



Circle Feeder



The image shows two large, industrial-grade Circle Feeders. Each feeder consists of a large, green-painted hopper at the top, which tapers down to a circular stainless steel discharge ring. Below this ring is a complex mechanical assembly, including a motor and various gears and bearings, all painted in a matching green. The feeders are positioned on a light-colored concrete floor with yellow safety lines. The background shows the interior of a large industrial building with white walls and a high ceiling.

**Sludgy,
Fibrous,
Rigid,
Waxy,
Tacky,
Lumpy,
Fluffy,
Flaky,
Arching,
etc. ...**

If your product is difficult to meter, the Circle Feeder's unique operating principle provides reliable, accurate feeding where others fail.

The Circle Feeder™ Principle

The patented Circle Feeder is a unique device that accurately meters poorly flowing materials from bins or hoppers. Flat, slowly rotating vanes **1** cause radial flow of material under an adjustable annular ring **2**. Peripheral rotary vanes **3** convey this material toward one or more discharge ports **4**.

Accurately Metered Flow

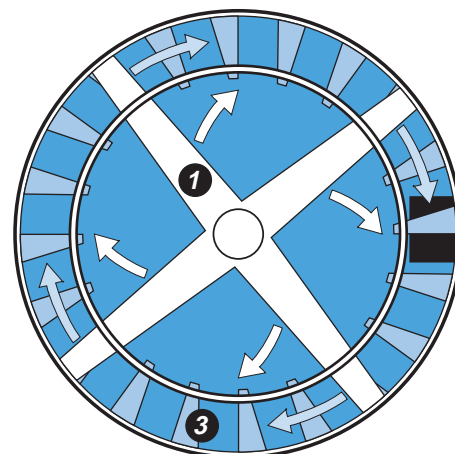
Large flow rate changes can be achieved by raising or lowering the annular ring while accurate metering is obtained through varying rotation speed. Load cells and digital controls are added for loss-in-weight applications where highly accurate mass flow must be maintained. The simple design allows for virtually complete discharge and mass flow.

Benefits

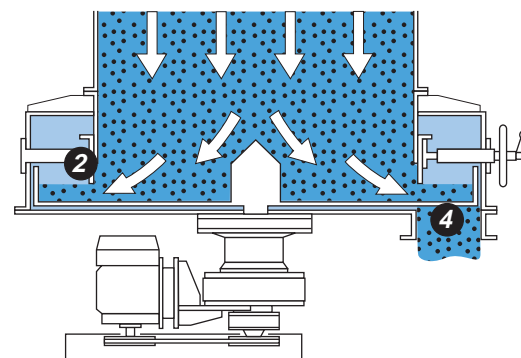
The Circle Feeder's large inlet easily exceeds most material's critical arching diameter. This, along with well distributed mass flow around the circumference, eliminates the formation of a stable arch and the resulting flow disruption.

In addition, new installations require less height because of the Circle Feeder's low profile and large inlet diameter, which reduces silo/hopper cone height. In some cases, the cone is totally eliminated.

The Circle Feeder's simple design and slow rotational speed assure quiet operation and low maintenance.



Top view



Cross-section view

Applications

Chemicals

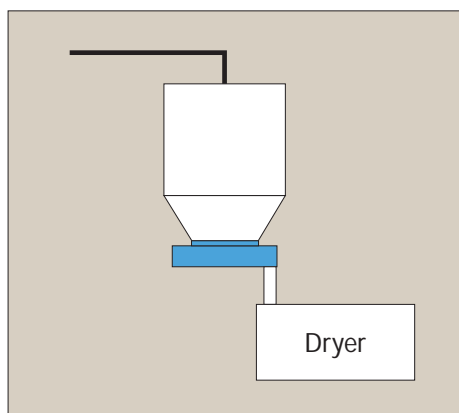
Chemical intermediates
Inorganic salts
Polymer flakes and powders
Soap powders and ingredients
Pigments
Resin flakes
Fertilizer components
Ink

