_{\frac{1}{2}}35Y$	1A-1B-1C	.8
Soybean, Flour	27-30	$29A_{40}35MN$	1A-1B-1C	.8
Soybean Meal, Cold	40	$40B_{6}35$	1A-1B-1C	.5
Soybean Meal, Hot	40	$40B_{6}35T$	2A-2B	.5
Soybeans, Whole	45-50	$48C_{\frac{1}{2}}26NW$	—	1.0
Starch	25-50	$38A_{40}15M$	1A-1B-1C	1.0
Steel Turnings, Crushed	100-150	$125D_{3}46WV$	3D	3.0
Sugar Beet, Pulp, Dry	12-15	$14C_{\frac{1}{2}}26$	2D	.9
Sugar Beet, Pulp, Wet	25-45	$35C_{\frac{1}{2}}35X$	1A-1B-1C	1.2
Sugar, Refined, Granulated Dry	50-55	$53B_{6}35PU$	1B	1.0-1.2
Sugar, Refined, Granulated Wet	55-65	$60C_{\frac{1}{2}}35X$	1B	1.4-2.0
Sugar, Powdered	50-60	$55A_{100}35PX$	1B	.8
Sugar, Raw	55-65	$60B_{6}35PX$	1B	1.5
Sulphur, Crushed−½"	50-60	$55C_{\frac{1}{2}}35N$	1A-1B	.8
Sulphur, Lumpy, −3"	80-85	$83D_{3}35N$	2A-2B	.8
Sulphur, Powdered	50-60	$55A_{40}35MN$	1A-1B	.6
Sunflower Seed	19-38	$29C_{\frac{1}{2}}15$	1A-1B-1C	.5
Talcum, −½"	80-90	$85C_{\frac{1}{2}}36$	2D	.9
Talcum Powder	50-60	$55A_{200}36M$	2D	.8
Tanbark, Ground(1)	55	$55B_{6}45$	1A-1B-1C	.7

(1)Consult FMC

Table 4 (cont'd) Material Characteristics

Material	Weight lbs/ft³	Material Code	Component Series	Mat'l. Factor Fm
Timothy Seed	36	$36B_6$35NY	1A-1B-1C	.6
Titanium Dioxide (See Ilmenite Ore)	—	—	—	—
Tobacco, Scraps	15-25	$20D_3$45Y	2A-2B	.8
Tobacco, Snuff	30	$30B_6$45MQ	1A-1B-1C	.9
Tricalcium Phosphate	40-50	$45A_{40}$45	1A-1B	1.6
Triple Super Phosphate	50-55	$53B_6$36RS	3D	2.0
Trisodium Phosphate	60	$60C_{½}$36	2D	1.7
Trisodium Phosphate, Granular	60	$60B_6$36	2D	1.7
Trisodium Phosphate, Pulverized	50	$50A_{40}$36	2D	1.6
Tung Nut Meats, Crushed	28	$28D_3$25W	2A-2B	.8
Tung Nuts	25-30	$28D_3$15	2A-2B	.7
Urea Polls, Coated	43-46	$45B_6$25	1A-1B-1C	1.2
Vermiculite, Expanded	16	$16C_{½}$35Y	1A-1B	.5
Vermiculite, Ore	80	$80D_3$36	2D	1.0
Vetch	48	$48B_6$16N	1A-1B-1C	.4
Walnut Shells, Crushed	35-45	$40B_6$36	2D	1.0
Wheat	45-48	$47C_{½}$25N	1A-1B-1C	.4
Wheat, Cracked	40-45	$43B_6$25N	1A-1B-1C	.4
Wheat, Germ	18-28	$23B_6$25	1A-1B-1C	.4
White Lead, Dry	75-100	$88A_{40}$36MR	2D	1.0
Wood Chips, Screened	10-30	$20D_3$45VY	2A-2B	.6
Wood Flour	16-36	$26B_6$35N	1A-1B	.4
Wood Shavings	8-16	12E45VY	2A-2B	1.5
Zinc, Concentrate Residue	75-8	$78B_6$37	3D	1.0
Zinc Oxide, Heavy	30-35	$33A_{100}$45X	1A-1B	1.0
Zinc Oxide, Light	10-15	$13A_{100}$45XY	1A-1B	1.0

Selection of Conveyor Size and Speed

In order to determine the size and speed of a screw conveyor, it is necessary first to establish the material code number. It will be seen from what follows that this code number controls the cross-sectional loading that should be used.

The various cross-sectional loadings shown in the Screw Conveyor Capacity Table 5 are for use with the standard screw conveyor components indicated in the Component Group Selection Guide Table 8 on page 38, and are for the usual screw conveyor applications. The usual screw conveyor applications may be defined as those in industrial use where the conveying operation is controlled with volumetric feeders and where the material is uniformly fed into the conveyor housing and discharged from it.

Check lump size limitations before choosing conveyor diameter. See Table 7, page 37.

Capacity Table

The Capacity Table 5 gives the capacities in cubic feet per hour at one revolution per minute for various sized screw conveyors for four cross-sectional loadings and for various classes of materials as delineated by code numbers. Also shown are capacities in cubic feet per hour at the maximum recommended revolutions per minute.

Conveyor Speed

For screw conveyors with screws having regular helical flights all of standard pitch, the conveyor speed may be calculated by the formula:

$$N = \frac{\text{Required capacity cubic feet per hour}}{\text{Cubic feet per hour at 1 revolution per minute}}$$

where

N = revolutions per minute of screw, but not greater than the maximum recommended speed.

For the calculation of conveyor speeds where special types of screws are used, such as short pitch screws, cut flights, cut and folded flights and ribbon flights, an equivalent required capacity must be used, based on factors in Table 6, page 36.

Factor CF_1 relates to the pitch of the screw. Factor CF_2 relates to the type of the flight. Factor CF_3 relates to the use of mixing paddles within the flight pitches.

The equivalent capacity then is found by multiplying the required capacity by one or more of the capacity factors that are involved. See Table 6, page 36, for capacity factors.

$$C_E = \frac{\text{Equiv. Capacity cubic feet per hour}}{} = \frac{\text{Required Capacity cubic feet per hour}}{} (CF_1)(CF_2)(CF_3)$$

Table 5 Horizontal Screw Conveyor Capacity*

Material Class Code	Degree of Trough Loading	Screw Dia. Inches	Maximum Recommended rpm	Capacity Cubic Feet Per Hour	
				At Max. rpm	At One rpm
A-15	45%	6	165	368	2.23
A-25		9	155	1270	8.2
B-15					
B-25		12	145	2820	19.4
C-15		14	140	4370	31.2
C-25					
		16	130	6060	46.7
		18	120	8120	67.6
		20	110	10300	93.7
		24	100	16400	164.0
A-35 E-35	30% A	6	120	180	1.49
A-45 E-45		9	100	545	5.45
B-35		12	90	1160	12.9
B-45		14	85	1770	20.8
C-35					
C-45					
D-15					
D-25					
D-35		16	80	2500	31.2
D-45		18	75	3380	45.0
E-15		20	70	4370	62.5
E-25		24	65	7100	109.0
A-16 D-16	30% B	6	60	90	1.49
A-26 D-26		9	55	300	5.45
A-36 D-36		12	50	645	12.9
A-46 D-46		14	50	1040	20.8
B-16 E-16					
B-26 E-26					
B-36 E-36					
B-46 E-46					
C-16		16	45	1400	31.2
C-26		18	45	2025	45.0
C-36		20	40	2500	62.5
C-46		24	40	4360	109.0
A-17 D-17	15%	6	60	45	0.75
A-27 D-27		9	55	150	2.72
A-37 D-37		12	50	325	6.46
A-47 D-47		14	50	520	10.4
B-17 E-17					
B-27 E-27					
B-37 E-37					
B-47 E-47					
C-17		16	45	700	15.6
C-27		18	45	1010	22.5
C-37		20	40	1250	31.2
C-47		24	40	2180	54.6

*For capacities of inclined screw conveyors, contact FMC.

Table 6 Special Conveyor Capacity Factors

Special Conveyor Pitch Capacity Factor CF_1

Pitch	Description	CF_1
Standard	Pitch = Diameter of screw	1.00
Short	Pitch = 2/3 Diameter of screw	1.50
Half	Pitch = 1/2 Diameter of screw	2.00
Long	Pitch = 1 1/2 Diameter of screw	0.67

Special Conveyor Flight Capacity Factor CF_2

Type of Flight	Conveyor Loading		
	15%	30%	45%
Cut Flight	1.95	1.57	1.43
Cut & Folded Flight	Not Recommended	3.75	2.54
Ribbon Flight	1.04	1.37	1.62

Special Conveyor Mixing Paddle Capacity Factor CF_3

Std. paddles per pitch set at 45° reverse pitch					
Quantity	None	1	2	3	4
Factor CF_3	1.00	1.08	1.16	1.24	1.32

Lump Size Limitations

The size of a screw conveyor not only depends on the capacity required, but also on the size and proportion of lumps in the material to be handled. The size of a lump is the maximum dimension it has. A closer definition of the lump size would be the diameter of a ring thru which the lump would pass. However, if a lump has one dimension much longer than its transverse cross-section, the long dimension or length would determine the lump size.

The character of the lump also is involved. Some materials have hard lumps that won't break up in transit through a screw conveyor. In that case provision must be made to handle these lumps. Other materials may have lumps that are fairly hard, but degradable in transit through the screw conveyor, thus really reducing the lump size to be handled. Still other materials have lumps that are easily broken in a screw conveyor and lumps of these materials impose no limitations.

Three classes of lump sizes apply as follows:

Class 1
A mixture of lumps and fines in which not more than 10% are lumps ranging from maximum size to one half of the maximum; and 90% are lumps smaller than one half of the maximum size.

Class 2
A mixture of lumps and fines in which not more than 25% are lumps ranging from the maximum size to one half of the maximum; and 75% are lumps smaller than one half of the maximum size.

Class 3
A mixture of lumps only in which 95% or more are lumps ranging from maximum size to one half of the maximum size; and 5% or less are lumps less than one tenth of the maximum size.

Table 7, page 37 shows the recommended maximum lump size for each customary screw diameter and the three lump classes. The ratio, R, is included to show the average factor used for the normal screw diameters which then may be used as a guide for special screw sizes and constructions.
For example:

$$\text{Ratio, } R = \frac{\text{Radial Clearance, inches}}{\text{Lump Size, inches}}$$

This ratio applies to such unusual cases as screws 16 inches diameter mounted on 2 inch solid shafts; or 12 inch diameter screws mounted on 6 inch diameter pipes (the large pipe serving to reduce deflection of the screw).

The allowable size of a lump in a screw conveyor is a function of the radial clearance between the outside diameter of the central pipe and the radius of the inside of the screw trough, as well as the proportion of lumps in the mix. The following illustration illustrates this relationship.

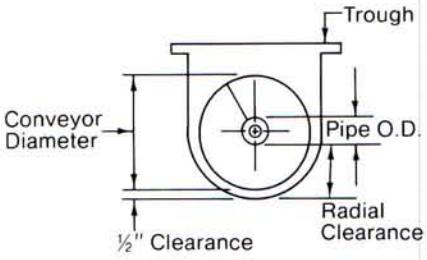


Figure C

To illustrate the choice of screw size from Table 7, say the material is ice with Material Characteristic code number D15, 35 to 45 lbs. per cubic foot and with size distribution as follows:

4"x2," 9%
2"x1," 41%
1"x⅜," 22%
minus ⅜," 28%.

This lump size distribution falls under Class 1. From Table 7, the ratio R is 1.75 and the radial clearance (4) (1.75) or 7 inches. This calls for an 18 inch diameter screw.

Table 7 Maximum Lump Size

Screw Dia.	Pipe O.D.	Radial Clearance	Class I 10% Lumps Ratio, R, = 1.75 Max. Lump, Inch	Class II 25% Lumps Ratio, R, = 2.5 Max. Lump, Inch	Class III 95% Lumps Ratio, R, = 4.5 Max. Lump, Inch
Inches					
6	2⅜	2 5/16	1¼	¾	½
9	2⅜	3 13/16	2¼	1½	¾
9	2⅞	3 9/16	2¼	1½	¾
12	2⅞	5 1/16	2¾	2	1
12	3½	4¾	2¾	2	1
12	4	4½	2¾	2	1
14	3½	5¾	3¼	2½	1¼
14	4	5½	3¼	2½	1¼
16	4	6½	3¾	2¾	1½
16	4½	6¼	3¾	2¾	1½
18	4	7½	4¼	3	1¾
18	4½	7¼	4¼	3	1¾
20	4	8½	4¾	3½	2
20	4½	8¼	4¾	3½	2
24	4½	10¼	6	3¾	2½

Component Groups

To facilitate the selection of proper specifications for a screw conveyor for a particular duty, screw conveyors are broken down into three Component Groups. These groups relate both to the Material Classification Code and also to screw, pipe size, type of bearings and trough thickness.

If the material to be conveyed is not listed in Table 4, pages 26 thru 34, then its Classification code may be determined from Table 3, page 25.

Table 8 is a guide to the proper selection of the appropriate Component Group. It will be observed that in addition to the flow characteristics of a material, consideration must be given to the material size, its abrasiveness and its corrosiveness as these determine construction details.

For example, if the material has suitable flow characteristics, is of a classification Code Size B, has an abrasive number of 5 and is non-corrosive, the Component Group Number is 1. If babbitted or bronze bearings, 1A; or for ball bearings, 1C. It will be noted that if the material is at all corrosive, ball bearings are not recommended.

Having made the Component Group selection, refer to Tables 9, 10 and 11, pages 39 and 40, which give the specifications of the various sizes of conveyor screws. The tabulated screw numbers in this table refer to CEMA Standard No. 300 on Screw Conveyors. This standard gives complete data on the screws such as the length of standard sections, minimum edge thickness of screw flight, bushing data, bolt size, bolt spacing, etc.

Table 8 Component Group Selection Guide

Material Classification Code				Component Group Designation					
				Group Number Designation	Type of Intermediate Hanger Bearing(3) See Table 12				
Material Size Classification		Abrasiveness Number	Corrosiveness Letter		Babbitted or Bronze	Self Lubricating	Ball Bearing (2)	Hard Iron	Plastic Nylon Teflon
A_{200} A_{100} A_{40}	B_6	5	Non-Corr.	1	B	B	A	–	–
	$C_{1/2}$		T	2	B	B	–	–	C
			S	3	B	B	–	–	–
D_3 D_2 D_{16} D_x	or E	5	Non-Corr.	2	B	B	A	–	–
			T	2	B	B	–	–	C
			S	3	B	B	–	–	–
A_{200} A_{100} A_{40}	B_6	6	Non- Corr.	2	–	–	–	D	–
	$C_{1/2}$		T	3	–	–	–	D	–
			S	3(1)	–	–	–	D	–
D_3 D_7 D_{16} D_x	or E	6	Non-Corr.	2	–	–	–	D	–
			T	3	–	–	–	D	–
			S	3(1)	–	–	–	D	–
A_{200} A_{100} A_{40}	B_6	7	Non-Corr.	3	–	–	–	D	–
	$C_{1/2}$		T	3	–	–	–	D	–
			S	3(1)	–	–	–	D	–
D_3 D_7 D_{16} D_x	or E	7	Non-Corr.	3	–	–	–	D	–
			T	3	–	–	–	D	–
			S	3(1)	–	–	–	D	–

(1)For very corrosive conditions (codes 6S or 7S) lighter gauge special anti-corrosion materials may be used.

(2)Ball bearings are not usually recommended for conveyors handling materials partly or wholly finely ground. (Code A)

(3)Any abrasive material which is flammable, corrosive, or which may contain explosive dust, consult manufacturer for bearing recommendations.

Conveyor screw speeds must be considered when using hard iron bearings on hardened coupling shafts in order to minimize wear and to reduce the squealing noise of dry metal on metal. The following formula gives maximum recommended operating speed:

$$N = \frac{120}{\text{Shaft diameter in inches}}$$

where

N = Maximum operating rpm of screw

For bearing types A, B and C listed above, the shafting used for the couplings is AISI C1018 standard cold rolled steel or equal.

For hard iron bearings, the shafting for the couplings is usually medium carbon steel AISI 1045 and surface hardened. Suitably hardened alloy shafting also may be used.

Component Groups

Table 9 Normal Service

Component Groups 1A, 1B and 1C Regular Flights and Regular Troughs					
Screw Dia. Inches	Coupling Dia. Inches	Screw Number(1)		Thickness, U.S. Std. Gauge or Inches	
		Helicoid Flights	Sectional Flights	Trough	Cover
6	1½	6H304	6S307	16 ga.	16 ga.
9	1½	9H306	9S307	14 ga.	14 ga.
9	2	9H406	9S409	14 ga.	14 ga.
12	2	12H408	12S409	12 ga.	14 ga.
12	2 7/16	12H508	12S509	12 ga.	14 ga.
14	2 7/16	14H508	14S509	12 ga.	14 ga.
16	3	16H610	16S612	12 ga.	14 ga.
18	3	18H610	18S612	10 ga.	12 ga.
20	3	—	20S612	10 ga.	12 ga.
24	3 7/16	—	24S712	10 ga.	12 ga.

(1)Screw numbers refer to CEMA Standard No. 300.

Table 10 Heavy Service

Component Groups 2A, 2B, 2C and 2D Heavy Flights and Heavy Troughs					
Screw Dia. Inches	Coupling Dia. Inches	Screw Number(1)		Thickness, U.S. Std. Gauge or Inches	
		Helicoid Flights	Sectional Flights	Trough	Cover
6	1½	6H308	6S309	14 ga.	16 ga.
9	1½	9H312	9S309	10 ga.	14 ga.
9	2	9H412	9S412	10 ga.	14 ga.
12	2	12H412	12S412	3/16"	14 ga.
12	2 7/16	12H512	12S512	3/16"	14 ga.
12	3	12H614	12S616	3/16"	14 ga.
14	2 7/16	—	14S512	3/16"	14 ga.
14	3	14H614	14S616	3/16"	14 ga.
16	3	16H614	16S616	3/16"	14 ga.
18	3	—	18S616	3/16"	12 ga.
20	3	—	20S616	3/16"	12 ga.
24	3 7/16	—	24S716	3/16"	12 ga.

(1)Screw numbers refer to CEMA Standard No. 300

Table 11 Extra Heavy Service

Component Groups 3A, 3B and 3D Extra Heavy Flights and Extra Heavy Troughs					
Screw Dia. Inches	Coupling Dia. Inches	Screw Number(1)		Thickness, U.S. Std. Gauge or Inches	
		Helicoid Flights	Sectional Flights	Trough	Cover
6	1½	6H312	6S312	10 ga.	16 ga.
9	1½	9H312	9S312	3/16"	14 ga.
9	2	9H414	9S416	3/16"	14 ga.
12	2	12H412	12S412	¼"	14 ga.
12	2 7/16	12H512	12S512	¼"	14 ga.
12	3	12H614	12S616	¼"	14 ga.
14	3	—	14S624	¼"	14 ga.
16	3	—	16S624	¼"	14 ga.
18	3	—	18S624	¼"	12 ga.
20	3	—	20S624	¼"	12 ga.
24	3 7/16	—	24S724	¼"	12 ga.

(1)Screw numbers refer to CEMA Standard No. 300.

Table 12 Recommended Hanger Bearings and Coupling Shafts

Component Group	Bearing Type	Coupling
Group A	Ball	Standard
Group B	Babbitt Bronze (1)Graphite bronze (1)Canvas base phenolic (1)Oil Impregnated bronze (1)Oil Impregnated wood	Standard
Group C	(1)Plastic (1)Nylon (1)Teflon	Standard
Group D	(1)Chilled hard iron (1)Hardened alloy sleeve	Hardened

(1)Nonlubricated bearings, or bearings not additionally lubricated.

Horsepower Requirements, Horizontal Screw Conveyors

The horsepower required to operate a horizontal screw conveyor is based on proper installation, uniform and regular feed rate to the conveyor and other design criteria as determined in this catalog.

The following factors determine the horsepower requirement of a screw conveyor operating under the foregoing conditions.

C_E = Equivalent capacity in cubic feet per hour.
$_e$ = Drive efficiency
F_b = Hanger bearing factor. See Table 13.
F_d = Conveyor diameter factor. See Table 14, page 42.
F_m = Material factor. See Table 4, pages 26 thru 34.
F_o = Overload factor. See Figure D, Page 42.
L = Total length of conveyor, feet.
N = Operating speed, rpm.
W = Apparent density of the material AS CONVEYED, lbs. per cubic foot. See Table 4, page 26 thru 34.

The horsepower requirement is the total of the horsepower to overcome conveyor friction (HP_f) and the horsepower to transport the material at the specified rate (HP_m) multiplied by the overload factor F_o and divided by the total drive efficiency e, or:

$$HP_f = \frac{LN\ F_d\ F_b}{1{,}000{,}000}$$

$$HP_m = \frac{C_E\ LWF_m}{1{,}000{,}000}$$

$$\text{Motor HP} = \frac{(HP_f + HP_m)\ Fo}{e}$$

or use Figure E, page 42, where $HP_t = (HP_f + HP_m)$.

It is generally accepted practice that all power transmitting elements of a screw conveyor be sized and selected to handle safely the full load motor torque. If, for example, a screw conveyor requires 3.5 horsepower as determined by the horsepower formula, a 5 hp motor must be used and all power transmitting elements must be capable of safely handling the full 5 horsepower.

Problem

Material	Vermiculite Ore
Weight	75-85 lbs/ft³
Capacity	1200 ft³/hr
Max. Lump	1"
Length of Conveyor	31'-0"

Refer to Table 4, pages 26 thru 34. The material class is 80D₃36. The component series is 2D and the material factor F_m is 1.0

Refer to Table 5, page 35, and select a 16" diameter conveyor @ 30% loading capable of 1400 ft³/hr. at a max. speed of 45 rpm. Capacity of unit is 31.2 ft³/hr. at 1 rpm.

$$N = \frac{120}{3} = 40 \text{ rpm; 39 rpm satisfactory}$$

$$HP_t = \frac{LN\ F_d\ F_b}{1{,}000{,}000} = \frac{31 \times 39 \times 106 \times 4.4}{1{,}000{,}000} = 0.56$$

$$HP_m = \frac{C_E LW\ F_m}{1{,}000{,}000} = \frac{1200 \times 31 \times 85 \times 1.0}{1{,}000{,}000} = 3.16$$

$$MHP = \frac{(HP_f + HP_m) \times F_o}{e} = \frac{(0.56 + 3.16)\ 1.21}{.85} = 5.28 \text{ use } 7\frac{1}{2}$$

or use Figure E, page 42, $HP_t = 0.56 + 3.16 = 3.72$ Use 7½ hp.

$$\text{Torque} = \frac{HP \times 63{,}000}{N} \qquad T = \frac{7.5 \times 63{,}000}{39} \qquad T = 12{,}115 \text{ in. lb.}$$

Table 15, page 43, indicates a 2-bolt connection is rated 16,400 in. lb.

$$\text{Required speed} = \frac{1200}{31.2} = 38.46$$
call 39 rpm.

Table 8, page 38, indicates a hard iron hanger bearing.

Component series 2D indicates Heavy Service Table 10, page 39.

16H614 helicoid screw flight—3" diameter shaft $^3/_{16}$" trough and 14 ga. cover.

Max. speed for 3" diameter shaft using hard iron bearings.

Table 13 Hanger Bearing Factor, F_b

Component Group	Bearing Type	F_b
Group A	Ball	1.0
Group B	Babbitt Bronze (1)Graphite bronze (1)Canvas base phenolic (1)Oil Impregnated bronze (1)Oil Impregnated wood	1.7
Group C	(1)Plastic (1)Nylon (1)Teflon	2.0
Group D	(1)Chilled hard iron (1)Hardened alloy sleeve	4.4

(1) Nonlubricated bearings, or bearings not additionally lubricated.

Table 14 Screw Diameter Factor, F_d

Screw Diameter Inches	F_d	Screw Diameter Inches	F_d
4	12.0	14	78.0
6	18.0	16	106.0
9	31.0	18	135.0
10	37.0	20	165.0
12	55.0	24	235.0

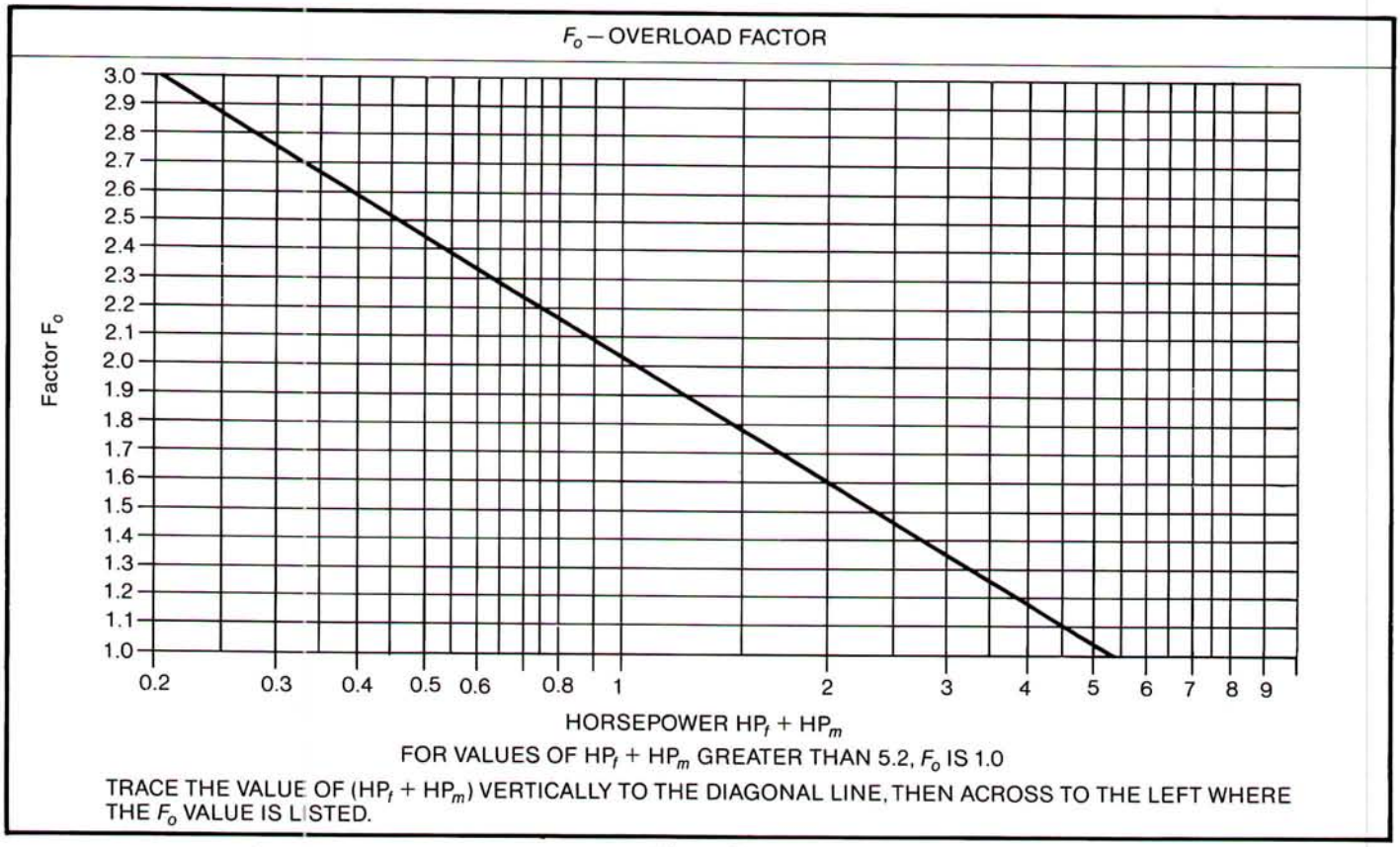


Figure D

Factor F_0 and A Drive Efficiency of 85% Are Included.

Figure E

Torsional Ratings of Conveyor Screw Parts

Screw conveyors are limited in overall length by the amount of torque that can be safely transmitted through the pipes and couplings.

Table 15 combines the various torsional ratings of bolts, couplings and pipes so that it is easy to compare the torsional ratings of all the stressed parts of standard conveyor screws. The table conforms to the CEMA Screw Conveyor Standard No. 300. The torsional values are confined to the sizes listed in that standard.

The lowest torsional rating figure for any given size of coupling will be the one that governs how much horsepower may be safely transmitted. For example, using standard unhardened two bolt coupling shafts, the limiting torsional strength of each part is indicated in Table 15.

Thus it can be seen that the shaft itself is the limiting factor on 1", 1½" and 2" couplings. The bolts in shear are the limiting factors on the 2 7/16" coupling and on the 3" coupling used in conjunction with 4" pipe. The bolts in bearing are the limiting factors for the 3" coupling used in conjunction with 3½" pipe, and for the 3 7/16" coupling.

$$\text{Torque, } T_o = \frac{63025 \times HP}{rpm}$$

If coupling bolt shear is the limiting torsional rating, high strength bolts may be substituted. When using high strength bolts the limiting factor will, in all cases, be either the coupling shaft or the bearing value, and both must be checked.

Table 15 Torsional Ratings of Bolts, Pipe and Coupling In. Lbs.

Shaft Dia.	Pipe		Couplings		Bolts				
	Size	Torque In. Lbs.	Torque In. Lbs.		Dia.	Bolts in Shear T_1 In. Lbs.		Bolts in Bearing T_2 In. Lbs.	
			Std.	Hard		Number of Bolts Used			
Inches		T_3	T_4	T_5	Inches	2	3	2	3
1	1¼	3,140	820[1]	1,025	⅜	1,380	2,070	1,970	2,955
1½	2	7,500	3,070[1]	3,850	½	3,660	5,490	5,000	7,500
2	2½	14,250	7,600[1]	9,500	⅝	7.600	11,400	7,860	11,790
2 7/16	3	23,100	15,090	18,900	⅝	9,270[1]	13,900	11,640	17,460
3	3½	32,100	28,370	35,400	¾	16,400	24,600	15,540[1]	23,310
3	4	43,000	28,370	35,400	¾	16,400[1]	24,600	25,000	37,500
3 7/16	4	43,000	42,550	53,000	⅞	25,600	38,400	21,800[1]	32,700

[1]Limiting Torsional Strength

Screw Conveyor End Thrust

Most screw conveyors can be designed with little thought given to thrust as the thrust force in an ordinary screw conveyor is moderate and commonly used screw conveyor drives will accommodate thrust in either direction. However, in screw feeders with long inlet openings and in screws used to compress material (either by design or by accident when discharge openings are plugged) thrust forces can be very severe. Severe thrust forces can strip the flights from the pipe, stall the drive, result in sheared coupling bolts or fractured couplings and shaft.

The direction of thrust in a screw conveyor or feeder is opposite to the direction of flow of the product. It is preferred to accommodate the thrust at the discharge end as this results in the line of screws and couplings being in tension.

The most common drives in use today are the so-called screw conveyor drives that are adaptations of shaft mounted reducers. These include drive shafts that are secured in the reducer so as to take thrust in either direction and transfer the thrust force to one of the hollow shaft bearings of the reducer.

CONVEYOR SCREW DEFLECTION

Deflections of conveyor screws of standard length is not usually a problem. However, if longer than standard sections of screw are to be used, without intermediate hanger bearings, care should be taken to prevent the screw flights from contacting the trough because of excessive deflection. The nomograph on page 45 indicates the deflection of standard helicoid conveyor screw sections on schedule 40 and schedule 80 pipe, for various lengths of screw sections. The schedule 80 pipe may be needed for large torques.

Applications of screw conveyors in which the deflection of the screw exceeds 0.25 inches should be referred to the screw conveyor manufacturer for recommendations. (In some applications, a deflection of even less than 0.25 inches could be critical and should be referred to the manufacturer.) Very often the problem can be solved by using a conveyor screw section with a larger diameter pipe. It will be noted from the nomograph that the use of a schedule 80 pipe reduces the deflection very little, hence it isn't practical to reduce deflections by using heavier pipe. Larger diameter pipe should be used.

Example NO. 1

Determine the deflection of a 12H512 conveyor screw section mounted on a schedule 40 pipe, with an overall unsupported length of 18 feet. From the nomographic chart, Figure 3.6, the deflection is greater than 0.25 inch, and therefore indicates that the problem should be referred to the screw conveyor manufacturer for solution.

When the flights of the screw are mounted on something other than Schedule 40 or Schedule 80 steel pipe, such as mechanically drawn tubing or solid shafting or steel or other metals, the deflection at mid span may be calculated from the following formula:

Schedule 40 Pipe (only)

Pipe Size	Diameter, Inches		Weight Per Foot Pounds	Moment Of Inertia, I
	External	Internal		
1-1/4	1.660	1.380	2.272	0.19
2	2.375	2.067	2.652	0.67
2-1/2	2.875	2.469	5.793	1.53
3	3.500	3.068	7.575	3.02
3-1/2	4.000	3.548	9.109	4.79
4	4.500	4.026	10.790	7.23
5	5.563	5.047	14.617	15.16
6	6.625	6.065	18.974	28.14
8	8.625	7.981	28.554	72.49
10	10.750	10.020	40.483	160.73
12	12.750	12.000	49.562	279.34

$$\Delta = \frac{5\,WL^3}{384\,EI}$$

where:

Δ = deflection at mid span, inches
W = total weight of screw, lbs.
L = Length of screw between bearings, inches
E = modulus of elasticity for steel
I = moment of inertia of hollow or solid shaft section.

