Syntron®

Heavy Duty Feeders
Look to FMC Technologies for exceptional value and performance in bulk material handling. For nearly 80 years, we’ve partnered with our customers to solve material handling requirements in the most demanding and diverse industries and applications. Proven, low-maintenance and built to last, our Syntron® line – backed by our expert team of engineers and application specialists – sets the standard for quality, performance and reliability.

FMC Technologies is committed to complete customer satisfaction, with fast, efficient solutions for most bulk handling applications. From state-of-the-art electronic data capabilities, to expert sales and engineering support specialists, we’re focused on ensuring a smooth design, production and installation process – from start to finish. Once you’re up and running, our customer service and field service teams are on call 24/7 with technical assistance and service.

The first name in vibration technology. Rugged and built to last, Syntron® bulk material handling equipment has a proven track record for reliable, low-maintenance performance for a wide range of industries and applications.
# Table of Contents

- **Syntron® Heavy-duty Feeders**
  - Page 2

- **Syntron® Electromagnetic Feeders**
  - Page 4

- **Syntron® Electromechanical Feeders**
  - Page 14

- **Syntron® RF Electromechanical Feeders**
  - Page 16

- **Syntron® MF Electromechanical Feeders**
  - Page 18

- **Syntron® Feeder Controls**
  - Page 26

- **Recommended Installation Guidelines**
  - Page 30

- **Syntron® Vibrators**
  - Page 33
Increase bulk handling productivity with controlled high feed rates that improve cost-per-ton handling efficiency.
Syntron® Heavy-Duty Vibrating Feeders

Syntron® Vibrating Feeders for heavy industry are ideal for feeding a wide variety of bulk materials from storage piles, hoppers, bins and silos. Rugged and dependable, Syntron heavy-duty feeders are backed by years of service-proven performance in the mining, aggregates, glass, cement, chemical, wood products and steel industries.

Syntron Vibrating Feeders are designed to increase bulk handling productivity with high, controlled feed rates to improve cost-per-ton efficiency. Electromagnetic and electromechanical models are available. With capacity ranges from 25 to 4,000 tons per hour, these feeders are ideally suited for high-tonnage feeding. Feeder selection should include consideration of production requirements, material characteristics, and operating environment.

Syntron Vibrating Feeders are sub-resonant tuned, two-mass, spring-connected systems. These features enable Syntron feeders to work consistently under material damping and other varying headload conditions with negligible changes in trough stroke. Sub-resonant tuning maintains stroke consistency and speed stability, thus delivering higher capacities at controlled feed rates.

Precise, sub-resonant tuning is a key characteristic of both types of Syntron vibrating feeders. Electromagnetic models are tuned through careful calculation of the number and thickness of the special leaf springs required to accomplish the desired tuning ratio. Electromechanical models are tuned by adjusting the operating speed to obtain the exact tuning ratio. Because sub-resonant tuning is so critical to feeder performance, a detailed explanation is provided for electromagnetic feeders on page 6 and for electromechanical feeders on page 15.

Dependable, flexible control sets Syntron vibrating feeders apart from other feeding and conveying machinery. Material feed rates are controlled and easily adjusted with Syntron solid-state controls; a wide range of standard and special models is available. Control devices can also be supplied for integration into systems that use external signals from automatic sensing devices. In addition, control arrangements are available for selecting and sequencing a group of feeders.
**Syntron® Heavy-Duty Electromagnetic Feeders**

Bulk material feeding with full-range control.

Syntron® Heavy-Duty Electromagnetic Feeders come in ten different models with capacities ranging from 25 to 1600 tons per hour.* These versatile feeders are capable of handling a variety of materials from the finest powders to large, coarse particles.

Syntron Electromagnetic Feeders can be supplied in various configurations including multiple-drive units and above-deck drive units. Above-deck drive units are recommended where there is insufficient space below the trough.

Syntron Electromagnetic Feeders require minimal maintenance as there are no mechanical parts to wear out, such as cams, eccentrics, belts and bearings – thus eliminating the need for lubrication. All movement is confined to the heavy-duty leaf springs. Electrical components, such as the coil, will provide years of service under normal operating conditions. Dust-tight drive units are standard on all models.

Dependable, flexible controls provide easily adjustable feed rates with instantaneous response. A variety of controls with special control arrangements are available. (For more information on electromagnetic feeder controls, see pages 26 - 28.)

* Based on dry sand weighing 100 pounds per cubic foot. Capacities vary depending on drive unit location, material characteristics, material density, trough length and width, trough liner type, feeder installation, skirt boards and hopper transitions.
Syntron® Electromagnetic Feeders are normally installed by suspension mounting with four flexible wire rope cables. They can also be supplied for base mounting on a solid base, or with a combination of base mounting and suspension mounting.

Syntron® F-380 Electromagnetic Feeder with above-deck drive unit evenly distributes parts at a consistent rate to a heat treatment furnace.

Feeding gypsum with Syntron model F-380 Electromagnetic Feeder.

Syntron Electromagnetic Feeders are ideal for use in a stationary operation such as a tunnel system from a surge pile. They are usually controlled from a remote point to provide the desired feed rate. In this application, a model FH-22 feeds limestone to a belt conveyor.
Low sub-resonant tuning is the key characteristic of Syntron® electromagnetic feeders, making them the most stable and consistent feeders available on the market.

Feeder tuning involves adjustment of the natural frequency of the feeder in relationship to its operating frequency. If the operating frequency is greater than the natural frequency, the feeder is super-resonant tuned, making it very unstable under headload. Conversely, if the natural frequency is greater than the operating frequency, the feeder is sub-resonant tuned, making it more consistent and stable under headload.

Electromagnetic feeders are tuned through careful calculation of the number and thickness of the special leaf springs required to accomplish the desired tuning ratio.

Regardless of manufacturer, all heavy-duty, two-mass electromagnetic vibrating feeders are sub-resonant tuned. For sub-resonant tuned feeders, the distance from resonance is critical to feeder performance. Most manufacturers tune their feeders closer to resonance, while Syntron electromagnetic feeders are tuned further from resonance.

Material damping and other variations in headload cause fluctuations in capacity and feed rates of all sub-resonant tuned feeders. Because Syntron electromagnetic feeders are tuned further from resonance, capacity and feed rates remain more stable and consistent even when the feeder is subjected to material damping and other variations in headload.

This is why Syntron electromagnetic Feeders are the best solution for rugged material handling applications.
Electromagnetic Feeder Specifications

Model FH-22

Please request a certified drawing for installation.

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 240/480/600 Volt 60 Hz single-phase. 230/400/415 Volt 50 Hz single-phase. Above-deck and base mounting drive units are available.

<table>
<thead>
<tr>
<th>Trough W x L</th>
<th>Approx. tph</th>
<th>Approx. Current (460 V)</th>
<th>Model</th>
<th>Wt. (lb)</th>
<th>Approx. Feeder/Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 x 60</td>
<td>50</td>
<td>5 Amps</td>
<td>CRSDC-2C</td>
<td>480</td>
<td>575</td>
</tr>
<tr>
<td>18 x 42</td>
<td>125</td>
<td>5 Amps</td>
<td>CRSDC-2C</td>
<td>460</td>
<td>555</td>
</tr>
<tr>
<td>24 x 42</td>
<td>170</td>
<td>5 Amps</td>
<td>EVF-7.5D</td>
<td>480</td>
<td>575</td>
</tr>
</tbody>
</table>

Many other trough sizes are available. Capacities vary depending on drive unit location, material characteristics, material density, trough length and width, trough liner type, feeder installation, skirt boards and hopper transitions. Cad drawings are available.

