Since 1951, FEECO has been designing and supplying custom bulk material handling systems for industries around the world. Whether you’re looking for a single piece of equipment, or a complete turnkey system, we can offer you a customized solution, tailored to your handling needs. We can provide handling systems for both new projects and existing systems. Advantages of a FEECO system include:

**RUGGED CONSTRUCTION**
You can rest assured when you purchase FEECO material handling equipment that you’re getting a system that was built with longevity in mind. Our engineers work closely with our in-house fabricators to ensure everything is crafted just right. We use only the best materials to provide you with a dependable solution that will work reliably for years to come.

**CUSTOM SOLUTIONS**
What sets FEECO material handling systems apart from our competitors is not just the quality of craftsmanship, but the customized solutions we offer. We look at our customers’ unique needs, from facility layout, to material characteristics, and process goals, in order to design a system that operates at optimal efficiency, and accomplishes exactly what the customer is looking for. Our familiarity with hundreds of materials allows us to provide you with the best handling solution possible.

**WHO WE WORK WITH**
FEECO’s expertise has been sought by everyone from start-ups to Fortune 100 companies seeking innovative solutions in process design, engineering, and manufacturing for a variety of industries. Some of these companies include:

**COMMON MATERIALS:**
- Aggregates
- Animal Feeds
- Biomass Products
- Clinker
- Coal
- Copper Ore
- Fertilizer Products
- Frac Sand
- Grain
- Gypsum
- Inorganic Chemicals
- Iron Ore
- Lignite
- Limestone
- Nickel
- Organic Chemicals
- Petroleum Coke
- Potash
- Pulp & Paper Products
- Sulfur
- Woodchips
CUSTOM SOLUTIONS, BUILT TO LAST.

The conveyors supplied to us by FEECO are top notch, heavy-duty, and have had no issues in our continuously operating facility. FEECO worked with diligence to meet our timeline and they are first in class in terms of experience and compatibility. I would recommend them to anyone looking for a conveyor manufacturer.

- George Handler
Nestle-Purina
TROUGHEd BELT CONVEYORS

The troughed belt conveyor is one of FEECO International’s most commonly used pieces of equipment for material handling. Troughed belt conveyors are capable of handling nearly any type of material, and are available in configurations 18” to 72” wide, with capacities up to 8,000 TPH. Standard troughed belt conveyors are usually comprised of conveyor belting, riding on heavy-duty troughed idlers, ranging in angles from 20°-45°, each securely mounted to a structural steel frame. Troughed belt conveyors can be run at various inclined angles, typically between 0°-20° (30° with cleated/chevron belting).

FEECO specializes in large, heavy-duty belt conveyors that are engineered for long-lasting performance. Advantages include:

CUSTOMIZATION
Every conveyor manufactured at FEECO is engineered, designed, and manufactured per each customer’s specifications. This process allows us to create equipment that will be the exact length and width at the angle required for your unique scenario.

HANDLING AGAINST THE ELEMENTS
All of FEECO’s troughed belt conveyors can either be equipped with weather covers, or integrated with gallery enclosures. Both options allow for material transfer outside of building structures without risking exposure of the material or equipment to outdoor elements such as wind, rain, sun, or other elements.

PRECISE ENGINEERING
FEECO relies on precise engineering for creating robust and reliable material handling equipment. Whether a conveyor is horizontal or at an incline, curved or straight, our Engineering Department can design a handling system to meet the needs of both small and large projects.

ADDITIONAL COMPONENTS
All of FEECO’s belt conveyors are available with a multitude of additional components to increase customization and flexibility. Some of the most common options include:

- Walkways & Service Platforms
- Belt Cleaners/Scrapers
- Weather Covers
- Loading Skirtboards
- Transfer Chutes
- Safety Cables and Shut-offs
- Belt Scale (Used for tracking quantity/interval of time)
**TROUGHED SIDE WALLS**
One of the greatest benefits of the troughed belt conveyor over a flat belt is increased capacity. The trough design also contains and arranges the material in one continuous stream, while at the same time, eliminating spillage. The troughed belt can also help shield the material from unforeseen forces, such as airflow from other equipment operating nearby.