Example NO. 2

Determine deflection of a 12H614 conveyor screw 20 ft. long. According to manufacturers' catalogues it has a weight of 228 lbs. for an 11'-9" long section and has helicoid flighting mounted on 3½" schedule 40 iron pipe size.

$$W = \frac{228}{11.75} \times 20 = 388 \text{ lbs.}$$

$L = 20 \times 12 = 240''$; $L^3 = 13.8 \times 10^6$

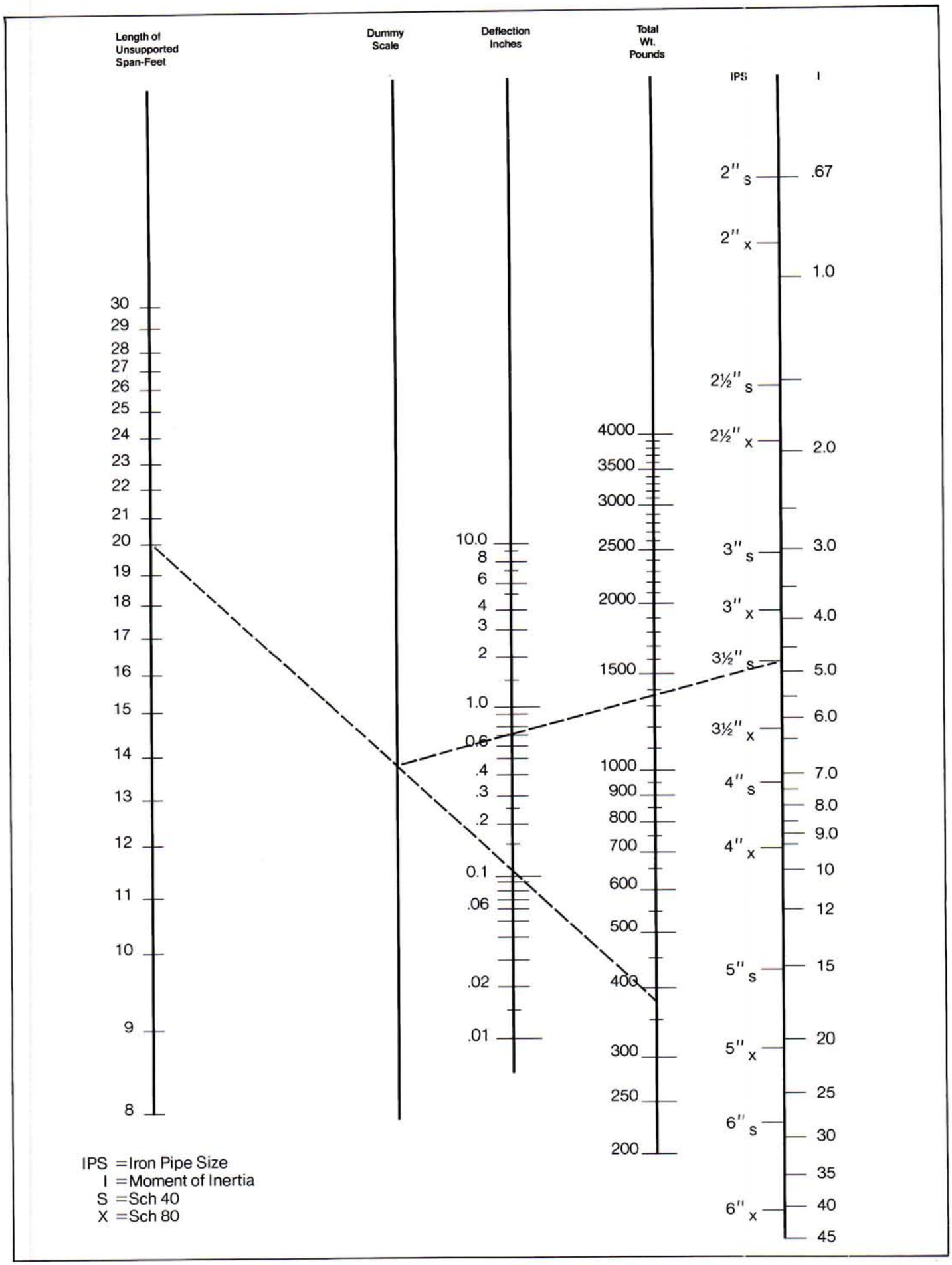
$E = 30 \times 10^6$

$I = 4.79$ (3½" schedule 40 pipe)

$$\Delta = \frac{(5)\ (388)\ (13.8)\ (10)^6}{(384)\ (30)\ \ (10)^6\ (4.79)} = 0.48$$

The 0.48 inch deflection is greater than the 0.25 inch normally allowable deflection. Therefore, a larger diameter pipe or other section having a higher moment of inertia may be tried.

The nomograph on Page 45 will solve some examples of conveyors longer than usual or longer than standard lengths.



IPS = Iron Pipe Size
I = Moment of Inertia
S = Sch 40
X = Sch 80

Screw Feeders

This section relates to screw feeders that are used to control the rate of flow of a bulk material from a bin or hopper. This is limited to the handling of bulk free flowing materials less than ⅛" in size and which are classified as abrasive 5 or 6 as shown in Table 3, page 25.

In screw feeders, the inlet portion of the trough is made to be flooded with the material and by means of a shroud in the trough, or by the use of a tubular trough, only a controlled amount is carried to the discharge.

The screws in the feeder are arranged in several different ways, depending upon circumstances. For relatively small inlet openings, the screw often has a standard diameter and pitch. Frequently, however the screw is tapered in diameter with its smallest diameter at the extreme feed end. Screws also may be made with a constant standard diameter and a variable pitch, the pitch growing larger from the extreme feed end. The purpose of the tapered diameter or variable pitch screw is to obtain an even flow from all areas of the feed opening. The capacity of tapered screws or variable pitch screws is determined by the diameter and pitch at the downstream end of the inlet opening.

Several factors should be established before selecting a screw feeder, these being:

A. Kind and character of material being handled.

B. Density of material as conveyed, lbs/ft³.

C. Maximum rate at which material is to be handled, ft³/hr.

D. Size consist or screen size analysis.

E. Overall length of feeder, or feeder with extended conveyor, feet.

F. Width and length of inlet opening.

Single screw feeders are most commonly used. However, if the inlet opening is very wide, multiple screw feeders are more practical.

Single Screw Feeders

The single screw feeder may be a separate unit, or it may be extended by sections of normal screw conveyor to any practical length. The procedure by which to choose a single screw feeder is as follows:

Refer to Material Classification Code, Table 3, page 25, and the Material Characteristics, Table 4, pages 26 thru 34. Determine the material code class and density from Table 4.

Capacity and Speed

From Table 16, under the column captioned at maximum rpm, find the capacity which equals or exceeds the desired feeder capacity. Then find from that the feeder diameter and capacity at one rpm or C_1. Divide the required feeder capacity by C_1 to obtain the required speed in rpm.

$$N = \frac{C}{C_1}$$

where:

N = Speed of feeder in rpm.

C = Required capacity of feeder, ft³/hr.

C_1 = Capacity at one rpm, ft³/hr.

This maximum rpm is not absolute but has been selected as general recommended practice. Experience with a particular set of conditions, or application, may establish slightly different design limitations. Many factors including bin or hopper design, a subject not covered here, will significantly affect screw feeder performance.

Single Screw Feeder Arrangement

The arrangement and dimensional data for single screw feeders are shown in Figure F, page 47, and Table 16.

Extension Conveyor

The arrangement of an extension conveyor, directly connected to a single screw feeder, is shown in Figure G, page 47. Obviously the extension conveyor must operate at the same rpm as the feeder. The size of the extension conveyor may be obtained by referring to Table 5, page 35. For the code class of the material to be handled find a screw diameter which will give an equal or greater capacity in cubic feet per hour at one rpm than the C_1 capacity of the screw feeder used in the formula to determine the feeder speed. The degree of trough loading corresponding to the code class of material to be handled and its abrasiveness, must not be exceeded.

Table 16 Screw Feeder Capacities, Speeds and Typical Dimensions(1)

Screw Dia. A Inches	Max. Speed RPM	Capacity Cubic Feet Per Hour(2)		Dimensions for Fig. F, page B-46				
		At One rpm	At Maximum rpm	B(3)	C(4)	D	Flared Through E	U-Trough E
				Inches				
6	70	4.98	348	36	12	7	14	7
9	65	18.50	1202	42	18	9	18	10
12	60	44.40	2664	48	24	10	22	13
14	55	70.00	3850	54	28	11	24	15
16	50	104.70	5235	56	32	11½	28	17
18	45	151.00	6795	58	36	12⅛	31	19
20	40	209	8360	60	40	13½	34	21
24	30	363	10,890	64	48	16½	40	25

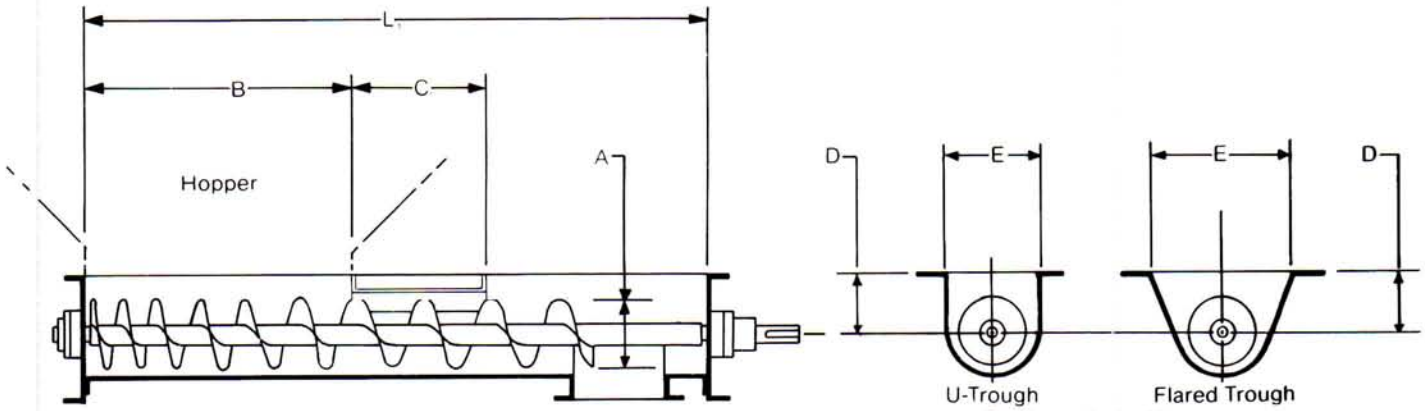
(1) Dimensions are typical and approximate. Actual dimensions should be certified for installation purposes.

(2) Based on 100% of theoretical capacity with standard pitch and screw pipe. For non-standard pitch or pipe size consult screw conveyor manufacturer.

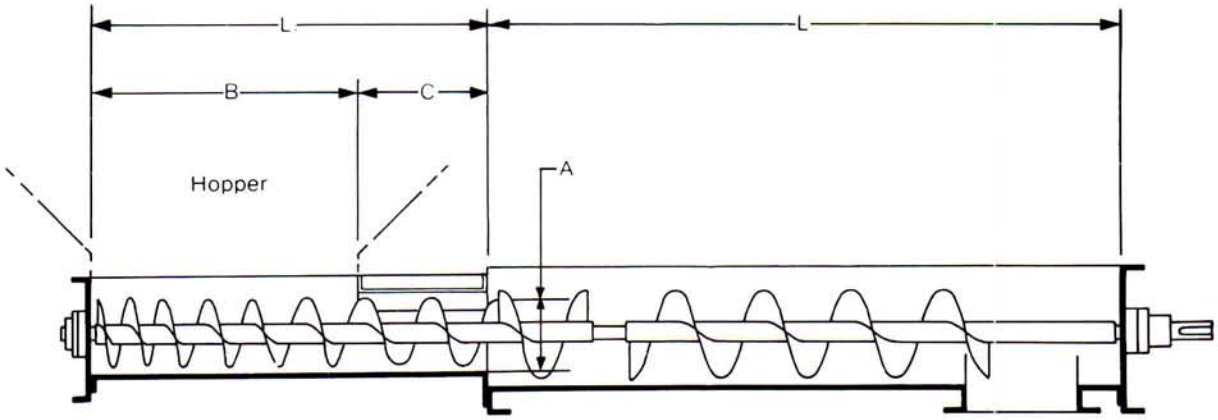
(3) Maximum in regular construction. Larger inlet openings require engineering consideration not covered here.

(4) The length C is equal to two standard pitches.

engineering information



Single Screw Feeder
Figure F



Single Screw Feeder With Extension Conveyor
Figure G

Power Required

The calculation of the required horsepower to operate screw feeders is very similar to that involved for standard screw conveyors. Essentially, the calculation involves the addition of two horsepowers, one for empty feeder friction, and the other the material friction.

Horsepower for Single Screw Feeder:

$$HP = \frac{(HP_a + HP_b)\,F_o}{e}$$

Horsepower for Single Screw Feeder with Extension Conveyor:

$$HP = \frac{{}_1(HP_a + HP_b + HP_1 + HP_m)\,F_o}{e}$$

where: Empty Feeder Friction Power

$$HP_a = \frac{L_1\,N\,F_d\,F_b}{1{,}000{,}000}$$

Feeder Material Friction Power

$$HP_b = \frac{C\,W\,L_f\,F_m}{1{,}000{,}000}$$

and Empty Extension Conveyor Friction Power

$$HP_f = \frac{L\,N\,F_d\,F_b}{1{,}000{,}000}$$

Extension Conveyor Material Friction Power

$$HP_m = \frac{C\,W\,L\,F_m}{1{,}000{,}000}$$

and the nomenclature used is defined:

C = Capacity in ft^3/hr.

W = Apparent density of materials as conveyed, lbs/ft^3

L = Length of extension conveyor, feet.

L_f = Equivalent length of feeder, feet. See Table 17, page 48, for method of arriving at values of L_1.

L_f = Length of feeder, feet, as shown in Figures F and G.

N = Speed of screw rotation, rpm.

F_b = Hanger bearing factor, Table 13, page 41.

F_d = Conveyor diameter factor, Table 14, page 42.

F_m = Material factor, Table 4, pages 26 thru 34.

F_o = Overload factor, Figure 14, page 42.

e = Efficiency of the drive selected.

Table 17 Equivalent Length of Feeder, L_1

Material Code Class	Maximum Particle Size Inches	Flight Type Under Inlet	Values of L1 Feet For Dimensions See Figures F & G, page B-45
A15, A16, A17 A25, A26, A27 A35, A36, A37	⅛	Standard pitch Uniform dia. Short pitch Uniform dia.	$L_1 + \frac{B}{6} + \frac{C}{12}$
B15, B16, B17 B25, B26, B27 B35, B36, B37	⅛	Standard pitch (1)Tapered dia. Short pitch (1)Tapered dia.	B & C from Table 16, page 46

(1)Variable pitch of constant diameter may be used in place of tapered diameter and constant pitch flighting.

Example of Single Screw Feeder Selection

Problem:

Select a single screw feeder without extension conveyor for the following conditions

Material to be handled	Salt cake, dry, pulverized
Weight per cubic foot	65-85 lbs per ft³
Capacity	26 tons (2000lb) per hour = 800 cubic feet per hour
Length of feeder, L_1	10 feet
Inlet opening	40 inches long, 10 inches wide

Required is an even rate of flow along the whole inlet opening.

Solution:

(a) From table 4, pages 26 thru 34, salt cake is code classified at 75 $B_6$36 TU has a component group designation of 3-D and a material factor (F_m) of 1.7.

(b) From Table 13, page 41, for a Component Group D, the hanger bearing factor, F_b = 1.0. Since this example does not have a hanger, F_b = 1.0. Use the appropriate factor when a hanger bearing or a tail bearing that utilizes a hanger insert type bearing is used.

(c) To be prudent, for capacity calculations use the lowest apparent density, 65 lbs/ft³. Then the volume for 26 tons per hour is

$$\frac{(26)\ (2000)}{65} =$$

800 ft³/hr required feed rate.

(d) Referring to Table 16, page 46, a 9-inch diameter single screw feeder will handle 1202 ft³/hr at a maximum of 65 rpm and C_1 =18.5 at one rpm. Using the formula for speed.

$$N = \frac{C}{C_f} = \frac{800}{18.5} = 43.2 \text{ rpm}$$

(e) From Table 17, the equivalent length of the feeder is

$$L_1 + \frac{B}{6} + \frac{C}{12} \text{ in which}$$

$$L_1 = 10, \frac{B}{6} = \frac{40}{6} \text{ or 6.7, and}$$

$$\frac{C}{12} = \frac{(18)}{12} = 1.5$$

L_f = 10 + 6.7 + 1.5 + 18.2 feet

(f) From Table 14, page 42, the conveyor diameter factor F_d = 31.

(g) Again to be prudent, for power calculations it is well to use the largest apparent density for W, so W = 85 lbs/ft³.

(h) $$HP_a = \frac{L_1\ N\ F_d\ F_b}{1{,}000{,}000} = \frac{(10)\ (43.2)\ (31)\ (1.0)}{1{,}000{,}000} = .013 \text{ HP}$$

(i) $$HP_b = \frac{C\ W\ L_f\ F_m}{1{,}000{,}000} = \frac{(800)\ (85)\ (21.5)\ (1.7)}{1{,}000{,}000} = .2.10 \text{ HP}$$

(j) Referring to Figure D, page 42, the factor F_o depends upon the sum of the horsepower for friction of the empty conveyor (feeder in the example) and the horsepower of

$$HP = \frac{(HP_a + HP_b)\ F_o}{e} = \frac{(.013 + 2.10)\ (1.57)}{.085} = 3.90 \text{ HP}$$

material friction. In this example this sum is .059 + 2.10 = 2.113 HP and F_o = 1.57.

(k) Then assuming a drive efficiency (expressed decimally) of 0.85,

Or use Figure E, page 42

$HP_t = (HP_a + HP_b)$ = 2.159 MHP = 5

(l) Use a 5 hp electric motor with speed reduction to 43.2 rpm.

The theoretical estimated power requirements calculated in the foregoing example conceivably could be exceeded to the extent that the full 5 horsepower of the motor would be used. Therefore, all components of the power train, the feeder shaft, the screw pipe shaft and the screw itself should be capable of withstanding-at the speeds involved for each-the torsion force or torque of full 5 horsepower. See Table 15, page 43 for torsional capacities of screw conveyor components.

Effect of Material Loads on Screw

In many cases, where screw feeders are mounted at the bottoms of bins or hoppers, the screw has to perform its function under heavy loads of material above the bin opening or feeder inlet. Under certain conditions and with certain materials the start-up torque can be very high, resulting in bigger drives and heavier feeder components.

An alternative solution is the use of multiple screw feeders. Multiple screw feeders may consist of twin, triple, or quadruple screws, side by side to feed materials from very wide inlet openings.

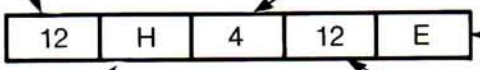
Conveyor Designation System

Screw diameter & pitch

12- = Full Pitch
12-8 = ⅔ pitch
12-6 = ½ pitch
12-4 = ⅓ pitch

Coupling diameter

3 = 1½"
4 = 2"
5 = 2 7/16"
6 = 3"
7 = 3 7/16"



E = Standard Length
EF = Flighting
F = Flight

Type Conveyor

H = Helicoid
HR = Helicoid ribbon
HS = Helicoid stainless
HSR = Helicoid stainless ribbon
S = Sectional
SR = Sectional ribbon
SS = Sectional stainless
SSR = Sectional stainless ribbon

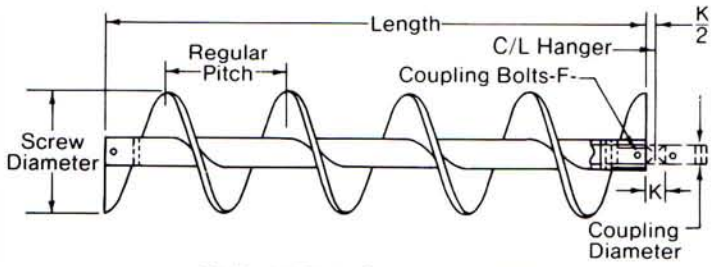
NOTE: Q prefix on all above types for Quik-Link.

Flight thickness
at outer edge 1/64" increments

Helicoid Flight and Sectional Flight Screws — Comparison Table.

Screw Diameter, Inches	Coupling Diameter, Inches	Nominal Pipe Size Inches (1)	Helicoid Flight			Sectional Flight	
			Conveyor Screw Size Designation	Thickness of Flight, Inches		Conveyor Screw Size Designation	Thickness of Flight, Inches
				Inner Edge	Outer Edge		
6	1½	2	6H304	⅛	1/16	6S307	12 ga.
	1½	2	6H308	¼	1/8	6S309	10 ga.
	1½	2	6H312	⅜	3/16	6S312	3/16
9	1½	2	9H306	3/16	3/32	9S307	12 ga.
	2	2½	9H406	3/16	3/32	9S407	12 ga.
	1½	2	9H312	⅜	3/16	9S312	3/16
	2	2½	9H412	⅜	3/16	9S412	3/16
	2	2½	9H414	7/16	7/32	9S416	¼
10	1½	2	10H306	3/16	3/32	10S309	10 ga.
	2	2½	10H412	⅜	3/16	10S412	3/16
12	2	2½	12H408	¼	1/8	12S409	10 ga.
	2 7/16	3	12H508	¼	1/8	12S509	10 ga.
	2	2½	12H412	⅜	3/16	12S412	3/16
	2 7/16	3	12H512	⅜	3/16	12S512	3/16
	3	3½	12H614	7/16	7/32	12S616	¼
14	2 7/16	3	14H508	¼	1/8	14S509	10 ga.
	3	3½	14H614	7/16	7/32	14S616	¼
16	3	3½	16H610	5/16	5/32	16S609	10 ga.
	3	4 (2)	16H614	7/16	7/32	16S616	¼
18	3	3½	18H610	5/16	5/32	18S609	10 ga.

(1) Schedule 40
(2) 3½" for 16S616



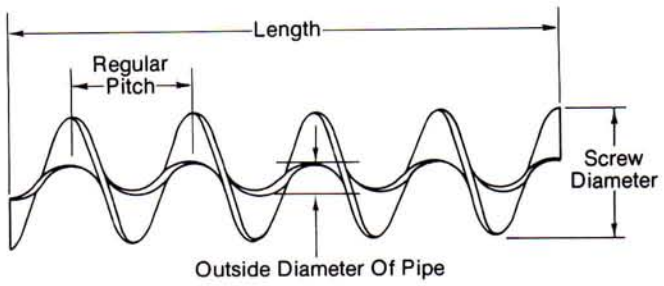
Helicoid Flight Conveyor Screw

Helicoid Flight Conveyor Screws are made of a continuous one-piece helix fastened to a pipe with spaced intermittent welds. Steel lugs are welded to pipe and flight at both ends, except on 4-inch size.

Helicoid Flight Conveyor Screws

Screw Diameter, Inches	Coupling Diameter, Inches	Conveyor Screw Number	Part Numbers		Length, Feet and Inches	Average Weight, Pounds		Maximum Horse-power at 100 rpm	Nominal Pipe Diameter, Inches		Thickness of Flight, Inches		Pitch Inches	F	K
			Left Hand	Right Hand		Per Section	Per Foot		Inside	Outside	Inner Edge	Outer Edge		Inches	
4	1	4H204-E	171-85-A	171-85-B	9-10½	32	3.2	1.5	1¼	1⅝	12 ga.	1/16	4	3/8	1½
	1	4H206-E	171-85-C	171-85-D	9-10½	38	3.9	1.5	1¼	1⅝	3/16	3/32	4	3/8	1½
6	1½	6H304-E	171-85-E	171-85-F	9-10	51	5.2	5	2	2⅜	1/8	1/16	6	½	2
	1½	6H308-E	171-85-G	171-85-H	9-10	66	6.7	5	2	2⅜	¼	1/8	6	½	2
	1½	6H312-E	171-85-J	171-85-K	9-10	85	8.6	5	2	2⅜	3/8	3/16	6	½	2
9	1½	9H306-E	171-85-L	171-85-M	9-10	67	6.8	5	2	2⅜	3/16	3/32	9	½	2
	1½	9H312-E	171-85-N	171-85-P	9-10	103	10	5	2	2⅜	3/8	3/16	9	½	2
	2	9H406-E	171-85-R	171-85-S	9-10	89	9.1	10	2½	2⅞	3/16	3/32	9	5/8	2
	2	9H412-E	171-85-T	171-85-U	9-10	123	13	10	2½	2⅞	3/8	3/16	9	5/8	2
	2	9H414-E	171-85-V	171-85-W	9-10	135	14	10	2½	2⅞	7/16	7/32	9	5/8	2
10	1½	10H306-E	171-85-X	171-85-Y	9-10	70	7.1	5	2	2⅜	3/16	3/32	10	½	2
	2	10H412-E	171-85-Z	171-85-AA	9-10	133	14	10	2½	2⅞	3/8	3/16	10	5/8	2
12	2	12H408-E	171-85-AB	171-85-AC	11-10	144	12	10	2½	2⅞	¼	1/8	12	5/8	2
	2	12H412-E	171-85-AD	171-85-AE	11-10	176	15	10	2½	2⅞	3/8	3/16	12	5/8	2
	2 7/16	12H508-E	171-85-AF	171-85-AG	11-9	167	14	15	3	3½	¼	1/8	12	5/8	3
	2 7/16	12H512-E	171-85-AH	171-85-AJ	11-9	201	17	15	3	3½	3/8	3/16	12	5/8	3
	3	12H614-E	171-85-AK	171-85-AL	11-9	240	20	25	3½	4	7/16	7/32	12	¾	3
14	2 7/16	14H508-E	171-85-AM	171-85-AN	11-9	176	15	15	3	3½	¼	1/8	14	5/8	3
	3	14H614-E	171-85-AP	171-85-AR	11-9	245	21	25	3½	4	7/16	7/32	14	¾	3
16	3	16H610-E	171-85-AS	171-85-AT	11-9	218	19	25	3½	4	5/16	5/32	16	¾	3
	3	16H614-E	171-85-AU	171-85-AV	11-9	300	26	25	4	4½	7/16	7/32	16	¾	3
18	3	18H610-E	171-85-BA	171-85-BB	11-9	241	21	25	3½	4	5/16	5/32	18	¾	3

component selection

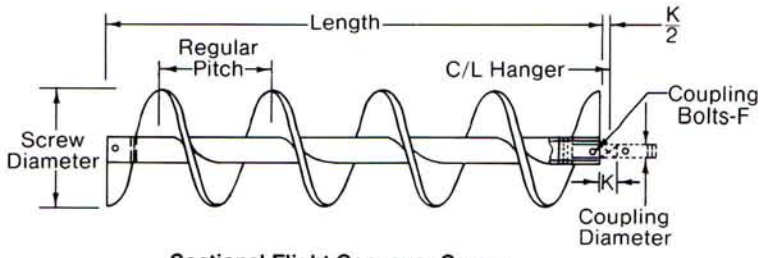


Helicoid Flighting

Helicold Flighting is manufactured in a continuous one-piece helix of the desired diameter, pitch and thickness. The helicold flight is tapered in cross section, with the thickness at the inner edge about twice the thickness at the outer edge.

Helicoid Flighting

Flighting Diameter, Inches	Inside Diameter, Inches	Conveyor Number	Part Numbers		Length Feet and Inches	Average Weight Pounds		Thickness of Flight, Inches		Pitch Inches
			Left Hand	Right Hand		Per Section	Per Foot	Inner Edge	Outer Edge	
4	1⅝	4H204-EF	168-36-3	168-36-4	9-10½	8.4	.85	12 ga.	1/16	4
	1⅝	4H206-EF	168-36-7	168-36-8	9-10½	14	1.4	3/16	3/32	4
6	2⅜	6H304-EF	168-36-11	168-36-12	9-10	15	1.5	1/8	1/16	6
	2⅜	6H308-EF	168-36-15	168-36-16	9-10	29	3.0	1/4	1/8	6
	2⅜	6H312-EF	168-36-19	168-36-20	9-10	49	5.0	3/8	3/16	6
9	2⅜	9H306-EF	168-36-27	168-36-28	9-10	31	3.2	3/16	3/32	9
	2⅜	9H312-EF	168-36-31	168-36-32	9-10	67	6.8	3/8	3/16	9
	2⅞	9H406-EF	168-36-35	168-36-36	9-10	31	3.2	3/16	3/32	9
	2⅞	9H412-EF	168-36-39	168-36-40	9-10	66	6.7	3/8	3/16	9
	2⅞	9H414-EF	168-36-43	168-36-44	9-10	78	7.9	7/16	7/32	9
10	2⅜	10H306-EF	168-36-47	168-36-48	9-10	33	3.4	3/16	3/32	10
	2⅞	10H412-EF	168-36-51	168-36-52	9-10	75	7.6	3/8	3/16	10
12	2⅞	12H408-EF	168-36-59	168-36-60	11-10	70	5.9	1/4	1/8	12
	2⅞	12H412-EF	168-36-63	168-36-64	11-10	102	8.6	3/8	3/16	12
	3½	12H508-EF	168-36-67	168-36-68	11-9	68	5.8	1/4	1/8	12
	3½	12H512-EF	168-36-71	168-36-72	11-9	102	8.7	3/8	3/16	12
	4	12H614-EF	168-36-75	168-36-76	11-9	123	10	7/16	7/32	12
14	3½	14H508-EF	168-36-79	168-36-80	11-9	78	6.6	1/4	1/8	14
	4	14H614-EF	168-36-83	168-36-84	11-9	128	11	7/16	7/32	14
16	4	16H610-EF	168-36-87	168-36-88	11-9	101	8.6	5/16	5/32	16
	4½	16H614-EF	168-36-91	168-36-92	11-9	153	13	7/16	7/32	16
18	4	18H610-EF	168-36-99	168-36-100	11-9	124	11	5/16	5/32	18



Sectional Flight Conveyor Screw

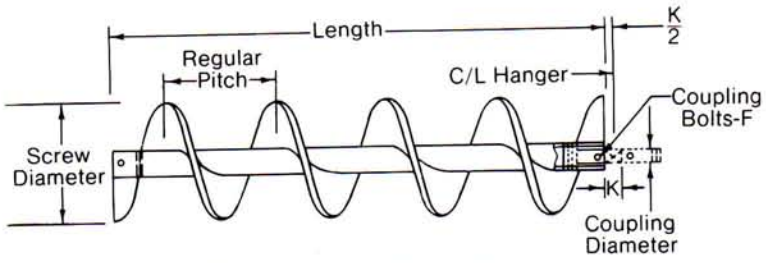
Sectional Flight

Sectional Flight Conveyor Screws consist of individual flights formed into a helix, then butt welded together and fastened to a pipe or shaft with spaced intermittent welds. Steel lugs are welded to pipe and flight at both ends, except on regular sectional flight screw sizes larger than 16-inch diameter. Both ends of the pipe have permanent internal collars with inside diameters to accept couplings, drive shafts or end shafts.

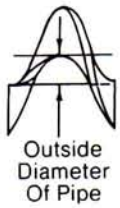
Sectional Flight Conveyor Screws

Screw Diameter, Inches	Coupling Diameter, Inches	Conveyor Screw Number	Part Numbers		Length, Feet and Inches	Average Weight, Pounds		Maximum Horse-power at 100 rpm	Nominal Pipe Diameter, Inches		Thickness of Flight Inches	Pitch Inches	F	K
			Left Hand	Right Hand		Per Section	Per Foot		Inside	Outside			Inches	
6	1½	6S307-E	172-135-C	172-135-D	9-10	54	5.5	5	2	2⅜	12 ga.	6	½	2
	1½	6S309-E	172-135-E	172-135-F	9-10	57	5.8	5	2	2⅜	10 ga.	6	½	2
	1½	6S312-E	172-135-G	172-135-H	9-10	64	6.5	5	2	2⅜	3/16	6	½	2
	1½	6S316-E	172-135-J	172-135-K	9-10	73	7.4	5	2	2⅜	¼	6	½	2
9	1½	9S307-E	172-135-N	172-135-P	9-10	66	6.7	5	2	2⅜	12 ga.	9	½	2
	1½	9S309-E	172-135-R	172-135-S	9-10	73	7.4	5	2	2⅜	10 ga.	9	½	2
	1½	9S312-E	172-135-T	172-135-U	9-10	84	8.5	5	2	2⅜	3/16	9	½	2
	1½	9S316-E	172-139-A	172-139-B	9-10	100	10	5	2	2⅜	¼	9	½	2
	2	9S407-E	172-135-Y	172-135-Z	9-10	86	8.8	10	2½	2⅞	12 ga.	9	⅝	2
	2	9S409-E	172-135-AA	172-135-AB	9-10	93	9.5	10	2½	2⅞	10 ga.	9	⅝	2
	2	9S412-E	172-135-AC	172-135-AD	9-10	99	10	10	2½	2⅞	3/16	9	⅝	2
	2	9S416-E	172-135-AE	172-135-AF	9-10	113	11	10	2½	2⅞	¼	9	⅝	2
10	1½	10S309-E	172-135-AL	172-135-AM	9-10	80	8.1	5	2	2⅜	10 ga.	10	½	2
	1½	10S312-E	172-139-C	172-139-D	9-10	93	9.5	5	2	2⅜	3/16	10	½	2
	1½	10S316-E	172-139-E	172-139-F	9-10	112	11	5	2	2⅜	¼	10	½	2
	2	10S412-E	172-135-AR	172-135-AS	9-10	112	11	10	2½	2⅞	3/16	10	⅝	2
	2	10S416-E	172-135-AT	172-135-AU	9-10	130	13	10	2½	2⅞	¼	10	⅝	2
12	2	12S409-E	172-135-AX	172-135-AY	11-10	130	11	10	2½	2⅞	10 ga.	12	⅝	2
	2	12S412-E	172-135-AZ	172-135-BA	11-10	150	13	10	2½	2⅞	3/16	12	⅝	2
	2	12S416-E	172-135-BB	172-135-BC	11-10	177	15	10	2½	2⅞	¼	12	⅝	2
	2	12S424-E	172-139-G	172-139-H	11-10	229	19	10	2½	2⅞	⅜	12	⅝	2
	2 7/16	12S509-E	172-135-BF	172-135-BG	11-9	151	13	15	3	3½	10 ga.	12	⅝	3
	2 7/16	12S512-E	172-135-BH	172-135-BJ	11-9	167	14	15	3	3½	3/16	12	⅝	3
	2 7/16	12S516-E	172-135-BK	172-135-BL	11-9	192	16	15	3	3½	¼	12	⅝	3
	2 7/16	12S524-E	172-139-J	172-139-K	11-9	240	20	15	3	3½	⅜	12	⅝	3
	3	12S612-E	172-135-BM	172-135-BN	11-9	180	15	25	3½	4	3/16	12	¾	3
	3	12S616-E	172-136-A	172-136-B	11-9	203	17	25	3½	4	¼	12	¾	3
	3	12S624-E	172-136-C	172-136-D	11-9	248	21	25	3½	4	⅜	12	¾	3

component selection



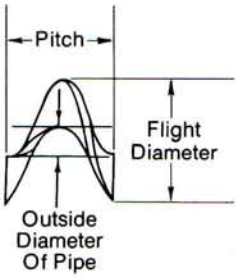
Sectional Flight Conveyor Screw



Sectional Flight

Sectional Flight Conveyor Screws (Continued)

Screw Diameter, Inches	Coupling Diameter, Inches	Conveyor Screw Number	Part Numbers		Length, Feet and Inches	Average Weight, Pounds		Maximum Horse-power at 100 rpm	Nominal Pipe Diameter, Inches		Thickness of Flight Inches	Pitch Inches	F	K
			Left Hand	Right Hand		Per Section	Per Foot		Inside	Outside			Inches	
14	2 7/16	14S509-E	172-136-G	172-136-H	11-9	157	13	15	3	3½	10 ga.	14	5/8	3
	2 7/16	14S512-E	172-136-J	172-136-K	11-9	177	15	15	3	3½	3/16	14	5/8	3
	2 7/16	14S516-E	172-139-N	172-139-P	11-9	206	18	15	3	3½	1/4	14	5/8	3
	3	14S612-E	172-136-L	172-136-M	11-9	192	16	25	3½	4	3/16	14	3/4	3
	3	14S616-E	172-136-N	172-136-P	11-9	221	19	25	3½	4	1/4	14	3/4	3
	3	14S624-E	172-136-R	172-136-S	11-9	273	23	25	3½	4	3/8	14	3/4	3
16	3	16S609-E	172-136-T	172-136-U	11-9	184	16	25	3½	4	10 ga.	16	3/4	3
	3	16S612-E	172-136-V	172-136-W	11-9	207	18	25	3½	4	3/16	16	3/4	3
	3	16S616-E	172-136-X	172-136-Y	11-9	240	20	25	3½	4	1/4	16	3/4	3
	3	16S624-E	172-136-Z	172-136-AA	11-9	303	26	25	3½	4	3/8	16	3/4	3
	3	16S632-E	172-136-AB	172-136-AC	11-9	365	31	25	3½	4	1/2	16	3/4	3
18	3	18S612-E	172-136-AF	172-136-AG	11-9	228	19	25	3½	4	3/16	18	3/4	3
	3	18S616-E	172-136-AH	172-136-AJ	11-9	269	23	25	3½	4	1/4	18	3/4	3
	3	18S624-E	172-136-AK	172-136-AL	11-9	346	29	25	3½	4	3/8	18	3/4	3
	3	18S632-E	172-136-AM	172-136-AN	11-9	423	36	25	3½	4	1/2	18	3/4	3
	3 7/16	18S712-E	172-139-R	172-139-S	11-8	247	21	41	4	4½	3/16	18	7/8	4
	3 7/16	18S716-E	172-136-AP	172-136-AR	11-8	286	25	41	4	4½	1/4	18	7/8	4
	3 7/16	18S724-E	172-136-AS	172-136-AT	11-8	359	31	41	4	4½	3/8	18	7/8	4
	3 7/16	18S732-E	172-139-T	172-139-U	11-8	432	37	41	4	4½	1/2	18	7/8	4
20	3	20S612-E	172-136-AU	172-136-AV	11-9	234	20	25	3½	4	3/16	20	3/4	3
	3	20S616-E	172-136-AW	172-136-AX	11-9	277	24	25	3½	4	1/4	20	3/4	3
	3	20S624-E	172-136-AY	172-136-AZ	11-9	357	30	25	3½	4	3/8	20	3/4	3
	3	20S632-E	172-139-V	172-139-W	11-9	438	37	25	3½	4	1/2	20	3/4	3
	3 7/16	20S712-E	172-139-X	172-139-Y	11-8	259	22	41	4	4½	3/16	20	7/8	4
	3 7/16	20S716-E	172-139-Z	172-139-AA	11-8	301	26	41	4	4½	1/4	20	7/8	4
	3 7/16	20S724-E	172-136-BA	172-136-BB	11-8	382	33	41	4	4½	3/8	20	7/8	4
	3 7/16	20S732-E	172-139-AB	172-139-AC	11-8	463	40	41	4	4½	1/2	20	7/8	4
24	3 7/16	24S712-E	172-136-BC	172-136-BD	11-8	294	25	41	4	4½	3/16	24	7/8	4
	3 7/16	24S716-E	172-136-BE	172-136-BF	11-8	349	30	41	4	4½	1/4	24	7/8	4
	3 7/16	24S724-E	172-136-BG	172-136-BH	11-8	453	39	41	4	4½	3/8	24	7/8	4
	3 7/16	24S732-E	172-136-BJ	172-136-BK	11-8	558	48	41	4	4½	1/2	24	7/8	4



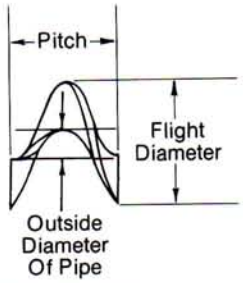
Sectional Flight

Sectional Flights are individual flights formed into a spiral or helix of the desired diameter and pitch, butt welded together to form a continuous conveyor screw.