Please call FMC Technologies for expert help with your application.

Model FH-24

Please request a certified drawing for installation.

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 240/480/600 Volt 60 Hz single-phase. 230/400/415 Volt 50 Hz single-phase. Above-deck and base mounting drive units are available.

<table>
<thead>
<tr>
<th>Trough W x L</th>
<th>Approx. tph</th>
<th>Approx. Current (460 V)</th>
<th>Model</th>
<th>Wt. (lb)</th>
<th>Approx. Feeder/Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 x 60</td>
<td>125</td>
<td>7 Amps</td>
<td>CRSDC-2C</td>
<td>600</td>
<td>650</td>
</tr>
<tr>
<td>24 x 48</td>
<td>195</td>
<td>7 Amps</td>
<td>CRSDC-2C</td>
<td>600</td>
<td>650</td>
</tr>
<tr>
<td>30 x 36</td>
<td>200</td>
<td>7 Amps</td>
<td>CRSDC-2C</td>
<td>600</td>
<td>650</td>
</tr>
</tbody>
</table>
Electromagnetic Feeder Specifications, cont’d.

Model F-330

![Diagram of Model F-330](image)

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 240/480/600 Volt 60 Hz single-phase. 230/400/415 Volt 50 Hz single-phase. Above-deck and base mounting drive units are available.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>24 x 54</td>
<td>230</td>
<td>13 Amps</td>
<td>CRSDC-2C</td>
<td>1130</td>
<td>1200</td>
</tr>
<tr>
<td>30 x 48</td>
<td>305</td>
<td>13 Amps</td>
<td>EVF-15D</td>
<td>1130</td>
<td>1200</td>
</tr>
</tbody>
</table>

Please request a certified drawing for installation.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>in</td>
<td>mm</td>
<td>24</td>
<td>610</td>
<td>54</td>
<td>1372</td>
<td>6</td>
<td>152</td>
<td>21 1/16</td>
<td>535</td>
<td>75 1/16</td>
<td>1907</td>
<td>35 7/8</td>
<td>911</td>
</tr>
<tr>
<td>in</td>
<td>mm</td>
<td>30</td>
<td>762</td>
<td>48</td>
<td>1219</td>
<td>6</td>
<td>152</td>
<td>24 3/8</td>
<td>613</td>
<td>72 1/8</td>
<td>1832</td>
<td>47 7/8</td>
<td>1064</td>
</tr>
</tbody>
</table>

Model F-380

![Diagram of Model F-380](image)

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 240/480/600 Volt 60 Hz single-phase. 230/400/415 Volt 50 Hz single-phase. Above-deck and base mounting drive units are available.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>24 x 60</td>
<td>230</td>
<td>18 Amps</td>
<td>CRSDC-2C</td>
<td>1370</td>
<td>1400</td>
</tr>
<tr>
<td>30 x 60</td>
<td>330</td>
<td>18 Amps</td>
<td>EVF-15D</td>
<td>1400</td>
<td>1450</td>
</tr>
<tr>
<td>36 x 48</td>
<td>375</td>
<td>18 Amps</td>
<td>EVF-15D</td>
<td>1400</td>
<td>1450</td>
</tr>
</tbody>
</table>

Please request a certified drawing for installation.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>in</td>
<td>mm</td>
<td>24</td>
<td>610</td>
<td>60</td>
<td>1524</td>
<td>6</td>
<td>152</td>
<td>18 1/8</td>
<td>460</td>
<td>78 1/8</td>
<td>1984</td>
<td>35 7/8</td>
<td>911</td>
</tr>
<tr>
<td>in</td>
<td>mm</td>
<td>30</td>
<td>762</td>
<td>60</td>
<td>1524</td>
<td>6</td>
<td>152</td>
<td>18 1/8</td>
<td>460</td>
<td>78 1/8</td>
<td>1984</td>
<td>41 7/8</td>
<td>1064</td>
</tr>
<tr>
<td>in</td>
<td>mm</td>
<td>36</td>
<td>914</td>
<td>48</td>
<td>1219</td>
<td>6</td>
<td>152</td>
<td>24 1/8</td>
<td>613</td>
<td>72 1/8</td>
<td>1832</td>
<td>47 7/8</td>
<td>1016</td>
</tr>
</tbody>
</table>

Many other trough sizes are available. Capacities vary depending on drive unit location, material characteristics, material density, trough length and width, trough liner type, feeder installation, skirt boards and hopper transitions. Cad drawings are available. Please call FMC Technologies for expert help with your application.
Model F-440

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 240/480/600 Volt 60 Hz single-phase. 230/400/415 Volt 50 Hz single-phase. Above-deck and base mounting drive units are available.

<table>
<thead>
<tr>
<th>Trough W x L</th>
<th>Approx. Capacity tph ♦</th>
<th>Approx. Current (460 V) Control Model</th>
<th>Net Wt. (lb) Feeder/Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 X 72</td>
<td>330</td>
<td>20 Amps</td>
<td>2400</td>
</tr>
<tr>
<td>36 X 60</td>
<td>430</td>
<td>20 Amps</td>
<td>2400</td>
</tr>
</tbody>
</table>

♦ Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 240/480/600 Volt 60 Hz single-phase. 230/400/415 Volt 50 Hz single-phase. Above-deck and base mounting drive units are available.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>in</td>
<td>30</td>
<td>72</td>
<td>7</td>
<td>26 3/16</td>
<td>27 3/4</td>
<td>33</td>
<td>705</td>
<td>7</td>
<td>1105</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mm</td>
<td>762</td>
<td>1829</td>
<td>178</td>
<td>665</td>
<td>838</td>
<td>34 1/4</td>
<td>883</td>
<td>20 Amps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in</td>
<td>36</td>
<td>60</td>
<td>7</td>
<td>32 3/16</td>
<td>28 1/4</td>
<td>33</td>
<td>718</td>
<td>7</td>
<td>1257</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mm</td>
<td>914</td>
<td>1524</td>
<td>178</td>
<td>818</td>
<td>838</td>
<td>35 1/4</td>
<td>895</td>
<td>20 Amps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Many other trough sizes are available. Capacities vary depending on drive unit location, material characteristics, material density, trough length and width, trough liner type, feeder installation, skirt boards and hopper transitions. Cad drawings are available. Please call FMC Technologies for expert help with your application.

Model F-450

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 240/480/600 Volt 60 Hz single-phase. 230/400/415 Volt 50 Hz single-phase. Above-deck and base mounting drive units are available.

<table>
<thead>
<tr>
<th>Trough W x L</th>
<th>Approx. Capacity tph ♦</th>
<th>Approx. Current (460 V) Control Model</th>
<th>Net Wt. (lb) Feeder/Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 X 72</td>
<td>485</td>
<td>25 Amps</td>
<td>3250</td>
</tr>
<tr>
<td>42 X 60</td>
<td>560</td>
<td>25 Amps</td>
<td>3200</td>
</tr>
</tbody>
</table>

♦ Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 240/480/600 Volt 60 Hz single-phase. 230/400/415 Volt 50 Hz single-phase. Above-deck and base mounting drive units are available.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>in</td>
<td>36</td>
<td>72</td>
<td>7</td>
<td>26 3/16</td>
<td>29 3/8</td>
<td>33</td>
<td>746</td>
<td>7</td>
<td>1210</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mm</td>
<td>914</td>
<td>1829</td>
<td>178</td>
<td>665</td>
<td>838</td>
<td>34 1/4</td>
<td>883</td>
<td>20 Amps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in</td>
<td>42</td>
<td>60</td>
<td>7</td>
<td>32 3/16</td>
<td>29 11/32</td>
<td>33</td>
<td>745</td>
<td>7</td>
<td>1363</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mm</td>
<td>1067</td>
<td>1524</td>
<td>178</td>
<td>818</td>
<td>838</td>
<td>36 11/32</td>
<td>923</td>
<td>20 Amps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Many other trough sizes are available. Capacities vary depending on drive unit location, material characteristics, material density, trough length and width, trough liner type, feeder installation, skirt boards and hopper transitions. Cad drawings are available. Please call FMC Technologies for expert help with your application.
Electromagnetic Feeder Specifications, cont’d.