**DUST CONTROL AT LOAD POINTS**
Integrated skirtboard and exhaust ports provide additional control for each customer’s specific scenario. These are usually located at the tail section of the conveyor, where the material is loaded onto the belt. This design has dual functionality; it centers the material on the belt and contains dust and fines. Often times, a dust pick off point is also located at the top of the discharge hood.

**TRUSS FRAME**
Heavy-duty box truss frames are available in several standard depths. This type of frame construction is utilized when long spans are required between support points. In addition to span length, other load factors such as wind, snow, etc., are accounted for in proper truss selection.

**CHANNEL FRAME**
The channel frame is typically utilized for conveyors that do not require long spans between supports. They are also often used when located close to grade, thus not requiring a cantilevered walkway. With that in mind, the channel frame conveyors get the same precision engineering that is expected from all FEECO material handling equipment.
The reversing shuttle conveyor is used for building an in-line, continuous pile, or for feeding multiple fixed discharge points. Similar in form to a troughed belt conveyor, reversing shuttle conveyors are designed with traveling shuttle functionality. The shuttle functionality allows the conveyor to be moved along a track, as well as convey material in both directions, creating opportunity for extreme flexibility.

The conveyor is typically half the length of the track rails; for example, a 100’ long shuttle conveyor would have the ability to transport material throughout the length of a 200’ storage facility.

The most important design advantages of a FEECO reversing shuttle conveyor involve:

**Stationary Inlet**
A stationary material feed chute allows for processed material to be directed to one central location. This reduces or eliminates the need for complex chute systems or diverters to get the product to the desired locations.

**Reversible Belt Direction**
The reversing terminology refers to added control of the belt’s conveying direction. The ability to control this means that the reversing shuttle conveyor is not restricted to which end of the conveyor material can discharge from.

**Remote / Automation**
Reversing shuttle conveyors can either be controlled from a remote location, such as a control room, by trained personnel, or automatically, through an automated program. This greatly reduces the labor cost of sorting and storing materials.

**Drive Components**
Only heavy-duty, high quality drive components are used for FEECO reversing shuttle conveyors. All of the moving components, from the trolley wheels to the drive motors, have been engineered to ensure continued functionality and reliability.

**Troughed Idlers**
Much like the drive components, only the highest quality CEMA idlers are selected for FEECO conveyor equipment. A commonly overlooked component, idlers can cause substantial belt wear and equipment downtime when not functioning properly. Making the investment for equipment designed and engineered with quality components will greatly reduce maintenance costs and downtime.
BELT TRIPPERS

FEECO belt trippers are custom designed and built to accommodate your desired specifications, with the same guidelines you can expect from all of our equipment (i.e., precision engineering, quality components, and heavy-duty construction). The purpose of the belt tripper, or traveling tripper, is to add versatility and functionality to a troughed belt conveyor, including:

ENHANCED STORAGE CAPABILITIES
The belt tripper’s ability to travel along the length of a conveyor allows for greater storage options. The tripper can be moved to pre-designated locations and discharge material, or travel continuously at a constant speed for layered stacking in a large storage structure.

CUSTOM DESIGN FOR SPECIFIC APPLICATIONS
FEECO’s belt trippers are designed to meet the customer’s specific needs; this means the options are based solely on how each customer wants the material flow re-directed. Some of the more common options are: one, two, or three way discharge chutes with diverter and/or auxiliary feeders (e.g. screw feeder, reversible belt feeder, etc.).

ENGINEERED PULLEY LOOP
The conveyor belting travels through a set of pulleys which create the material “trip,” or discharge point and then redirects the belt back on to the idlers. This “pulley loop” is designed so the conveyor belting will experience a very limited amount of stress, eliminating the opportunity for premature wear and stretching.