Sectional Flighting

Flight Diameter, Inches	Inside Diameter, Inches	Flight Number	Part Numbers		Length Inches	Average Weight, Pounds	Thickness Inches	Pitch Inches
			Left Hand	Right Hand				
6	2⅜	6S307-F	169-9-101	169-9-102	7¾	.90	12 ga.	6
	2⅜	6S309-F	169-9-9	169-9-10	7¾	1.2	10 ga.	6
	2⅜	6S312-F	169-9-11	169-9-12	7½	1.5	3/16	6
	2⅜	6S316-F	169-9-13	169-9-14	7½	2.1	¼	6
9	2⅜	9S307-F	169-9-103	169-9-104	10½	2.3	12 ga.	9
	2⅜	9S309-F	169-9-17	169-9-18	10½	2.9	10 ga.	9
	2⅜	9S312-F	169-9-19	169-9-20	10½	3.9	3/16	9
	2⅜	9S316-F	169-9-123	169-9-124	10½	5.3	¼	9
	2⅞	9S407-F	169-9-105	169-9-106	10½	2.2	12 ga.	9
	2⅞	9S409-F	169-9-23	169-9-24	10¾	2.8	10 ga.	9
	2⅞	9S412-F	169-9-25	169-9-26	10¾	3.8	3/16	9
	2⅞	9S416-F	169-9-27	169-9-28	10¾	5.1	¼	9
10	2⅜	10S309-F	169-9-33	169-9-34	11	3.7	10 ga.	10
	2⅜	10S312-F	169-9-137	169-9-138	11	4.9	3/16	10
	2⅜	10S316-F	169-9-127	169-9-128	11	6.7	¼	10
	2⅞	10S412-F	169-9-39	169-9-40	11⅛	4.8	3/16	10
	2⅞	10S416-F	169-9-41	169-9-42	11⅛	6.5	¼	10
12	2⅞	12S409-F	169-9-107	169-9-108	13¼	5.4	10 ga.	12
	2⅞	12S412-F	169-9-45	169-9-46	13¼	7.1	3/16	12
	2⅞	12S416-F	169-9-47	169-9-48	13¼	9.7	¼	12
	2⅞	12S424-F	169-9-139	169-9-140	13¼	15	⅜	12
	3½	12S509-F	169-9-109	169-9-110	13¼	5.1	10 ga.	12
	3½	12S512-F	169-9-51	169-9-52	13¾	6.8	3/16	12
	3½	12S516-F	169-9-121	169-9-122	13¾	9.2	¼	12
	3½	12S524-F	169-9-129	169-9-130	13¾	14	⅜	12
	4	12S612-F	169-9-53	169-9-54	14¼	6.6	3/16	12
	4	12S616-F	169-9-55	169-9-56	14¼	8.9	¼	12
	4	12S624-F	169-9-57	169-9-58	14¼	13	⅜	12
14	3½	14S509-F	169-9-111	169-9-112	17	7.3	10 ga.	14
	3½	14S512-F	169-9-61	169-9-62	17	9.7	3/16	14
	3½	14S516-F	169-9-143	169-9-144	17	13	¼	14
	4	14S612-F	169-9-63	169-9-64	17	9.3	3/16	14
	4	14S616-F	169-9-65	169-9-66	17	13	¼	14
	4	14S624-F	169-9-67	169-9-68	17	19	⅜	14

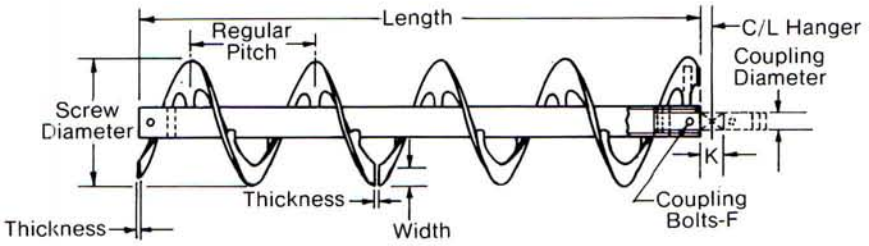
component selection



Sectional Flight

Sectional Flighting (Continued)

Flight Diameter, Inches	Inside Diameter, Inches	Flight Number	Part Numbers		Length Inches	Average Weight, Pounds	Thickness Inches	Pitch Inches
			Left Hand	Right Hand				
16	4	16S609-F	169-9-69	169-9-70	19¼	9.4	10 ga.	16
	4	16S612-F	169-9-71	169-9-72	19¼	13	3/16	16
	4	16S616-F	169-9-73	169-9-74	19¼	17	¼	16
	4	16S624-F	169-9-75	169-9-76	19¼	26	⅜	16
	4	16S632-F	169-9-113	169-9-114	19¼	34	½	16
18	4	18S612-F	169-9-79	169-9-80	20½	16	3/16	18
	4	18S616-F	169-9-81	169-9-82	20½	22	¼	18
	4	18S624-F	169-9-83	169-9-84	20½	33	⅜	18
	4	18S632-F	169-9-115	169-9-116	20½	45	½	18
	4½	18S712-F	169-9-145	169-9-146	21	16	3/16	18
	4½	18S716-F	169-9-97	169-9-98	21	22	¼	18
	4½	18S724-F	169-9-99	169-9-100	21	33	⅜	18
	4½	18S732-F	169-9-147	169-9-148	21	44	½	18
20	4	20S612-F	169-9-85	169-9-86	24¼	20	3/16	20
	4	20S616-F	169-9-87	169-9-88	24¼	28	¼	20
	4	20S624-F	169-9-117	169-9-118	24¼	42	⅜	20
	4	20S632-F	169-9-149	169-9-150	24¼	56	½	20
	4½	20S712-F	169-9-151	169-9-152	24	20	3/16	20
	4½	20S716-F	169-9-153	169-9-154	24	28	¼	20
	4½	20S724-F	169-9-89	169-9-90	24	41	⅜	20
	4½	20S732-F	169-9-155	169-9-156	24	55	½	20
24	4½	24S712-F	169-9-91	169-9-92	27	30	3/16	24
	4½	24S716-F	169-9-93	169-9-94	27	41	¼	24
	4½	24S724-F	169-9-95	169-9-96	27	61	⅜	24
	4½	24S732-F	169-9-119	169-9-120	27	82	½	24



Ribbon Flight Conveyor Screw

Ribbon flight conveyor screws consist of sectional flights, butt welded together to form a continuous helix. Flights are secured to the pipe by supporting lugs. Both ends of the pipe have permanent internal collars with inside diameters to accept couplings, drive shafts and end shafts.

They are used for conveying sticky, gummy or viscous substances, or where the material tends to adhere to flighting at the pipe. Stainless steel ribbon flight conveyor screws can be furnished.

Sectional Ribbon Flight Conveyor Screws*

Screw Diameter, Inches	Coupling Diameter, Inches	Conveyor Screw Number	Part Numbers		Length Feet and Inches	Average Weight, Pounds		Maximum Horse-power at 100 rpm	Nominal Pipe Diameter, Inches		Flight Size, Thickness and Width Inches	Pitch Inches	F	K
			Left Hand	Right Hand		Per Section	Per Foot		Inside	Outside			Inches	
6	1 1/2	6SR312-E	172-143-A	172-143-B	9-10	57	5.8	5	2	2 3/8	3/16 x 1	6	1/2	2
9	1 1/2	9SR316-E	172-143-G	172-143-H	9-10	79	8.0	5	2	2 3/8	1/4 x 1 1/2	9	1/2	2
10	1 1/2	10SR316-E	172-143-N	172-143-P	9-10	79	8.0	5	2	2 3/8	1/4 x 1 1/2	10	1/2	2
12	2	12SR416-E	172-143-V	172-143-W	11-10	143	12	10	2 1/2	2 7/8	1/4 x 2	12	5/8	2
	2	12SR424-E	172-143-AB	172-143-AC	11-10	186	16	10	2 1/2	2 7/8	3/8 x 2 1/2	12	5/8	2
	2 7/16	12SR524-E	172-143-AH	172-143-AJ	11-9	209	18	15	3	3 1/2	3/8 x 2 1/2	12	5/8	3
14	2 7/16	14SR516-E	172-143-AP	172-143-AR	11-9	166	14	15	3	3 1/2	1/4 x 2	14	5/8	3
	2 7/16	14SR524-E	172-143-AW	172-143-AK	11-9	214	18	15	3	3 1/2	3/8 x 2 1/2	14	5/8	3
	3	14SR624-E	172-143-BC	172-143-BD	11-9	232	20	25	3 1/2	4	3/8 x 2 1/2	14	3/4	3
16	3	16SR616-E	172-143-BJ	172-143-BK	11-9	197	17	25	3 1/2	4	1/4 x 2 1/2	16	3/4	3
	3	16SR624-E	172-143-BR	172-143-BS	11-9	232	20	25	3 1/2	4	3/8 x 2 1/2	16	3/4	3
18	3	18SR624-E	172-143-BX	172-143-BY	11-9	267	23	25	3 1/2	4	3/8 x 3	18	3/4	3
20	3 7/16	20SR724-E	172-143-CD	172-143-CE	11-8	278	24	41	4	4 1/2	3/8 x 3	20	7/8	4
24	3 7/16	24SR724-E	172-143-CK	172-143-CL	11-8	279	24	41	4	4 1/2	3/8 x 3	24	7/8	4

Sectional Ribbon Fighting*

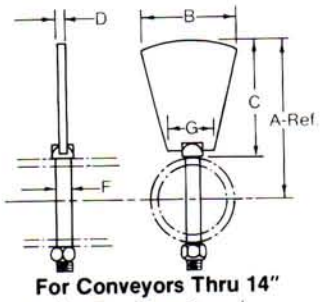
Flight Diameter, Inches	Inside Diameter, Inches	Flight Number	Part Numbers		Length Inches	Average Weight Pounds	Thickness Inches	Pitch Inches
			Left Hand	Right Hand				
6	4	6SR312-F	169-20-1	169-20-2	6 1/8	.95	3/16	6
9	6	9SR316-F	169-20-3	169-20-4	9 9/16	2.9	1/4	9
10	7	10SR316-F	169-20-5	169-20-6	10 1/2	3.2	1/4	10
12	8	12SR416-F	169-20-7	169-20-8	12 1/4	5.1	1/4	12
	7	12SR424-F	169-20-9	169-20-10	12 7/8	9.2	3/8	12
	7	12SR524-F	169-20-11	169-20-12	12 7/8	9.2	3/8	12
14	10	14SR516-F	169-20-13	169-20-14	14 7/8	6.1	1/4	14
	9	14SR524-F	169-20-15	169-20-16	14 3/4	11	3/8	14
	9	14SR624-F	169-20-17	169-20-18	14 3/4	11	3/8	14
16	11	16SR616-F	169-20-19	169-20-20	17 1/4	8.6	1/4	16
	11	16SR624-F	169-20-21	169-20-22	17 1/4	13	3/8	16
18	12	18SR624-F	169-20-23	169-20-24	18	17	3/8	18
20	14	20SR724-F	169-20-25	169-20-26	20 1/2	20	3/8	20
24	18	24SR724-F	169-20-27	169-20-28	25 1/4	24	3/8	24

*Ribbon Fltg. is non-stock

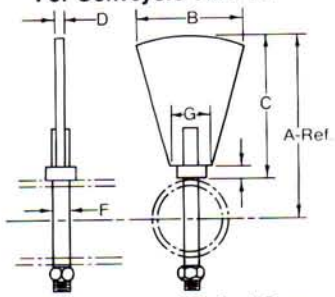
component selection

Type 1 Paddles consist of formed steel blades mounted on bolt or rod shanks which are inserted through regular conveyor screw pipe. They are normally mounted at 120 degree intervals spacing, three paddles per pitch. Paddle at each end of conveyor may be inserted through bolt hole in place of regular coupling bolt. Paddle blades may be set at any angle to produce the desired degree of agitation. Paddle conveyor screws are used for mixing, blending or stirring dry or fluid materials.

Paddles-type 1



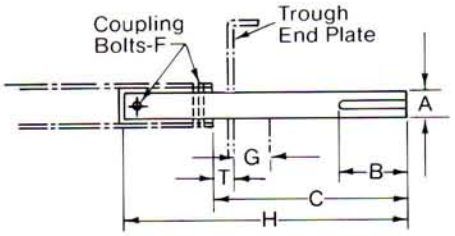
For Conveyors Thru 14"



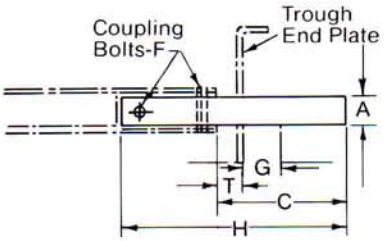
For Conveyors 16" And Over

Type 1 Paddle

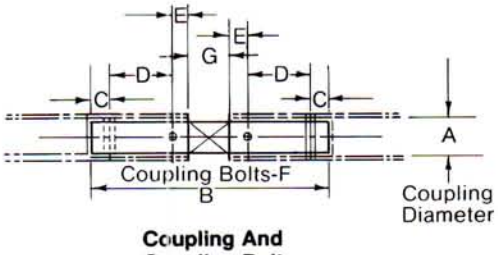
Screw Diameter	Pipe OD	Part Numbers	Weight, Pounds	A	B	C	D	F	G
Inches				Inches					
4	1⅝	161-59-A	.21	2	1½	1 3/16	3/16	3/8	13/16
6	2⅜	161-59-B	.54	3	2 1/16	1 13/16	¼	½	1 7/16
9	2⅜	161-59-C	.82	4½	2¾	3 5/16	¼	½	1½
	2⅞	161-59-D	1.00	4½	2¾	3 1/16	¼	5/8	1⅝
10	2⅜	161-59-E	.94	5	3⅛	3 13/16	¼	½	1½
	2⅞	161-59-F	1.10	5	3⅛	3 9/16	¼	5/8	1⅝
12	2⅞	161-59-G	1.90	6	3 11/16	4 9/16	3/8	5/8	1¾
	3½	161-59-H	1.90	6	3 11/16	4¼	3/8	5/8	1⅞
	4	161-59-J	2.20	6	3 11/16	4	3/8	¾	2
14	3½	161-59-K	2.30	7	4¼	5¼	3/8	5/8	2
	4	161-59-L	2.70	7	4¼	5	3/8	¾	2⅛
16	4	161-60-A	3.20	8	4 15/16	6	3/8	¾	2¼
	4½	161-60-B	3.60	8	4 15/16	5¾	3/8	⅞	2⅜
18	4	161-60-C	3.70	9	5⅜	7	3/8	¾	2⅛
	4½	161-60-D	4.10	9	5⅜	6¾	3/8	⅞	2¼
20	4	161-60-E	4.50	10	6⅛	8	3/8	¾	2 7/16
	4½	161-60-F	4.90	10	6⅛	7¾	3/8	⅞	2 9/16
24	4½	161-60-G	8.10	12	7⅜	9¾	½	⅞	2 11/16



Typical Drive Shaft



Typical End Shaft



Coupling And Coupling Bolts

Drive shafts deliver the driving power, and are designed to provide adequate torque, bending and shear strength, and correct bearing clearances. For extra heavy loads, high carbon steel or heat-treated alloy steel shafts are used. Jig-drilled coupling bolt holes and accurately cut keyseats contribute to ease of assembly.

End shafts serve only as support for the last section of conveyor screw and are furnished of cold-finished steel.

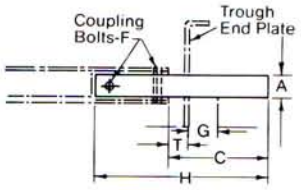
Drive Shafts and End Shafts

Screw Diameter, Inches	Shaft Diameter, Inches	Drive Shaft Number For Steel Plate Trough End				End Shaft Number For Steel Plate Trough End			
		Without Trough End Seal		With Trough End Seal		Without Trough End Seal		With Trough End Seal	
		Babbitted and Bronze Bearing	Ball Bearing	Babbitted and Bronze Bearing	Ball Bearing	Babbitted and Bronze Bearing	Ball Bearing	Babbitted and Bronze Bearing	Ball Bearing
4	1	716-2-1	716-2-11	—	—	716-1-9	716-1-8	—	—
6, 9, 10	1½	716-2-17	716-2-14	716-2-46	716-2-15	716-1-2	716-1-11	716-1-44	716-1-38
9, 10, 12	2	716-2-24	716-2-20	716-2-48	716-2-47	716-1-3	716-1-16	716-1-45	716-1-3
12, 14	2 7/16	716-2-51	716-2-49	716-2-52	716-2-50	716-1-47	716-1-46	716-1-25	716-1-4
12, 14, 16, 18, 20	3	716-2-54	716-2-53	716-2-55	716-2-8	716-1-41	716-1-27	716-1-31	716-1-30
18, 20, 24	3 7/16	716-2-58	716-2-56	716-2-40	716-2-57	716-1-43	716-1-33	716-1-49	716-1-48

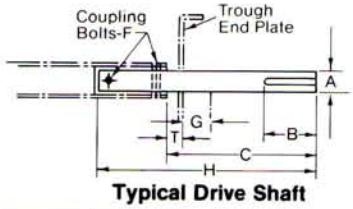
Drive Shafts For Double Ball Bearing Flanged Blocks.

Shaft Dia. A Inches	Part Numbers(1)		Weight, Lbs.		B	C		F	G (2)	H		T
	No Seal	For Seal	No Seal	For Seal		No Seal	For Seal			No Seal	For Seal	
					Inches							
1½	1462-86-G	1462-86-K	6.6	7.5	3¼	9	10¾	½	1¾	13¾	15½	1¼
2	1462-86-V	1462-86-Y	13	15	3¾	10 5/16	12 1/16	5/8	1¾	15 1/16	16 13/16	1¼
2 7/16	1462-86-AH	1462-86-AL	21	23	4¼	11 15/16	13 11/16	5/8	1¾	16 13/16	18 9/16	1 13/16
3	1462-86-AW	1462-86-AZ	36	40	5¼	13¾	15½	¾	1¾	18¾	20½	1⅞
3 7/16	1462-86-BJ	1462-86-BM	59	65	5¾	16 5/16	18 9/16	⅞	2¼	23 1/16	25 5/16	2⅜

(1) Includes snap rings and washers.
(2) Trough end seal width.



Typical End Shaft



Typical Drive Shaft

End Shafts For Double Ball Bearing Flanged Blocks.

Shaft Dia. A Inches	Part Numbers (1)		Weight, Lbs.		C		F	G (2)	H		T
	No Seal	For Seal	No Seal	For Seal	No Seal	For Seal			No Seal	For Seal	
					Inches						
1½	716-1-69	716-1-70	5.4	6.3	6	7¾	½	1¾	10¾	12½	1¼
2	716-1-71	716-1-72	10	12	6 13/16	8 9/16	⅝	1¾	11 9/16	13 5/16	1¼
2 7/16	716-1-73	716-1-74	17	19	7⅞	9⅝	⅝	1¾	12¾	14½	1 13/16
3	716-1-75	716-1-76	28	31	8¾	10½	¾	1¾	13¾	15½	1⅞
3 7/16	716-1-77	716-1-78	46	52	10 25/32	13 1/32	⅞	2¼	17 9/16	19 13/16	2⅜

(1)Includes snap rings and washers.
(2)Trough end seal width.

Drive Shafts For Babbitted, Bronze and Single Ball Bearing Flanged Blocks.

Shaft Dia., A Inches	Part Numbers				Weight, Lbs.				B	C				F	G (1)	H				T
	No Seal		For Seal		No Seal		For Seal			No Seal		For Seal				No Seal		For Seal		
	Babb. Brz.	Ball	Babb. Brz.	Ball	Babb. Brz.	Ball	Babb. Brz.	Ball		Babb. Brz.	Ball	Babb. Brz.	Ball			Babb. Brz.	Ball	Babb. Brz.	Ball	
									Inches											
1	716-2-1	716-2-11	716-2-61	716-2-59	1.8	1.7	2.2	2.0	2¼	5½	4⅞	7	6⅜	⅜	1½	8½	7⅞	10	9⅜	15/16
1½	716-2-17	716-2-14	716-2-46	716-2-15	6.5	6.1	7.4	7.0	4¼	8⅝	7⅞	10½	9⅝	½	1¾	13⅜	12⅝	15¼	14⅜	1¼
2	716-2-24	716-2-20	716-2-48	716-2-47	13	12	15	13	4½	9 13/16	8 5/16	11¾	10 1/16	⅝	1¾	14 9/16	13 1/16	16½	14 13/16	1¼
2 7/16	716-2-51	716-2-49	716-2-52	716-2-50	23	20	26	22	5½	12 9/16	10⅛	14 5/16	11⅞	⅝	1¾	17 7/16	15	19 5/16	16¾	1 13/16
3	716-2-54	716-2-53	716-2-55	716-2-8	38	32	42	36	6	14⅛	11⅛	15⅞	12⅞	¾	1¾	19⅛	16⅛	20⅞	17⅞	1⅞
3 7/16	716-2-58	716-2-56	716-2-40	716-2-57	63	54	67	59	7¼	16⅞	13½	19⅛	15⅜	⅞	2¼	23⅜	20¼	25⅞	22½	2⅜

(1)Trough end seal thickness.

End Shafts For Babbitted, Bronze and Single Ball Bearing Flanged Blocks.

Shaft Dia., A Inches	Part Numbers				Weight, Lbs.				C				F	G (1)	H				T
	No Seal		For Seal		No Seal		For Seal		No Seal		For Seal				No Seal		For Seal		
	Babb. Brz.	Ball	Babb. Brz.	Ball	Babb. Brz.	Ball	Babb. Brz.	Ball	Babb. Brz.	Ball	Babb. Brz.	Ball			Babb. Brz.	Ball	Babb. Brz.	Ball	
									Inches										
1	716-1-9	716-1-8	716-1-52	716-1-50	1.4	1.2	1.7	1.5	3¼	2⅝	4¾	4⅛	⅜	1½	6¼	5⅝	7¾	7⅛	15/16
1½	716-1-2	716-1-11	716-1-44	716-1-38	4.7	4.1	5.6	4.9	4⅜	3⅝	6¼	5⅜	½	1¾	9⅝	8⅜	11	10⅛	1¼
2	716-1-3	716-1-16	716-1-45	716-1-3	9.0	7.4	10	9.0	5¾	3⅞	7⅜	5¾	⅝	1¾	10½	8⅝	12⅛	10½	1¼
2 7/16	716-1-47	716-1-46	716-1-25	716-1-47	15	12	18	14	7⅛	4⅝	9⅛	7⅛	⅝	1¾	12	9½	14	11¼	1 13/16
3	716-1-41	716-1-27	716-1-31	716-1-30	26	20	29	23	8½	5½	10⅛	6⅞	¾	1¾	13½	10½	15⅛	11⅞	1⅞
3 7/16	716-1-43	716-1-33	716-1-49	716-1-48	43	34	47	39	10⅛	6⅞	12	8¾	⅞	2¼	16⅞	13⅜	18¾	15½	2⅜

(1)Trough end seal thickness.

Drive Shafts For Outboard Bracket Bearings Reference page 82

Shaft Dia. A Inches	Part Numbers(1)			Weight, Lbs. Maximum	B	C			F	G(2)		H			T
	Babb. Brz.	Ball	Roller			Babb. Brz.	Ball	Roller		Babb. Brz.	Ball Roller	Babb. Brz.	Ball	Roller	
						Inches									
1½	716-31-L	716-31-A	716-31-B	7.9	3¾	11 1/16	10⅞	11½	½	4¾	4¼	16 7/16	15⅝	16¼	1¼
2	716-31-M	716-31-C	716-31-D	15	4¼	13½	12½	13	⅝	5½	5 1/16	18¼	17¼	17¾	1¼
2 7/16	716-31-N	716-31-E	716-31-F	27	5¼	16½	14 13/16	15 7/16	⅝	6⅜	5 11/16	21⅜	19 11/16	20 5/16	1 13/16
3	716-31-P	716-31-G	716-31-H	47	5¾	19 1/16	16½	17⅛	¾	7	6 9/16	24 1/16	21½	22⅛	1⅞
3 7/16	716-31-R	716-31-J	716-31-K	73	6¾	21 13/16	19 5/16	19 13/16	⅞	8⅝	7½	28 9/16	26 1/16	26 9/16	2⅜

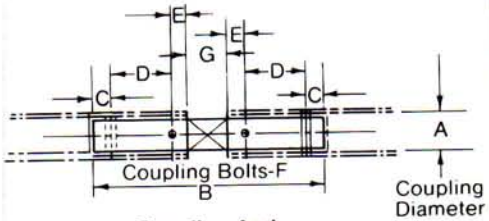
(1)Includes snap rings and washers.
(2)Distance from outside of trough end plate to centerline of pillow block.

End Shafts For Outboard Bracket Bearings Reference page 82

Shaft Dia. A Inches	Part Numbers			Weight, Lbs. Maximum	C			F	G(1)		H			T
	Babb. Brz.	Ball	Roller		Babb. Brz.	Ball	Roller		Babb. Brz.	Ball Roller	Babb. Brz.	Ball	Roller	
					Inches									
1½	716-31-77	716-31-57	716-31-59	6.2	7 15/16	7⅛	7¾	½	4¾	4¼	12 11/16	11⅞	12½	1¼
2	716-31-79	716-31-61	716-31-63	12	9¼	8¼	8¾	⅝	5½	5 1/16	14	13	13½	1¼
2 7/16	716-31-81	716-31-65	716-31-67	21	11¼	9 9/16	10 3/16	⅝	6⅜	5 11/16	16⅛	14 7/16	15 1/16	1 13/16
3	716-31-83	716-31-69	716-31-71	36	13 5/16	10¾	11⅜	¾	7	6 9/16	18 5/16	15¾	16⅜	1⅞
3 7/16	716-31-85	716-31-73	716-31-75	56	14 9/16	12 9/16	13 1/16	⅞	8⅝	7½	21 13/16	19 5/16	19 13/16	2⅜

(1)Distance from outside of trough end plate to centerline of pillow block.

component selection



Coupling And Coupling Bolts

Standard Coupling

Coupling Diameter, A Inches	Part Numbers		Weight, Pounds	B	C	D	E	F	G
	Cold Rolled Steel	Hardened Steel(1)		Inches					
1	170-13-2	170-38-9	1.5	7½	½	2	½	⅜	1½
1½	170-13-3	170-38-10	5.6	11½	⅞	3	⅞	½	2
2	170-13-4	170-38-11	9.8	11½	⅞	3	⅞	⅝	2
2 7/16	170-13-5	170-38-12	15	12¾	15/16	3	15/16	⅝	3
3	170-13-6	170-38-13	24	13	1	3	1	¾	3
3 7/16	170-13-7	170-38-14	43	17½	1¼	4	1½	⅞	4

(1)Only bearing length G is hardened.

Close Coupling

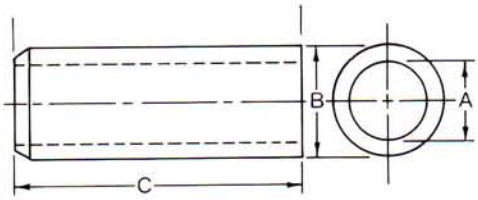
Coupling Diameter, A Inches	Part Numbers	Weight, Pounds	B	C	D	E	F(1)
			Inches				
1	716-1-9	1.4	6¼	½	2	½	⅜
1½	716-1-38	4.9	10⅛	⅞	3	⅞	½
2	716-1-3	9	10½	⅞	3	⅞	⅝
2 7/16	716-1-4	14	11¼	15/16	3	15/16	⅝
3	716-1-27	20	10½	1	3	1	¾
3 7/16	716-1-34	39	14⅞	1¼	4	1½	⅞

(1)Drill two holes at one end, in assembly, 1/32" over bolt diameter.

Coupling Bolts

Coupling Diameter, Inches	Part Numbers				Average Weight Per Hundred Pieces, Pounds	Diameter and Length, Inches
	Regular	Galvanized	High Strength	Stainless Steel(1)		
1	126-527-A	126-528-A	86-50-A	126-627-A	13	⅜ x 2⅛
1½	126-527-C	126-528-C	86-50-C	126-627-C	32	½ x 3
2	126-527-E	126-528-E	86-50-E	126-627-E	56	⅝ x 3⅝
2 7/16	126-527-G	126-528-G	86-50-G	126-627-G	63	⅝ x 4¼
3	126-527-J	126-528-J	86-50-J	126-627-J	105	¾ x 5
3 7/16	126-527-AA	126-528-AA	86-50-AA	126-627-AA	157	⅞ x 5½

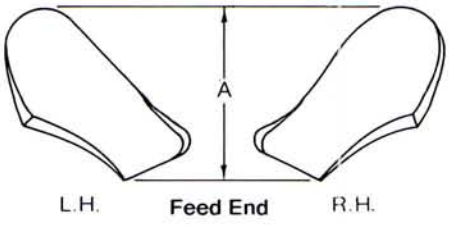
(1)Type 304, other types can be furnished.

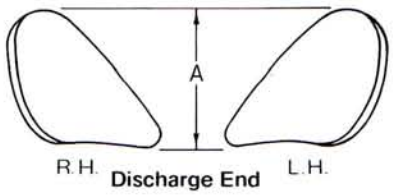


Internal Collars

Coupling Dia.	Nominal Inside Dia. of Pipe	Part Numbers		Weight Pounds	A	B	C
		Carbon Steel	Stainless Steel(1)		Inches		
1	1¼	129-43-6	496-475-2	0.7	1	1⅜	3¼
1½	2	129-43-34	496-475-4	2.2	1½	2 1/16	5
2	2½	129-43-51	496-475-6	2.4	2	2½	5
2 7/16	3	129-43-72	496-475-53	4.1	2 7/16	3 1/16	5⅛
3	3½	129-43-93	496-475-55	4.3	3	3 9/16	5¼
3 7/16	4	129-43-105	496-475-42	7.3	3 7/16	4 1/16	7

(1)Type 304, other types can be furnished.



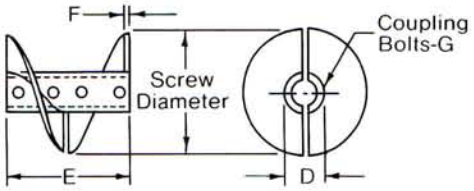


End Lugs are die-formed steel plates welded to both ends of helicoid flighting and to the pipe to strengthen the end of flighting.

Lugs

Screw Diameter Inches	Part Numbers				Avg. Wgt. Per/C Pounds	A, Approximate	
	Feed End		Discharge End			Feed End	Discharge End
	Right Hand	Left Hand	Right Hand	Left Hand		Inches	
6	163-5-3	163-5-5	163-5-4	163-5-6	5	1 13/16	1 7/16
9&10	163-6-3	163-6-5	163-6-4	163-6-6	13	2 13/16	2 11/16
12	163-7-3	163-7-5	163-7-4	163-7-6	26	4 1/2	4 1/8
14&16	163-8-3	163-8-5	163-8-4	163-8-6	38	5 5/8	5 5/16

All lugs are made of 12 gauge steel.



Split Flight Coupling

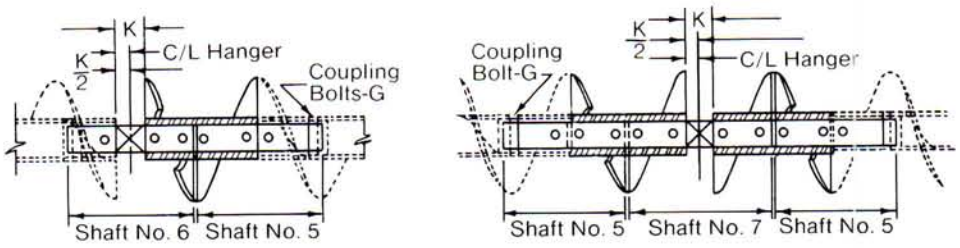
Split Flight Couplings permit installing or removing individual conveyor screws without disturbing adjoining sections. With split flight couplings installed on both sides of each hanger, conveyor screws can be removed without disturbing the hangers. The split flight coupling is sturdily constructed and jig drilled for coupling bolts.