Food/Feed

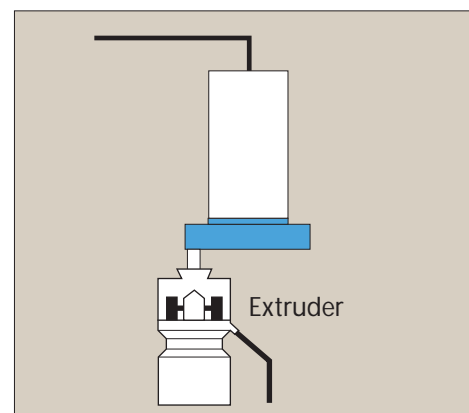
Corn, rice, potato starches
Corn, soybean, wheat flours
Residual vegetable cuttings and pulp
Minced meat
Seed hulls and components
Fermented products
Seasonings

Other

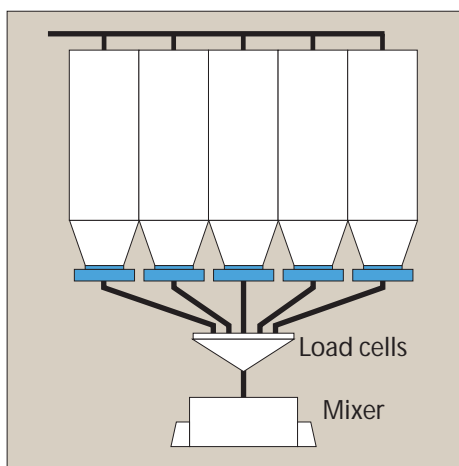
Carbon black
Sewage sludge
Metallic powders
Recycled plastic/paper flakes and grind
Cellulose derivatives
Fibers
Paper pulp
Cement



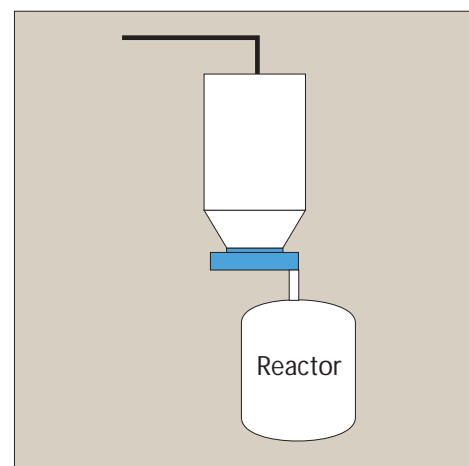
To dryer (compactor dehydrator)



To extruder



To scale / mixer

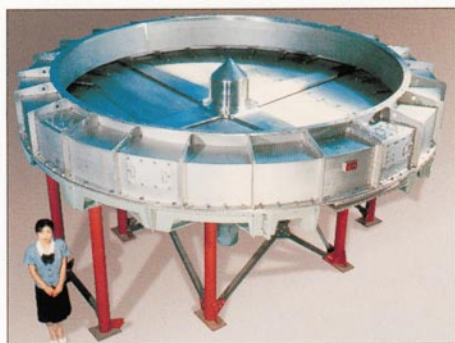


To reactor

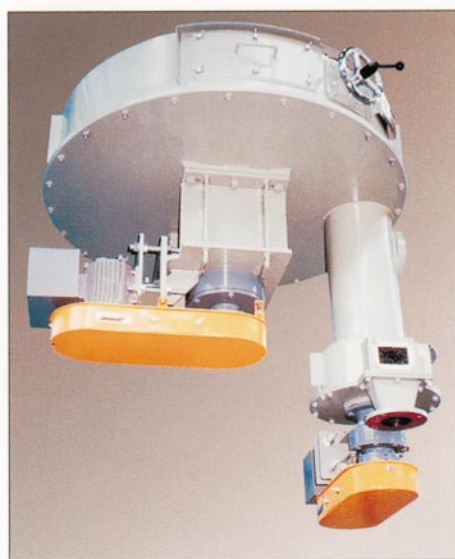
Design Choices

Circle Feeders have been built for a wide variety of uses and can be designed to suit exacting requirements. Special configurations have been engineered for the following applications:

- Sanitary
- Smooth/Precision feeding
- Loss-in-weight control
- High precision batch weighing
- High temperature
- High wear
- Applications requiring wash down or airtight construction
- Applications requiring explosion-proof construction
- Laboratory / low rate feeding