Model F-480

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>42 X 84</td>
<td>665</td>
<td>31.5 Amps</td>
<td>CRSDC-2C or EVF-25D</td>
<td>4100</td>
<td>4200</td>
</tr>
<tr>
<td>48 X 72</td>
<td>780</td>
<td>31.5 Amps</td>
<td></td>
<td>4000</td>
<td></td>
</tr>
</tbody>
</table>

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 480/600 Volt 60 Hz single-phase. 400/415 Volt 50 Hz single-phase. Above-deck and base mounting drive units are available.

Please request a certified drawing for installation.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>84</td>
<td>7</td>
<td>178</td>
<td>23</td>
<td>15/16</td>
<td>668</td>
<td>33</td>
<td>838</td>
<td>30</td>
<td>11/16</td>
<td>779</td>
<td>37</td>
<td>11/16</td>
</tr>
<tr>
<td>48</td>
<td>72</td>
<td>7</td>
<td>178</td>
<td>28</td>
<td>1/16</td>
<td>713</td>
<td>33</td>
<td>838</td>
<td>27</td>
<td>13/16</td>
<td>706</td>
<td>34</td>
<td>13/16</td>
</tr>
</tbody>
</table>

Many other trough sizes are available. Capacities vary depending on drive unit location, material characteristics, material density, trough length and width, trough liner type, feeder installation, skirt boards and hopper transitions. Cad drawings are available. Please call FMC Technologies for expert help with your application.

Model F-560

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>54 X 72</td>
<td>820</td>
<td>27 Amps</td>
<td>CRSDC-2C or EVF-25D</td>
<td>8500</td>
<td>9000</td>
</tr>
</tbody>
</table>

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 480/600 Volt 60 Hz single-phase. 400/415 Volt 50 Hz single-phase. Above-deck and base mounting drive units are available.

Please request a certified drawing for installation.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>72</td>
<td>8</td>
<td>203</td>
<td>48</td>
<td>3/8</td>
<td>1229</td>
<td>51</td>
<td>1/2</td>
<td>35</td>
<td>1/2</td>
<td>902</td>
<td>43</td>
<td>1/2</td>
</tr>
</tbody>
</table>

Many other trough sizes are available. Capacities vary depending on drive unit location, material characteristics, material density, trough length and width, trough liner type, feeder installation, skirt boards and hopper transitions. Cad drawings are available. Please call FMC Technologies for expert help with your application.
Model F-660

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 480/600 Volt 60 Hz single-phase. 400/415 Volt 50 Hz single-phase. Above-deck and base mounting drive units are available. Please request a certified drawing for installation.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>60 X 90</td>
<td>1000</td>
<td>31.5 Amps</td>
<td>CRSDC-2C</td>
<td>9200</td>
<td>9300</td>
</tr>
</tbody>
</table>

Model F-88

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 480/600 Volt 60 Hz single-phase. 400/415 Volt 50 Hz single-phase. Above-deck and base mounting drive units are available. Please request a certified drawing for installation.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>72 X 96</td>
<td>1600</td>
<td>70 Amps</td>
<td>CRSDC-3C</td>
<td>11400</td>
<td>12000</td>
</tr>
</tbody>
</table>

Many other trough sizes are available. Capacities vary depending on drive unit location, material characteristics, material density, trough length and width, trough liner type, feeder installation, skirt boards and hopper transitions. Cad drawings are available. Please call FMC Technologies for expert help with your application.
Electromagnetic Feeder Troughs

Syntron® Electromagnetic Feeder models FH-22 through F-88 can be furnished with standard flat-bottom troughs, special flat-bottom troughs or belt-centering discharge troughs.

Drive units can be positioned either above or below the trough. A below-deck drive unit is most commonly used, but above-deck drive units can be supplied for installations where there is insufficient space below the trough. However, an above-deck drive unit may reduce feeder capacity slightly.

Capacities for feeder models with standard troughs are based on sand weighing 100 pounds per cubic foot. Capacities vary depending on drive unit location, material characteristics, material density, trough length and width, trough liner type, feeder installation, skirt boards and hopper transitions.

Several trough options are available for special applications. Syntron® extra-long feeder troughs can be supplied with either below-deck or above-deck multiple electromagnetic drive units. Extra-long feeder troughs provide many advantages in conveying materials over long distances; unlike belt conveyors, there are no idlers or pulley drive units to wear, lubricate, or replace. Long tubular troughs can convey pure, clean materials without atmospheric contamination and safely convey dusty, poisonous materials without endangering processing personnel.

Other trough options include:
- Syntron vibrating inspection tables feed material forward at a smooth, controlled rate of flow. This enables an operator to remove material that does not meet specification.
- Syntron “spreader” feeders spread a wide, even layer of material with a diagonal discharge trough or diagonal-slotted trough.
- Electrically heated trough liner plates minimize accumulation of damp or wet materials in feeder troughs. Available only on specially designed feeders, heated liner plates increase feeder efficiency by eliminating the downtime required to clean troughs. They are especially effective for materials with moisture contents ranging from five to fifteen percent. The electric heating element is insulated and sandwiched between two steel plates.

Other Trough Options Include:
- Covered Trough with Dust Seals
- Open Trough with Dust Seals
- Screening Feeders
- Diagonal Discharge Trough
- Belt-Centering Discharge Trough

Trough Liner Options Include:
- T-1A
- AR-400
- AR-500
- Stainless Steel
- UHMW Plastic
- Rubber
- Ceramic
- Carbide Overlay
Multiple-Drive Unit Electromagnetic Feeders

Syntron® Electromagnetic drive units can be combined to create feeders ideally suited for special applications.

Multiple-drive units, positioned one behind the other, result in a long, vibrating conveyor. When an especially wide material layer is desired, multiple-drive units can be placed side by side on extra wide feeder troughs. The number of drive units required is determined by the trough width and length.

Dual-twin drive units – two sets of twin drive units, one set placed behind the other – provide both increased capacity and the ability to handle exceptionally heavy loads.

The material flow rate of all multiple-drive unit models can be easily regulated. A special control permits adjustment of all drive units simultaneously to control the flow rate of the entire feeder.

A selection of some of the available multiple-drive unit configurations.
Syntron® Electromechanical Feeders

Increase bulk handling productivity with controlled high feed rate units.

Syntron® Heavy-Duty Electromechanical Feeders are available in a number of models with capacities ranging from 400 to 4,000 tons per hour.* Above-deck drive units are available, but will provide slightly lower capacities.

Syntron Electromechanical Feeders are ruggedly constructed to reduce maintenance and improve production efficiency.

Controls

Dependable, flexible solid-state control sets Syntron heavy-duty feeders apart from other feeding and conveying machinery. Feed rates are easily adjusted. Response is instantaneous. Control devices can be supplied for integration in systems using external signals from automatic sensing devices in instruments. Special control arrangements are also available for selecting and sequencing a group of feeders.