Split Flight Couplings

Screw Diameter, Inches	Coupling Diameter, Inches	Split Flight Coupling Number(1)		Weight, Pounds	D	E	F	G
		Right Hand	Left Hand		Inches			
4	1	502-3-A	502-3-B	3	1 5/8	4 11/16	10 ga.	3/8
6	1 1/2	502-3-C	502-3-D	9	2 3/8	6 11/16	1/4 in.	1/2
9	1 1/2	502-3-E	502-3-F	14	2 3/8	9 11/16	3/16 in.	1/2
	2	502-3-G	502-3-H	17	2 7/8	9 11/16	1/4 in.	5/8
10	1 1/2	502-3-J	502-3-K	16	2 3/8	10 11/16	10 ga.	1/2
	2	502-3-L	502-3-M	21	2 7/8	10 11/16	1/4 in.	5/8
12	2	502-3-N(1)	502-3-P(1)	29	2 7/8	12 11/16	1/4 in.	5/8
	2 7/16	502-3-R	502-3-S	31	3 1/2	12 11/16	3/16 in.	5/8
	3	502-3-T(1)	502-3-U(1)	40	4	12 11/16	3/8 in.	3/4
14	2 7/16	502-3-V	502-3-W	42	3 1/2	14 3/4	3/16 in.	5/8
	3	502-3-X	502-3-Y	51	4	14 3/4	3/8 in.	3/4
16	3	502-3-Z	502-3-AA	61	4	16 3/4	3/8 in.	3/4
18	3	502-3-AB	502-3-AC	75	4	18 3/4	3/8 in.	3/4
	3 7/16	502-3-AK	502-3-AL	76	4 1/2	18 3/4	3/8 in.	7/8
20	3	502-3-AD	502-3-AE	75	4	20 3/4	1/4 in.	3/4
	3 7/16	502-3-AF	502-3-AG	84	4 1/2	20 7/8	3/8 in.	7/8
24	3 7/16	502-3-AH	502-3-AJ	114	4 1/2	24 7/8	3/8 in.	7/8

(1)Indicates split flight couplings normally carried in stock. Coupling bolts are included.

component selection



Assembly A **Assembly B**

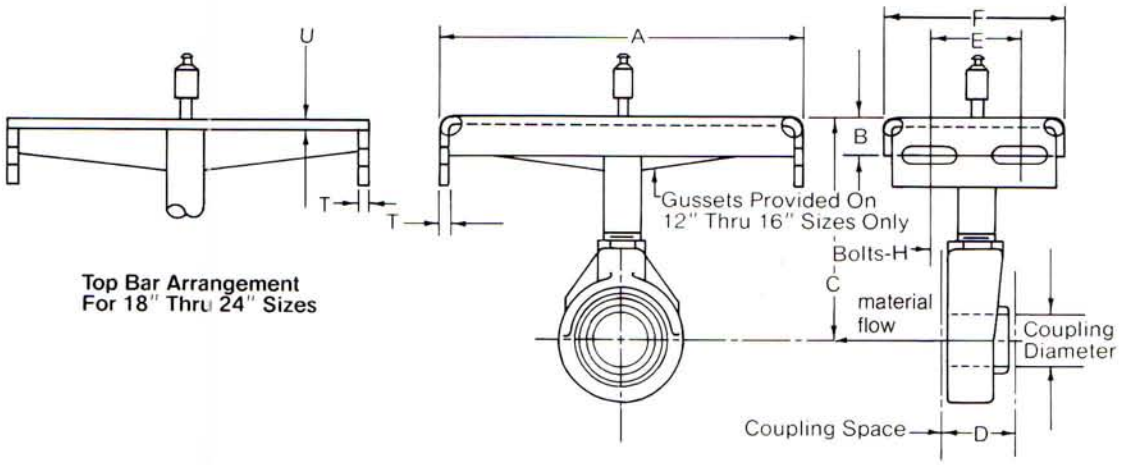
Split Flight Coupling Shafts

Split Flight Coupling Shafts are used to transmit rotation and to position accurately and support the split flight couplings.

Split Flight Coupling Shafts

Screw Diameter, Inches	Coupling Diameter, Inches	Part Numbers Shaft No.					Weight, Pounds Shaft No.			Length, Inches Shaft No.			G	K
		5	6		7		5	6	7	5	6	7	Inches	
			Regular	Hardened(1)	Regular	Hardened(1)								
4	1	170-28-1	170-29-1	170-32-1	170-30-1	170-33-1	1.1	1.4	1.3	5¼	6¾	6	⅜	1½
6	1½	170-28-2	170-29-2	170-32-2	170-30-2	170-33-2	3.8	4.7	4.0	8	10	8½	½	2
9	1½	170-28-3	170-29-3	170-32-3	170-30-3	170-33-3	4.5	5.4	5.4	9½	11½	11½	½	2
	2	170-28-5	170-29-5	170-32-5	170-30-5	170-33-5	8.2	9.5	9.5	9½	11½	11½	⅝	2
10	1½	170-28-4	170-29-4	170-32-4	170-30-4	170-33-4	4.8	5.6	5.9	10	12	12½	½	2
	2	170-28-6	170-29-6	170-32-6	170-30-6	170-33-6	8.6	10	10	10	12	12½	⅝	2
12	2	170-28-7	170-29-7	170-32-7	170-30-7	170-33-7	9.4	11	12	11	13	14½	⅝	2
	2 7/16	170-28-8	170-29-8	170-32-8	170-30-8	170-33-8	14	18	19	11⅛	14⅛	15½	⅝	3
	3	170-28-10	170-29-10	170-32-10	170-30-10	170-33-10	22	27	29	11¼	14¼	15½	¾	3
14	2 7/16	170-28-9	170-29-9	170-32-9	170-30-9	170-33-9	16	19	22	12⅛	15⅛	17½	⅝	3
	3	170-28-11	170-29-11	170-32-11	170-30-11	170-33-11	24	29	33	12¼	15¼	17½	¾	3
16	3	170-28-12	170-29-12	170-32-12	170-30-12	170-33-12	26	30	36	13¼	16¼	19½	¾	3
18	3	170-28-13	170-29-13	170-32-13	170-30-13	170-33-13	28	32	39	14¼	17¼	21½	¾	3
	3 7/16	170-28-17	170-29-17	170-32-17	170-30-17	170-33-17	41	49	55	16¼	20¼	22½	⅞	4
20	3	170-28-14	170-29-14	170-32-14	170-30-14	170-33-14	30	34	41	15¼	18¼	23½	¾	3
	3 7/16	170-28-15	170-29-15	170-32-15	170-30-15	170-33-15	44	51	54	17¼	21¼	24½	⅞	4
24	3 7/16	170-28-16	170-29-16	170-32-16	170-30-16	170-33-16	49	56	69	19¼	23¼	28½	⅞	4

(1)Only bearing length K is hardened.



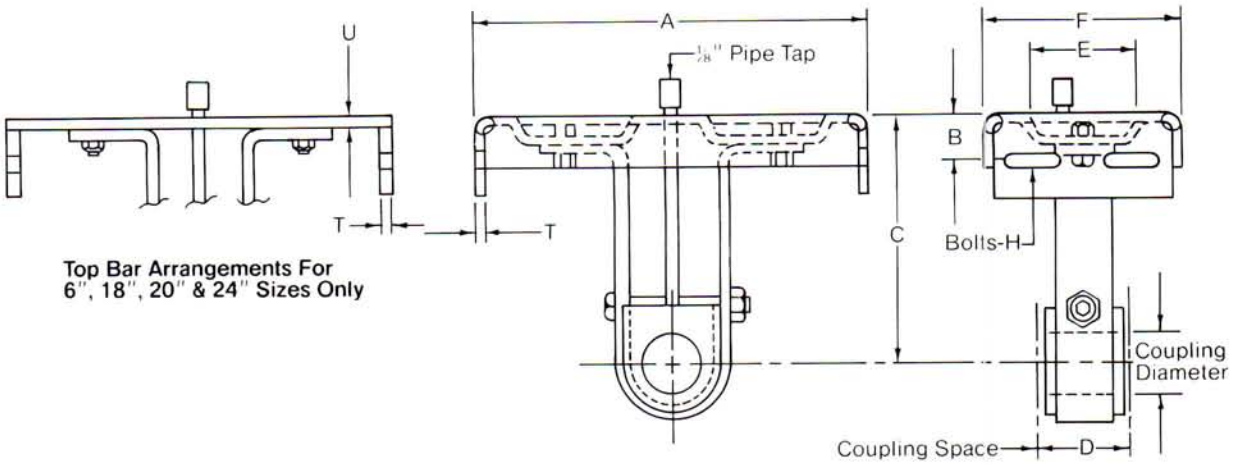
Top Bar Arrangement For 18" Thru 24" Sizes

No. 270 Hangers have formed steel frames and self-aligning ball bearings which reduce power consumption and noise levels.

No. 270 Ball Bearing Hangers

Screw Diameter, Inches	Coupling Diameter, Inches	Part Numbers	Weight Pounds	A	B	C	D	E	F	H	T	U
				Inches								
6	1½	162-513-A	8.1	7	¾	4½	2	2½	5	⅜	3/16	—
9	1½	162-514-A	9.4	10	1	6⅛	2	2½	5	⅜	3/16	—
	2	162-515-A	11	10	1	6⅛	2	2½	5	⅜	3/16	—
10	1½	162-516-A	10	11	1	6⅜	2	2½	5	⅜	3/16	—
	2	162-517-A	11	11	1	6⅜	2	2½	5	⅜	3/16	—
12	2	162-518-A	13	13	1¼	7¾	2	2½	5	½	3/16	—
	2 7/16	162-519-A	16	13	1¼	7¾	3	2½	5	½	3/16	—
	3	162-520-A	22	13	1¼	7¾	3	2½	5	½	3/16	—
14	2 7/16	162-521-A	18	15	1⅜	9¼	3	2½	5	½	3/16	—
	3	162-522-A	23	15	1⅜	9¼	3	2½	5	½	3/16	—
16	3	162-523-A	24	17	1⅜	10⅝	3	2½	5	½	3/16	—
18	3	162-524-A	36	19	1⅝	12⅛	3	3½	6	⅝	⅜	½
	3 7/16	162-525-A	38	19	1⅝	12⅛	4	3½	6	⅝	⅜	½
20	3	162-526-A	38	21	1⅝	13½	3	3½	6	⅝	⅜	½
	3 7/16	162-527-A	43	21	1⅝	13½	4	3½	6	⅝	⅜	½
24	3 7/16	162-528-A	50	25	1¾	16½	4	3½	6	⅝	⅜	⅝

component selection

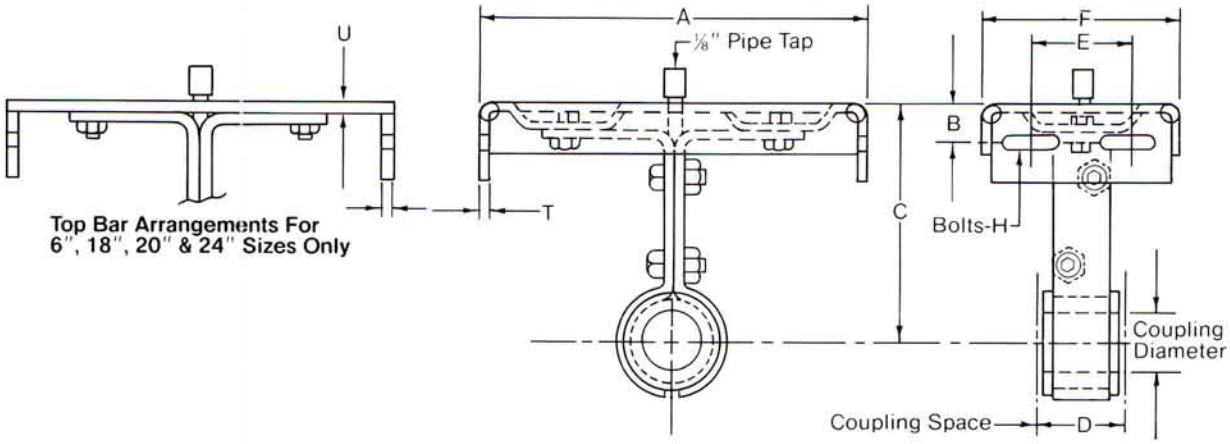


Top Bar Arrangements For 6", 18", 20" & 24" Sizes Only

No. 216 Hangers have formed steel frames of superior strength and rigidity and are excellent for heavy service. These hangers are normally furnished with hard iron, babbitted, bronze, oil impregnated wood or molded fabric bearings, but can also be furnished with special bearings.

No. 216 Hangers

Screw Diameter, Inches	Coupling Diameter, Inches	Part Numbers		Weight Pounds	A	B	C	D	E	F	H	T	U
		Without Oil Pipe	With Oil Pipe		Inches								
6	1½	162-353-B	162-353-C	4.2	7	¾	4½	2	2½	5	⅜	3/16	3/16
9	1½	162-473-B	162-473-C	6.7	10	1	6⅛	2	2½	5	⅜	3/16	—
	2	162-474-B	162-474-C	7.8	10	1	6⅛	2	2½	5	⅜	3/16	—
10	1½	162-475-B	162-475-C	7.1	11	1	6⅜	2	2½	5	⅜	3/16	—
	2	162-476-B	162-476-C	8.2	11	1	6⅜	2	2½	5	⅜	3/16	—
12	2	162-477-B	162-477-C	9.6	13	1¼	7¾	2	2½	5	½	3/16	—
	2 7/16	162-478-B	162-478-C	9.7	13	1¼	7¾	3	2½	5	½	3/16	—
	3	162-479-B	162-479-C	12	13	1¼	7¾	3	2½	5	½	3/16	—
14	2 7/16	162-480-B	162-480-C	12	15	1⅜	9¼	3	2½	5	½	3/16	—
	3	162-481-B	162-481-C	14	15	1⅜	9¼	3	2½	5	½	3/16	—
16	3	162-482-B	162-482-C	15	17	1⅜	10⅝	3	2½	5	½	3/16	—
18	3	162-364-B	162-364-C	26	19	1⅝	12⅛	3	3½	6	⅝	⅜	½
	3 7/16	162-365-B	162-365-C	35	19	1⅝	12⅛	4	3½	6	⅝	⅜	½
20	3	162-366-B	162-366-C	30	21	1⅝	13½	3	3½	6	⅝	⅜	½
	3 7/16	162-367-B	162-367-C	38	21	1⅝	13½	4	3½	6	⅝	⅜	½
24	3 7/16	162-368-B	162-368-C	49	25	1¾	16½	4	3½	6	⅝	⅜	⅝

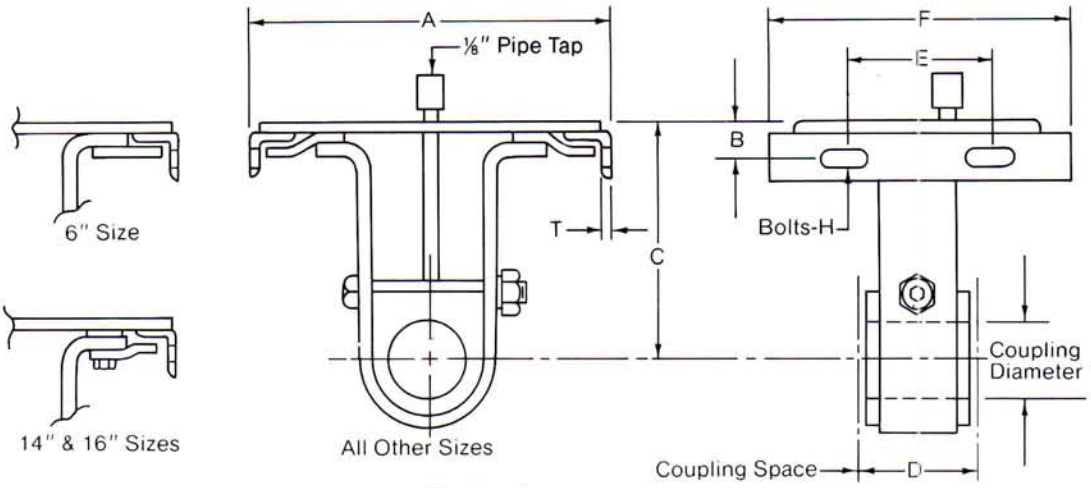


No. 226 Hangers have a rigid, formed steel frame with clearance for passage of material in large volume. These hangers are normally furnished with hard iron, babbitted, bronze, oil impregnated wood or molded fabric bearings, but can also be furnished with special bearings. Stainless steel frames can be furnished.

No. 226 Hangers

Screw Diameter, Inches	Coupling Diameter, Inches	Part Numbers		Weight Pounds	A	B	C	D	E	F	H	T	U
		Without Oil Pipe	With Oil Pipe		Inches								
4	1	162-409-B	—	2.5	5	⅝	3⅝	1½	2	3½	¼	3/16	3/16
6	1½	162-381-B	162-381-C	5.6	7	¾	4½	2	2½	5	⅜	3/16	3/16
9	1½	162-483-B	162-483-C	8.3	10	1	6⅛	2	2½	5	⅜	3/16	—
	2	162-484-B	162-484-C	8.6	10	1	6⅛	2	2½	5	⅜	3/16	—
10	1½	162-485-B	162-485-C	9.9	11	1	6⅜	2	2½	5	⅜	3/16	—
	2	162-486-B	162-486-C	10	11	1	6⅜	2	2½	5	⅜	3/16	—
12	2	162-487-B	162-487-C	12	13	1¼	7¾	2	2½	5	½	3/16	—
	2 7/16	162-488-B	162-488-C	16	13	1¼	7¾	3	2½	5	½	3/16	—
	3	162-489-B	162-489-C	16	13	1¼	7¾	3	2½	5	½	3/16	—
14	2 7/16	162-490-B	162-490-C	18	15	1⅜	9¼	3	2½	5	½	3/16	—
	3	162-491-B	162-491-C	18	15	1⅜	9¼	3	2½	5	½	3/16	—
16	3	162-492-B	162-492-C	26	17	1⅜	10⅝	3	2½	5	½	3/16	—
18	3	162-392-B	162-392-C	35	19	1⅝	12⅛	3	3½	6	⅝	⅜	½
	3 7/16	162-393-B	162-393-C	50	19	1⅝	12⅛	4	3½	6	⅝	⅜	½

component selection

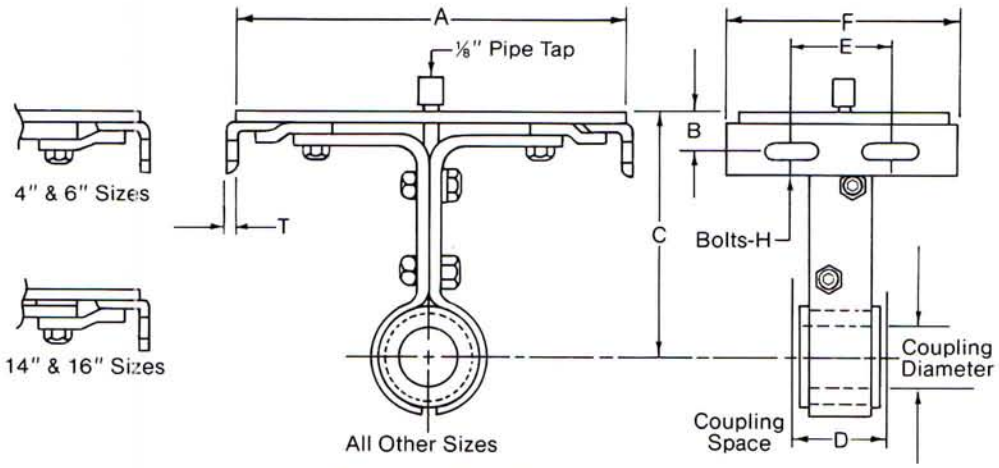


Top Bar Arrangements

No. 316 Hangers are similar in construction to No. 216 hangers, except that they are self-adjusting. The top bars are arranged to slide on angle guides fastened to the troughs. These hangers are normally furnished with hard iron, babbitted, bronze, oil impregnated wood or molded fabric bearings, but can also be furnished with special bearings.

No. 316 Hangers

Screw Diameter, Inches	Coupling Diameter, Inches	Part Numbers		Weight Pounds	A	B	C	D	E	F	H	T
		Without Oil Pipe	With Oil Pipe		Inches							
6	1½	162-65-B	162-65-C	4.6	7	¾	4½	2	2½	6	⅜	⅛
9	1½	162-503-B	162-503-C	7.7	10	1	6⅛	2	2½	6	⅜	3/16
	2	162-504-B	162-504-C	8.7	10	1	6⅛	2	2½	6	⅜	3/16
10	1½	162-505-B	162-505-C	8.1	11	1	6⅜	2	2½	6	⅜	3/16
	2	162-506-B	162-506-C	9.2	11	1	6⅜	2	2½	6	⅜	3/16
12	2	162-507-B	162-507-C	13	13	1¼	7¾	2	2½	6½	½	3/16
	2 7/16	162-508-B	162-508-C	14	13	1¼	7¾	3	2½	6½	½	3/16
	3	162-509-B	162-509-C	16	13	1¼	7¾	3	2½	6½	½	3/16
14	2 7/16	162-510-B	162-510-C	20	15	1⅜	9¼	3	2½	6½	½	¼
	3	162-511-B	162-511-C	22	15	1⅜	9¼	3	2½	6½	½	¼
16	3	162-512-B	162-512-C	24	17	1⅜	10⅜	3	2½	6½	½	¼
18	3	162-331-B	162-331-C	30	19	1⅝	12⅛	3	3½	6½	⅝	¼
	3 7/16	162-332-B	162-332-C	37	19	1⅝	12⅛	4	3½	6½	⅝	¼
20	3	162-333-B	162-333-C	32	21	1⅝	13½	3	3½	6½	⅝	¼
	3 7/16	162-334-B	162-334-C	40	21	1⅝	13½	4	3½	6½	⅝	¼
24	3 7/16	162-335-B	162-335-C	54	25	1¾	16½	4	3½	7	⅝	5/16



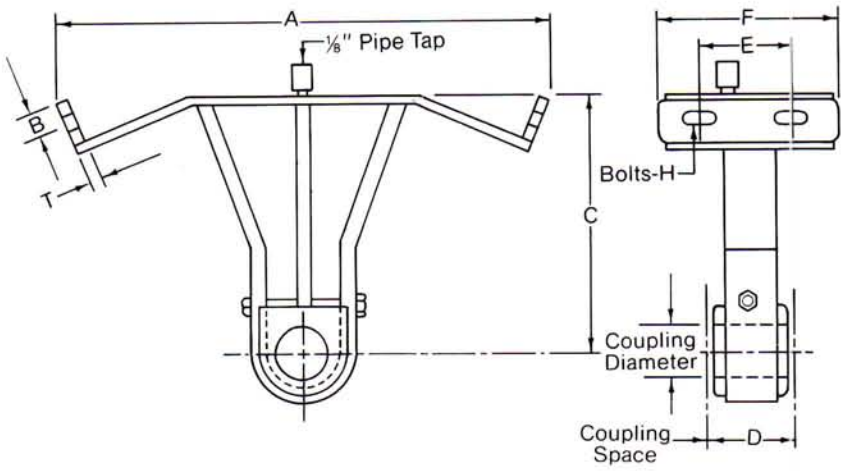
Top Bar Arrangements

No. 326 Hangers are similar in construction to No. 226 hangers, except that they are self-adjusting. The top bars are arranged to slide on angle guides fastened to the troughs. These hangers are normally furnished with hard iron, babbitted, bronze, oil impregnated wood or molded fabric bearings, but can also be furnished with special bearings.

No. 326 Hangers

Screw Diameter, Inches	Coupling Diameter, Inches	Part Numbers		Weight Pounds	A	B	C	D	E	F	H	T
		Without Oil Pipe	With Oil Pipe		Inches							
4	1	162-410-B	—	3.0	5	⅝	3⅜	1½	2	5	¼	⅛
6	1½	162-336-B	162-336-C	5.9	7	¾	4½	2	2½	6	⅜	⅛
9	1½	162-493-B	162-493-C	9.3	10	1	6⅛	2	2½	6	⅜	3/16
	2	162-494-B	162-494-C	9.5	10	1	6⅛	2	2½	6	⅜	3/16
10	1½	162-495-B	162-495-C	11	11	1	6⅜	2	2½	6	⅜	3/16
	2	162-496-B	162-496-C	11	11	1	6⅜	2	2½	6	⅜	3/16
12	2	162-497-B	162-497-C	16	13	1¼	7¾	2	2½	6½	½	3/16
	2 7/16	162-498-B	162-498-C	20	13	1¼	7¾	3	2½	6½	½	3/16
	3	162-499-B	162-499-C	20	13	1¼	7¾	3	2½	6½	½	3/16
14	2 7/16	162-500-B	162-500-C	26	15	1⅜	9¼	3	2½	6½	½	¼
	3	162-501-B	162-501-C	27	15	1⅜	9¼	3	2½	6½	½	¼
16	3	162-502-B	162-502-C	34	17	1⅜	10⅝	3	2½	6½	½	¼
18	3	162-347-B	162-347-C	39	19	1⅝	12⅛	3	3½	6½	⅝	¼
	3 7/16	162-348-B	162-348-C	54	19	1⅝	12⅛	4	3½	6½	⅝	¼

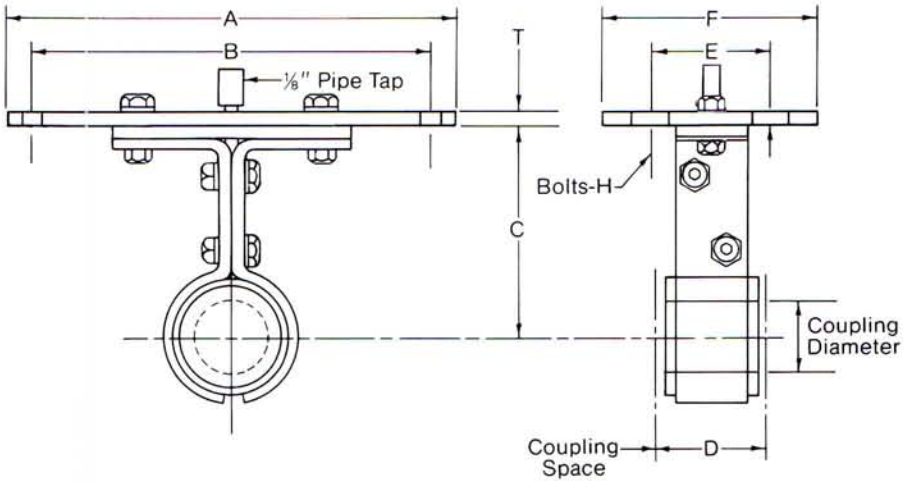
component selection



No. 216F Hangers are similar in construction to No. 216 hangers, except that they are designed for mounting in flared trough. These hangers are normally furnished with hard iron, babbitted, bronze, oil impregnated wood or molded fabric bearings, but can also be furnished with special bearings.

No. 216F Hangers

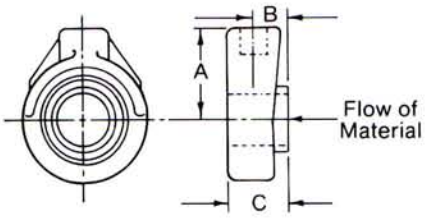
Screw Diameter, Inches	Coupling Diameter, Inches	Part Numbers		Weight Pounds	A	B	C	D	E	F	H	T
		Without Oil Pipe	With Oil Pipe		Inches							
6	1½	162-419-B	162-419-A	9.4	14	⅞	7	2	2½	5	⅜	3/16
9	1½	162-420-B	162-420-A	14	18	⅞	9	2	2½	5	⅜	3/16
	2	162-421-B	162-421-A	17	18	⅞	9	2	2½	5	⅜	3/16
12	2	162-422-B	162-422-A	24	22	1⅛	10	2	2½	5	½	⅜
	2 7/16	162-423-B	162-423-A	28	22	1⅛	10	3	2½	5	½	⅜
	3	162-424-B	162-424-A	32	22	1⅛	10	3	2½	5	½	⅜
14	2 7/16	162-425-B	162-425-A	31	24	1⅛	11	3	2½	5	½	⅜
	3	162-426-B	162-426-A	34	24	1⅛	11	3	2½	5	½	⅜
16	3	162-427-B	162-427-A	38	28	1⅛	11½	3	2½	5	½	⅜
18	3	162-462-B	162-462-A	52	31	1½	12⅛	3	3½	6	⅝	⅜
	3 7/16	162-463-B	162-463-A	61	31	1½	12⅛	4	3½	6	⅝	⅜
20	3	162-464-B	162-464-A	55	34	1½	13½	3	3½	6	⅝	⅜
	3 7/16	162-465-B	162-465-A	64	34	1½	13½	4	3½	6	⅝	⅜
24	3 7/16	162-466-B	162-466-A	71	40	1½	16½	4	3½	6	⅝	⅜



No. 220 Hangers are similar in construction to No. 226 hangers, except that they are mounted on top of the trough angles or flanges. These hangers are normally furnished with hard iron, babbitted, bronze, oil impregnated wood or molded fabric bearings, but can also be furnished with special bearings. Stainless steel frames can be furnished.

No. 220 Hangers

Screw Diameter, Inches	Coupling Diameter, Inches	Part Numbers		Weight Pounds	A	B	C	D	E	F	H	T
		Without Oil Pipe	With Oil Pipe		Inches							
6	1½	162-369-B	162-369-C	5.4	9¾	8¾	4½	2	2½	4½	⅜	3/16
9	1½	162-370-B	162-370-C	8.3	13½	12¼	6⅛	2	2½	4½	⅜	¼
	2	162-371-B	162-371-C	8.5	13½	12¼	6⅛	2	2½	4½	⅜	¼
10	1½	162-372-B	162-372-C	10	14½	13¼	6⅜	2	2½	4½	⅜	¼
	2	162-373-B	162-373-C	11	14½	13¼	6⅜	2	2½	4½	⅜	¼
12	2	162-374-B	162-374-C	17	17½	15¾	7¾	2	2½	5	½	⅜
	2 7/16	162-375-B	162-375-C	21	17½	15¾	7¾	3	2½	5	½	⅜
	3	162-376-B	162-376-C	22	17½	15¾	7¾	3	2½	5	½	⅜
14	2 7/16	162-377-B	162-377-C	28	19½	17¾	9¼	3	2½	5	½	½
	3	162-378-B	162-378-C	29	19½	17¾	9¼	3	2½	5	½	½
16	3	162-379-B	162-379-C	36	21½	19¾	10⅝	3	2½	5	½	½
18	3	162-380-B	162-380-C	45	24½	22¼	12⅛	3	3½	6	⅝	½

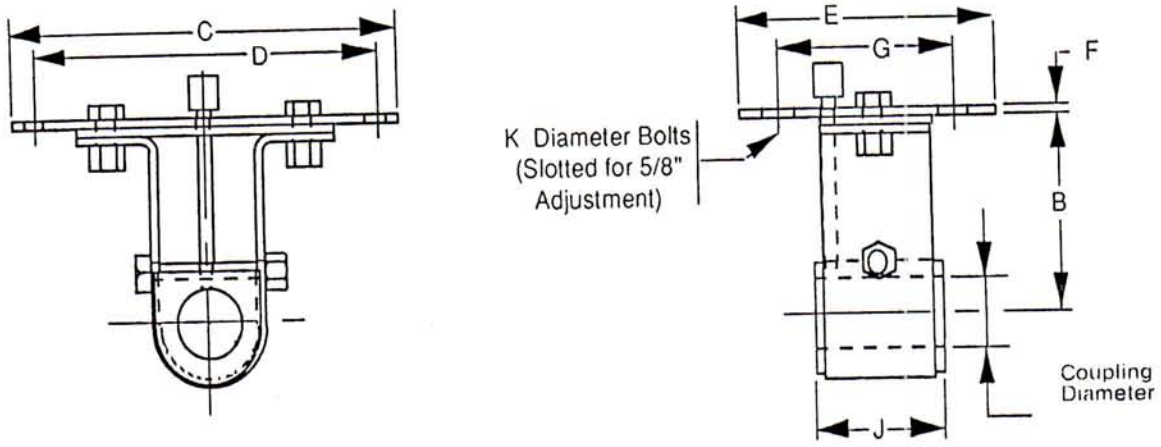


Hanger Bearing 270

No. 270 Hanger Bearings

Coupling Diameter, Inches	Part Numbers	A	B	C
1½	324-154-1	2⅞	1 1/32	1⅞
2	324-154-2	3¼	1 7/64	2
2 7/16	324-154-3	4	1 9/64	2 5/16
3	324-154-4	4⅞	1 17/32	2 15/16
3 7/16	324-154-5	6	1 23/64	3⅛

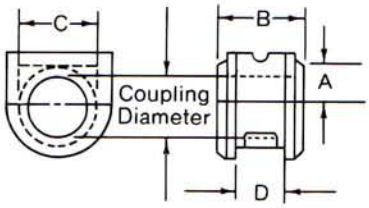
component selection



No. 230 Hangers are similar in construction to No. 216 hangers, except that they are mounted on top of the trough angles or flanges. These hangers are normally furnished with hard iron, babitted, bronze, oil impregnated wood or molded fabric bearings, but can also be furnished with special bearings. Stainless steel frames can be furnished.

No. 230 Hangers

Screw Diameter Inches	Coupling Diameter Inches	Part Numbers		Weight Pounds	B	C	D	E	F	G	J	K
		Without Oil Pipe	With Oil Pipe		Inches							
6	1 1/2	162-571-FA	162-571-FAP	4	4 1/2	9 3/4	8 3/4	4 1/2	3/16	2 1/2	1 15/16	3/8
9	1 1/2	162-571-FB	162-571-FBP	7	6 1/8	13 1/2	12 1/4	4 1/2	1/4	2 1/2	1 15/16	3/8
	2	162-571-FC	162-571-FCP	8	6 1/8	13 1/2	12 1/4	4 1/2	1/4	2 1/2	1 15/16	3/8
10	1 1/2	162-571-FD	162-571-FDP	8	6 3/8	14 1/2	13 1/4	4 1/2	1/4	2 1/2	1 15/16	3/8
	2	162-571-FE	162-571-FEP	8	6 3/8	14 1/2	13 1/4	4 1/2	1/4	2 1/2	1 15/16	3/8
12	2	162-571-FF	162-571-FFP	14	7 3/4	17 1/2	15 3/4	5	3/8	2 1/2	1 15/16	1/2
	2 7/16	162-571-FG	162-571-FGP	15	7 3/4	17 1/2	15 3/4	5	3/8	2 1/2	2 15/16	1/2
	3	162-571-FH	162-571-FHP	16.63	7 3/4	17 1/2	15 3/4	5	3/8	2 1/2	2 15/16	1/2
14	2 7/16	162-571-FJ	162-571-FJP	22	9 1/4	19 1/2	17 3/4	5	1/2	2 1/2	2 15/16	1/2
	3	162-571-FK	162-571-FKP	24	9 1/4	19 1/2	17 3/4	5	1/2	2 1/2	2 15/16	1/2
16	3	162-571-FL	162-571-FLP	26	10 5/8	21 1/2	19 3/4	5	1/2	2 1/2	2 15/16	1/2
18	3	162-571-FM	162-571-FMP	35	12 1/8	24 1/2	22 1/4	6	1/2	3 1/2	2 15/16	5/8
	3 7/16	162-571-FN	162-571-FNP	41	12 1/8	24 1/2	22 1/4	6	1/2	3 1/2	3 15/16	5/8
20	3	162-571-FP	162-571-FPP	40	13 1/2	26 1/2	24 1/4	6	1/2	3 1/2	2 15/16	5/8
	3 7/16	162-571-FR	162-571-FRP	42	13 1/2	26 1/2	24 1/4	6	1/2	3 1/2	3 15/16	5/8
24	3 7/16	162-571-FS	162-571-FSP	61	16 1/2	30 1/2	28 1/4	6	5/8	3 1/2	3 15/16	5/8

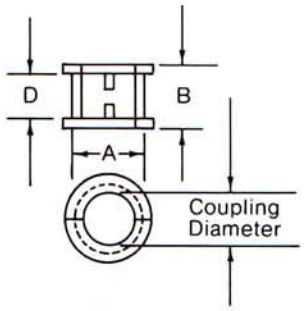


No. 216 And 316 Hanger Bearings

No. 216, 216F and 316 Hanger Bearings ▲

Coupling Diameter, Inches	Bearing	Part Numbers					A	B	C	D
		Hard Iron		Babbitted	Bronze	Oil Impregnated Wood	Inches			
		No Oil Pipe	For Oil Pipe							
1½	Upper	283-120-1	283-168-A	283-16-C	283-39-C	283-56-D	1 3/32	1 15/16	2¼	1 5/16
	Lower	283-21-4								
2	Upper	283-121-1	283-168-B	283-16-E	283-39-E	283-57-D	1 11/32	1 15/16	3¼	1 9/16
	Lower	283-23-4								
2 7/16	Upper	283-122-1	283-168-C	283-16-F	283-39-F	283-58-B	1 27/32	2 15/16	4	1 9/16
	Lower	283-25-4								
3	Upper	283-123-1	283-168-D	283-16-H	283-39-H	283-59-D	1 31/32	2 15/16	4½	2 1/16
	Lower	283-27-5								
3 7/16	Upper	283-136-1	283-168-E	283-16-J	283-39-J	283-60-B	2 3/32	3 15/16	4⅞	2 9/16
	Lower	283-137-1								
3 15/16	Upper	283-30-3	283-168-F	—	283-39-K	—	2 21/32	3 15/16	5¾	3 1/16
	Lower	283-31-3								

▲ For numbers 16, 16B, 24, and 24A, old style hangers.