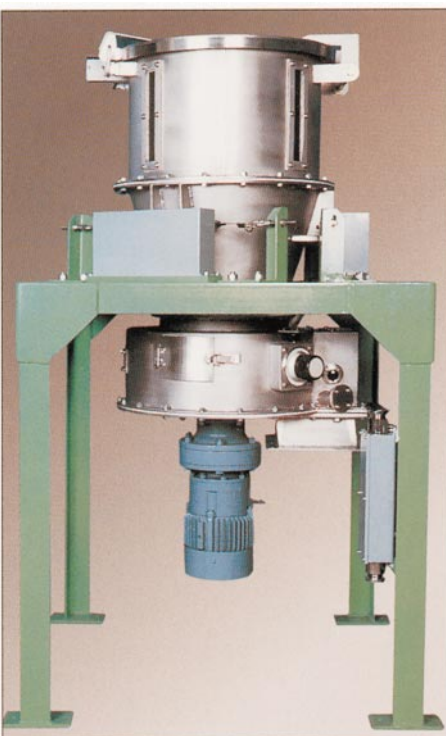
Standard designs are constructed of carbon steel or 304 stainless steel. Other materials are available on request.



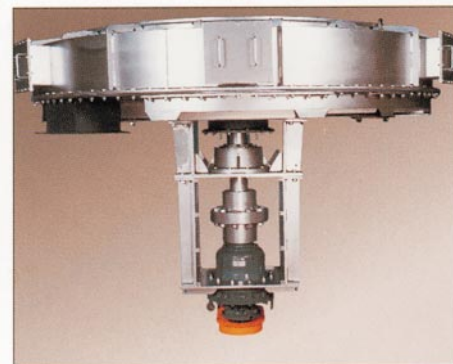
High precision feeding can be achieved a number of ways. This system features a smaller Circle Feeder on the discharge port of a larger Circle Feeder for extra control of feed rate.



Sanitary designs feature high internal polishing and hinged or lift-type upper case for cleaning access.



Loss-in-weight control is achieved by monitoring the weight of the material being discharged and automatically adjusting the rotation speed to achieve the desired rate.



High temperature designs can handle materials up to 660° F (350° C).

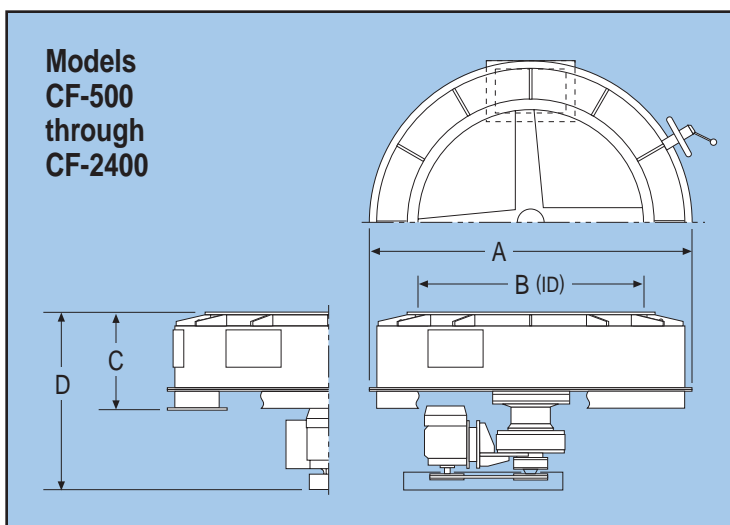
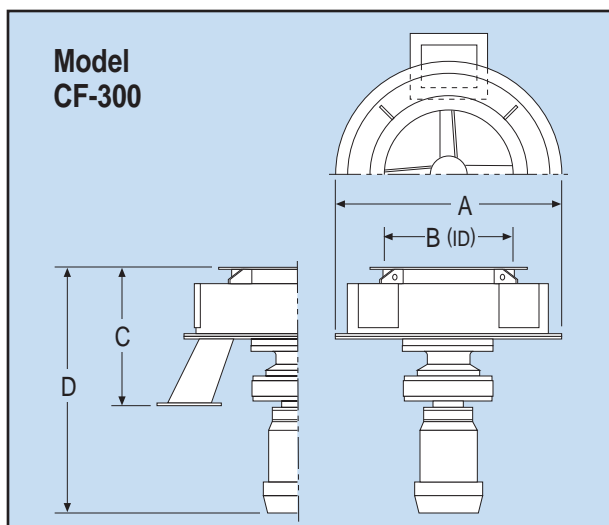


Containerized designs allow quick change-out of feeders to accommodate different product streams without the need for cleaning.