Variable frequency controls for RF and MF feeders provide linear feed rate and are available for either local or remote control operation. Control components are enclosed in a sturdy wall-mounted enclosure, and are available in general purpose, dust-tight, watertight or explosion-proof construction. For more information about electromechanical feeder controls, see page 29.

Trough Selection

Feeder troughs for RF and MF feeders are one-piece unitized weldments providing a rigid durable trough to meet application requirements. Troughs with bolt-together construction are available for tunnel installations or other confined areas.

Standard finish includes High Solids Enamel Paint, International Red, 2.0 to 3.0 mils D.F.T. Stainless steel troughs are also available. Special coatings and trough liners are available options to satisfy application requirements.

* Based on sand weighing 100 pounds per cubic foot. Capacities vary depending on material density, trough liner type, trough length, trough width, hopper transitions and skirt board arrangement.
Sub-resonant Tuning for Electromechanical Feeders

Stroke consistency and speed stability for high-capacity feeding.

Low sub-resonant tuning is the key characteristic of Syntron® electromechanical feeders, making them the most stable and consistent feeders available on the market.

Feeder tuning involves adjustment of the natural frequency of the feeder in relationship to its operating frequency. If the operating frequency is greater than the natural frequency, the feeder is super-resonant tuned, making it very unstable under headload. Conversely, if the natural frequency is greater than the operating frequency, the feeder is sub-resonant tuned, making it more consistent and stable under headload.

Regardless of manufacturer, all heavy-duty, two-mass electromechanical vibrating feeders are sub-resonant tuned. For sub-resonant tuned feeders, the distance from resonance is critical to feeder performance. Most manufacturers tune their feeders closer to resonance, while Syntron feeders are tuned further from resonance.

Material damping and other variations in headload cause fluctuations in capacity and feed rates of all sub-resonant tuned feeders. Because Syntron electromechanical feeders are tuned further from resonance, capacity and feed rates remain more stable and consistent even when the feeder is subjected to material damping and other variations in headload. In addition, Syntron electromechanical feeder design incorporates internal damping, which contributes to their stability and consistency.

On the comparison chart (Figure 1), curve 1 represents a typical competitive feeder in a no-load state without internal damping. Curve 2 represents a Syntron feeder in a no-load state with internal damping. Curve 3 represents a feeder with material headload and associated damping. Because Syntron feeders are tuned further from resonance and are designed with internal damping, it is evident that the loss in relative trough stroke under headload for a Syntron feeder (Y) is negligible as compared to a substantial loss in relative trough stroke for competitive feeders (X). This is why Syntron electromechanical feeders are more consistent and stable than any other feeder, even when subjected to material damping and other variations in headload.
RF Medium-Duty Electromechanical Feeders

These master material movers can feed it all.

Syntron® RF Medium-Duty Electromechanical Vibrating Feeders meet the varying, mid-range bulk material handling needs of industry. Capable of handling a wide range of materials, these two models provide feed rate capacities from 400 to 600 tons per hour.*

Syntron RF feeders are two-mass vibrating units; the trough is one mass and the exciter unit is the other. The exciter is belt-driven by a standard-frame induction motor and connected to the trough with long-life polymeric shear springs. The ball bearings in the exciter unit have a minimum life expectancy of 20,000 L10 hours.

Variable pitch motor sheaves provide a positive method of tuning. This Syntron design permits higher feed capacities from smaller trough sizes, enabling you to select a more economical unit to meet your capacity requirements.

Variable operating speeds and trough stroke, combined with the damping characteristics of polymeric shear springs, are significant factors in the performance capabilities of Syntron RF Medium-Duty Electromechanical Feeders.

All Syntron RF Feeder motors are labeled for inverter duty and vibration service and are furnished with a cast-iron frame. Special motors can be supplied to meet UL explosion-proof requirements.

* Based on dry sand weighing 100 pounds per cubic foot. Capacities vary depending on material density, trough liner type, trough length, trough width, hopper transitions and skirt board arrangement.
RF Medium-Duty Feeder Specifications

Model RF-80

Many other trough sizes are available. Capacities vary depending on material density, trough liner type, trough length, trough width and hopper transitions and skirt board arrangement. Cad drawings are available. Please call FMC Technologies for expert help with your application.

Model RF-120

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 230/460/575 Volt 60 Hz three-phase. 230/380/415 Volt 50 Hz three-phase.

Please request a certified drawing for installation.
MF Heavy-Duty Electromechanical Feeders

The high-capacity performers.

Syntron® MF Heavy-Duty Electromechanical Feeders are the heavy-weights of bulk material handling and are used for higher capacity requirements. The eight heavy-duty models handle capacities from 600 to 4,000 tons per hour.*

Syntron Heavy-Duty Electromechanical Feeders combine extra structural strength with durable components. The deep wing plates form a bridge between inlet and discharge suspension supports, providing extra strength for years of dependable service. Standard troughs feature unitized weldments – one-piece, completely welded units for greater strength. Troughs are also available with bolt-together construction for tunnel installations or other confined areas.

MF Heavy-Duty Electromechanical Feeders are two-mass, spring-connected and sub-resonant-tuned. The exciter unit is connected to the trough with corrosion resistant polymeric springs, which are more stable under varying conditions. The springs are compressed for improved load stability, improved feed angles and straight line motion. The spring design eliminates pinch points, an important safety feature. Exciters in these heavy-duty feeders use double roll, spherical roller bearings, with L10 expectancies up to 140,000 hours.

All Syntron MF Electromechanical Feeder motors are labeled for inverter duty and vibration service. Special motors can be supplied to meet UL explosion-proof requirements.

Attachments for safety cables are included on all Syntron MF feeders.

* Based on sand weighing 100 pounds per cubic foot. Capacities vary depending on material characteristics, material density, trough length and width, trough liner type, feeder installation, skirt boards and hopper transitions.
MF Electromechanical Feeder Features

- Operating frequency - 1100 VPM at 60Hz
- Stroke: 0.25 - 0.30 inches
- Start and operate in empty or fully-loaded state
- Dependable, flexible, easily adjustable control
- Precise sub-resonant tuning ratio
  - Stroke consistency and speed stability under varying material conditions
  - Reduces effects of varying headload and material damping
- Structural strength
  - Deep wing plates
  - Unitized weldments
- Infinite unbalance adjustment
  - Achieve desired stroke with easy adjustment
- Suitable for use in hazardous areas
  - Explosion-proof motors required by coal, coke or other hazardous environments are available
- Bolt-in trough liners

Syntron® MF-600 Electromechanical Feeder feeding coal from a truck dump hopper to a belt conveyor.

Syntron MF-1600 Electromechanical Feeder feeding rock from the primary crusher to a belt conveyor.

Syntron MF-600 Electromechanical Feeder feeding rock to a crusher.
### MF Heavy-Duty Feeder Specifications

#### Model MF-200

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>36 x 72</td>
<td>600</td>
<td>5</td>
<td>7.0 Amps</td>
<td>VF-5D</td>
<td>2200</td>
<td>2800</td>
</tr>
<tr>
<td>42 x 72</td>
<td>700</td>
<td>5</td>
<td>7.0 Amps</td>
<td>VF-5D</td>
<td>2400</td>
<td>3000</td>
</tr>
<tr>
<td>48 x 84</td>
<td>900</td>
<td>5</td>
<td>7.0 Amps</td>
<td>VF-5D</td>
<td>2500</td>
<td>3100</td>
</tr>
<tr>
<td>48 x 96</td>
<td>1000</td>
<td>5</td>
<td>7.0 Amps</td>
<td>VF-5D</td>
<td>2600</td>
<td>3200</td>
</tr>
<tr>
<td>54 x 96</td>
<td>1000</td>
<td>5</td>
<td>7.0 Amps</td>
<td>VF-5D</td>
<td>2800</td>
<td>3400</td>
</tr>
</tbody>
</table>

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 460/575 Volt 60 Hz three-phase.