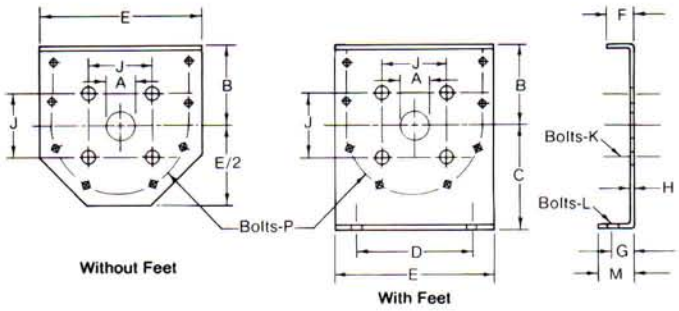
No. 220, 226 And 326 Hanger Bearings

No. 220, 226 and 326 Hanger Bearings •

Coupling Diameter Inches	Bearing	Part Numbers							A	B	D
		Hard Iron		Babbitted	Bronze	Oil Impregnated Wood	Wearite	Nylon with MOS2	Inches		
		No Oil Pipe	For Oil Pipe								
1	Upper	283-69-3	—	283-61-F	283-84-A	283-97-D	—	—	1½	1 7/16	1 1/16
	Lower	283-69-3									
1½	Upper	283-70-3	283-70-4	283-61-A	283-84-B	283-98-D	283-171-A	283-147-1	2⅛	1 15/16	1 9/16
	Lower	283-70-3									
2	Upper	283-72-3	283-72-4	283-61-B	283-84-C	283-99-D	283-171-B	283-147-2	2¾	1 15/16	1 9/16
	Lower	283-72-3									
2 7/16	Upper	283-73-3	283-73-4	283-61-C	283-84-D	283-100-B	283-171-C	283-147-3	3¼	2 15/16	2 3/8
	Lower	283-73-3									
3	Upper	283-74-3	283-74-4	283-61-D	283-84-E	283-101-D	283-171-D	283-147-4	4	2 15/16	2 3/8
	Lower	283-74-3									
3 7/16	Upper	283-138-1	—	283-61-E	283-84-F	283-102-B	283-171-E	283-147-5	4¾	3 15/16	3⅛
	Lower	283-138-1									
3 15/16	Upper	283-114-1	—	—	—	—	—	—	5¼	3 15/16	3⅛
	Lower	283-114-1									

• For numbers 20A, 20B, 26A, 26B, 28A, 28B old style hangers.

component selection

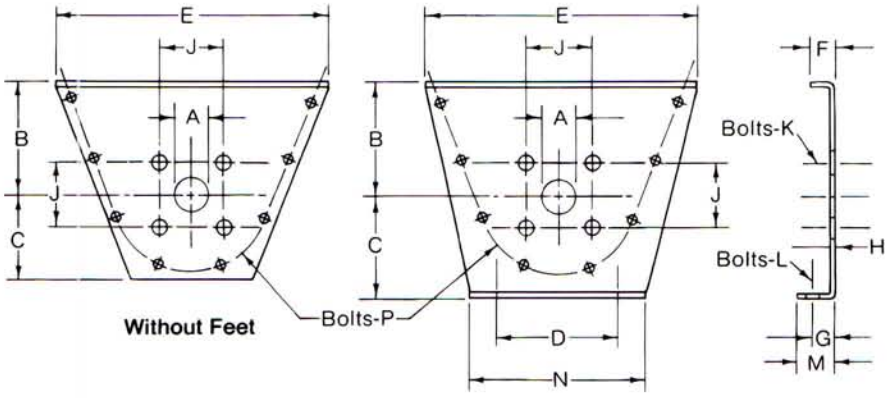


Trough End Plates consist of heavy steel plate, flanged at the top for supporting the trough cover. They can be furnished with or without feet, formed by a flange at the bottom, for supporting the conveyor trough. They are drilled, and countersunk on the back side, to suit either babbitted, bronze, or ball bearing flanged units, or shaft-mounted screw conveyor drive adapter housings. Trough end plates with mounting holes located other than shown, can be furnished. Stainless steel trough end plates with or without feet, can be furnished.

Trough End Plates—U, for Babbitt, Bronze or Ball Bearings

Screw Dia.,	Shaft Dia.,	Trough End Plate				A	B	C	D	E	F	G	H	J	K	L	M	P
		With Feet		Without Feet														
Inches		Part No.	Weight	Part No.	Weitht	Inches												
4	1	651-536-1	5	651-536-4	3	1 1/4	3 5/8	4 5/8	5 3/4	7 3/4	1 7/16	1	3/16	2 3/4	3/8	3/8	1 5/8	3/8(1)
6	1 1/2	651-536-7	7	651-536-10	5	1 3/4	4 1/2	5 5/8	8 1/8	9 3/4	1 1/2	1	3/16	4	1/2	3/8	1 3/4	3/8(1)
9	1 1/2	651-536-13	17	651-536-19	12	1 3/4	6 1/8	7 7/8	9 3/8	13 3/4	1 5/8	1 1/2	1/4	4	1/2	1/2	2 5/8	3/8(2)
	2	651-536-16	17	651-536-22	12	2 1/4	6 1/8	7 7/8	9 3/8	13 3/4	1 5/8	1 1/2	1/4	5 1/8	5/8	1/2	2 5/8	3/8(2)
10	1 1/2	651-536-25	20	651-536-31	14	1 3/4	6 3/8	8 7/8	9 1/2	14 3/4	1 3/4	1 3/4	1/4	4	1/2	1/2	2 7/8	3/8(2)
	2	651-536-28	20	651-536-34	14	2 1/4	6 3/8	8 7/8	9 1/2	14 3/4	1 3/4	1 3/4	1/4	5 1/8	5/8	1/2	2 7/8	3/8(2)
12	2	651-536-37	28	651-536-46	19	2 1/4	7 3/4	9 5/8	12 1/4	17 1/4	2	1 5/8	1/4	5 1/8	5/8	5/8	2 3/4	1/2(2)
	2 7/16	651-536-40	28	651-536-49	19	2 11/16	7 3/4	9 5/8	12 1/4	17 1/4	2	1 5/8	1/4	5 5/8	5/8	5/8	2 3/4	1/2(2)
	3	651-536-43	28	651-536-52	19	3 1/4	7 3/4	9 5/8	12 1/4	17 1/4	2	1 5/8	1/4	6	3/4	5/8	2 3/4	1/2(2)
14	2 7/16	651-536-55	42	651-536-61	32	2 11/16	9 1/4	10 7/8	13 1/2	19 1/4	2	1 5/8	5/16	5 5/8	5/8	5/8	2 7/8	1/2(2)
	3	651-536-58	42	651-536-64	32	3 1/4	9 1/4	10 7/8	13 1/2	19 1/4	2	1 5/8	5/16	6	3/4	5/8	2 7/8	1/2(2)
16	3	651-536-67	54	651-536-70	41	3 1/4	10 5/8	12	14 7/8	21 1/4	2 1/2	2	5/16	6	3/4	5/8	3 1/4	5/8(2)
18	3	651-536-73	80	651-536-79	61	3 1/4	12 1/8	13 3/8	16	24 1/4	2 1/2	2	3/8	6	3/4	5/8	3 1/4	5/8(3)
	3 7/16	651-536-76	80	651-536-82	61	3 11/16	12 1/8	13 1/8	16	24 1/4	2 1/2	2	3/8	6 3/4	3/4	5/8	3 1/4	5/8(3)
20	3	651-536-85	96	651-536-91	72	3 1/4	13 1/2	15	19 1/4	26 1/4	2 1/2	2 1/4	3/8	6	3/4	3/4	3 3/4	5/8(3)
	3 7/16	651-536-88	96	651-536-94	72	3 11/16	13 1/2	15	19 1/4	26 1/4	2 1/2	2 1/4	3/8	6 3/4	3/4	3/4	3 3/4	5/8(3)
24	3	651-536-97	130	651-536-103	96	3 1/4	16 1/2	18 1/8	20	30 1/4	2 1/2	2 1/2	3/8	6	3/4	3/4	4 1/8	5/8(4)
	3 7/16	651-536-100	130	651-536-106	96	3 11/16	16 1/2	18 1/8	20	30 1/4	2 1/2	2 1/2	3/8	6 3/4	3/4	3/4	4 1/8	5/8(4)

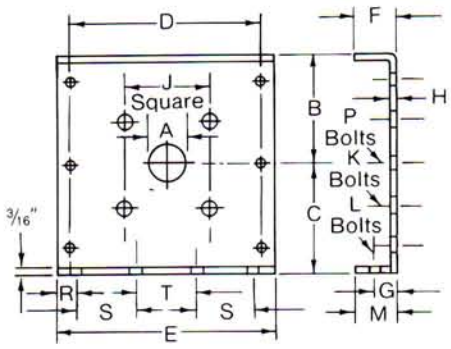
(1)Six bolt holes (3)Ten bolt holes
(2)Eight bolt holes (4)Twelve bolt holes



Trough End Plates—Flared, for Babbitt, Bronze or Ball Bearings

Screw Dia.,	Shaft Dia.,	Trough End Plate With Feet		Trough End Plate Without Feet		A	B	C W/Feet	C W/O Feet	D	E	F	G	H	J	K	L	M	N	P
Inches		Part. No.	Weight	Part No.	Weight	Inches														
6	1 1/2	651-537-1	10	651-537-4	9	1 3/4	7	5 5/8	5	8 1/8	16 5/8	1 1/2	1	3/16	4	1/2	3/8	1 3/4	10 1/4	3/8(1)
9	1 1/2	651-537-7	25	651-537-13	21	1 3/4	9	7 7/8	6 3/4	9 3/8	21 1/4	1 5/8	1 1/2	1/4	4	1/2	1/2	2 5/8	14 3/8	3/8(2)
	2	651-537-10	24	651-537-16	20	2 1/4	9	7 7/8	6 3/4	9 3/8	21 1/4	1 5/8	1 1/2	1/4	5 1/8	5/8	1/2	2 5/8	14 3/8	3/8(2)
12	2	651-537-19	36	651-537-28	31	2 1/4	10	9 5/8	8 3/4	12 1/4	26 3/8	2	1 5/8	1/4	5 1/8	5/8	5/8	2 3/4	17 7/8	1/2(2)
	2 7/16	651-537-22	36	651-537-31	31	2 11/16	10	9 5/8	8 3/4	12 1/4	26 3/8	2	1 5/8	1/4	5 5/8	5/8	5/8	2 3/4	17 7/8	1/2(2)
	3	651-537-25	35	651-537-34	30	3 1/4	10	9 5/8	8 3/4	12 1/4	26 3/8	2	1 5/8	1/4	6	3/4	5/8	2 3/4	17 7/8	1/2(2)
14	2 7/16	651-537-37	54	651-537-43	46	2 11/16	11	10 7/8	9 3/4	13 1/2	28 3/8	2	1 5/8	5/16	5 5/8	5/8	5/8	2 7/8	19 1/2	1/2(3)
	3	651-537-40	53	651-537-46	46	3 1/4	11	10 7/8	9 3/4	13 1/2	28 3/8	2	1 5/8	5/16	6	3/4	5/8	2 7/8	19 1/2	1/2(3)
16	3	651-537-49	66	651-537-52	57	3 1/4	11 1/2	12	10 3/4	14 7/8	32 1/2	2 1/2	2	5/16	6	3/4	5/8	3 1/4	21 3/4	5/8(3)
18	3	651-537-A	107	651-537-G	91	3 1/4	12 1/8	13 3/8	12 1/4	16	36 1/2	2 1/2	2	3/8	6	3/4	5/8	3 1/4	24 3/4	5/8(3)
	3 7/16	651-537-D	107	651-537-K	91	3 11/16	12 1/8	13 3/8	12 1/4	16	36 1/2	2 1/2	2	3/8	6 3/4	3/4	5/8	3 1/4	24 3/4	5/8(3)
20	3	651-537-N	129	651-537-V	106	3 1/4	13 1/2	15	13 1/4	19 1/4	39 1/2	2 1/2	2 1/4	3/8	6	3/4	3/4	3 3/4	26 7/8	5/8(3)
	3 7/16	651-537-S	128	651-537-Y	106	3 11/16	13 1/2	15	13 1/4	19 1/4	39 1/2	2 1/2	2 1/4	3/8	6 3/4	3/4	3/4	3 3/4	26 7/8	5/8(3)
24	3	651-537-AB	175	651-537-AH	143	3 1/4	16 1/2	18 1/8	15 1/4	20	45 1/2	2 1/2	2 1/2	3/8	6	3/4	3/4	4 1/8	31	5/8(4)
	3 7/16	651-537-AE	175	651-537-AL	142	3 11/16	16 1/2	18 1/8	15 1/4	20	45 1/2	2 1/2	2 1/2	3/8	6 3/4	3/4	3/4	4 1/8	31	5/8(4)

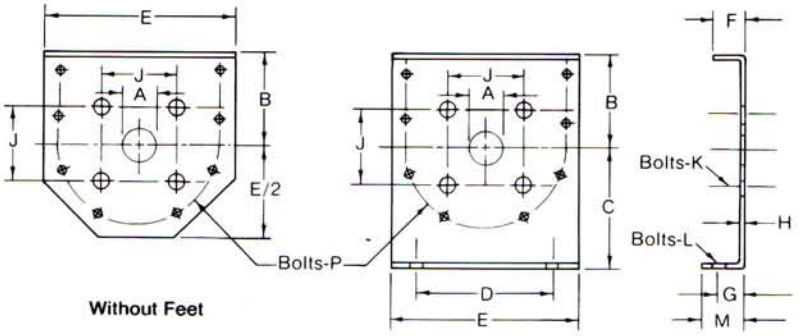
(1)Six bolt holes
(2)Eight bolt holes
(3)Ten bolt holes
(4)Twelve bolt holes



Trough End Plates—Flush End, for Babbitt, Bronze or Ball Bearings

Screw Dia.	Shaft Dia.	Part Number	Weight, Pounds	A	B	C	D	E	F	G	H	J	K	L	M	P	R	S	T
Inches				Inches															
4	1	651-538-A	4	1 1/4	3 5/8	3 3/4	7	7 3/4	1 7/16	7/8	3/16	2 3/4	3/8	1/4 (1)	1 1/4	3/8 (2)	1/2	2 1/4	2 1/4
6	1 1/2	651-538-D	6	1 3/4	4 1/2	5	8 7/8	9 3/4	1 1/2	13/16	3/16	4	1/2	3/8 (1)	1 1/2	3/8 (2)	9/16	2 13/16	3
9	1 1/2	651-538-G	14	1 3/4	6 1/8	7 1/8	12 1/2	13 3/4	1 5/8	1	1/4	4	1/2	3/8 (1)	1 1/2	3/8 (3)	7/8	4	4
	2	651-538-K	14	2 1/4	6 1/8	7 1/8	12 1/2	13 3/4	1 5/8	1	1/4	5 1/8	5/8	3/8 (1)	1 1/2	3/8 (3)	7/8	4	4
10	1 1/2	651-538-N	17	1 3/4	6 3/8	7 1/8	13 1/4	14 3/4	1 3/4	1	1/4	4	1/2	3/8 (1)	1 5/8	3/8 (3)	7/8	4 5/16	4 1/4
	2	651-538-S	17	2 1/4	6 3/8	7 1/8	13 1/4	14 3/4	1 3/4	1	1/4	5 1/8	5/8	3/8 (1)	1 5/8	3/8 (3)	7/8	4 5/16	4 1/4
12	2	651-538-V	22	2 1/4	7 3/4	8 7/8	15 7/8	17 1/4	2	1 1/4	1/4	5 1/8	5/8	3/8 (1)	2 1/8	1/2 (3)	7/8	5 1/8	5 1/4
	2 7/16	651-538-Y	22	2 11/16	7 3/4	8 7/8	15 7/8	17 1/4	2	1 1/4	1/4	5 5/8	5/8	3/8 (1)	2 1/8	1/2 (3)	7/8	5 1/8	5 1/4
	3	651-538-AB	22	3 1/4	7 3/4	8 7/8	15 7/8	17 1/4	2	1 1/4	1/4	6	3/4	3/8 (1)	2 1/8	1/2 (3)	7/8	5 1/8	5 1/4
14	2 7/16	651-538-AE	37	2 11/16	9 1/4	10 1/8	17 7/8	19 1/4	2	1 1/4	5/16	5 5/8	5/8	3/8 (2)	2 1/8	1/2 (3)	7/8	3 1/2	3 1/2
	3	651-538-AH	36	3 1/4	9 1/4	10 1/8	17 7/8	19 1/4	2	1 1/4	5/16	6	3/4	3/8 (2)	2 1/8	1/2 (3)	7/8	3 1/2	3 1/2
16	3	651-538-AL	45	3 1/4	10 5/8	11 1/8	20	21 1/4	2 1/2	1 1/4	5/16	6	3/4	3/8 (2)	2 1/8	5/8 (3)	7/8	3 1/4	4
18	3	651-538-AP	69	3 1/4	12 1/8	12 3/8	22	24 1/4	2 1/2	1 1/2	3/8	6	3/4	1/2 (2)	2 5/8	5/8 (4)	1 1/8	4 7/16	4 3/8
	3 7/16	651-538-AT	68	3 11/16	12 1/8	12 3/8	22	24 1/4	2 1/2	1 1/2	3/8	6 3/4	3/4	1/2 (2)	2 5/8	5/8 (4)	1 1/8	4 7/16	4 3/8
20	3	651-538-AW	82	3 1/4	13 1/2	13 3/8	24 3/8	26 1/4	2 1/2	1 1/2	3/8	6	3/4	1/2 (2)	2 5/8	5/8 (4)	1 1/8	4 7/8	4 3/4
	3 7/16	651-538-AZ	81	3 11/16	13 1/2	13 3/8	24 3/8	26 1/4	2 1/2	1 1/2	3/8	6 3/4	3/4	1/2 (2)	2 5/8	5/8 (4)	1 1/8	4 7/8	4 3/4
24	3	651-538-BC	111	3 1/4	16 1/2	15 3/8	28 1/2	30 1/4	2 1/2	1 1/2	3/8	6	3/4	1/2 (2)	2 5/8	5/8 (5)	1 1/8	5 5/8	5 1/2
	3 7/16	651-538-BF	110	3 11/16	16 1/2	15 3/8	28 1/2	30 1/4	2 1/2	1 1/2	3/8	6 3/4	3/4	1/2 (2)	2 5/8	5/8 (5)	1 1/8	5 5/8	5 1/2

(1)Four bolt holes
(2)Six bolt holes
(3)Eight bolt holes
(4)Ten bolt holes
(5)Twelve bolt holes



Trough End Plates — U, For Double Roller Bearings

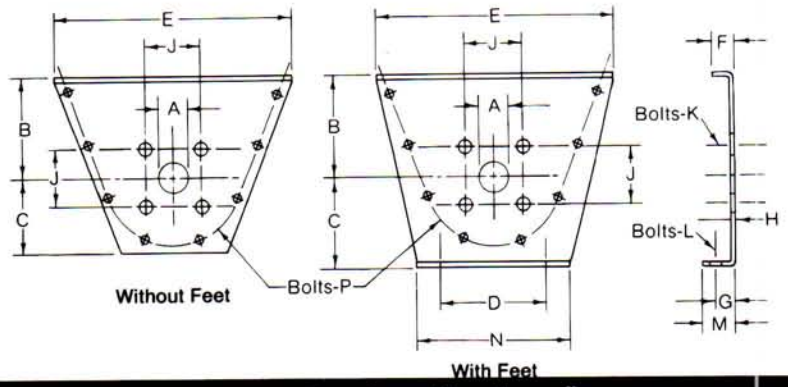
Screw Dia., Inches	Shaft Dia., Inches	Trough End Plate				A(5)	B	C	D	E	F	G	H	J	K	L	M	P
		With Foot		Without Foot														
		Part Number	Weight, Pounds	Part Number	Weight, Pounds	Inches												
6	1½	651-123-1	11	651-123-64	8	4¾	4½	5⅝	8⅛	9¾	1½	1	⅜	5¾	¾	⅜	1¾	⅜(1)
9	1½	651-123-2	24	651-123-65	17	4¾	6⅛	7⅞	9⅜	13¾	1⅝	1½	⅜	5¾	¾	½	2⅝	⅜(2)
	2	651-123-2	24	651-123-65	17	4¾	6⅛	7⅞	9⅜	13¾	1⅝	1½	⅜	5¾	¾	½	2⅝	⅜(2)
10	1½	651-123-3	30	651-123-67	19	4¾	6⅜	8⅞	9½	14¾	1¾	1¾	⅜	5¾	¾	½	2⅞	⅜(2)
	2	651-123-3	30	651-123-67	19	4¾	6⅜	8⅞	9½	14¾	1¾	1¾	⅜	5¾	¾	½	2⅞	⅜(2)
12	2	651-123-4	37	651-123-69	28	4¾	7¾	9⅝	12¼	17¼	2	1⅝	⅜	5¾	¾	⅝	2¾	½(2)
	2 7/16	651-123-5	36	651-123-70	27	5½	7¾	9⅝	12¼	17¼	2	1⅝	⅜	6¼	⅞	⅝	2¾	½(2)
	3	651-123-6	36	651-123-71	27	6	7¾	9⅝	12¼	17¼	2	1⅝	⅜	8	1	⅝	2¾	½(2)
14	2 7/16	651-123-7	61	651-123-72	47	5½	9¼	10⅞	13½	19¼	2	1⅝	½	6¼	⅞	⅝	2⅞	½(2)
	3	651-123-8	61	651-123-73	46	6	9¼	10⅞	13½	19¼	2	1⅝	½	8	1	⅝	2⅞	½(2)
16	3	651-123-9	77	651-123-74	60	6	10⅝	12	14⅞	21¼	2½	2	½	8	1	⅝	3¼	⅝(2)
18	3	651-123-A	113	651-123-S	92	6	12⅛	13⅜	16	24¼	2½	2	½	8	1	⅝	3¼	⅝(3)
	3 7/16	651-123-A	113	651-123-S	92	6	12⅛	13⅜	16	24¼	2½	2	½	8	1	⅝	3¼	⅝(3)
	3 15/16	651-123-A	113	651-123-S	92	6	12⅛	13⅜	16	24¼	2½	2	½	8	1	⅝	3¼	⅝(3)
20	3	651-123-C	136	651-123-U	109	6	13½	15	19¼	26¼	2½	2¼	½	8	1	¾	3¾	⅝(3)
	3 7/16	651-123-C	136	651-123-U	109	6	13½	15	19¼	26¼	2½	2¼	½	8	1	¾	3¾	⅝(3)
	3 15/16	651-123-C	136	651-123-U	109	6	13½	15	19¼	26¼	2½	2¼	½	8	1	¾	3¾	⅝(3)
24	3 7/16	651-123-E	186	651-123-W	147	6	16½	18⅛	20	30¼	2½	2½	½	8	1	¾	4⅛	⅝(4)
	3 15/16	651-123-E	186	651-123-W	147	6	16½	18⅛	20	30¼	2½	2½	½	8	1	¾	4⅛	⅝(4)

(1)Six bolt holes (3)Ten bolt holes (5)Tolerance + .010"
(2)Eight bolt holes (4)Twelve bolt holes

Trough End Plates — Flared, For Double Roller Bearings

Screw Dia.,	Shaft Dia.,	Trough End Plate				A(5)	B	C		D	E	F	G	H	J	K	L	M	N	P
		With Feet		Without Feet				With Foot	W/O Foot											
Inches		Part No.	Weight	Part No.	Weight	Inches														
6	1½	651-447-35	19	651-480-35	16	4¾	7	5⅝	5	8⅛	16⅝	1½	1	⅜	5¾	¾	⅜	1¾	10¼	⅜(1)
9	1½ & 2	651-447-36	36	651-480-36	30	4¾	9	7⅞	6¾	9⅜	21¼	1⅝	1½	⅜	5¾	¾	½	2⅝	14⅜	⅜(2)
12	2	651-447-37	53	651-480-37	46	4¾	10	9⅝	8¾	12¼	26⅜	2	1⅝	⅜	5¾	¾	⅝	2¾	17⅞	½(2)
	2 7/16	651-447-38	53	651-480-38	45	5½	10	9⅝	8¾	12¼	26⅜	2	1⅝	⅜	6¼	⅞	⅝	2¾	17⅞	½(2)
	3	651-447-39	52	651-480-39	44	6	10	9⅝	8¾	12¼	26⅜	2	1⅝	⅜	8	1	⅝	2¾	17⅞	½(2)
14	2 7/16	651-447-40	83	651-480-40	72	5½	11	10⅞	9¾	13½	28⅜	2	1⅝	½	6¼	⅞	⅝	2⅞	19½	½(3)
	3	651-447-41	82	651-480-41	71	6	11	10⅞	9¾	13½	28⅜	2	1⅝	½	8	1	⅝	2⅞	19½	½(3)

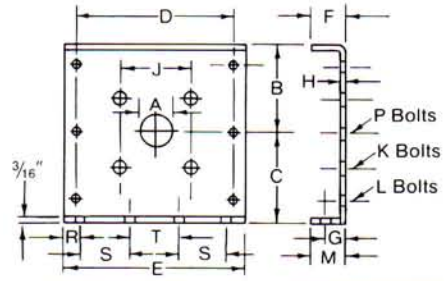
component selection



Trough End Plates—Flared, For Double Roller Bearings (Continued)

Screw Dia.,	Shaft Dia.,	Trough End Plate				A	B	C		D	E	F	G	H	J	K	L	M	N	P
		With Feet		Without Feet				With Foot	W/O Foot											
Inches		Part No.	Weight	Part No.	Weight	Inches														
16	3	651-447-42	103	651-480-42	88	6	11½	12	10¾	14⅞	32½	2½	2	½	8	1	⅝	3¼	21¾	⅝(3)
18	3	651-512-S	140	651-512-A	118	6	12⅛	13⅜	12¼	16	36½	2½	2	½	8	1	⅝	3¼	24¾	⅝(3)
	3 7/16	651-512-S	140	651-512-A	118	6	12⅛	13⅜	12¼	16	36½	2½	2	½	8	1	⅝	3¼	24¾	⅝(3)
	3 15/16	651-512-S	140	651-512-A	118	6	12⅛	13⅜	12¼	16	36½	2½	2	½	8	1	⅝	3¼	24¾	⅝(3)
20	3	651-512-U	168	651-512-C	139	6	13½	15	13¼	19¼	39½	2½	2¼	½	8	1	¾	3¾	26⅞	⅝(3)
	3 7/16	651-512-U	168	651-512-C	139	6	13½	15	13¼	19¼	39½	2½	2¼	½	8	1	¾	3¾	26⅞	⅝(3)
	3 15/16	651-512-U	168	651-512-C	139	6	13½	15	13¼	19¼	39½	2½	2¼	½	8	1	¾	3¾	26⅞	⅝(3)
24	3 7/16	651-512-W	230	651-512-E	188	6	16½	18⅛	15¼	20	45½	2½	2½	½	8	1	¾	4⅛	31	⅝(4)
	3 15/16	651-512-W	230	651-512-E	188	6	16½	18⅛	15¼	20	45½	2½	2½	½	8	1	¾	4⅛	31	⅝(4)

(1)Six bolt holes (3)Ten bolt holes (5)Tolerance +.010"
(2)Eight bolt holes (4)Twelve bolt holes

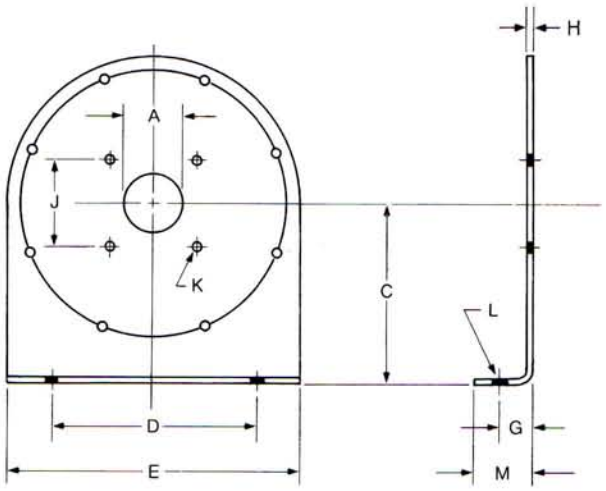


Trough End Plates—Flush End, For Double Roller Bearings

Screw Dia.	Shaft Dia.	Part Number	Weight, Pounds	A(6)	B	C	D	E	F	G	H	J	K	L	M	P	R	S	T
Inches				Inches															
6	1½	651-502-A	10	4¾	4½	5	8⅞	9¾	1½	13/16	⅜	5¾	¾	⅜(1)	1½	⅜(2)	9/16	2 13/16	3
9	1½	651-502-D	21	4¾	6⅛	7⅛	12½	13¾	1⅝	1	⅜	5¾	¾	⅜(1)	1½	⅜(3)	⅞	4	4
	2	651-502-D	21	4¾	6⅛	7⅛	12½	13¾	1⅝	1	⅜	5¾	¾	⅜(1)	1½	⅜(3)	⅞	4	4
10	1½	651-502-G	24	4¾	6⅜	7⅞	13¼	14¾	1¾	1	⅜	5¾	¾	⅜(1)	1⅝	⅜(3)	⅞	4 5/16	4⅜
	2	651-502-G	24	4¾	6⅜	7⅞	13¼	14¾	1¾	1	⅜	5¾	¾	⅜(1)	1⅝	⅜(3)	⅞	4 5/16	4⅜
12	2	651-502-AB	35	4¾	7¾	8⅞	15⅞	17¼	2	1¼	⅜	5¾	¾	⅜(1)	2⅛	½(3)	⅞	5⅛	5¼
	2 7/16	651-502-AE	34	5½	7¾	8⅞	15⅞	17¼	2	1¼	⅜	6¼	⅞	⅜(1)	2⅛	½(3)	⅞	5⅛	5¼
	3	651-502-AH	34	6	7¾	8⅞	15⅞	17¼	2	1¼	⅜	8	1	⅜(1)	2⅛	½(3)	⅞	5⅛	5¼
14	2 7/16	651-502-AL	55	5½	9¼	10⅛	17⅛	19¼	2	1¼	½	6¼	⅞	⅜(2)	2⅛	½(3)	⅞	3½	3½
	3	651-502-AP	54	6	9¼	10⅛	17⅛	19¼	2	1¼	½	8	1	⅜(2)	2⅛	½(3)	⅞	3½	3½
16	3	651-502-AT	69	6	10⅝	11⅛	20	21¼	2½	1¼	½	8	1	⅜(2)	2⅛	⅝(3)	⅞	3¾	4
18	3	651-502-K	104	6	12⅛	12⅜	22	24¼	2½	1½	½	8	1	½(2)	2⅝	⅝(4)	1⅛	4 7/16	4⅜
	3 7/16	651-502-K	104	6	12⅛	12⅜	22	24¼	2½	1½	½	8	1	½(2)	2⅝	⅝(4)	1⅛	4 7/16	4⅜
	3 15/16	651-502-K	104	6	12⅛	12⅜	22	24¼	2½	1½	½	8	1	½(2)	2⅝	⅝(4)	1⅛	4 7/16	4⅜
20	3	651-502-V	122	6	13½	13⅜	24⅜	26¼	2½	1½	½	8	1	½(2)	2⅝	⅝(4)	1⅛	4⅞	4¾
	3 7/16	651-502-V	122	6	13½	13⅜	24⅜	26¼	2½	1½	½	8	1	½(2)	2⅝	⅝(4)	1⅛	4⅞	4¾
	3 15/16	651-502-V	122	6	13½	13⅜	24⅜	26¼	2½	1½	½	8	1	½(2)	2⅝	⅝(4)	1⅛	4⅞	4¾
24	3 7/16	651-502-Y	163	6	16½	15⅜	28½	30¼	2½	1½	½	8	1	½(2)	2⅝	⅝(5)	1⅛	5⅝	5½
	3 15/16	651-502-Y	163	6	16½	15⅜	28½	30¼	2½	1½	½	8	1	½(2)	2⅝	⅝(5)	1⅛	5⅝	5½

(1)Four bolt holes (3)Eight bolt holes (5)Twelve bolt holes
(2)Six bolt holes (4)Ten bolt holes (6)Tolerance +.010"

Trough Ends

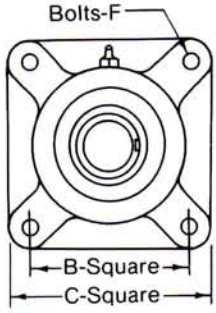


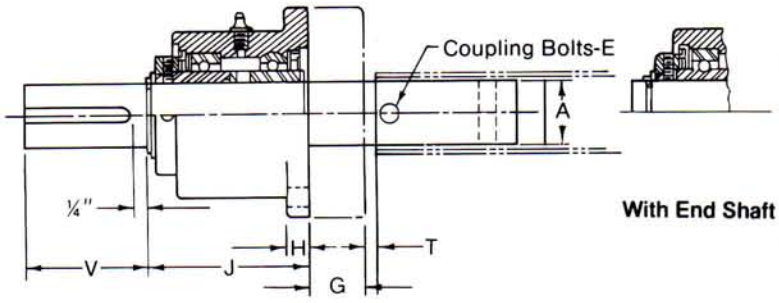
Trough End Plates—Tubular, for Babbitt, Bronze, or Ball Bearings

Screw Dia.	Shaft Dia.	Part Number*			Weight, Pounds		A	C	D	E	G	H	J	K	L	M
		C.S.	304sst	316sst	C.S.	SST										
6	1½	546-1	547-1	548-1	6	6.7	1⅝	5⅝	8⅛	10	1	3/16	4	9/16	7/16	1¾
9	1½	546-2	547-2	548-2	15.5	17	1⅝	7⅞	9⅜	13¾	1¼	¼	4	9/16	9/16	2⅝
	2	546-3	547-3	548-3			2⅛						5⅛	11/16		
12	2	546-4	547-4	548-4	23.9	26	2⅛	9⅝	12¼	17½	1⅝	¼	5⅛	11/16	11/16	2¾
	2 7/16	546-5	547-5	548-5			2 9/16						5⅝	11/16		
	3	546-6	547-6	548-6			3⅛						6	13/16		
14	2 7/16	546-7	547-7	548-7	37	40	2 9/16	10⅞	12¼	19½	1⅝	5/16	5⅝	11/16	11/16	2⅞
	3	546-8	547-8	548-8			3⅛						6	13/16		
16	3	546-9	547-9	548-9	45	48.6	3⅛	12	14⅞	21½	2	5/16	6	13/16	11/16	3¼
18	3	546-10	547-10	548-10	68.3	73.7	3⅛	13⅜	16	24½	2	⅜	6	13/16	11/16	3¼
	3 7/16	546-11	547-11	548-11			3 9/16						6¾			
20	3	546-12	547-12	548-12	82	88.5	3⅛	15	19¼	26½	2¼	⅜	6	13/16	13/16	3¾
	3 7/16	546-13	547-13	548-13			3 9/16						6¾			
24	3	546-14	547-14	548-14	111	120	3⅛	18⅛	20	30½	2½	⅜	6	13/16	13/16	4⅛
	3 7/16	546-15	547-15	548-15			3 9/16						6¾			

* Complete part number by adding prefix 651-. Example: 651-546-7

component selection





With End Shaft

With Drive Shaft

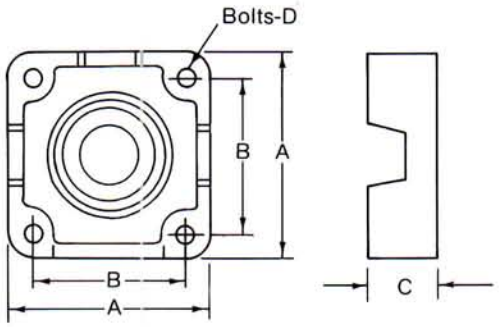
Double Ball Bearing Flanged Blocks with drive shafts consist of rigid shafts operating in two single row, deep groove ball bearings which are effectively sealed and mounted in heavy, one-piece gray iron housings. Spring locking collars with two set screws hold bearings firmly on shafts. This unit will accommodate radial and thrust loads. Shafts are available for use with or without trough end seals. These flanged blocks can also be furnished with tail shafts.