DIRECT DRIVE
FEECO belt trippers are equipped with direct mounted motor and gear reducers that are separate from the main conveyor drive components. This allows for the tripper travel to be controlled from either a remote or local location.
BELT FEEDERS

Belt feeders are used to provide a controlled discharge rate of material. Commonly used when material that is either stockpiled or loaded (at an uncontrolled rate) in a bin or hopper needs to be introduced into the system at a controlled feed rate.

FEECO belt feeders offer a variety of beneficial features, some of which include:

- Engineered hopper/feed bin
- Fully enclosed belt skirting
- Manual material leveling gate
- Variable speed

BELT PLOWS

FEECO belt plows are designed to increase a belt conveyor's material discharge control capabilities. Much like belt trippers, belt plows can release material on either side of the belt at pre-designated locations. Belt plows have several features that increase versatility, including:

- Pneumatically actuated plow blades
- Integrated belt flattening system
- UHMW plow blades
STEEP INCLINE CONVEYORS

Steep incline conveyors can be a great substitute for drag chain or conveyor/bucket elevator configurations, because of the reduced noise and the elimination of transfer points.

FEECO steep incline conveyors are designed to transport bulk materials at inclines ranging from 18° to 90°, while still maintaining the feed and discharge properties of a standard belt conveyor. The advantages of this unique design include:

REDUCED MATERIAL DEGRADATION
Through “L” and “S” shape designs, transfer points are eliminated, allowing for smooth, continuous conveying.

HANDLING EFFICIENCY
Corrugated sidewalls contain the material, reducing spillage along the conveyor path and loading points, while cleats, located at calculated positions, capture the material and eliminate fallback.

LESS SPACE REQUIREMENTS
Steeper geometric options of the steep incline conveyor reduce the length requirements to reach the desired elevation when compared to conventional conveyors, eliminating wasted space.

BELTING DESIGN
The steep incline conveyor uses flexible corrugated sidewall belting, which contains the material and permits loose material such as fertilizer, coal fines, chemicals, assembly parts, scrap materials, grain, and other bulk materials to be conveyed without spilling. Cleated belting, which prevents fallback of the material when conveying at steep angles up to 90°, is available.
**DRIVE ASSEMBLY**
Head and tail sections come fully assembled with shop mounted pulleys and complete drive systems. The picture at left illustrates a shaft mounted reducer with a direct mount drive motor. Other drive options such as belt and chain systems are also available. Back stops can either be mounted internally to the reducer, or externally on the conveyor head shaft.

**MATERIAL TRANSFER**
Loading points remain clean with custom designed inlet hoppers, which maximize loading capacity for straight incline, horizontal, and “L” and “S” shape configurations. Turning wheel assemblies are incorporated to direct belting up the desired incline. Fully enclosed systems are available to protect material and reduce dust. This all-in-one design eliminates transfer points, preventing product degradation and spillage, and allowing for smooth, continuous conveying.
WOODCHIP/BIO MASS HANDLING SYSTEM
FEECO supplied a complete material handling system that was used to transfer woodchips/biomass fuel material from delivery vehicles to a large fuel storage building, and from storage to boiler fuel silos in a biomass power facility.

The system included troughed belt conveyors, belt feeders, galleries, transfer towers, feed and diverter chutes, and a traveling belt tripper for fuel storage.

MAGNESITE ORE CONVEYOR SYSTEM
FEECO supplied several conveyors for handling Magnesite Ore, including receiving hoppers with vibrating feeders, belt scales, and a magnetic separator.
FRAC SAND CONVEYOR SYSTEM
FEECO supplied several 30” (.8m) wide inclined conveyor belts designed to handle 250 TPH of frac sand, as well as four (4) 30” x 108” (.8 x 33m) long reversing powered shuttle conveyors.

The system delivers sand to any of the nine (9) product silos from three different production streams.