#### Model MF-300

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>36 x 72</td>
<td>800</td>
<td>5</td>
<td>7.0 Amps</td>
<td>VF-5D</td>
<td>2300</td>
<td>2900</td>
</tr>
<tr>
<td>48 x 84</td>
<td>1200</td>
<td>5</td>
<td>7.0 Amps</td>
<td>VF-5D</td>
<td>2600</td>
<td>3200</td>
</tr>
</tbody>
</table>

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 460/575 Volt 60 Hz three-phase.

Many other trough sizes are available. Capacities vary depending on material density, trough liner type, trough length, trough width, hopper transitions and skirt board arrangement. Cad drawings are available. Please call FMC Technologies for expert help with your application.
Many other trough sizes are available. Capacities vary depending on material density, trough liner type, trough length, trough width, hopper transitions and skirt board arrangement. Cad drawings are available. Please call FMC Technologies for expert help with your application.

**Model MF-400**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>54 x 84</td>
<td>900</td>
<td>10</td>
<td>12 Amps</td>
<td>VF-10D</td>
<td>4500</td>
<td>5200</td>
</tr>
<tr>
<td>54 x 96</td>
<td>1000</td>
<td>10</td>
<td>12 Amps</td>
<td>VF-10D</td>
<td>4600</td>
<td>5300</td>
</tr>
<tr>
<td>60 x 84</td>
<td>1000</td>
<td>10</td>
<td>12 Amps</td>
<td>VF-10D</td>
<td>4600</td>
<td>5300</td>
</tr>
<tr>
<td>60 x 96</td>
<td>1200</td>
<td>10</td>
<td>12 Amps</td>
<td>VF-10D</td>
<td>4800</td>
<td>5400</td>
</tr>
<tr>
<td>66 x 96</td>
<td>1400</td>
<td>10</td>
<td>12 Amps</td>
<td>VF-10D</td>
<td>4900</td>
<td>5600</td>
</tr>
<tr>
<td>72 x 96</td>
<td>1600</td>
<td>10</td>
<td>12 Amps</td>
<td>VF-10D</td>
<td>5100</td>
<td>5800</td>
</tr>
</tbody>
</table>

**Model MF-600**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>66 x 108</td>
<td>1600</td>
<td>15</td>
<td>18.5 Amps</td>
<td>VF-15D</td>
<td>8300</td>
<td>9100</td>
</tr>
<tr>
<td>72 x 96</td>
<td>1800</td>
<td>15</td>
<td>18.5 Amps</td>
<td>VF-15D</td>
<td>8100</td>
<td>8900</td>
</tr>
</tbody>
</table>

**Please request a certified drawing for installation.**

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 460/575 Volt 60 Hz three-phase. 380/415 Volt 50 Hz three-phase.

Please request a certified drawing for installation.

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 460/575 Volt 60 Hz three-phase. 380/415 Volt 50 Hz three-phase.
Many other trough sizes are available. Capacities vary depending on material density, trough liner type, trough length, trough width, hopper transitions and skirt board arrangement. Cad drawings are available. Please call FMC Technologies for expert help with your application.
Model MF-1600

The largest Syntron® Electromechanical Feeder is the MF-2000. With a trough measuring 120-inches wide x 168-inches long, the MF-2000 has capacities up to 4,000 tph. Each one is custom built to meet demanding capacity requirements. Please contact FMC Technologies for dimensions.

Many other trough sizes are available. Capacities vary depending on material density, trough liner type, trough length, trough width and hopper transitions and skirt board arrangement. Cad drawings are available. Please call FMC Technologies for expert help with your application.

-----

Model MF-2000

A Syntron® MF-2000 Electromechanical Feeder measuring 72-inches wide by 240-inches long is custom built to feed coal at 1000 tph.

---

Please request a certified drawing for installation.

---

Based on feeder with 10° down slope, below-deck drive unit, installed with proper hopper transition and skirt board arrangement, feeding sand weighing 100 pounds per cubic foot. 460/575 Volt 60 Hz three-phase. 380/415 Volt 50 Hz three-phase.
Syntron® Crusher Loading Feeder

The new Syntron Crusher Loading Feeder is a traditional mechanical style vibratory feeder with a peripheral discharge. The Crusher Loading Feeder retains the high reliability and robust design of the mechanical feeder; the peripheral discharge, which has its origins in distribution of snack foods and cereals onto radial scales, enables equal distribution of fine and coarse product. The trough is fully lined to account for wear, and it is suspended by the same method as traditional vibratory feeders. The suspension framework is mounted on a trolley that can simply be moved out of the way for crusher maintenance.

In side-by-side installations of a feeder-plus-rotary distributor and a Syntron Crusher Loading Feeder directly feeding the crusher, the Crusher Loading Feeder delivered superior, cone-friendly performance. The specially configured discharge blended fines and coarse materials to provide uniform distribution of material to the cone.

In addition to the savings potential of reduced capital equipment costs, the Syntron Crusher Loading Feeder provides easy installation and maintenance accessibility. Like all Syntron feeders, the Crusher Loading Feeder is sub-resonant tuned and incorporates linear feed rate control to improve bulk handling productivity. It can be sized to match application requirements. For more information, call 1-800-356-4899 and ask to speak with one of our applications specialists.

Benefits of the Syntron® Crusher Loading Feeder Include:

- One piece of equipment
- Lower amp draw on crusher
- Longer life for crusher wear components
- Higher crusher productivity
- Easier maintenance for the crusher
- Improved fracture ratio
MF Heavy-Duty Feeder Trough Styles

All standard troughs are unitized welded construction and can be supplied in a variety of materials. Special coatings and liners are available, including abrasion-resistant steel, manganese, stainless steel, urethane, UHMW plastic, rubber overlay and ceramic tiles.

Optional above-deck drive units can be furnished for installations where there is insufficient space below the trough. Covers, down spouts and belt centering discharges can also be provided.

Other Trough Options Include:
- Covered Trough with Dust Seals
- Open Trough with Dust Seals
- Screening Feeders
- Diagonal Discharge Trough

Trough Liner Options Include:
- T-1A
- AR-400
- AR-500
- Stainless Steel
- Carbide Overlay
- Ceramic
- Rubber
- UHMW Plastic
Syntron® Electro-magnetic Feeder Controls are solid-state units that control material flow. Controls for electromagnetic feeders are EVF Series (VFD-type) and are optimized for efficient operation. EVF Series controls feature a full range of adjustable control with a 10:1 turn-down ratio. The newly designed EVF line of electromagnetic feeder controls are available in single- or three-phase input with single-phase half-wave output thus allowing for reduced power consumption when compared to our legacy CRSDC controls. Additional features of the new EVF product offering include precise voltage regulation, expanded DC control signals and PC communication, and improved diagnostic capability. Please reference the chart below for model offerings or call one of our applications specialists at 1-800-356-4899 for additional information.