Trough End Bearings—Flanged-Double Ball Bearing

Shaft Diameter A, Inches	Flanged Block With Shaft						B	C	E	F	G	H	J	T	V	Keyseat
	No Provision For Trough End Seal			With Provision For Trough End Seal												
	Part Numbers		Weight, Pounds (1)	Part Numbers		Weight Pounds (1)	Inches									
	Drive Shaft	End Shaft		Drive Shaft	End Shaft											
1½	153-96-BA	153-96-DA	17	153-96-FC	153-96-FD	18	4	5⅛	½	½	1¾	9/16	4¼	1¼	3½	⅜ x 3/16
2	153-97-BA	153-97-DA	30	153-97-FC	153-97-FD	32	5⅛	6⅜	⅝	⅝	1¾	11/16	5 1/16	1¼	4	½ x ¼
2 7/16	153-98-AG	153-98-CC	44	153-98-EA	153-98-EB	46	5⅝	6⅞	⅝	⅝	1¾	11/16	5 19/32	1 13/16	4½	⅝ x 5/16
3	153-99-BJ	153-99-EG	70	153-99-HG	153-99-HH	74	6	7¾	¾	¾	1¾	¾	6⅜	1⅞	5½	¾ x ⅜
3 7/16	153-100-BA	153-100-DA	107	153-100-FC	153-100-FD	112	6¾	8 9/16	¾	⅞	2¼	1	7 15/16	2⅜	6	⅞ x 7/16

(1)Weights are for assemblies with drive shaft.

Trough End Seals provide bearing protection against dust or fumes from within the trough and against entrance of dirt, moisture or lubricant along the shaft. The gray iron seal housings are designed for assembly between bearing flanged blocks and the trough end plates. They can be provided with lip-type seals for maximum protection for or against the materials being handled, with felt seals when handling dusty materials, or with waste packing when handling abrasive materials.

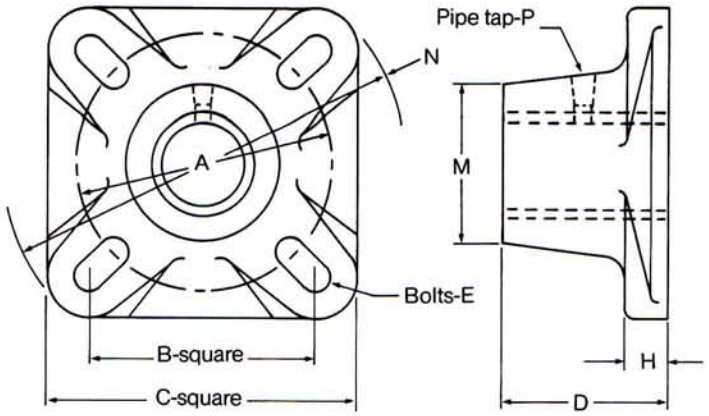


Lip Type

Trough End Seals

Shaft Diameter, Inches	Trough End Seal Number			Weight Pounds	A	B	C	D
	Lip Type(1)		Waste-Pack Type(1)		Inches			
1	121-83-EL		121-83-EW	2.2	3¾	2¾	1½	⅜
1½	121-83-KL		121-83-KW	4.3	5⅛	4	1¾	½
2	121-83-SL		121-83-SW	6.0	6⅜	5⅛	1¾	⅝
2 7/16	121-83-UL		121-83-UW	7.0	6⅞	5⅝	1¾	⅝
3	121-83-XL		121-83-XW	10.0	7¾	6	1¾	¾
3 7/16	121-83-YL		121-83-YW	15.5	8 9/16	6¾	2¼	¾

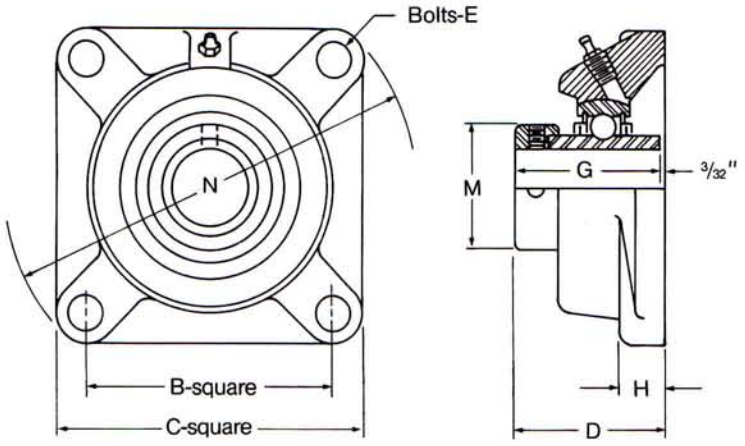
(1)Normally carried in stock as unassembled parts.
(2) 304 and 316 SST applications use 121-92.



Babbitted and bronze bearing—flanged blocks

Shaft diameter, inches	Part numbers		Weight, pounds	A	B	C	D	E	H	M	N	P
	Babbitted	Bronze		Inches								
1	176-62-C	556-6-C	2.4	3	2¾	3¾	2	⅜	½	1⅞	4 29/32	⅛
1½	176-62-H	556-6-H	5.3	4⅛	4	5⅛	3	½	¾	2½	6 13/16	¼
2	176-62-AB	556-6-AB	10.3	5¼	5⅛	6⅜	4	⅝	⅞	3¼	8½	¼
2 7/16	176-62-AE	556-6-AE	16.5	6¼	5⅝	6⅞	5	⅝	1	4	9¼	⅜
3	176-62-AK	556-6-AK	26.0	7⅜	6	7¾	6	¾	1⅛	4¾	10¼	⅜
3 7/16	176-62-BC	556-6-BC	35.0	8⅜	6¾	8 9/16	7	¾	1¼	5½	11⅜	½

Grease cups or fittings are not included.

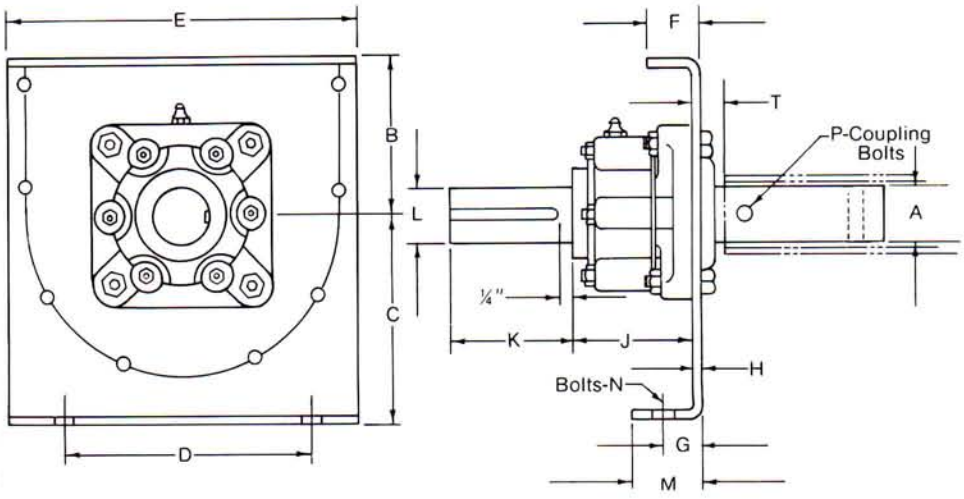


Ball bearing—flanged blocks

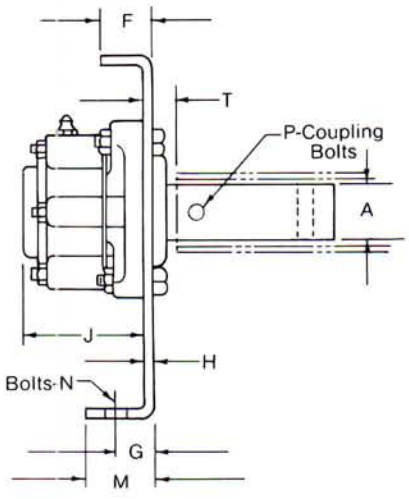
Shaft diameter, inches	Part number*	Weight, pounds	B	C	D	E	G	H	M	N
			Inches							
1	292	2.0	2¾	3¾	1 29/64	7/16	1 23/64	19/32	1¾	4 29/32
1½	301	5.2	4	5⅛	2 5/64	½	1 29/32	⅝	2 11/16	6 25/32
2	309	9.5	5⅛	6⅜	2 19/64	⅝	2¼	¾	3½	8½
2 7/16	318	11.0	5⅝	6⅞	2 27/32	⅝	2½	15/16	3 25/32	9 7/32
3	39	17.0	6	7¾	2 31/32	¾	2⅞	¾	4⅝	10¼
3 7/16	42	26.0	6¾	8 9/16	3 21/32	¾	3 9/16	1	5 3/16	11⅜

* Complete number by adding prefix 1040-10. Example: 1040-10-9.
Blocks include grease fittings, are greased and ready for operation.
These are Series F3-U200N thru 2 7/16" size and Series F 200 for 3" and over.

component selection



With Drive Shaft



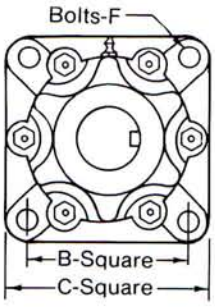
With End Shaft

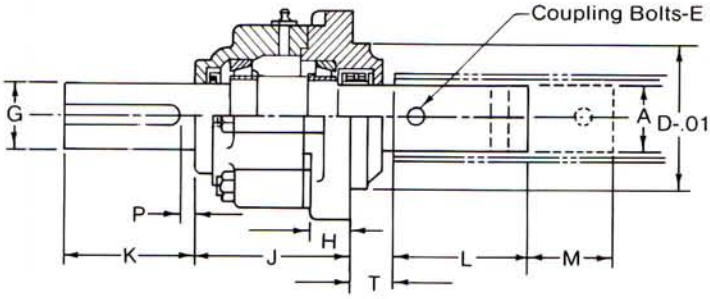
Drive Shaft Trough Ends with Double Roller Bearings have large radial capacity. In addition, the assembly accommodates heavy thrust loads in either direction, making separate thrust provisions unnecessary.

Trough End with Double Roller Bearings

Screw Diameter,	A, Shaft Dia.	Part Numbers		Weight, Pounds (1)	B	C	D	E	F	G	H	J	K	L	M	N	P	T
Inches		Drive Shaft	End Shaft		Inches													
6	1½	155-6-AD	155-6-BD	65	4½	5⅝	8⅛	9¾	1½	1	⅜	6¾	4	1 7/16	1¾	⅜	½	1⅜
9	1½	155-6-AE	155-6-BE	78	6⅛	7⅞	9⅜	13¾	1⅝	1½	⅜	6¾	4	1 7/16	2⅝	½	½	1⅜
	2	155-7-AD	155-7-BD	81	6⅛	7⅞	9⅜	13¾	1⅝	1½	⅜	6¾	4½	1 15/16	2⅝	½	⅝	1⅜
10	1½	155-6-AF	155-6-BF	84	6⅜	8⅞	9½	14¾	1¾	1¾	⅜	6¾	4	1 7/16	2⅞	½	½	1⅜
	2	155-7-AE	155-7-BE	87	6⅜	8⅞	9½	14¾	1¾	1¾	⅜	6¾	4½	1 15/16	2⅞	½	⅝	1⅜
12	2	155-7-AF	155-7-BF	94	7¾	9⅝	12¼	17¼	2	1⅝	⅜	6¾	4½	1 15/16	2¾	⅝	⅝	1⅜
	2 7/16	153-130-L	153-130-H	102	7¾	9⅝	12¼	17¼	2	1⅝	⅜	6¼	5½	2 7/16	2¾	⅝	⅝	1⅞
	3	153-131-W	153-131-P	165	7¾	9⅝	12¼	17¼	2	1⅝	⅜	8¼	6	2 15/16	2¾	⅝	¾	2
14	2 7/16	153-130-M	153-130-J	127	9¼	10⅞	13½	19¼	2	1⅝	½	6¼	5½	2 7/16	2⅞	⅝	⅝	1⅞
	3	153-131-X	153-131-R	190	9¼	10⅞	13½	19¼	2	1⅝	½	8¼	6	2 15/16	2⅞	⅝	¾	2
16	3	153-131-Y	153-131-S	206	10⅝	12	14⅞	21¼	2½	2	½	8¼	6	2 15/16	3¼	⅝	¾	2
18	3	153-131-Z	153-131-T	242	12⅛	13⅜	16	24¼	2½	2	½	8¼	6	2 15/16	3¼	⅝	¾	2
	3 7/16	153-142-R	153-142-K	264	12⅛	13⅜	16	24¼	2½	2	½	8¼	7	3 7/16	3¼	⅝	⅞	2½
	3 15/16	153-143-R	153-143-K	280	12⅛	13⅜	16	24¼	2½	2	½	8¼	6⅛	3 15/16	3¼	⅝	1	2½
20	3	153-131-AA	153-131-U	265	13½	15	19¼	26¼	2½	2¼	½	8¼	6	2 15/16	3¾	¾	¾	2
	3 7/16	153-142-S	153-142-L	287	13½	15	19¼	26¼	2½	2¼	½	8¼	7	3 7/16	3¾	¾	⅞	2½
	3 15/16	153-143-S	153-143-L	303	13½	15	19¼	26¼	2½	2¼	½	8¼	6⅛	3 15/16	3¾	¾	1	2½
24	3 7/16	153-142-T	153-142-M	337	16½	18⅛	20	30¼	2½	2½	½	8¼	7	3 7/16	4⅛	¾	⅞	2½
	3 15/16	153-143-T	153-143-M	353	16½	18⅛	20	30¼	2½	2½	½	8¼	6⅛	3 15/16	4⅛	¾	1	2½

(1)Weights are for drive shaft assembly.
Bearing blocks are provided with grease fittings and are greased ready for operation. Coupling bolts are not included.





With Drive Shaft

With End Shaft

Double Roller Bearing Flanged Blocks with drive shafts consist of rigid shafts operating in two oversize roller bearings which are effectively sealed and mounted in rugged two-piece gray iron housings. The bearings are held in place by necked shafts and are suitable for heavy thrust loads in either direction in addition to carrying radial loads for overhung drive applications. These flanged blocks can also be furnished with tail shafts.

Trough End Bearings—Flanged—Double Roller (Part Numbers and Weights)

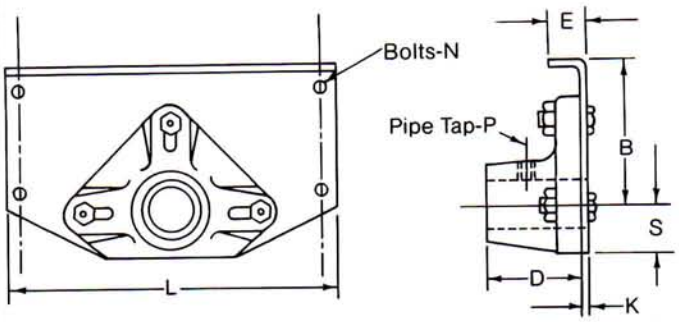
Shaft Diameter Inches	With Drive Shaft	With End Shaft	Without Drive Shaft	Without End Shaft	Weight,(1) Pounds
1½	155-6-AB	155-6-BB	155-6-B	155-6-C	52
2	155-7-AB	155-7-BB	155-7-B	155-7-C	55
2 7/16	153-130-K	153-130-G	153-130-D	153-130-A	63
3	153-131-V	153-131-N	153-131-G	153-131-A	125
3 7/16	153-142-P	153-142-J	153-142-E	153-142-A	147
3 15/16	153-143-P	153-143-J	153-143-E	153-143-A	163

(1)Weights are for drive shaft assembly. Blocks include grease fittings, are greased and ready for operation. Bore tolerance for mounting +.010"—.000." For unusually heavy loads extend shaft and provide outboard bearing.

Trough End Bearings – Flanged – Double Roller (Dimensions)

Shaft Dia. A	B	C	D	E	F	G	H	J	K	L	M	P	T	Keyseat
Inches														
1½	5¾	7¼	4.75	½	¾	1 7/16	1¼	6¾	4	4¾	3	¼	1 3/8	3/8 x 3/16
2	5¾	7¼	4.75	5/8	¾	1 15/16	1¼	6¾	4½	4¾	3	¼	1 3/8	½ x ¼
2 7/16	6¼	8	5.50	5/8	7/8	2 7/16	1½	6¼	5½	4 7/8	3	¼	1 7/8	5/8 x 5/16
3	8	10	6.00	¾	1	2 15/16	1½	8¼	6	5	3	¼	2	¾ x ⅜
3 7/16	8	10	6.00	7/8	1	3 7/16	1½	8¼	7	7	4	¼	2½	7/8 x 7/16
3 15/16	8	10	6.00	1	1	3 15/16	1½	8¼	6⅛	7	4	1 3/8	2½	1 x ½

component selection

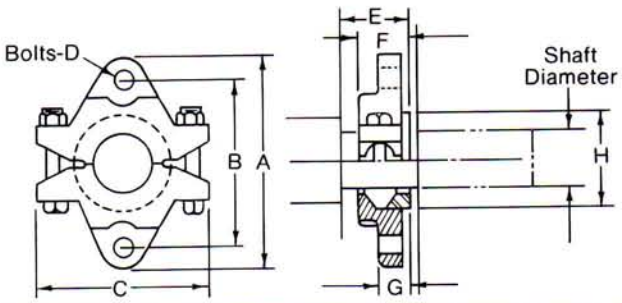


Outside Discharge Trough Ends are for bolting to conventional trough flanges, permitting free discharge of material below the trough end. They are made of heavy steel with a top flange to support the trough cover and are fitted with babbitted, bronze or ball bearing flanged blocks.

Outside Discharge Trough Ends

Screw Diameter, Inches	Coupling Diameter, Inches	Part Numbers: Babbitted Bearing	Part Numbers: Bronze Bearing	Part Numbers: Ball Bearing (3)	Weight/Lbs.: Babbitted or Bronze	Weight/Lbs.: Ball Bearing	B	D: Babb. Brz.	D: Ball	E	K	L	N	P Babb. Brz. (4)	S: Babb. Brz.	S: Ball
							Inches									
6	1½	153-127-A	153-128-A	—	9.2	—	4½	3	—	1½	3/16	9¾	3/8(1)	¼	1⅜	—
9	1½	153-127-B	153-128-B	153-129-B	13	13.	6⅛	3	2	1⅝	¼	13¾	3/8(1)	¼	1½	2
	2	153-127-C	153-128-C	153-129-C	20	18.	6⅛	4	2 11/32	1⅝	¼	13¾	3/8(1)	¼	1⅞	2 11/16
10	1½	153-127-D	153-128-D	153-129-D	14	14.	6⅜	3	2	1¾	¼	14¾	3/8(1)	¼	1½	2
	2	153-127-E	153-128-E	153-129-E	21	19.	6⅜	4	2 11/32	1¾	¼	14¾	3/8(1)	¼	1⅞	2 11/16
12	2	153-127-F	153-128-F	153-129-F	23	22.	7¾	4	2 11/32	2	¼	17¼	½(1)	¼	1⅞	2 11/16
	2 7/16	153-127-G	153-128-G	153-129-G	30	23.	7¾	5	2 19/32	2	¼	17¼	½(1)	⅜	2⅛	3
	3	153-127-H	153-128-H	153-129-H	39	30.	7¾	6	2 31/32	2	¼	17¼	½(1)	⅜	2⅝	3⅜
14	2 7/16	153-127-J	153-128-J	153-129-J	38	31.	9¼	5	2 19/32	2	5/16	19¼	½(1)	⅜	2⅛	3
	3	153-127-K	153-128-K	153-129-K	48	39.	9¼	6	2 31/32	2	5/16	19¼	½(1)	⅜	2⅝	3⅜
16	3	153-127-L	153-128-L	153-129-L	54	44.	10⅝	6	2 31/32	2½	5/16	21¼	5/8(1)	⅜	2⅝	3⅜
18	3	153-127-M	153-128-M	153-129-M	67	57.	12⅛	6	2 31/32	2½	⅜	24¼	5/8(1)	⅜	2⅝	3⅜
	3 7/16	153-127-N	153-128-N	153-129-N	74	65.	12⅛	7	3 21/32	2½	⅜	24¼	5/8(1)	½	3⅛	3⅞
20	3	153-127-P	153-128-P	153-129-P	74	64.	13½	6	2 31/32	2½	⅜	26¼	5/8(1)	⅜	2⅝	3⅜
	3 7/16	153-127-R	153-128-R	153-129-R	81	71.	13½	7	3 21/32	2½	⅜	26¼	5/8(1)	½	3⅛	3⅞
24	3 7/16	153-127-S	153-128-S	153-129-S	98	89.	16½	7	3 21/32	2½	⅜	30¼	5/8(2)	½	3⅛	3⅞

(1) Four bolt holes
(2) Six bolt holes
(3) Series FX-3-U200N for 1½"; Series F3-U200N for 2" and 2 7/16"; Series F200 for 3" & 3 7/16."
(4) Babbitted or bronze bearings.

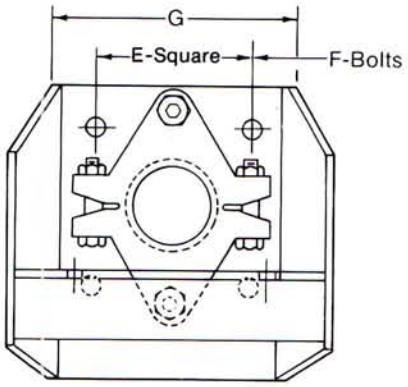


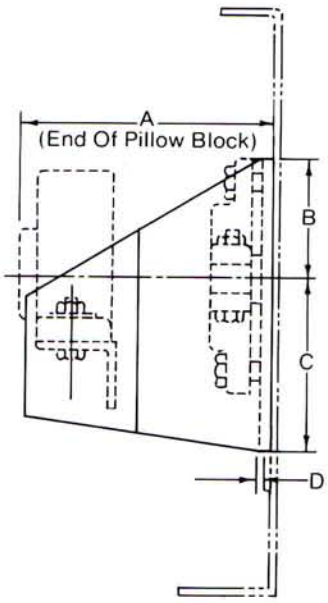
Seal Glands are mounted internally on all trough ends except the outboard bearing type where they are externally mounted. They consist of gray iron split flanges in which packing materials are compressed against machined steel collars. These seals provide maximum protection for or against materials being handled.

Seal Glands

Shaft Diameter, Inches	Part Numbers (1)	Weight, Each Pounds	A	B	C	D	E	F	G	H
			Inches							
1½	318-9-A	3	5⅝	4⅜	4 13/16	½	2	1 7/16	⅞	2½
2	318-9-B	5	6½	5¼	5⅝	½	2	1½	⅞	3¼
2 7/16	318-9-C	7	7⅝	6⅛	6½	⅝	2	1⅝	1	3 11/16
3	318-9-D	8	8⅝	7⅛	7⅛	⅝	2	1⅝	1	4¼
3 7/16	318-9-E	15	10¼	8¼	8¾	¾	3	2⅛	1¼	4 11/16
3 15/16	318-9-F	15	10½	9	9	¾	2¼	1⅞	1⅛	5⅜

(1) Mounting bolts not included





Outboard Bearing Trough End Brackets permit the use of pillow block bearings to accommodate greater thrust, radial loads and special sealing arrangements.

Trough End Bracket, Outboard Bearing (Dimensions)

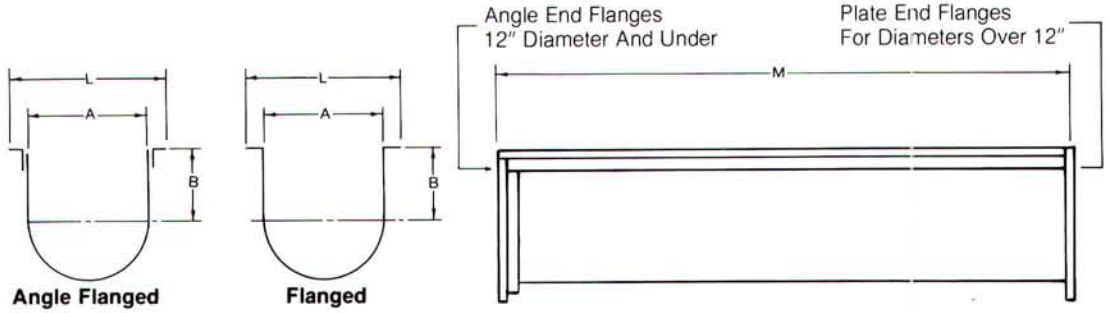
Shaft Diameter	Screw Diameter	A			B	C	D	E	F	G
		Roller	Ball	Sleeve						
				Inches						
1½	6-9-10	6	5 7/16	6¼	3	4½	¼	4	½	6½
2	9-10-12	7	6½	7½	3½	4¾	¼	5⅛	⅝	8
2 7/16	12-14	7⅞	7¼	8⅜	4	5½	5/16	5⅝	⅝	8¾
3	12-14	9	8⅜	10	4½	6⅜	⅜	6	¾	9⅝
	16-18-20	9	8⅜	10	4½	6⅜	⅜	6	¾	9⅝
3 7/16	20-24	10 3/16	9⅝	12⅛	5¼	7½	⅜	6¾	¾	10⅜

Trough End Bracket, Outboard Bearing (Part Numbers and Weights)

Shaft Diameter, Inches	Shelf & Seal Gland Assembly Only			Shelf & Seal Gland Assembly with Pillow Block(1)							
	For Ball or Roller Bearing	For Sleeve Bearing	Weight, Pounds	Ball Bearing	Weight, Pounds	Roller Bearing	Weight, Pounds	Babbitted Bearing	Weight, Pounds	Brz. Bushed Bearing	Weight, Pounds
1½	154-437-A	154-437-F	11	154-437-L	16	154-437-S	18	154-437-X	15	154-437-AC	15
2	154-437-B	154-437-G	16	154-437-M	24	154-437-T	28	154-437-Y	24	154-437-AD	24
2 7/16	154-437-C	154-437-H	25	154-437-N	37	154-437-U	42	154-437-Z	39	154-437-AE	39
3	154-437-D	154-437-J	39	154-437-P	58	154-437-V	66	154-437-AA	61	154-437-AF	61
3 7/16	154-437-E	154-437-K	57	154-437-R	71	154-437-W	101	154-437-AB	90	154-437-AG	90

(1)Ball bearing pillow blocks are series P3-U200N thru 2 7/16" bore, and P-200 for 3" & 3 7/16" bore. Roller bearing pillow blocks are series P-B22400H. Sleeve bearing pillow blocks are series 2-1200 for babbitt and 2-1200Z for bronze.

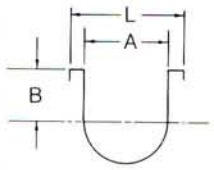
component selection

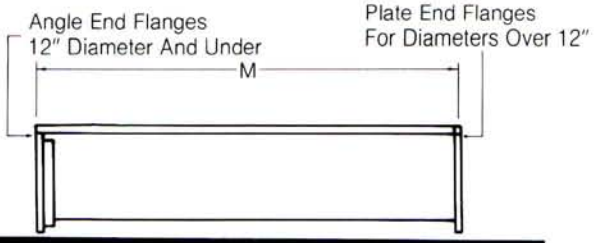


Screw Conveyor U-Troughs are made in two basic types: angle flanged and flanged. Angle flanged troughs consist of steel angles welded lengthwise to the trough plates to form the top flanges. Flanged troughs are made by forming the top flanges integrally with the trough sides from a single steel plate. Steel end flanges are securely welded to each end of the trough plate in special fixtures to assure square, true connections. They also preserve trough contour and facilitate assembly. Angle end flanges are used on troughs for 4- through 12-inch diameter screws, and plate end flanges on all other sizes. Troughs made of stainless steel, or other kinds of special metals for specific purposes, can be furnished.