Laboratory sized units (Mini-Ace) are designed for table-top use and incorporate all controls needed for operation.

Specifications



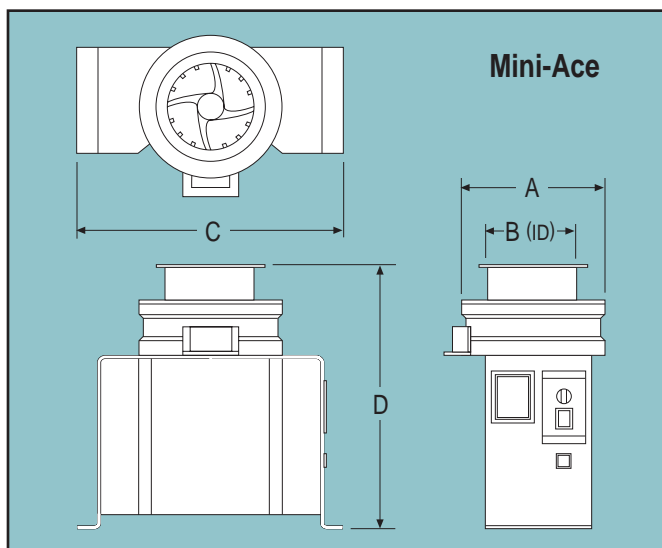
Model			CF-300	CF-500	CF-700		CF-1000		CF-1200		CF-1400		CF-1600		CF-1800		CF-2000		CF-2400 ²		
Discharge Type ¹					A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Max. Capacity ^{m³/h} <i>CFM</i>	Number of Discharge Ports ³	1	1 <i>0.59</i>	2.8 <i>1.7</i>	6.2 <i>3.7</i>	16 <i>9.4</i>	12 <i>7.1</i>	27 <i>16</i>	17 <i>10</i>	38 <i>22</i>	25 <i>15</i>	49 <i>29</i>	29 <i>17</i>	55 <i>32</i>	36 <i>21</i>	65 <i>38</i>	40 <i>24</i>	79 <i>47</i>	58 <i>34</i>	115 <i>68</i>	
		2										40 <i>24</i>	79 <i>47</i>	47 <i>28</i>	89 <i>52</i>	59 <i>35</i>	105 <i>62</i>	65 <i>38</i>	126 <i>74</i>	93 <i>55</i>	185 <i>109</i>
1		0.1 <i>0.06</i>	0.9 <i>0.5</i>	1.8 <i>1.1</i>	6.6 <i>3.9</i>	2.6 <i>1.5</i>	10 <i>5.9</i>	3 <i>1.8</i>	11 <i>6.5</i>	4.5 <i>2.7</i>	18 <i>11</i>	6 <i>3.5</i>	19.5 <i>12</i>	6.4 <i>3.8</i>	21 <i>12</i>	7.3 <i>4.3</i>	23 <i>14</i>	8.9 <i>5.2</i>	39 <i>23</i>		
2											7 <i>4.1</i>	28 <i>17</i>	9.5 <i>5.6</i>	31 <i>18</i>	11 <i>6.5</i>	33 <i>19</i>	12 <i>7.1</i>	36 <i>21</i>	15 <i>8.8</i>	62 <i>37</i>	
Motor Capacity KW			0.2	0.75	0.75	1.5	1.5	2.2	2.2	3.7	2.2	3.7	3.7	5.5	3.7	5.5	5.5	7.5	7.5	7.5	
Max. Rotation Speed rpm			6	7.2	6.3	6.3	5.6	5.6	5	5	4.5	4.5	4.1	4	3.4	3.4	3.2	3.2	2.7	2.5	
Dimensions mm			A	524	826	1076	1176	1426	1526	1626	1776	1900	2050	2150	2300	2400	2550	2650	2800	3150	3350
			B	300	500	700	700	1000	1000	1200	1200	1400	1400	1600	1600	1800	1800	2000	2000	2400	2400
			C	318	325	370	450	430	500	490	550	575	620	580	625	625	690	625	730	700	815
			D	528	615	660	800	780	900	890	1000	1005	1100	1060	1105	1105	1200	1135	1280	1330	1475
Weight ^{kg} <i>lb</i>			90	270	380	410	520	660	700	870	1030	1250	1260	1570	1620	1800	2020	2330	2760	3300	
			198	595	838	904	1146	1455	1543	1918	2271	2756	2778	3461	3571	3968	4453	5137	6085	7275	