<table>
<thead>
<tr>
<th>Control Model</th>
<th>Input Voltage</th>
<th>Hz</th>
<th>Amps</th>
<th>Enclosure</th>
<th>DC Signal Input</th>
<th>Manual Control</th>
<th>Output RC</th>
<th>Voltage Regulation</th>
<th>Soft Start</th>
<th>Variable Frequency</th>
<th>Certifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVF-7.5D*</td>
<td>230, 380-460, 575-600</td>
<td>50</td>
<td>10 A</td>
<td>Nema 1</td>
<td>●</td>
<td>●</td>
<td>Keypad</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>EVF-15D*</td>
<td>230, 380-460, 575-600</td>
<td>50</td>
<td>21 A</td>
<td>Nema 1</td>
<td>●</td>
<td>●</td>
<td>Keypad</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>EVF-25D*</td>
<td>230, 380-460, 575-600</td>
<td>50</td>
<td>34 A</td>
<td>Nema 1</td>
<td>●</td>
<td>●</td>
<td>Keypad</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>EVF-50D*</td>
<td>230, 380-460, 575-600</td>
<td>50</td>
<td>60 A</td>
<td>Nema 1</td>
<td>●</td>
<td>●</td>
<td>Keypad</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

CRSDC Series

Syntron controls provide infinite variable control of material feed rates. The CRSDC-2C Series controls are the standard for Syntron Heavy-Duty Electromagnetic Feeders. They operate on half-wave rectification of AC power and provide adjustable control with a 10:1 turndown ratio. CRSDC-2C controls contain an SCR (silicon controlled rectifier) and produce 3600 vibrations per minute at 60 Hz operation. These compact controls conform to National Electrical Manufacturers Association (NEMA) standards.
## Electromagnetic Feeder Control Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>Feeder Type</th>
<th>Overall Dims (in.)</th>
<th>Mtg. Dims (in.)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVF - 7.5D</td>
<td>F-22, FH-22, FH-24</td>
<td>7.88</td>
<td>7.22</td>
<td>3.01</td>
</tr>
<tr>
<td>EVF - 15D</td>
<td>F-330, F-380</td>
<td>7.88</td>
<td>12.72</td>
<td>7.22</td>
</tr>
<tr>
<td>EVF - 25D</td>
<td>F-440, F-450, F-480, F-560, F-660</td>
<td>9.84</td>
<td>15.9</td>
<td>8.08</td>
</tr>
<tr>
<td>EVF - 50D</td>
<td>F-88</td>
<td>14.57</td>
<td>23.19</td>
<td>10.24</td>
</tr>
<tr>
<td>CRSDC-2C</td>
<td>F-22 through F-660</td>
<td>19.75</td>
<td>19.75</td>
<td>8.25</td>
</tr>
<tr>
<td>CRSDC-3C</td>
<td>F-88</td>
<td>24</td>
<td>24</td>
<td>12</td>
</tr>
</tbody>
</table>
Syntron® Heavy-Duty Electromagnetic Vibrating Feeder Controls

**Standard Electronic Feeder Control**

Electronic Control accepts a variable DC current or voltage signal from an external source and uses it to vary the feed rate.

**Two-Rate Automatic Scale**

Perfect for batch weighing or bagging operations. External scale switches connected to control automatically signal primary fast material flow, secondary dribble flow, and instant shut-off at exactly the pre-selected weight. Primary and secondary setpoints are adjustable on keypad.

**Load Monitoring Control**

Sensor on electrical load of process equipment motors to determine when the machine is approaching an overload or underload condition connected to control which adjusts feeder output to correct machine loading.
Syntron® Electromechanical Feeder Controls

Syntron® Electromechanical Feeder Controls are state-of-the-art, solid-state units that can vary material flow rate.

Controls for electromechanical feeders are VF Series (variable frequency VFD-type) controls and are optimized for efficient operation. VF Series controls feature a full range of adjustable control with a 10:1 turn-down ratio. Diagnostic features are additional benefits of VF controls.

The VF Series controls are UL/CUL approved. In addition, a wide range of optional functions are available for specific control requirements.

Electromechanical Feeder Control Dimensions

<table>
<thead>
<tr>
<th>Model*</th>
<th>Feeder Type</th>
<th>Overall Dims (in.)</th>
<th>Mtg. Dims (in.)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>VF - 1D</td>
<td>RF-80</td>
<td>4.65</td>
<td>7.28</td>
<td>5.71</td>
</tr>
<tr>
<td>VF - 2D</td>
<td>RF-120</td>
<td>4.65</td>
<td>7.28</td>
<td>6.3</td>
</tr>
<tr>
<td>VF - 5D</td>
<td>MF-200, 300</td>
<td>5.91</td>
<td>10.24</td>
<td>6.31</td>
</tr>
<tr>
<td>VF - 10D</td>
<td>MF-400</td>
<td>7.88</td>
<td>12.72</td>
<td>7.22</td>
</tr>
<tr>
<td>VF - 15D</td>
<td>MF-600</td>
<td>7.88</td>
<td>12.72</td>
<td>7.22</td>
</tr>
<tr>
<td>VF - 20D</td>
<td>MF-800</td>
<td>9.84</td>
<td>15.9</td>
<td>8.08</td>
</tr>
<tr>
<td>VF - 25D</td>
<td>MF-1000</td>
<td>9.84</td>
<td>15.9</td>
<td>8.08</td>
</tr>
<tr>
<td>VF - 30D, 40D</td>
<td>MF-1600, 2000</td>
<td>9.84</td>
<td>15.9</td>
<td>8.08</td>
</tr>
</tbody>
</table>

* Models VF-1D, VF-2D, VF-5D, VF-10D, and VF-15D are representative of IMAGE A below. Models VF-20 D, VF-25 D, and VF-30D represent IMAGE B.
Recommended Designs for Hoppers and Transitions

Feeder Transition Hoppers

Feeder capacity depends on the design of the hopper. Material characteristics such as size distribution, shear properties and cohesiveness generally dictate the configuration of feeder transition hoppers. Material flow velocities vary, depending upon material properties, feeder stroke and operating speed.

Good transition hopper design optimizes flow rate, resulting in the most economical choice of a feeder. Improperly designed transition hoppers will substantially reduce feeder capacities.

Figure 1 illustrates Ideal and Acceptable Hopper designs. The Ideal Hopper with a throat (T) to gate height (H) ratio of 0.6 shows a uniform material flow pattern to the feeder trough. Material at the front and rear of the hopper moves at nearly the same velocity, and the discharge depth (d) is nearly equal to the hopper gate height. The Ideal Hopper design allows the most economical feeder to be used.

The Acceptable Hopper design may require a slightly larger feeder than required for the Ideal Hopper design. This is due to the non-uniform flow pattern of material at the rear of the hopper. Material flow velocity is reduced, material depth “d” is reduced and there is a reduction in feeder capacity. A T/H ratio of 0.6 to 1.0 is generally acceptable. However, when the T/H ratio exceeds this range, the material flow patterns distort drastically and will significantly reduce capacities.

\[
d (in) = \frac{\text{Capacity (tons per hour)} \times 4800}{[W \ (in) \cdot 4 \ (in)] \times R \ (ft/min) \times D \ (lb/ft^3)}
\]

\[
C \ (tph) = \frac{[W \ (in) \cdot 4 \ (in)] \times R \ (ft/min) \times D \ (lb/ft^3) \times d \ (in)}{4800}
\]

\[
H \ (in) = GF \times d \ (in)
\]

Flow Rate - R (ft/min)

Suggested Electromagnetic Size
If material size is -4-in with a trough down slope of up to 10°, use 30-40 ft/min.
If material size is +4-in to -12-in with a trough down slope of up to 10°, use 25-30 ft/min.
If material size is +12-in with a trough down slope of up to 10°, use 20-30 ft/min.