U-Trough

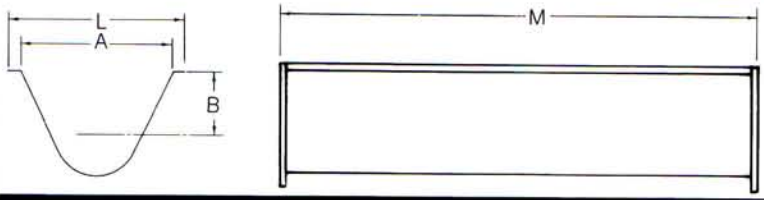
Screw Diameter, Inches	Trough Thickness	Part Numbers		Weight, Pounds		A	B	L	M
		Angle Flanged Trough	Flanged Trough	Angle Flanged Trough	Flanged Trough	Inches			Feet
4	16 ga.	157-73-F	157-63-F	48	39	5	3⅝	7⅛	10
	14 ga.	157-73-G	157-63-G	56	48	5	3⅝	7⅛	10
	12 ga.	157-73-H	157-63-H	71	66	5	3⅝	7¼	10
6	16 ga.	157-74-G	157-64-G	76	52	7	4½	9⅝	10
	14 ga.	157-74-H	157-64-H	86	64	7	4½	9⅝	10
	12 ga.	157-74-J	157-64-J	106	87	7	4½	9¾	10
	10 ga.	157-74-K	157-64-K	127	110	7	4½	9¾	10
	3/16"	157-74-L	157-64-L	159	145	7	4½	9⅞	10
9	14 ga.	157-75-K	157-65-K	117	89	10	6⅛	13⅛	10
	12 ga.	157-75-L	157-65-L	145	121	10	6⅛	13¼	10
	10 ga.	157-75-M	157-65-M	174	153	10	6⅛	13¼	10
	3/16"	157-75-N	157-65-N	219	201	10	6⅛	13⅜	10
	¼"	157-75-P	157-65-P	281	270	10	6⅛	13½	10
10	14 ga	157-76-K	157-66-K	123	95	11	6⅜	14⅛	10
	12 ga.	157-76-L	157-66-L	153	129	11	6⅜	14¼	10
	10 ga.	157-76-M	157-66-M	184	164	11	6⅜	14¼	10
	3/16"	157-76-N	157-66-N	232	215	11	6⅜	14⅜	10
	¼"	157-76-P	157-66-P	299	288	11	6⅜	14½	10
12	12 ga.	157-77-N	157-67-N	232	191	13	7¾	17¼	12
	10 ga.	157-77-P	157-67-P	276	241	13	7¾	17¼	12
	3/16"	157-77-R	157-67-R	343	315	13	7¾	17⅜	12
	¼"	157-77-S	157-67-S	439	422	13	7¾	17½	12
14	12 ga.	157-78-N	157-68-N	254	214	15	9¼	19¼	12
	10 ga.	157-78-P	157-68-P	307	272	15	9¼	19¼	12
	3/16"	157-78-R	157-68-R	385	358	15	9¼	19⅜	12
	¼"	157-78-S	157-68-S	498	482	15	9¼	19½	12
16	12 ga.	157-79-N	157-69-N	281	241	17	10⅝	21¼	12
	10 ga.	157-79-P	157-69-P	341	306	17	10⅝	21¼	12
	3/16"	157-79-R	157-69-R	430	403	17	10⅝	21⅜	12
	¼"	157-79-S	157-69-S	559	543	17	10⅝	21½	12
18	12 ga.	157-80-N	157-70-N	354	279	19	12⅛	24¼	12
	10 ga.	157-80-P	157-70-P	421	352	19	12⅛	24¼	12
	3/16"	157-80-R	157-70-R	522	463	19	12⅛	24⅜	12
	¼"	157-80-S	157-70-S	667	622	19	12⅛	24½	12
20	10 ga.	157-81-P	157-71-P	456	387	21	13½	26¼	12
	3/16"	157-81-R	157-71-R	568	509	21	13½	26⅜	12
	¼"	157-81-S	157-71-S	729	684	21	13½	26½	12
24	10 ga.	157-82-P	157-72-P	529	461	25	16½	30¼	12
	3/16"	157-82-R	157-72-R	664	605	25	16½	30⅜	12
	¼"	157-82-S	157-72-S	858	813	25	16½	30½	12





Double Flanged U-Trough

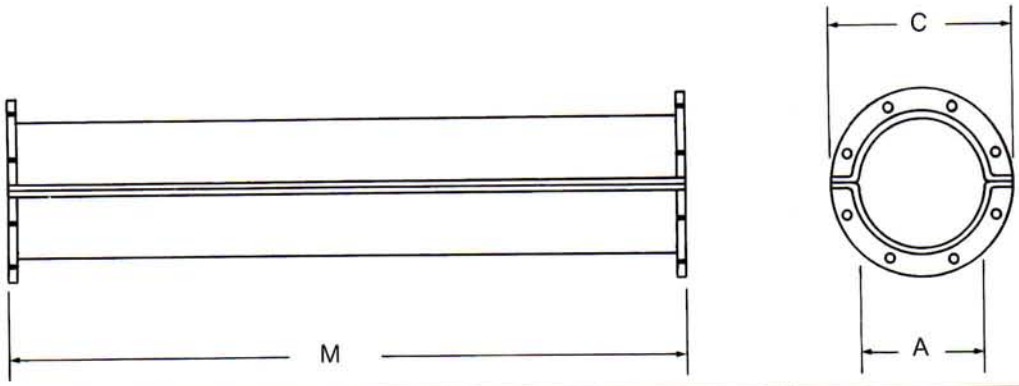
Screw Diameter, Inches	Trough Thickness	Part Number	Weight Pounds	A	B	L	M
				Inches			Feet
6	16 ga.	157-174-A	55	7	4½	10⅛	10
	14 ga.	157-174-C	68	7	4½	10⅛	10
	12 ga.	157-174-J	93	7	4½	10⅜	10
	10 ga.	157-174-L	118	7	4½	10⅜	10
9	14 ga.	157-175-A	95	10	6⅛	13¾	10
	12 ga.	157-175-E	130	10	6⅛	13⅞	10
	10 ga.	157-175-G	164	10	6⅛	13⅞	10
12	12 ga.	157-176-B	200	13	7¾	17⅝	12
	10 ga.	157-176-D	251	13	7¾	17⅝	12
14	12 ga.	157-177-B	223	15	9¼	19⅝	12
	10 ga.	157-177-D	281	15	9¼	19⅝	12
16	12 ga.	157-178-B	250	17	10⅝	21⅝	12
	10 ga.	157-178-D	316	17	10⅝	21⅝	12
18	10 ga.	157-179-B	358	19	12⅛	24⅝	12
20	10 ga.	157-180-B	391	21	13½	26⅝	12
24	10 ga.	157-181-B	463	25	16½	30⅝	12



Trough — Flared

Screw Diameter, Inches	Trough Thickness	Part Number	Weight Pounds	A	B	D	L	M
				Inches				Feet
6	14 ga.	157-87-C	81	14	7	3½	16⅝	10
	12 ga.	157-87-D	111	14	7	3½	16⅝	10
9	12 ga.	157-88-C	148	18	9	5	21¼	10
	10 ga.	157-88-D	188	18	9	5	21¼	10
12	12 ga.	157-89-G	215	22	10	6½	26¼	12
	10 ga.	157-89-H	273	22	10	6½	26¼	12
	3/16"	157-89-J	360	22	10	6½	26⅜	12
14	12 ga.	157-90-G	238	24	11	7½	28¼	12
	10 ga.	157-90-H	302	24	11	7½	28¼	12
	3/16"	157-90-J	398	24	11	7½	28⅜	12
16	10 ga.	157-91-G	310	28	11	8½	32¼	12
	3/16"	157-91-H	436	28	11½	8½	32⅜	12
	¼"	157-91-J	587	28	11	8½	32½	12
18	10 ga.	157-149-G	369	31	12⅛	9½	36¼	12
	3/16"	157-149-H	486	31	12⅛	9½	36⅜	12
	¼"	157-149-J	653	31	12⅛	9½	36½	12
20	10 ga.	157-150-G	405	34	13½	10½	39¼	12
	3/16"	157-150-H	533	34	13½	10½	39⅜	12
	¼"	157-150-J	717	34	13½	10½	39½	12
24	10 ga.	157-151-G	481	40	16½	12½	45¼	12
	3/16"	157-151-H	633	40	16½	12½	45⅜	12
	¼"	157-151-J	851	40	16½	12½	45½	12

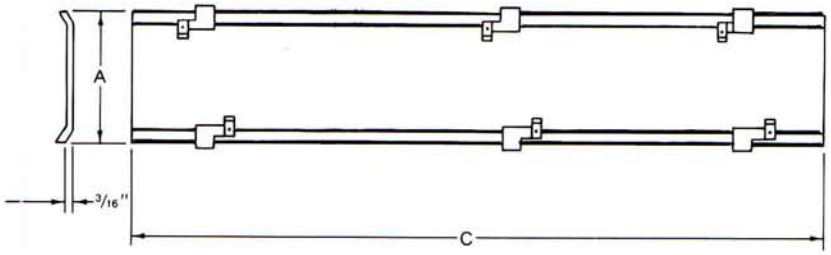
component selection



Tubular Trough

Trough Diameter	Trough Thk.	Part Numbers*			Dimensions			Weight, Pounds
		Carbon Steel	304SST	316SST	A	M	C	
6	14 ga. 12 ga. 10 ga.	A B C	AA AB AC	BA BB BC	7	120	10	75 105 135
9	14 ga. 12 ga. 10 ga. 3/16	D E F G	AD AE AF AG	BD BE BF BG	10	120	13 3/4	105 145 185 245
12	12 ga 10 ga. 3/16	H J K	AH AJ AK	BH BJ BK	13	144	17 1/2	235 300 395
14	10 ga. 3/16	L M	AL AM	BL BM	15	144	19 1/2	265 445
16	10 ga. 3/16	N P	AN AP	BN BP	17	144	21 1/2	370 490
18	3/16 1/4	R S	AR AS	BR BS	19	144	24 1/2	565 745
20	3/16 1/4	T U	AT AU	BT BU	21	144	26 1/2	610 805
24	3/16 1/4	V W	AV AW	BV BW	25	144	30 1/2	710 940

*Complete Part Number by Adding Prefix 157-243-. Example:157-243-AD

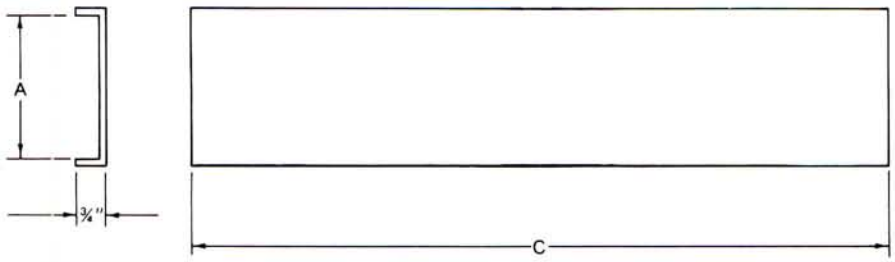


Screw Conveyor Trough Covers are used for the protection of operating personnel, dust control or protection for or against the material being handled. Covers for U and flared troughs are made in semi-flanged, flanged or hip roof types.

Covers — Semi-Flanged, U-Trough Spring Clamped

Screw Diameter, Inches	Trough Thickness	Cover Thickness	Part Number	Weight, Pounds	A	C
					Inches	
4	3/16" & under	16 ga.	188-37-AK	19	8¼	120
6	¼" & under	16 ga.	188-37-AL	24	10¾	120
9	⅜" & under	14 ga.	188-37-AM	41	14½	120
10	⅜" & under	14 ga.	188-37-AN	44	15½	120
12	¼" & under	14 ga.	188-37-BG	62	18¼	144
14	¼" & under	14 ga.	188-37-BJ	68	20¼	144
16	¼" & under	14 ga.	188-37-BL	75	22¼	144
18	¼" & under	12 ga.	188-37-BN	113	25¼	144
20	¼" & under	12 ga.	188-37-BR	122	27¼	144
24	¼" & under	12 ga.	188-37-BT	139	31¼	144

Covers for other trough lengths and thicknesses are available.

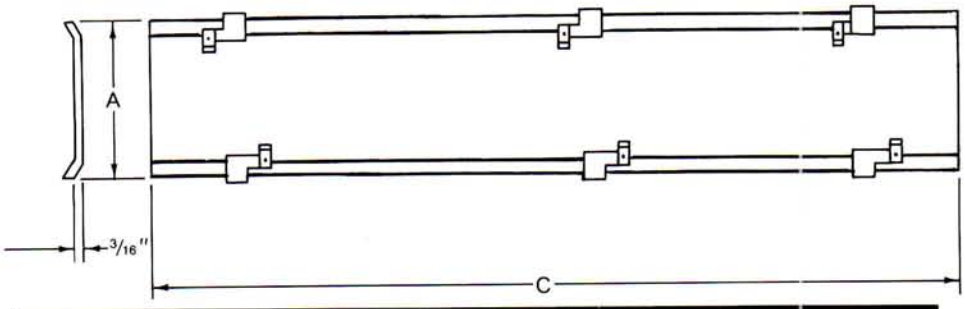


Covers — Flanged, U-Trough Screw Clamped

Screw Diameter, Inches	Trough Thickness	Cover Thickness	Part Number	Weight, Pounds	A	C
					Inches	
4	3/16" & under	16 ga.	188-27-41	20	8	120
6	¼" & under	16 ga.	188-27-42	22	10¼	120
9	⅜" & under	16 ga.	188-27-43	32	14	120
10	⅜" & under	16 ga.	188-27-44	34	15	120
12	¼" & under	14 ga.	188-27-65	63	18	144
14	¼" & under	14 ga.	188-27-66	70	20	144
16	¼" & under	14 ga.	188-27-67	76	22	144
18	¼" & under	14 ga.	188-27-68	86	25	144
20	¼" & under	14 ga.	188-27-69	92	27	144
24	¼" & under	14 ga.	188-27-70	105	31	144

Covers for other trough lengths and thicknesses are available.

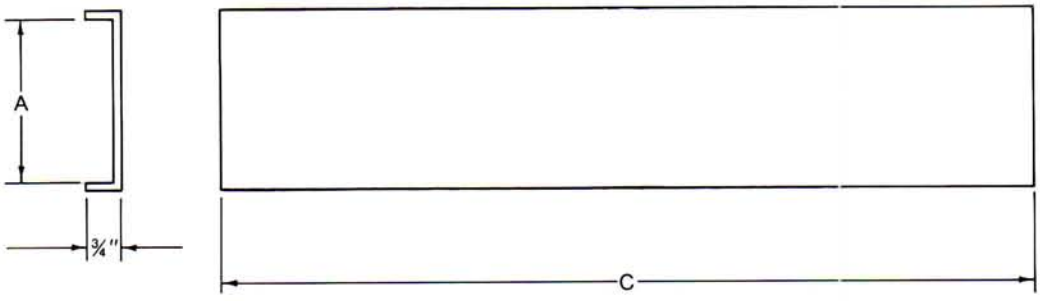
component selection



Covers — Semi-Flanged, Flared Trough Spring Clamped

Screw Diameter, Inches	Trough Thickness	Cover Thickness	Part Number	Weight, Pounds	A	C
					Inches	
6	¼" & under	16 ga.	188-67-CA	39	17⅝	120
9	⅜" & under	14 ga.	188-67-CE	62	22¼	120
12	¼" & under	14 ga.	188-67-CL	91	27⅜	144
14	¼" & under	14 ga.	188-67-CT	98	29⅜	144
16	¼" & under	14 ga.	188-67-CZ	111	33½	144
18	¼" & under	12 ga.	188-67-DF	166	37½	144
20	¼" & under	12 ga.	188-67-DM	179	40½	144
24	¼" & under	12 ga.	188-67-DU	205	46½	144

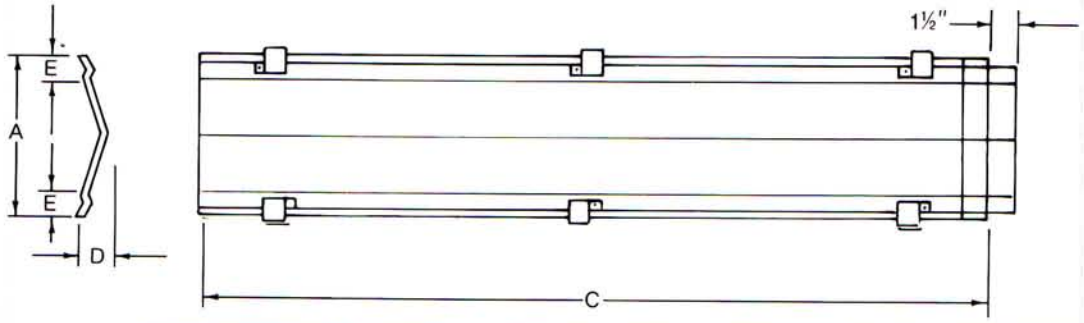
Covers for other trough lengths and thicknesses are available



Covers — Flanged, Flared Trough Screw Clamped

Screw Diameter, Inches	Trough Thickness	Cover Thickness	Part Number	Weight, Pounds	A	C
					Inches	
6	¼" & under	16 ga.	188-77-B	38	16⅞	120
9	⅜" & under	16 ga.	188-77-D	48	21½	120
12	¼" & under	14 ga.	188-77-G	91	26⅝	144
14	¼" & under	14 ga.	188-77-K	98	28⅝	144
16	¼" & under	14 ga.	188-77-N	111	32¾	144
18	¼" & under	14 ga.	188-77-S	124	36¾	144
20	¼" & under	14 ga.	188-77-V	134	39¾	144
24	¼" & under	14 ga.	188-77-Y	153	45¾	144

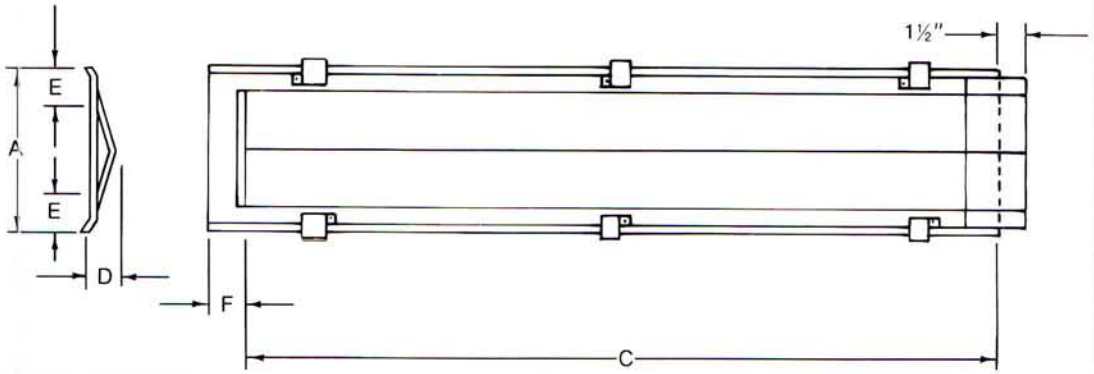
Covers for other trough lengths and thicknesses are available.



Covers – Hip Roof, Spring Clamped – U-Trough (Intermediate Cover with Butt Strap)

Screw Diameter, Inches	Trough Thickness	Cover Thickness	Part Number	Weight, Pounds	A	C	D	E
					Inches			
6	¼" & under	16 ga.	188-64-AN	24	10¾	120	1 7/16	1 7/16
9	⅜" & under	16 ga.	188-64-AP	33	14½	120	2⅜	1 13/16
10	⅜" & under	16 ga.	188-64-AR	36	15½	120	2 7/16	1 13/16
12	¼" & under	14 ga.	188-64-AS	62	18¼	144	2 11/16	2 3/16
14	¼" & under	14 ga.	188-64-AT	68	20¼	144	2⅞	2 3/16
16	¼" & under	14 ga.	188-64-AU	75	22¼	144	3 1/16	2 3/16
18	¼" & under	14 ga.	188-64-AV	84	25¼	144	3 1/16	2 11/16
20	¼" & under	14 ga.	188-64-AW	90	27¼	144	3 1/16	2 11/16
24	¼" & under	14 ga.	188-64-AX	103	31¼	144	3 1/16	2 11/16

Covers for other trough lengths and thicknesses are available.

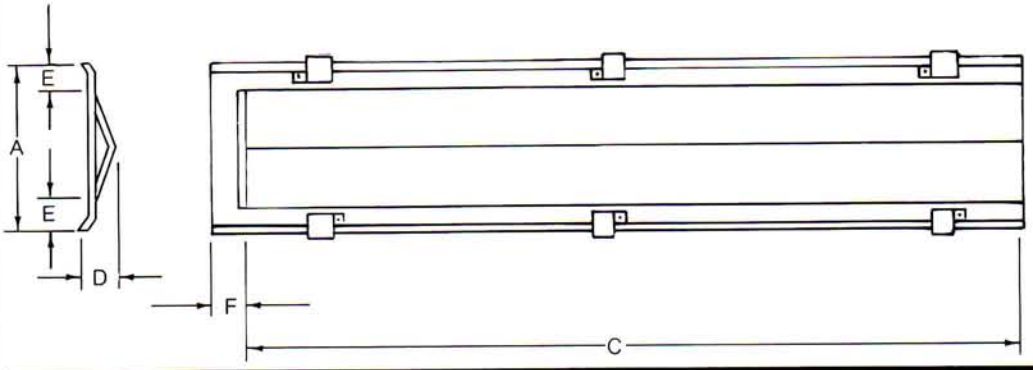


Covers – Hip Roof, Spring Clamped – U-Trough (Double End Cover)

Screw Diameter, Inches	Trough Thickness	Cover Thickness	Part Number	Weight, Pounds	A	C	D	E	F
					Inches				
6	¼" & under	16 ga.	188-64-AY	26	10¾	120	1 7/16	1 7/16	1½
9	⅜" & under	16 ga.	188-64-AZ	35	14½	120	2⅜	1 13/16	1⅝
10	⅜" & under	16 ga.	188-64-BA	37	15½	120	2 7/16	1 13/16	1¾
12	¼" & under	14 ga.	188-64-BB	64	18¼	144	2 11/16	2 3/16	2
14	¼" & under	14 ga.	188-64-BC	71	20¼	144	2⅞	2 3/16	2
16	¼" & under	14 ga.	188-64-BD	77	22¼	144	3 1/16	2 3/16	2½
18	¼" & under	14 ga.	188-64-BE	87	25¼	144	3 1/16	2 11/16	2½
20	¼" & under	14 ga.	188-64-BF	93	27¼	144	3 1/16	2 11/16	2½
24	¼" & under	14 ga.	188-64-BG	106	31¼	144	3 1/16	2 11/16	2½

Covers for other trough lengths and thicknesses are available.

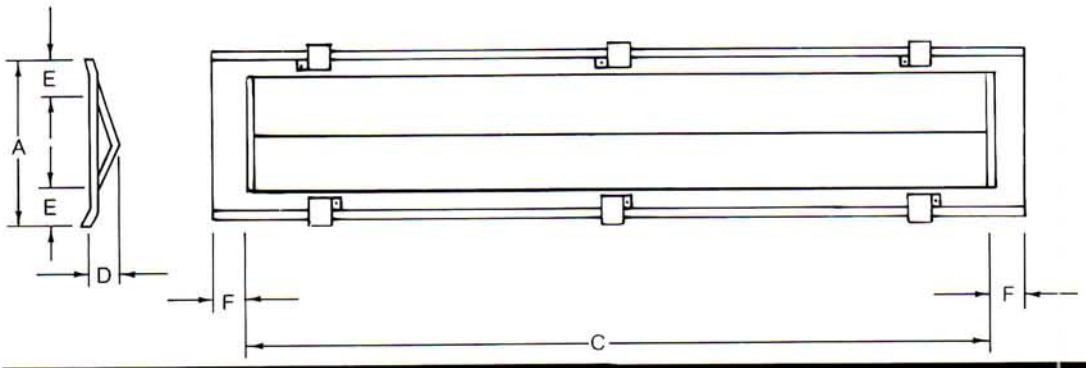
component selection



Covers — Hip Roof, Spring Clamped — U-Trough (Single End Cover)

Screw Diameter, Inches	Trough Thickness	Cover Thickness	Part Number	Weight, Pounds	A	C	D	E	F
					Inches				
6	¼" & under	16 ga.	188-64-BH	25	10¾	120	1 7/16	1 7/16	1½
9	⅜" & under	16 ga.	188-64-BJ	34	14½	120	2⅜	1 13/16	1⅝
10	⅜" & under	16 ga.	188-64-BK	36	15½	120	2 7/16	1 13/16	1¾
12	¼" & under	14 ga.	188-64-BL	63	18¼	144	2 11/16	2 3/16	2
14	¼" & under	14 ga.	188-64-BM	69	20¼	144	2⅞	2 3/16	2
16	¼" & under	14 ga.	188-64-BN	76	22¼	144	3 1/16	2 3/16	2½
18	¼" & under	14 ga.	188-64-BP	85	25¼	144	3 1/16	2 11/16	2½
20	¼" & under	14 ga.	188-64-BR	91	27¼	144	3 1/16	2 11/16	2½
24	¼" & under	14 ga.	188-64-BS	104	31¼	144	3 1/16	2 11/16	2½

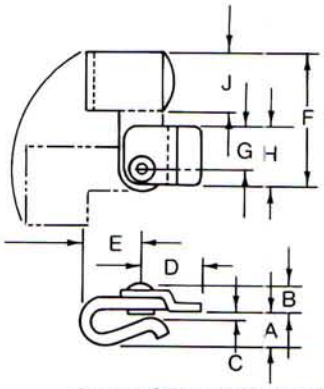
Covers for other trough lengths and thicknesses are available.



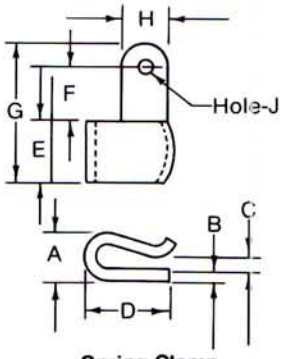
Covers — Hip Roof, Spring Clamped — U-Trough (Double End Cover)

Screw Diameter, Inches	Trough Thickness	Cover Thickness	Part Number	Weight, Pounds	A	C	D	E	F
					Inches				
6	¼" & under	16 ga.	188-64-BT	26	10¾	120	1 7/16	1 7/16	1½
9	⅜" & under	16 ga.	188-64-BU	36	14½	120	2⅜	1 13/16	1⅝
10	⅜" & under	16 ga.	188-64-BV	38	15½	120	2 7/16	1 13/16	1¾
12	¼" & under	14 ga.	188-64-BW	65	18¼	144	2 11/16	2 3/16	2
14	¼" & under	14 ga.	188-64-BX	72	20¼	144	2⅞	2 3/16	2
16	¼" & under	14 ga.	188-64-BY	78	22¼	144	3 1/16	2 3/16	2½
18	¼" & under	14 ga.	188-64-BZ	88	25¼	144	3 1/16	2 11/16	2½
20	¼" & under	14 ga.	188-64-CA	95	27¼	144	3 1/16	2 11/16	2½
24	¼" & under	14 ga.	188-64-CB	108	31¼	144	3 1/16	2 11/16	2½

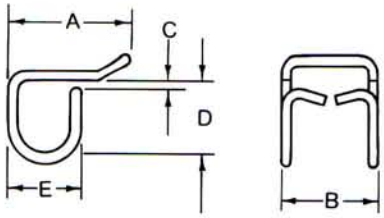
Covers for other trough lengths and thicknesses are available.



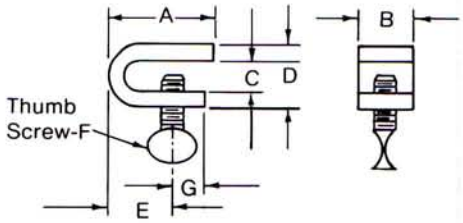
Spring Clamp With Bracket



Spring Clamp



Quik-Wire Clamp



Screw Clamp

Clamps for attaching covers to screw conveyor troughs are available in spring, Quik-Wire and screw types. Quick-acting clamps are primarily used for drop bottom screw conveyor troughs. Spring clamps with brackets are attached to the top side of semi-flanged covers. Plain spring clamps are used for service doors, inspection doors or removable covers and panels. Quik-Wire clamps and screw clamps are normally used for attaching flanged covers to screw conveyor troughs, but can also be used for attaching plain and semi-flanged covers.

Clamps

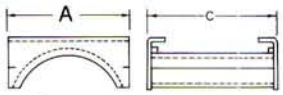
Type of Clamp	Part Number	Weight, Pounds	A	B	C	D	E	F	G	H	J
			Inches								
Spring clamp	368-16-1	.20	7/8	.134	1/4	1 5/8	1 1/4	1 1/4	2 15/16	7/8	17/32
	368-18-1	.40	1	3/16	1/4	2	1 1/2	1 1/8	3 3/16	1 1/8	13/32
Spring clamp with bracket	368-15-A	.31	11/16	3/8	3/16	1 1/4	1 3/16	2 7/8	7/8	1 1/4	1 1/4
	368-15-B(1)	.31	11/16	3/8	3/16	1 1/4	1 3/16	2 7/8	7/8	1 1/4	1 1/4
	368-15-C(2)	.31	11/16	3/8	3/16	1 1/4	1 3/16	2 7/8	7/8	1 1/4	1 1/4
Quick wire clamp(2)	368-23-1	.08	2	1 5/8	3/32	1 3/16	1 1/4	—	—	—	—
	368-23-2	.08	2	1 5/8	1/4	1 3/16	1 1/4	—	—	—	—
Screw clamp	368-12-A	.42	2 1/4	1	9/16	1 3/16	1 7/16	3/8	9/16	—	—
	368-12-B	.48	2 1/4	1	1 3/16	1 13/16	1 3/8	3/8	5/8	—	—

(1)Galvanized clamp with 304 stainless steel bracket
(2)Zinc plated

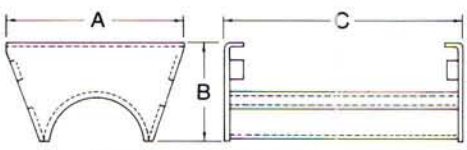
Shrouds are used in trough sections of screw feeders to decrease the clearance between the cover and feeder screw to obtain proper feed regulation. Lengths are sufficient to prevent flushing of the majority of materials being handled and gauges are proportioned to trough size and gauge. Stainless steel shrouds can be furnished.

Shrouds

Screw Diameter, Inches	Shroud Thickness	Part Number		Weight, Pounds		A		B		C
		U-Trough	Flared	U-Trough	Flared	U-Trough	Flared	U-Trough	Flared	
						Inches				
4	7 ga.	157-131-A	—	5	—	5	—	2 1/4	—	8
	12 ga.	157-131-B	—	4	—	5	—	2 1/4	—	8
6	7 ga.	157-132-A	157-141-A	11	16	7	13 3/4	2 11/16	6 3/4	14
	12 ga.	157-132-B	157-141-B	7	13	7	13 3/4	2 11/16	6 3/4	14
9	7 ga.	157-133-A	157-142-A	17	28	10	17 3/4	3 13/16	8 9/16	18
	12 ga.	157-133-B	157-142-B	13	23	10	17 3/4	3 13/16	8 9/16	18
10	7 ga.	157-134-A	—	19	—	11	—	3 13/16	—	20
	12 ga.	157-134-B	—	14	—	11	—	3 13/16	—	20
12	7 ga.	157-135-A	157-143-A	28	41	13	21 3/4	4 3/4	9 1/2	24
	12 ga.	157-135-B	157-143-B	20	32	13	21 3/4	4 3/4	9 1/2	24
14	7 ga.	157-136-A	157-144-A	37	54	15	23 3/4	5 13/16	10 5/16	28
	12 ga.	157-136-B	157-144-B	30	42	15	23 3/4	5 13/16	10 5/16	28
16	7 ga.	157-137-A	157-145-A	47	68	17	27 3/4	6 13/16	11 1/8	32
	12 ga.	157-137-B	157-145-B	35	52	17	27 3/4	6 13/16	11 1/8	32
18	7 ga.	157-138-A	157-146-A	60	82	19	30 3/4	7 7/8	11 7/8	36
	12 ga.	157-138-B	157-146-B	45	63	19	30 3/4	7 7/8	11 7/8	36
20	7 ga.	157-139-A	157-147-A	71	100	21	33 3/4	8 11/16	13 1/8	40
24	7 ga.	157-140-A	157-148-A	100	142	25	39 3/4	10 7/8	15 15/16	48

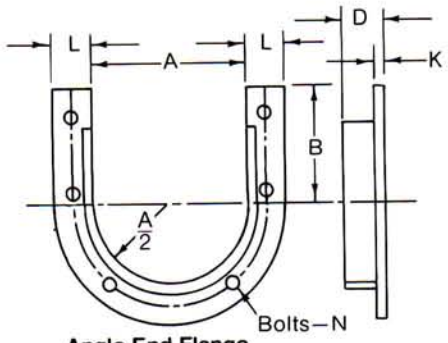


Shroud For U-Trough



Shroud For Flared Trough

component selection



Angle End Flange
4" To 12" Troughs

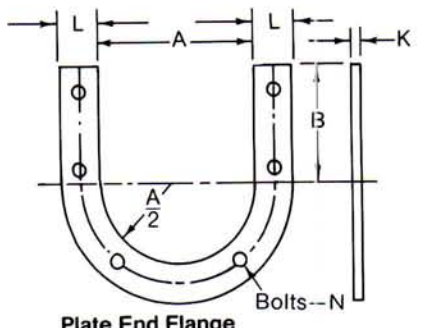
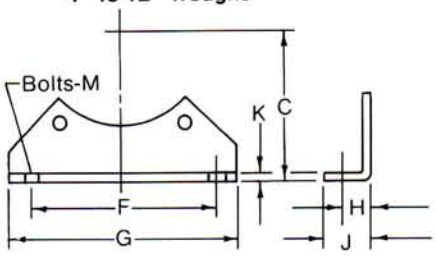
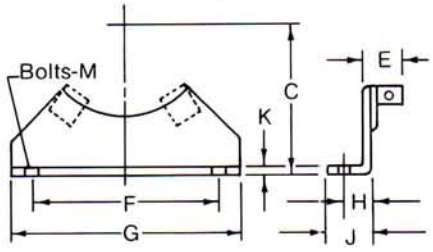


Plate End Flange
14" To 24" Troughs



Supporting Foot



Saddle

Trough End Flanges are made of steel angles or plates, formed and punched to assure accurate, closely-fitted trough connections and complete interchangeability. Angle end flanges are normally furnished in all listed gauges and on all trough sizes up to and including 12 inches. Plate end flanges are normally furnished on 14-inch and larger troughs, and on heavier than listed gauges for all size troughs.

Supporting Feet are of formed steel for use with end flanges and provide a convenient means of aligning and supporting conveyors from floors, and supporting structures.

Saddles are used when location of support points does not coincide with the spacing of joint flanges or when troughs with butt- welded or butt-strapped connections are used.

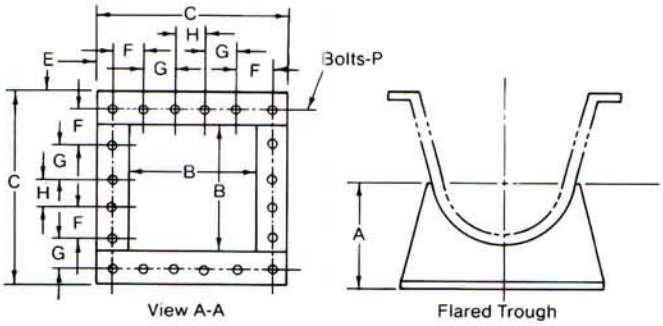
Trough End Flanges, Supporting Feet and Saddles (Dimensions)

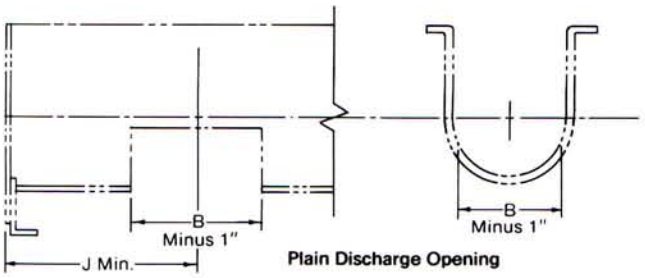
Screw Diameter Inches	A(2)		B			C	D		E	F	G	H	J	K		L		M	N
	Thru 10 Ga. Trough	3/16" and 1/4" Trough	Angle Flanged Trough Thru 1/4"	Flanged Trough Thru 10 Ga.	Flanged Trough 3/16" and 1/4"		Thru 10 Ga. Trough	3/16" and 1/4" Trough						End Flange	Supporting Foot and Saddle	Thru 10 Ga. Trough	3/16" and 1/4" Trough		
	Inches																		
4	5¼	—	3⅜	—	—	4⅝	1½	—	1 3/16	5¾	7⅜	⅞	1½	⅛	3/16	1¼	—	⅜	⅜(4)
6	7¼	7⅜	4½	—	—	5⅝	1¼	1¼	1 3/16	8⅛	10	13/16	1½	3/16	3/16	1¼	1¼	⅜	⅜(4)
9	10¼	10½	6⅛	—	—	7⅞	1¾	1½	1½	9⅜	12	1 5/16	2½	3/16	¼	1¾	1½	½	⅜(5)
10	11¼	11½	6⅜	—	—	8⅞	1¾	1½	1½	9½	12⅜	1 9/16	2½	3/16	¼	1¾	1½	½	⅜(5)
12	13¼	13½	7¾	—	—	9⅝	1½	1½	1½	12¼	15	1⅜	2½	¼	¼	2	2	⅝	½(5)
14	15¼	15½	9¼	9⅛	9	10⅞	—	—	1¾	13½	16½	1⅜	2½	¼	¼	2	2	⅝	½(5)
16	17¼	17½	10⅝	10½	10⅜	12	—	—	1¾	14⅞	18	1¾	3	¼	¼	2	2	⅝	⅝(5)
18	19¼	19½	12⅛	12	11⅞	13⅜	—	—	1¾	16	19⅛	1¾	3	¼	¼	2½	2½	⅝	⅝(6)
20	21¼	21½	13½	13⅜	13¼	15	—	—	2¼	19¼	22¾	2	3½	¼	¼	2½	2½	¾	⅝(6)
24	25¼	25½	16½	16⅜	16¼	18⅛	—	—	2¼	20	24	2¼	4	¼	¼	2½	2½	¾	⅝(7)

Trough End Flanges, Supporting Feet and Saddles (Part Numbers and Weights)

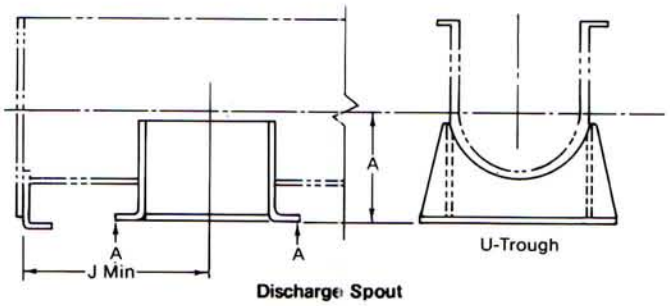
Screw Diameter, Inches	End Flange(2) Part Number (1)				Weight, Pounds	Support Foot(3)		Saddle	
	Angled Flanged Trough		Flanged Trough			Part Number (1)	Weight, Pounds	Part Number (1)	Weight, Pounds
	Thru 10 Ga. Trough	3/16" and 1/4" Trough	Thru 10 Ga. Trough	3/16" and 1/4" Trough					
4	156-13-1	—	156-13-1	—	1	166-1-1	1	658-1-A	1
6	156-13-3	156-13-2	156-13-3	156-13-2	3	166-2-1	1.5	658-2-A	1.5
9	156-13-6	156-13-4	156-13-6	156-13-4	5	166-3-1	4	658-3-A	4
10	156-13-7	156-13-5	156-13-7	156-13-5	6	166-4-1	4	658-4-A	4.5
12	156-13-8	156-13-11	156-13-8	156-13-11	10	166-5-1	5	658-5-A	5
14	278-10-1	278-10-2	278-10-4	278-10-5	6.4	166-6-1	6	658-6-A	6.5
16	278-11-1	278-11-2	278-11-4	278-11-5	7.1	166-7-1	7.5	658-7-A	8
18	278-12-1	278-12-2	278-12-4	278-12-5	10	166-8-1	8	658-8-A	8.5
20	278-13-1	278-13-2	278-13-4	278-13-5	11	166-9-1	12	658-9-A	13
24	278-15-1	278-15-2	278-15-4	278-15-5	13	166-10-1	14	658-11-A	15

(1) Bolts are not included. Saddles include angle clip fastened in place for welding to trough.
(2) Angle end flange for sizes 4" thru 12," other sizes are plate end flanges.
(3) Supporting feet are regularly furnished. Only one supporting foot per trough section is normally required.
(4) Six bolt holes
(5) Eight bolt holes
(6) Ten bolt holes
(7) Twelve bolt holes

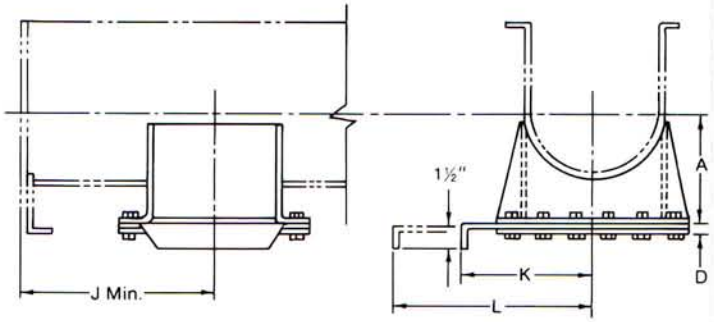




Plain Discharge Opening



Discharge Spout



Flat Side Discharge Gate

Discharge Spouts and Gates provide the means for discharging materials from the conveyor trough and for connection to succeeding equipment to which material is delivered. Gates provide for selective control of multiple spouts. When ordered separately, spouts or gates will be furnished loose. When ordered as parts of complete conveyors with locations determined, they will be furnished in place. Stainless steel discharge spouts and flat slide discharge gates can be furnished.