GYPSUM CONVEYOR SYSTEM
FEECO supplied a gypsum conveying system, including a dual tripper conveyor system providing for “under roof” storage of product, and reclaim conveyors to feed a permanent rail load out system.
CHANNEL FRAME CONVEYOR

INTERNATIONAL

GREEN BAY, WISCONSIN, U.S.A.
(920) 468-1000 FAX: 469-5110
(800) 373-9347

USED ON: STANDARDS
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE
IN INCHES. THE FOLLOWING TOLERANCES APPLY
DECIMAL DIMENSIONS  - X.X  +.1"  
- X.XX  +.03"  - X.XXX  +.010"
FRACTIONAL DIMENSIONS -    +1/16"  
ANGULAR DIMENSIONS -    +.25º
INTERPRET DIM AND TOL PER
ASME Y14.5M - 1994

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DRAWN       GREGM       DATE 08/12/15
CHECKED     LP          DATE 08/22/15
ENGINEER    JM          DATE 08/15/15
RELEASED    DATE 08/15/15

TITLE    CONVEYOR TECHNICAL SPECIFICATIONS
WEIGHT(U.S.LBS) SIZE DWG. NO. 02015128 REV: 0

CHANNEL FRAME CONVEYOR

O.A.W. = [BELT WIDTH +12" [25.4]]
BELT WIDTH
5" MINIMUM CHANNEL FRAME

SKIRTBOARD SEALS
2/3 [BELT WIDTH]

O.A.W. = (BELT WIDTH + 12" [25.4])
BELT WIDTH

27.50" [698.5]
BAR GRATING

EMERGENCY STOP
SAFETY CABLE

TRUSS HEIGHT
BASED ON O.A.L.

30.00" [762]
STANDARD WALKWAY
*AVAILABLE UP 36.00" [914.4]

30.00" [914.4]
TRUSS CONVEYOR

8" MINIMUM
CHANNEL FRAME

42.00" [1067]

COVER DIMENSIONS
BASED ON BELT WIDTH

SKIRTBOARD SPECS

BELT WIDTH
O.A.W. = (BELT WIDTH + 12" [25.4])

TPRN10.000  36.000  5.750
BAR GRATING

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SAFETY CABLE

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BASED ON BELT WIDTH

SKIRTBOARD SPECS

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30.00" [914.4]
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42.00" [1067]

COVER DIMENSIONS
BASED ON BELT WIDTH

SKIRTBOARD SPECS

BELT WIDTH
O.A.W. = (BELT WIDTH + 12" [25.4])

TPRN10.000  36.000  5.750
BAR GRATING

EMERGENCY STOP
SAFETY CABLE

TRUSS HEIGHT
BASED ON O.A.L.
For dimensions greater than the limits of the chart, divide the given dimensions by a figure to bring length within the range of the chart. Multiply the result by the same figure to restore the proportions. Example: 160 ft. horizontal distance, 52 ft. lift. Dividing by 2 = 80 ft. and 26 ft. Intersection of vertical line from 80 ft. horizontal distance and horizontal line from 26 ft. lift = length on incline of 84 ft. at the 18° line. Actual incline conveyor length is then 84 x 2, or 168 ft.
**ENGINEERING BELT CONVEYOR HORSEPOWER**

The conveyor belt capacity charts below show tons per hour (TPH) based on material weighing 100 lbs. per cubic foot, 20° material surcharge angle with three equal length rolls on troughing idlers.