Suggested Electromechanical Size
If material size is -4-in with a trough down slope of up to 10°, use 50-60 ft/min.
If material size is +4-in to -12-in with a trough down slope of up to 10°, use 45-55 ft/min.
If material size is +12-in with a trough down slope of up to 10°, use 40-50 ft/min.

Feeder down slope usually effects flow rate by 2% per degree. As down slope increases flow rate increases. As down slope decreases flow rate decreases.

Ideal Hopper Promotes:
- Uniform flow pattern
- Maximum capacity
- Maximum material velocity
- Maximum material depth
- Optimized feeder size
- Reduced potential for material buildup at inlet
- Reduced potential for spillage at back and sides
- Reduced material load on feeder
Recommended Hopper Design and Feeder Selection

Refer to Figure 2.

1. Rear wall angle steep enough to permit material flow (60° ± 5°).

2. Front wall angle just enough to permit material flow (55° ± 5°).

3. The throat dimension “T” for random size material should be a minimum of 2 times the largest particle of material. For particles that are nearly the same size (near size), “T” should be a minimum of 4 times the largest particle size to prevent blockage at the throat opening. In all cases, the arc “A” should exceed 2 1/2 times the largest particle size.

4. Gate opening “H” must be a minimum of 2 times the largest particle of material and should increase proportionally for the desired capacity. The most economical feeder is selected when the throat dimension “T” is equal to or slightly larger than H/2. If “T” is greater than “H” the flow pattern of the material is disturbed, resulting in non-uniform flow.

5. When adjustable gates are used, the gate must be parallel to the hopper’s front wall and must be as close to the front wall as possible. The separation must not exceed 2 inches. The gate should act as an adjustable front wall. Leveling blades and down stream gates must not be used. Horizontal cut off gates should be used to perform feeder maintenance and must not be used to regulate flow.

6. The inside width of the opening “D” (between stationary skirtboards) should allow for a 1-inch clearance between the feeder trough and skirt boards and should be a minimum of 2 1/2 times the largest particle size. For near size material the width of “D” should be a minimum of 4 times the largest particle size.

7. The minimum length of the feeder is determined by projecting the angle of repose for the specific material from the gate point to the feeder pan and adding approximately 6 inches.

8. The feeder must not contact any adjacent structure but must be free to vibrate. Allowance must be made for a decrease in feeder elevation of approximately 2 inches, due to static material load. In addition, 1 inch minimum clearance at sides and 1 1/2 inches at bottom and back must be maintained in both loaded and unloaded conditions.

9. The skirts must taper in the direction of flow (diverge from conveying surface) to prevent material from jamming and causing additional problems such as spillage and build-up. Skirts must run parallel to trough sides and must be reinforced to resist bulging outward against trough.

FMC Technologies offers free review and advice on your hopper and Syntron® feeder installation and isolation. Just send us your layout drawings.

For more information about hopper design, please request our free book or CD ROM, “Working with Hoppers.” Or, visit our website, call our Application Specialists at (662) 869-5711 or (800) 356-4899 or email us at mhsol.info@fmcti.com.
Feeder Mounting and Isolation

Base Mounting
Base-mounted vibratory equipment sits directly on isolation springs mounted on seats which attach to the stationary support structure made by others. The springs can be steel coil, polymeric or pneumatic.

Suspension Mounting
Suspension-mounted vibratory equipment hangs from isolation assemblies attached to the overhead stationary support structure made by others. FMC Technologies recommends the use of flexible wire rope for suspension-mounted vibratory equipment. A chart of the proper wire rope sizes is available on our website, www.fmcsyntron.com, in our free book “Working with Isolation” and in our Service Instruction Manuals which accompany the shipment of equipment.

FMC Technologies suggests the use of link bar assemblies when a wire rope suspension is too short to be assembled in accordance with wire rope manufacturer recommendations. Contact FMC Technologies for appropriate link bar dimensions for specific applications.

For more information about feeder mounting and isolation, ask for our free book “Working with Isolation,” visit our website, call the Application Specialists at (662) 869-5711 or (800) 356-4899, or email us at mhsol.info@fmcti.com.
Syntron® Vibrators

Syntron® Vibrators offer an efficient, cost-effective means to maintain free flow of product from bins, hoppers and chutes, with a direct and positive result on the bottom line. Whether the need is to ensure constant, uninterrupted material flow, or to eliminate the necessity for manual manipulation of a bin, hopper or bulk material, Syntron Vibrators increase productivity and reduce production costs.

Three types of Syntron Vibrators – electromagnetic, rotary electric and pneumatic – provide product flow solutions for just about any industry, application or environment. Compact yet mighty, Syntron Vibrators are designed for years of high-performance, trouble-free continuous or intermittent operation, with the broadest selection of models and power ranges available.

Syntron Electromagnetic Vibrators are ideal for continuous or intermittent operation. An easily adjustable control assures optimum and variable material flow. Dependable Syntron Electromagnetic Vibrators are virtually maintenance-free because the electromagnetic design eliminates moving parts. Most models come standard with fully-enclosed dust-tight and watertight construction.

Syntron Electric Rotary Vibrators are motor driven for reduced noise levels. These rugged vibrators are totally enclosed for reliable operation in dusty, dirty or moist environments. Adjustable eccentric weights allow easy adjustment of force to suit varying applications.

Syntron Pneumatic Vibrators can be installed where electricity is not readily available because they use compressed air. Two types of pneumatic vibrators, turbine and piston, are available. Designed to keep operating noise at a minimum, Syntron Pneumatic Turbine Vibrators are ideal for locations where noise pollution is undesirable. Vibrator speed is adjusted by simply varying the air supply. Pneumatic turbine vibrators feature totally enclosed construction which eliminates concern over environmental factors such as dust, dirt or moisture.
**VIBRATOR DATA SHEET**

Supplement this data sheet with additional comments and/or drawings that will assist in a complete description of the application.

<table>
<thead>
<tr>
<th>Material to beHandled</th>
<th>Name or Description</th>
<th>Samples being Furnished</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>□ Yes □ To be Returned</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ No □ To be Destroyed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum Weight in Bin or Hopper</th>
<th>Tendency to</th>
<th>Fineness (Attach screen analysis, if possible)</th>
<th>Weight</th>
<th>Moisture Content</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____ LBS.</td>
<td>Arch</td>
<td>Per cubic ft.</td>
<td>____ lbs.</td>
<td>____ %</td>
<td>_____ °F</td>
</tr>
<tr>
<td></td>
<td>Rathole</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bin or Hopper Location of Inlet Opening

Angle of Bottom

____° From Horizontal

Discharge

□ Intermittently □ Continuously

<table>
<thead>
<tr>
<th>Size of Bin or Hopper</th>
<th>Size of Discharge Opening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter ____</td>
<td>Diameter ____</td>
</tr>
<tr>
<td>Length ____</td>
<td>Length ____</td>
</tr>
<tr>
<td>Width ____</td>
<td>Width ____</td>
</tr>
<tr>
<td>Depth ____</td>
<td></td>
</tr>
</tbody>
</table>

Add dimensional information. Also show reinforcing, if any, and number and location of discharge opening. Use the reverse side for sketches if necessary.