1. B-type discharge openings are sometimes used for light, fluffly materials

2. Larger sizes can be provided

3. Additional ports can be attached as required

4. Minimum capacities represent use of variable speed drive and minimum annular ring opening



Model		MA-120	MA-180	MA-260
Feeding Capacity ml/min		40–400	70–700	100–1000
Rotation Speed		0.9–9 rpm		
Motor Capacity		40 w, Variable Speed		
Power		110v, 60 Hz		
Contact Materials		SUS 304		
Dimensions mm	A	196	264	350
	B	120	180	260
	C	360	420	470
	D	365	365	365
Weight kg lb		16	20	30
		35	44	66

Services

Testing. In our Test Center we can perform metering tests for confirming scaleup and process specifications. Capabilities include data acquisition and computer analysis, and hazardous material handling.

Engineering. LCI can supply hoppers and outlet subsystems as needed to accommodate your requirements.

Support. LCI provides parts and service support for all products we sell. You can reach our support staff 24 hours a day, seven days a week.

Other Products

LCI also provides products for pelleting powders and other materials, and for spheronizing powders. Low pressure extrusion systems are beneficial for end-use products where dispersion, dissolution, low dust levels, and shape are important. Medium to high pressure pelleting systems are appropriate for materials which naturally compact or where a hard or especially dense product is needed.

The patented Circle Feeder is manufactured by Yoshikawa Corporation of Japan.

Low pressure extruders and the Marumerizer are manufactured by Fuji Paudal of Japan.

The Pellet Press is manufactured by Amandus Kahl of Germany.



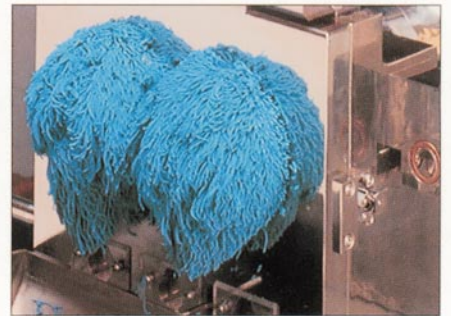
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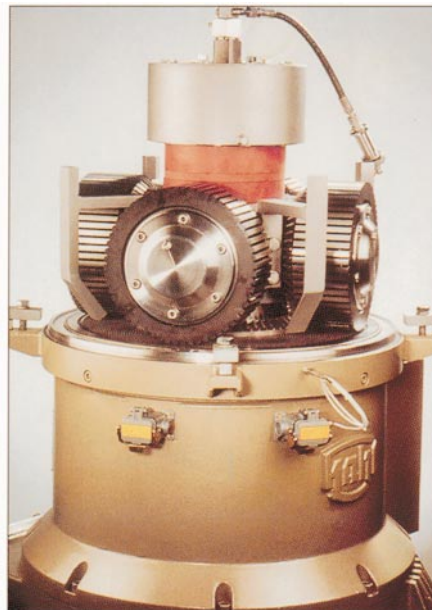
LCI's Test Center is staffed and equipped to test the feasibility of feeding your product with the Circle Feeder.



LCI granulation products can produce small, uniform granules like these.



The Twin Dome™ Granulator provides high capacity, low pressure extrusion of powders.



The Pellet Press is used for medium to high pressure extrusion.



The Marumerizer™ transforms pellets into smooth, uniform spheres.



Mixers and kneaders provide the proper powder/liquid mixture for subsequent extrusion.