### Table No. 1 - H.P. to Drive Empty Conveyor for each 100 FPM Belt Speed*

<table>
<thead>
<tr>
<th>Tons per Hour</th>
<th>18</th>
<th>20</th>
<th>24</th>
<th>30</th>
<th>42</th>
<th>48</th>
<th>54</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>.3</td>
<td>.4</td>
<td>.5</td>
<td>.6</td>
<td>.7</td>
<td>.8</td>
<td>.9</td>
<td>1.0</td>
</tr>
<tr>
<td>100</td>
<td>.6</td>
<td>.8</td>
<td>.9</td>
<td>1.1</td>
<td>1.2</td>
<td>1.4</td>
<td>1.6</td>
<td>1.9</td>
</tr>
<tr>
<td>150</td>
<td>1.2</td>
<td>1.5</td>
<td>1.8</td>
<td>2.1</td>
<td>2.4</td>
<td>2.7</td>
<td>3.0</td>
<td>3.3</td>
</tr>
<tr>
<td>200</td>
<td>1.8</td>
<td>2.3</td>
<td>2.7</td>
<td>3.2</td>
<td>3.6</td>
<td>4.1</td>
<td>4.6</td>
<td>5.1</td>
</tr>
<tr>
<td>250</td>
<td>2.7</td>
<td>3.4</td>
<td>4.1</td>
<td>4.8</td>
<td>5.5</td>
<td>6.1</td>
<td>6.9</td>
<td>8.0</td>
</tr>
<tr>
<td>300</td>
<td>3.6</td>
<td>4.5</td>
<td>5.5</td>
<td>6.4</td>
<td>7.3</td>
<td>8.2</td>
<td>9.1</td>
<td>10.2</td>
</tr>
<tr>
<td>350</td>
<td>4.5</td>
<td>5.5</td>
<td>6.5</td>
<td>7.5</td>
<td>8.5</td>
<td>9.5</td>
<td>10.6</td>
<td>11.6</td>
</tr>
<tr>
<td>400</td>
<td>5.5</td>
<td>6.5</td>
<td>7.6</td>
<td>8.7</td>
<td>9.7</td>
<td>10.7</td>
<td>11.8</td>
<td>12.8</td>
</tr>
<tr>
<td>450</td>
<td>6.5</td>
<td>7.6</td>
<td>8.7</td>
<td>9.8</td>
<td>10.8</td>
<td>11.9</td>
<td>12.9</td>
<td>13.9</td>
</tr>
</tbody>
</table>

*Example problem on next page.

### Table No. 2 - H.P. to Convey Material Horizontally - Any Speed, Any Material

<table>
<thead>
<tr>
<th>Center to Center Length “L” (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.2</td>
</tr>
<tr>
<td>24.0</td>
</tr>
<tr>
<td>30.0</td>
</tr>
<tr>
<td>36.0</td>
</tr>
<tr>
<td>42.0</td>
</tr>
<tr>
<td>48.0</td>
</tr>
<tr>
<td>54.0</td>
</tr>
<tr>
<td>60.0</td>
</tr>
</tbody>
</table>

### Table No. 3 - Additional Horsepower Required for Each Tripper

<table>
<thead>
<tr>
<th>Width of Belt (inches)</th>
<th>18</th>
<th>20</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>54</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.P. to add for fixed or hand propelled Tripper</td>
<td>1.00</td>
<td>1.40</td>
<td>1.70</td>
<td>2.50</td>
<td>3.20</td>
<td>4.50</td>
<td>6.00</td>
<td>7.50</td>
<td>9.00</td>
</tr>
<tr>
<td>H.P. to add for self-propelling Tripper</td>
<td>1.10</td>
<td>1.50</td>
<td>2.00</td>
<td>2.80</td>
<td>3.60</td>
<td>5.00</td>
<td>7.00</td>
<td>8.00</td>
<td>10.00</td>
</tr>
</tbody>
</table>
Where conveyor is to be started under load, a high starting torque motor should be used. Of the power loss, or 1.5 H.P. This would give us a motor H.P. of 16.2 in which case, we would recommend a 20 H.P. motor.

- Add 10% for each Reduction
- Add 5% for each Reduction
- Add 5%

HORSEPOWER CALCULATION

With the information given in Tables 1-5 inclusive, the total horsepower required can be determined.

Example: Assume a 24" belt conveyor with 300 horizontal centers, a 40 foot rise, and a belt speed of 400 feet per minute. Conveyor to handle 195 tons of coal per hour. Anti-friction idlers and terminal bearings to be used throughout.

Table No. 1 shows that we will require 1.0 H.P. for each 100 feet per minute belt speed to drive empty conveyor, or a total of 4.0 H.P. for a conveyor traveling 400 FPM. Table No. 2 shows that approximately 2.7 H.P. will be required to convey 195 tons over a horizontal distance of 300 feet. Table No. 4 shows that approximately 8 H.P. is required to elevate 195 TPH of material 40 feet. Table No. 3 gives the additional H.P. required to drive the tripper, but as no tripper would be required on the conveyor, we are considering this figure is omitted.