Bin or Hopper Construction

□ Steel: _____ Gauge □ Welded □ Riveted □ Wood: □ Plank _____ Inches □ Plywood _____ Thick □ Metal Liner

Special Requirements _____

Unit Preference

**Impacting:**

□ Electromagnetic (solid □ / Cushioned □)

□ Pneumatic Piston (solid □ / Cushioned □)

**Inertial**

□ Electromechanical

□ Pneumatic Turbine

Volts ____

Cycles ____

Phases ____

Customer Name ____________________________

Quote To Attention Of ______________________

Phone ____________________________

Street ____________________________

Contract Engineer ____________________________

FMC Representative ____________________________

City ____________________________

State ____________________________

Zip Code ______

Mail Quote To: □ Customer □ Sales Office

Date ____________________________

10212 02/17/10

_DATAVIB.DOT

34
### Quantity of Feeders:

<table>
<thead>
<tr>
<th>Weight (lbs.) per Cubic Foot</th>
<th>Size of Material (Sieve Analysis)</th>
<th>Material Width Max:</th>
<th>Material Length Max:</th>
<th>Material Thickness:</th>
<th>Temperature of Material ____ F deg. Max</th>
<th>Temperature of Surroundings ____ F deg. Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture Content: ____ %</td>
<td>Angle of Repose ____ deg.</td>
<td>Minimum feed rate (in tons per hour) ____ TPH</td>
<td>Maximum feed rate (in tons per hour) ____ TPH</td>
<td>Dimensions Requested: &quot;Wide X&quot; &quot;Long X&quot; &quot;High&quot;</td>
<td>None Requested (Provide most economical)</td>
<td></td>
</tr>
<tr>
<td>Trough Type: (Sketch if other than flat open pan)</td>
<td>Trough Liners: T1-A □ 304SS □ UHMW □ Other ____</td>
<td>Trough Slope: ____ deg. down ____ deg. up.</td>
<td>Type of Mounting: □ Base □ Suspension</td>
<td>Drive Position: □ Under trough in rear □ Over trough in front</td>
<td>AC (Municipal) Power: ____ Voltage ____ Cycle ____ Hz</td>
<td></td>
</tr>
</tbody>
</table>

**Controller Enclosure:**
- Standard (NEMA X) □ D.C. Input □ Load Monitoring □ Proportional □ Remote Pot

If there are any additional controller requirements please describe:

**Method of supplying material to Syntron Feeder trough:**

Feeder discharges into:

If an existing hopper, provide dimensions and wall slope. Provide additional sketch if necessary.

**Hopper Transition:**

- "T" = ____
- "H" = ____
- "B" = ____
- Rear Angle = ____
- Front Angle = ____
- "W" = ____
- Side Angle = ____

If there are any unusual operating conditions requiring special construction, please give details.

**Customer Type:** □ User □ OEM □ Resale

**Contact:**
- Address: __________
- City, State, Zip: __________

**Email:** mhsol.info@fmcti.com

**Phone:** __________

**Fax:** __________
### Quantity of Feeders:

<table>
<thead>
<tr>
<th>Weight (lbs.) per Cubic Foot PCF</th>
<th>Size of Material (Sieve Analysis)</th>
<th>Material Width Max:</th>
<th>Material Length Max:</th>
<th>Material Thickness</th>
<th>Temperature of Material _____ °F deg. Max</th>
<th>Temperature of Surroundings _____ °F deg. Max</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Moisture Content: _____ %</th>
<th>Angle of Repose _____ deg.</th>
<th>Minimum feed rate (in tons per hour) _____ TPH</th>
<th>Maximum feed rate (in tons per hour) _____ TPH</th>
</tr>
</thead>
</table>

**Trough Type:** (Sketch if other than flat open pan)
- Flat Open Pan
- Covered
- Tubular
- Down Spout
- Belt Loader
- Diag. Disc

**Dimensions Requested**
- "Wide X"
- "Long X"
- "High"

### Trough Liners:
- T1-A
- 304SS
- UHMW
- Other

**Trough Slope:**
- deg. down
- deg. up.

**Type of Mounting:**
- Base
- Suspension

**Drive Position:**
- Under trough in rear
- Over trough in front

**Controller Enclosure:**
- Standard (NEMA+)
- D.C. Input
- Load Monitoring
- Proportional
- Remote Pot

**If there are any additional controller requirements please describe:**

**Method of supplying material to Syntron Feeder trough:**

**If an existing hopper, provide dimensions and wall slope. Provide additional sketch if necessary.**

**Hopper Transition:**
- "T" = _____
- "H" = _____
- "B" = _____

**Rear Angle = _____**

**Front Angle = _____**

**W" = _____**

**Side Angle = _____**

If there are any unusual operating conditions requiring special construction, please give details.

**Customer Type:**
- [ ] User
- [ ] OEM
- [ ] Resale

**Company Name:**

**Contact:**
- Address:
- City, State, Zip:

**Email:**
- Phone:
- Fax:

**10204 02-17-10**
Syntron® service and support

At FMC Technologies, we understand that good, reliable equipment – operating at peak performance – is crucial to your bottom line. That’s why we’re committed to giving our customers value – before, during and after the sale.

Syntron Material Handling Solutions are based on the most rugged, reliable and durable vibratory equipment available – Syntron vibrating feeders, conveyors, screens, parts feeders and bin vibrators. To begin with, we’ll help you select the right equipment, considering all the variables of your application in order to maximize production and reduce costs.

Once you’re up and running, our Syntron Services Team will keep you on top and moving ahead. We’re on call – at the factory or in the field – wherever and whenever you need us for parts, service, inspection and training.

Dependable equipment is critical to your operation, and your success is critical to our success. At FMC Technologies, your satisfaction is our number one priority. You can rely on us.

Caution: Syntron® Heavy-Duty Feeders must be installed, operated and maintained in accordance with accompanying FMC Technologies Service Instructions. Failure to follow these instructions can result in serious personal injury, property damage or both. FMC Technologies Service Instructions accompany the shipment of equipment. If additional copies are required, they are available, free of charge from Material Handling Solutions, FMC Technologies, Inc., PO Box 1370, Tupelo, MS 38802.
Product Offering

- Belt Conveyor Idlers
- Idler Rolls
- Screw Conveyors
- Bucket Elevators
- Link-Belt® Component Parts
- Heavy-Duty Vibrating Feeders
- Light-Duty Vibrating Feeders
- Screening Feeders
- Vibrating Screens
- Vibra-Drive Units
- Volumetric Feeder Machines
- Grizzly Bar Screens
- Vibrating Conveyors
- Bin Vibrators
- Packing Tables
- Paper Joggers
- Syntron® Component Parts

Technisys Product Offering

- Automation and Process Control
- SCADA and Process Software
- Variable Frequency Drives
- DC Drives
- Motors
- Harmonic Filters
- Line Reactors
- Power Factor Correction
- Enclosures (Metal, Fiberglass, Plastic)
- Sensors
- Transformers
- Circuit Protective Devices
- Industrial Controls
- UL Panel Shop

FMC Technologies, Inc.
PO Box 1370
Tupelo, MS 38802
Tel: 662-869-5711
Fax: 662-869-7493
Toll Free: 800-356-4898
Email: mhsol.info@fmcti.com

FMC Technologies, Inc.
2# Road No. 1
Changshu Export Processing Zone
Changshu, Jiangsu, China 215513
Tel: 86-0512-52299002
Fax: 86-0512-52297228
Email: mhsolchina.info@fmcti.com

FMC Technologies, Inc.
479 West 900 North
North Salt Lake, UT 84054
Tel: 801-296-9500
Fax: 801-296-9601
Email: mhsol.info@fmcti.com

FMC Technologies Chile Ltda.
Callao 2970, Office 704
Las Condes, Santiago, Chile
Tel: 56 2 234 4418
Fax: 56 2 246 4361
Email: fmc@entelchile.net

We put you first.
And keep you ahead.