Discharge Spouts and Hand Slide Gates (Dimensions)

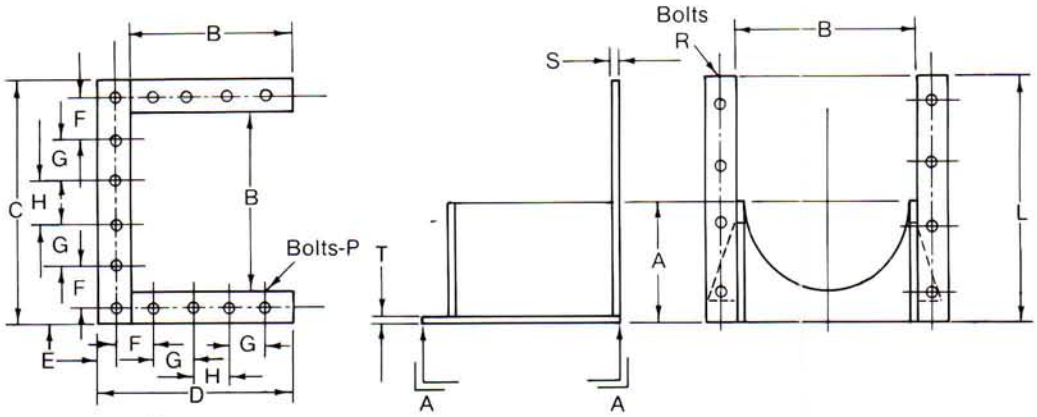
Screw Diameter	A	B	C	D	E	F	G	H	J With Foot	J W/O Foot	K	L	P
						Inches							
4	3¾	5	7½	5/16	3/8	2¼	—	2¼	6	4	5⅝	11	¼(1)
6	5	7	10	5/16	11/16	2 13/16	—	3	7½	6	6⅝	14	3/8(1)
9	7⅛	10	13	5/16	½	4	—	4	10	8	8	19	3/8(1)
10	7⅞	11	14¼	5/16	5/8	4 5/16	—	4⅜	11	9½	8⅜	20	3/8(1)
12	8⅞	13	17¼	5/16	⅞	5⅛	—	5¼	12½	10½	10⅛	24	3/8(1)
14	10⅛	15	19¼	5/16	⅞	3½	3½	3½	13½	11½	11¼	27	3/8(2)
16	11⅛	17	21¼	5/16	⅞	3¾	4	4	14½	13½	12⅜	30	3/8(2)
18	12⅜	19	24¼	5/16	1⅛	4 7/16	4⅜	4⅜	16½	14½	13⅜	33	½(2)
20	13⅜	21	26¼	3/8	1⅛	4⅞	4¾	4¾	17½	15½	14⅜	36	½(2)
24	15⅜	25	30¼	3/8	1⅛	5⅝	5⅝	5½	20	17½	16⅜	42	½(2)

(1)12 bolt holes
(2)20 bolt holes

Discharge Spouts and Hand Slide Gates (Part Numbers and Weights)

Screw Diameter, Inches	Trough Thickness	Spout and gate Thickness	Discharge Spouts				Hand Slide Gate Only	
			U-Trough		Flared Trough			
			Part Number	Weight, Pounds	Part Number	Weight, Pounds	Part Number	Weight, Pounds
4	16 and 14 ga. 12, ga.	14 ga. 12 ga.	164-13-A 164-13-B	2 3	— —	— —	180-43-CA 180-43-CA	4 4
6	16, 14, 12 & 10 ga. 3/16"	14 ga. 12 ga.	164-13-C 164-13-D	2 4	164-17-A 164-17-A	2 2	180-43-CD 180-43-CD	7 7
9	14, 12 & 10 ga. 3/16" & ¼"	14 ga. 10 ga.	164-13-E 164-13-F	6 10	164-17-D 164-17-D	6 6	180-43-CG 180-43-CG	10 10
10	14, 12 & 10 ga. 3/16" & ¼"	14 ga. 10 ga.	164-13-G 164-13-H	8 14	— —	— —	180-43-CK 180-43-CK	11 11
12	12 & 10 ga. 3/16" & ¼"	12 ga. 3/16"	164-13-J 164-13-K	12 21	164-17-G 164-17-K	12 21	180-43-CN 180-43-CN	18 18
14	12 & 10 ga. 3/16" & ¼"	12 ga. 3/16"	164-13-L 164-13-M	16 28	164-17-N 164-17-S	16 28	180-43-CS 180-43-CS	24 24
16	12 & 10 ga. 3/16" & ¼"	12 ga. 3/16"	164-13-N 164-13-P	19 34	164-17-V 164-17-Y	19 34	180-43-CV 180-43-CV	28 28
18	12 & 10 ga. 3/16" & ¼"	12 ga. 3/16"	164-13-Q 164-13-R	24 43	164-17-AB 164-17-AE	24 43	180-43-CY 180-43-CY	37 37
20	10 ga. 3/16" & ¼"	12 ga. 3/16"	164-13-S 164-13-T	28 51	164-17-AH 164-17-AL	28 51	180-43-DC 180-43-DC	41 41
24	10 ga. 3/16" & ¼"	12 ga. 3/16"	164-13-U 164-13-V	37 67	164-17-AP 164-17-AT	37 67	180-43-DF 180-43-DF	64 64

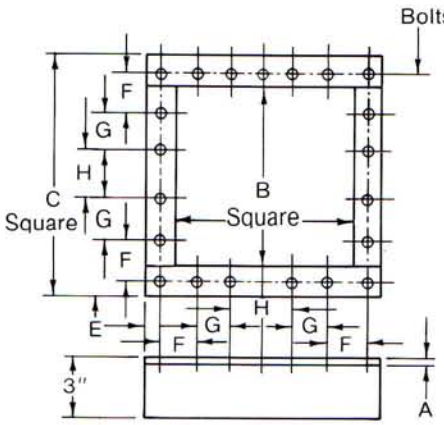
component selection



View AA

Flush End Discharge Spout

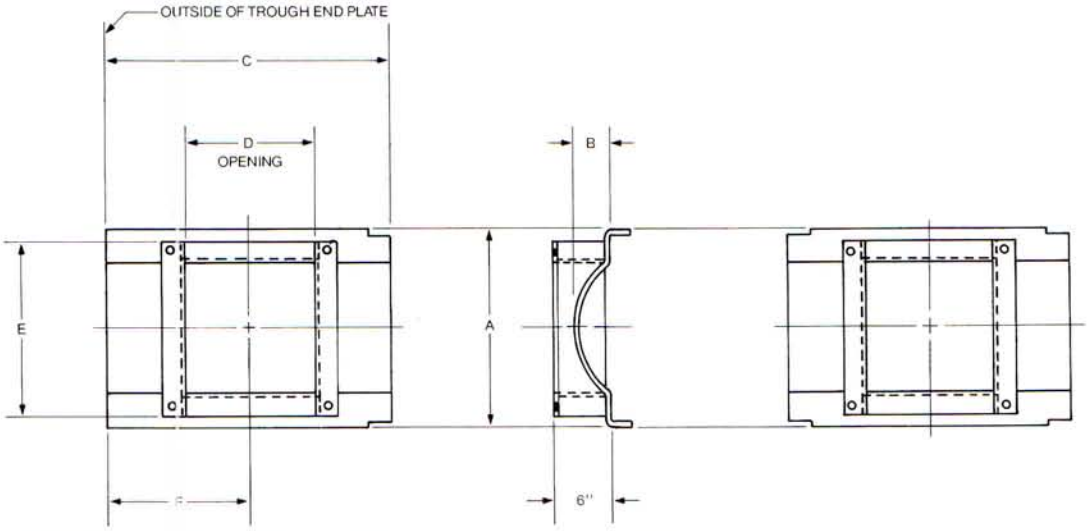
Screw Diameter Inches	Trough Thickness	Part Number		Weight Pounds	A	B	C	D	E	F	G	H	L	P	R	S	T
		Flanged Trough	Angle Flanged Trough		Inches												
4	16 & 14 ga.	164-22-A	164-24-A	2	3¾	5¼	7½	6¼	⅜	2¼	--	2¼	7⅜	¼(2)	⅜(1)	⅛	14 ga.
	12 ga.	164-22-B	164-24-B	3	3¾	5¼	7½	6¼	⅜	2¼	--	2¼	7⅜	¼(2)	⅜(1)	⅛	12 ga.
6	16, 14, 12, & 10 ga.	164-22-D	164-24-D	2	5	7¼	10	8½	11/16	2 13/16	--	3	9½	⅜(2)	⅜(1)	3/16	14 ga.
	3/16"	164-22-E	164-24-E	4	5	7⅜	10	8½	11/16	2 13/16	--	3	9½	⅜(2)	⅜(1)	3/16	12 ga.
9	14, 12 & 10 ga.	164-22-G	164-24-G	7	7⅛	10¼	13	11½	½	4	--	4	13¼	⅜(2)	⅜(2)	3/16	14 ga.
	3/16" & ¼"	164-22-H	164-24-H	10	7⅛	10½	13	11½	½	4	--	4	13¼	⅜(2)	⅜(2)	3/16	10 ga.
10	14, 12 & 10 ga.	164-22-J	164-24-J	9	7⅞	11¼	14¼	12⅝	⅝	4 5/16	--	4⅜	14¼	⅜(2)	⅜(2)	3/16	12 ga.
	3/16" & ¼"	164-22-K	164-24-K	13	7⅞	11½	14¼	12⅝	⅝	4 5/16	--	4⅜	14¼	⅜(2)	⅜(2)	3/16	3/16"
12	12 & 10 ga.	164-22-L	164-24-L	14	8⅞	13¼	17¼	15⅛	⅞	5⅛	--	5¼	16⅝	⅜(2)	½(2)	¼	12 ga.
	3/16" & ¼"	164-22-M	164-24-M	20	8⅞	13½	17¼	15⅛	⅞	5⅛	--	5¼	16⅝	⅜(2)	½(2)	¼	3/16"
14	12 & 10 ga.	164-22-N	164-24-N	17	10⅛	15¼	19¼	17⅛	⅞	3½	3½	3½	19⅜	⅜(5)	½(2)	¼	12 ga.
	3/16" & ¼"	164-22-P	164-24-P	26	10⅛	15½	19¼	17⅛	⅞	3½	3½	3½	19⅜	⅜(5)	½(2)	¼	3/16"
16	12 & 10 ga.	164-22-R	164-24-R	20	11⅛	17¼	21¼	19⅛	⅞	3¾	4	4	21¾	⅜(5)	⅝(2)	¼	12 ga.
	3/16" & ¼"	164-22-S	164-24-S	32	11⅛	17½	21¼	19⅛	⅞	3¾	4	4	21¾	⅜(5)	⅝(2)	¼	3/16"
18	12 & 10 ga.	164-22-T	164-24-T	27	12⅜	19¼	24¼	21⅜	1⅛	4 7/16	4⅛	4⅜	24½	½(5)	⅝(3)	¼	12 ga.
	3/16" & ¼"	164-22-U	164-24-U	41	12⅜	19½	24¼	21⅜	1⅛	4 7/16	4⅛	4⅜	24½	½(5)	⅝(3)	¼	3/16"
20	10 ga.	164-22-V	164-24-V	30	13⅜	21¼	26¼	23⅝	1⅛	4⅞	4¼	4¾	26⅞	½(5)	⅝(3)	¼	12 ga.
	3/16" & ¼"	164-22-W	164-24-W	48	13⅜	21½	26¼	23⅝	1⅛	4⅞	4¼	4¾	26⅞	½(5)	⅝(3)	¼	3/16"
24	10 ga.	164-22-X	164-24-X	39	15⅜	25¼	30¼	27⅝	1⅛	5⅝	5⅛	5½	31⅞	½(5)	⅝(4)	¼	12 ga.
	3/16" & ¼"	164-22-Y	164-24-Y	61	15⅜	25½	30¼	27⅝	1⅛	5⅝	5⅛	5½	31⅞	½(5)	⅝(4)	¼	3/16"



Inlet Spouts

Screw Diameter, Inches	Part Number Carbon	Weight Pounds	Flange Thickness A	B	C	E	F	G	H	P
				Inches						
4	164-23-A	3.0	12 ga.	5	7½	⅜	2¼	—	2¼	¼(1)
6	164-23-D	4.2	12 ga.	7	10	11/16	2 13/16	—	3	⅜(1)
9	164-23-G	7.8	10 ga.	10	13	½	4	—	4	⅜(1)
10	164-23-K	8.6	10 ga.	11	14¼	⅝	4 5/16	—	4⅜	3(1)
12	164-23-N	11	10 ga.	13	17¼	⅞	5⅛	—	5¼	⅜(1)
14	164-23-S	13	10 ga.	15	19¼	⅞	3½	3½	3½	⅜(2)
16	164-23-V	14	10 ga.	17	21¼	⅞	3¾	4	4	⅜(2)
18	164-23-Z	20	10 ga.	19	24¼	1⅛	4 7/16	4⅜	4⅜	½(2)
20	164-23-AC	22	10 ga.	21	26¼	1⅛	4⅞	4¾	4¾	½(2)
24	164-23-AF	23	10 ga.	25	30¼	1⅛	5⅝	5⅝	5½	½(2)

(1)12 bolts
(2)20 bolts

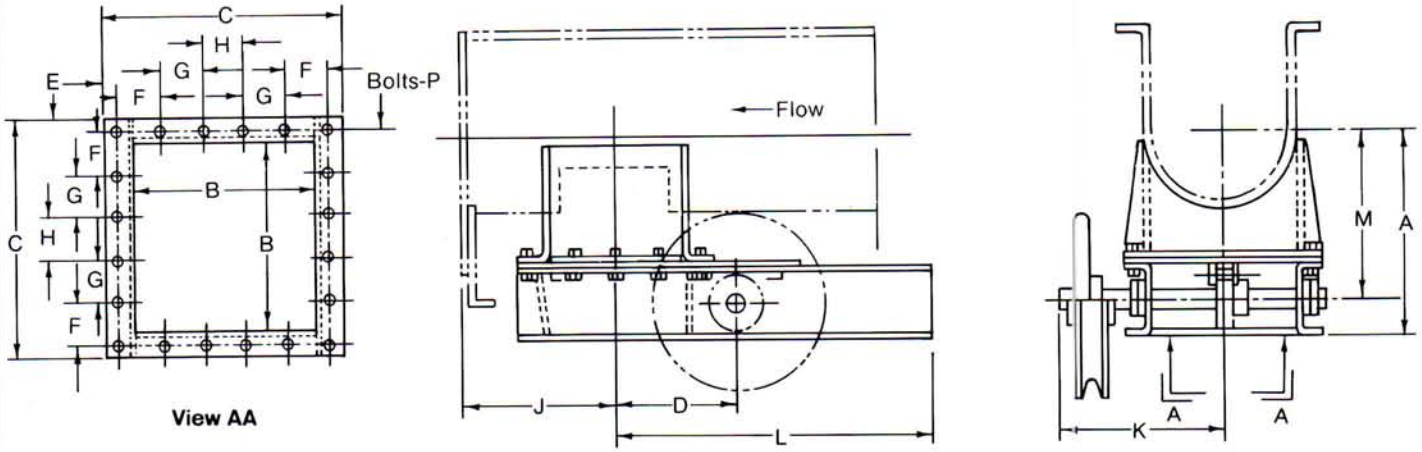


Inlet Spout—End and Intermediate—Carbon Steel (1) Dome Cover

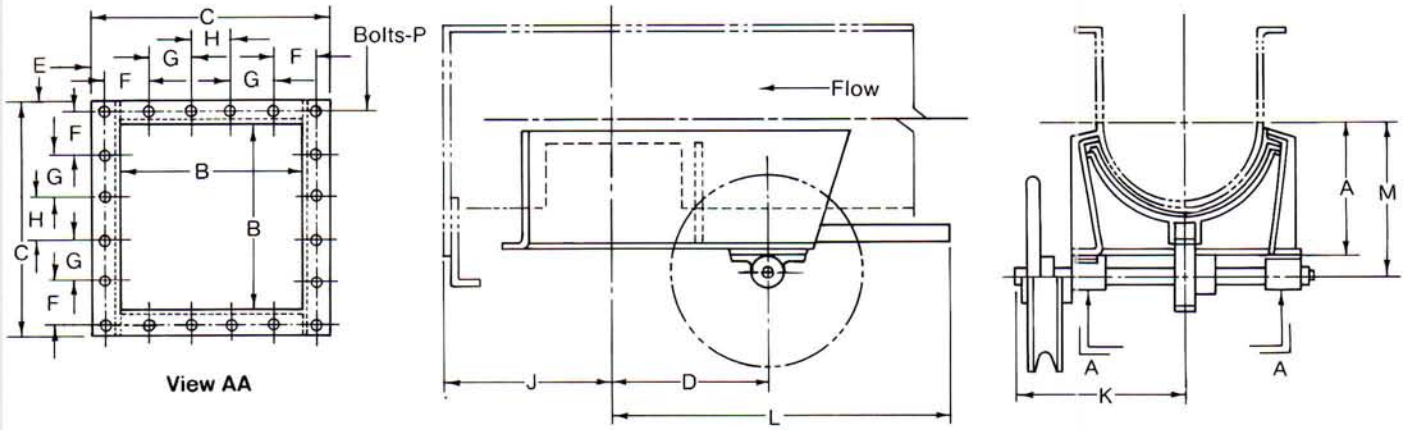
Shaft diameter, inches	Cover & Spout Thickness	Part Number		Wt., Lbs.	Dimensions, Inches						Cover Mounting Bolts (2)	
		End Inlet	Intermediate Inlet		A	B	C	D	E	F	Qty.	Dia.
4	12 ga.	164-33-A	164-32-A	8	8¼	1 5/16	15	5	7½	7½	4	⅜
6	12 ga.	164-33-B	164-32-B	13	10½	1½	18	7	10	9	4	⅜
9	10 ga.	164-33-C	164-32-C	24	14¼	1 13/16	23¼	10	13	11⅝	6	⅜
10	10 ga.	164-33-D	164-32-D	27	15¼	1⅞	25½	11	14¼	12¾	6	⅜
12	10 ga.	164-33-E	164-32-E	34	18¼	2 1/16	29	13	17¼	14½	6	⅜
14	10 ga.	164-33-F	164-32-F	39	20¼	2¼	31	15	19¼	15½	6	⅜
16	10 ga.	164-33-G	164-32-G	44	22¼	2⅜	34	17	21¼	17	8	⅜
18	10 ga.	164-33-H	164-32-H	54	25¼	2 13/16	38	19	24¼	19	8	½
20	10 ga.	164-33-J	164-32-J	59	27¼	2⅞	40	21	26¼	20	8	½
24	10 ga.	164-33-K	164-32-K	69	31¼	3 9/16	45	25	30¼	22½	8	½

(1) Stainless steel inlet spouts, can be furnished.
(2) Mounting bolts not included

component selection



Flat Slide



Curved Slide Gate

Rack and Pinion Discharge Gates have cut-tooth racks welded to the slide plates and are actuated by cut-tooth pinions mounted on pinion shafts operated by hand wheels or chain wheels. Stainless steel rack and pinions can be furnished.

Trough Rack and Pinion Discharge Gates (Dimensions)

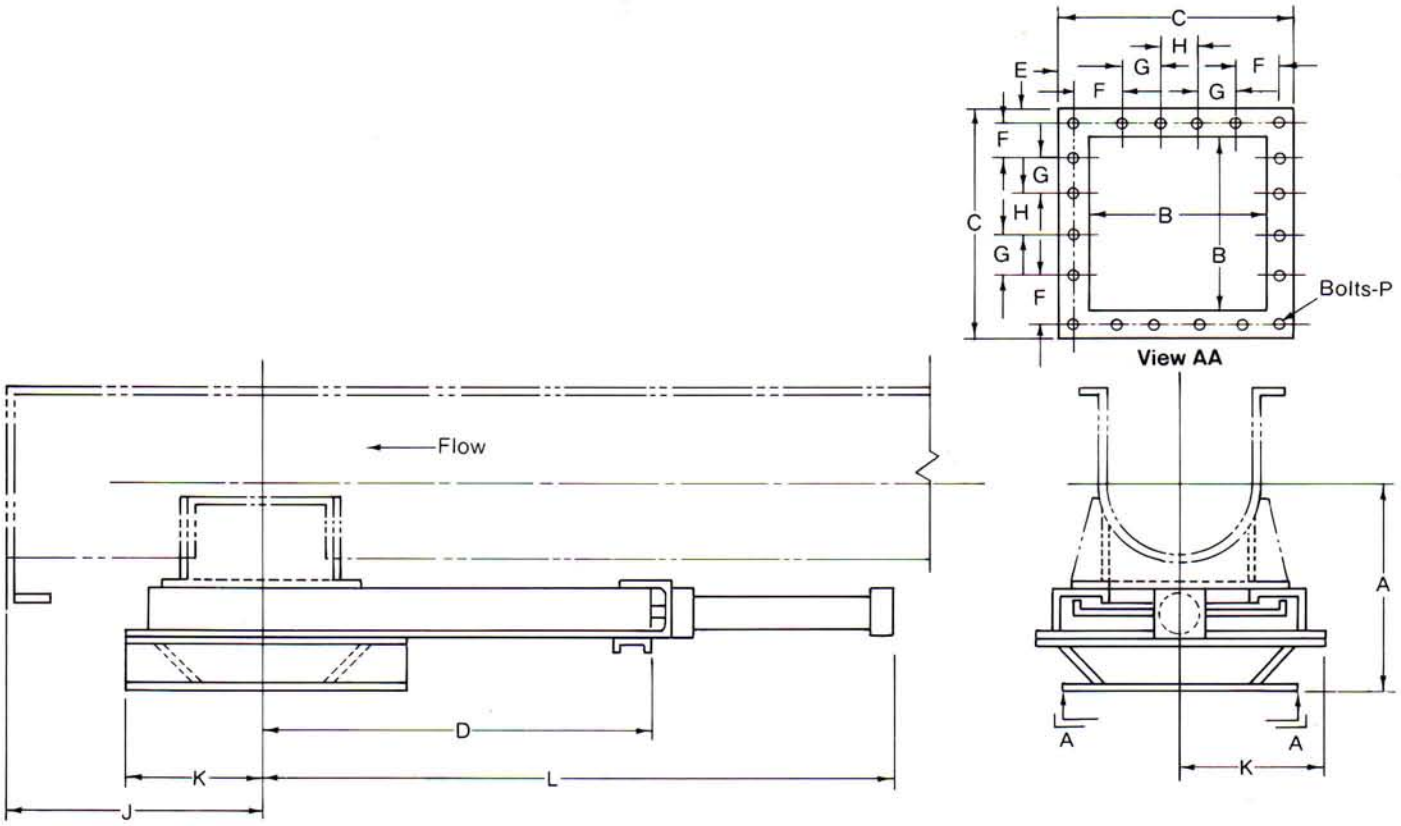
Screw Diameter,	A		B	C	D		E	F	G	H	J		Flat Slide Gate			Curved Slide Gate				
	Flat Slide	Curved Slide			Flat Slide	Curved Slide					With Feet	Less Feet	K	L	M	K	L Open	L Remove	M	P
Inches																				
4	7	3¾	5	7½	4¼	6⅛	⅜	2¼	—	2¼	6	4	5⅞	11¼	5½	6⅞	12	18½	4⅝	¼(1)
6	8¼	5	7	10	5½	7½	11/16	2 13/16	—	3	7½	6	6⅞	14½	6¾	8	15¼	22¼	5⅞	⅜(1)
9	10⅜	7⅛	10	13	7	9¼	½	4	—	4	10	8	9½	19⅛	8⅞	10	20½	29½	8⅛	⅜(1)
10	11⅛	7⅞	11	14¼	8⅜	10	⅝	4 5/16	—	4⅜	11	9½	10	21¾	9⅞	10⅝	22	31½	9	⅜(1)
12	12⅛	8⅞	13	17¼	9⅞	11½	⅞	5⅛	—	5¼	12½	10½	12¼	25½	10⅞	12	25½	37	10	⅜(1)
14	13⅜	10⅛	15	19¼	10⅞	12½	⅞	3½	3½	3½	13½	11½	13¼	28⅜	12⅛	13¼	29	42	11⅜	⅜(2)
16	14⅜	11⅛	17	21¼	11½	13½	⅞	3¾	4	4	14½	13½	14¼	30½	13⅛	14¼	32	45	12⅜	⅜(2)
18(3)	15⅝	12⅜	19	24¼	12⅝	15	1⅛	4 7/16	4⅜	4⅜	16½	14½	15¾	33⅞	14⅛	15¾	35½	49½	10¾	½(2)
20(3)	16¾	13⅜	21	26¼	13⅜	16	1⅛	4⅞	4¾	4¾	17½	15½	16¾	36⅞	15⅛	16¾	38½	54	11⅞	½(2)
24(3)	18¾	15⅜	25	30¼	16⅜	18	1⅛	5⅝	5⅝	5½	20	17½	18¾	43¾	17⅜	18¾	44½	63	13⅞	½(2)

(1) 12 bolt holes
(2) 20 bolt holes
(3) Uses two rack and pinion

Trough Rack and Pinion Discharge Gates (Part Numbers and Weights)

Screw Diameter, Inches	Trough Thickness	Flange Thickness (Maximum)	Discharge Gates							
			Flat Slide				Curved Slide			
			With Hand Wheel		With Chain Wheel		With Hand Wheel		With Chain Wheel	
			Part Number	Weight, Pounds	Part Number	Weight, Pounds	Part Number	Weight, Pounds	Part Number	Weight, Pounds
4	16 & 14 ga. 12 ga.	12 ga. 12 ga.	180-139-B 180-139-C	19 20	– –	– –	180-159-B 180-159-D	18 20	– –	– –
6	16, 14, 12 & 10 ga. 3/16"	12 ga. 12 ga.	180-140-B 180-140-C	25 27	– –	– –	180-160-B 180-160-D	22 25	– –	– –
9	14, 12 & 10 ga. 3/16" & 1/4"	10 ga. 10 ga.	180-141-B 180-141-D	43 47	180-141-C 180-141-E	48 52	180-161-B 180-161-D	39 47	180-161-C 180-161-E	48 55
10	14, 12 & 10 ga. 3/16" & 1/4"	10 ga. 10 ga.	180-142-B 180-142-D	51 57	180-142-C 180-142-E	56 62	180-162-B 180-162-D	45 54	180-162-C 180-162-E	53 62
12	12 and 10 ga. 3/16" & 1/4"	3/16" 3/16"	180-143-B 180-143-D	84 93	180-143-C 180-143-E	92 101	180-163-B 180-163-D	69 85	180-163-C 180-163-E	78 94
14	12 and 10 ga. 3/16" & 1/4"	3/16" 3/16"	180-144-B 180-144-D	95 108	180-144-C 180-144-E	103 116	180-164-B 180-164-D	81 100	180-164-C 180-164-E	90 109
16	12 and 10 ga. 3/16" & 1/4"	3/16" 3/16"	180-145-B 180-145-D	100 115	180-145-C 180-145-E	109 124	180-165-B 180-165-D	88 111	180-165-C 180-165-E	97 120
18	12 and 10 ga. 3/16" & 1/4"	3/16" 3/16"	180-146-B 180-146-D	138 158	180-146-C 180-146-E	147 167	180-166-B 180-166-D	128 158	180-166-C 180-166-E	137 167
20	10 ga. 3/16" & 1/4"	3/16" 3/16"	180-147-B 180-147-D	162 185	180-147-C 180-147-E	170 194	180-167-B 180-167-D	143 176	180-167-C 180-167-E	152 185
24	10 ga. 3/16" & 1/4"	3/16" 3/16"	180-148-B 180-148-D	206 243	180-148-C 180-148-E	214 243	180-168-B 180-168-D	185 230	180-168-C 180-168-E	194 235

component selection



Air Operated Gates for remote operation can be furnished with or without air cylinder.

Discharge Gates – Flat Slide, Air Operated

Screw Diameter Inches	Part Number		Weight/Lbs.		Thickness			Air Cylinder		A	B	C	D	E	F	G	H	J		K	L	P
	Air Cylinder Option				Gate Flange	Gate Body	Gate Plate	Bore	Stroke									With Feet	Less Feet			
	W/O	With	W/O	With				Inches														
4	180-266-A	180-266-B	73	93	10 ga.	10 ga.	7 ga.	2½	11	12⅛	5	7½	21 17/32	⅜	2¼	—	2¼	6	4	8⅛	37½	¼(1)
6	180-267-A	180-267-B	70	90	10 ga.	10 ga.	7 ga.	2½	11	12⅜	7	10	21 17/32	11/16	2 13/16	—	3	7½	6	8⅛	37½	⅜(1)
9	180-268-A	180-268-B	54	74	10 ga.	10 ga.	7 ga.	2½	11	12½	10	13	21 17/32	½	4	—	4	10	8	8⅛	37½	⅜(1)
10	180-269-A	180-269-B	59	80	10 ga.	10 ga.	7 ga.	2½	12	13¼	11	14¼	23 1/32	⅝	4 5/16	—	4⅜	11	9½	8⅝	40	⅜(1)
12	180-270-A	180-270-B	69	91	10 ga.	10 ga.	7 ga.	2½	14	14¼	13	17¼	26 1/32	⅞	5⅛	—	5¼	12½	10½	9⅝	45	⅜(1)
14	180-271-A	180-271-B	78	103	10 ga.	10 ga.	7 ga.	2½	16	15½	15	19¼	29 1/32	⅞	3½	3½	3½	13½	11½	10⅝	50	⅜(2)
16	180-272-A	180-272-B	88	114	10 ga.	10 ga.	7 ga.	2½	18	16½	17	21¼	32 1/32	⅞	3¾	4	4	14½	13½	11⅝	55	⅜(2)
18	180-273-A	180-273-B	160	202	7 ga.	7 ga.	¼"	3¼	20	20	19	24¼	36⅝	1⅛	4 7/16	4⅜	4⅜	16½	14½	13¼	62½	½(2)
20	180-274-A	180-274-B	176	221	7 ga.	7 ga.	¼"	3¼	22	21	21	26¼	39⅝	1⅛	4⅞	4¾	4¾	17½	15½	14¼	67½	½(2)
24	180-275-A	180-275-B	212	262	7 ga.	7 ga.	¼"	3¼	26	23	25	30¼	45⅝	1⅛	5⅝	5⅝	5½	20	17½	16¼	77½	½(2)

(1)12 bolt holes
(2)20 bolt holes

Screw Conveyor Safety Practices

TO AVOID UNSAFE OR HAZARDOUS CONDITIONS, THE FOLLOWING MINIMUM PROVISIONS MUST BE STRICTLY OBSERVED.

1.(A) **SCREW CONVEYORS SHALL NEVER BE OPERATED UNLESS THE CONVEYOR HOUSING COMPLETELY ENCLOSES THE CONVEYOR MOVING ELEMENTS.**
All necessary housings, covers, safety guards, railings, gratings and power transmission guards must be in place. If the conveyor is to be opened for inspection, cleaning or observation, the motor driving the conveyor is to be locked out electrically in such a manner that it cannot be started by anyone, however remote from the area unless the conveyor housing has been closed and all guards are in place. **THE HOUSINGS, COVERS, AND GUARDS ARE NECESSARY TO PREVENT ANYONE FROM ENTERING, REACHING, OR FALLING INTO THE MACHINERY, WHICH MAY RESULT IN SERIOUS PERSONAL INJURY.**

(B) If the conveyor must have an open housing as a condition of its use, the entire open conveyor is then to be guarded by a railing, fence or rugged safety grating.

(C) Feed openings for shovel, front end loader or other mechanical equipment shall be constructed in such a way that the conveyor is covered by a rugged grating. If the nature of the material is such that a grating can't be used, then the exposed section of the conveyor is to be guarded by a railing and there shall be warning signs posted.

2. **DO NOT PLACE HANDS OR FEET IN ANY CONVEYOR OPENING, TO AVOID BEING CAUGHT BETWEEN THE ROTATING CONVEYOR SCREW AND THE CONVEYOR HOUSING.**
3. **DO NOT WALK ON CONVEYOR COVERS OR GRATINGS OR POWER TRANSMISSION GUARDS, TO AVOID FALLING INTO OR AGAINST THE ROTATING CONVEYOR SCREW.**
4. **DO NOT** poke or prod material in the conveyor with a bar or stick, **to avoid being struck by the bar or stick.**
5. **DO NOT** overload conveyor or use it for anything but its intended use.
6. **DO** practice good housekeeping.

FMC SCREW CONVEYERS MUST BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE FMC OPERATION MAINTENANCE, INSTALLATION INSTRUCTION MANUAL.

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