By adding the horsepowers determined from Tables 1, 2, and 4, we get an effective H.P. of 14.7. Table No. 5 gives the additional horsepower required for the power loss in various types of drives. Assume the conveyor we have under consideration is driven by a helical gear reducer and roller chain drive. We would then have to add 10% of the effective H.P. to take care of the power loss, or 1.5 H.P. This would give us a motor H.P. of 16.2 in which case, we would recommend a 20 H.P. motor. Where conveyor is to be started under load, a high starting torque motor should be used.
The conveyor belt capacity charts below show tons per hour (TPH) based on material weighing 100 lbs. per cubic foot, 20º material surcharge angle with three equal length rolls on troughing idlers.

### TPH WITH 20º TROUGHING IDLERS

<table>
<thead>
<tr>
<th>Belt Width (inches)</th>
<th>Cross Load Section (Sq. Ft.)</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
<th>400</th>
<th>450</th>
<th>500</th>
<th>550</th>
<th>600</th>
<th>650</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>.180</td>
<td>54</td>
<td>80</td>
<td>110</td>
<td>135</td>
<td>160</td>
<td>190</td>
<td>218</td>
<td>243</td>
<td>270</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>24</td>
<td>.333</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td>300</td>
<td>350</td>
<td>400</td>
<td>450</td>
<td>500</td>
<td>550</td>
<td>600</td>
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<tr>
<td>30</td>
<td>.533</td>
<td>160</td>
<td>240</td>
<td>320</td>
<td>400</td>
<td>480</td>
<td>560</td>
<td>640</td>
<td>720</td>
<td>800</td>
<td>880</td>
<td>960</td>
<td>1040</td>
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<tr>
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**Note:** Capacities of flat belts are taken at one-half of those listed above.

### TPH WITH 35º TROUGHING IDLERS

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<th>Belt Width (inches)</th>
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<th>200</th>
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### TPH WITH 45º TROUGHING IDLERS

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<th>Cross Load Section (Sq. Ft.)</th>
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<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
<th>400</th>
<th>450</th>
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</tbody>
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### Maximum Size of Lumps (inches)

<table>
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<tr>
<th>Belt Width (inches)</th>
<th>Maximum Size of Lumps (inches)</th>
<th>Equal Size Lumps</th>
<th>Mixed with 90% Fines</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>3</td>
<td>5</td>
<td>Light, Free-Flowing Material (Grain, Pulverized Coal) 50 lb./cu.ft.</td>
</tr>
<tr>
<td>24</td>
<td>5</td>
<td>8</td>
<td>Average Material (Sand, Gravel, Stone, Coal, Fine Ore) 100 lb./cu.ft.</td>
</tr>
<tr>
<td>30</td>
<td>6</td>
<td>11</td>
<td>Abrasive Material (Coal, Screened Lump Coke) 30 to 50 lb./cu.ft.</td>
</tr>
<tr>
<td>36</td>
<td>8</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>42</td>
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</table>

**Note:** Capacities of flat belts are taken at one-half of those listed above.
THE FEECO COMMITMENT TO QUALITY

With 65+ years of experience, FEECO International has provided full-scale process solutions for thousands of satisfied customers (including some of the world’s largest corporations, engineering firms, and start-ups). Cited in over 250 US patents, the name FEECO has become synonymous with innovation and the reimagining of efficiency. As the leading manufacturer of processing and handling equipment in North America, no company in the world can move or enhance a concept from process development to production like FEECO International, Inc.

The choice to work with FEECO means a well-rounded commitment to quality. From initial feasibility testing, to engineering, manufacturing, and aftermarket services, we bring our passion for quality into everything we do. FEECO International is in the process of working towards ISO 9001:2015 quality management system compliance, with the goal of achieving ISO 9001:2015 Certification within the next calendar year.