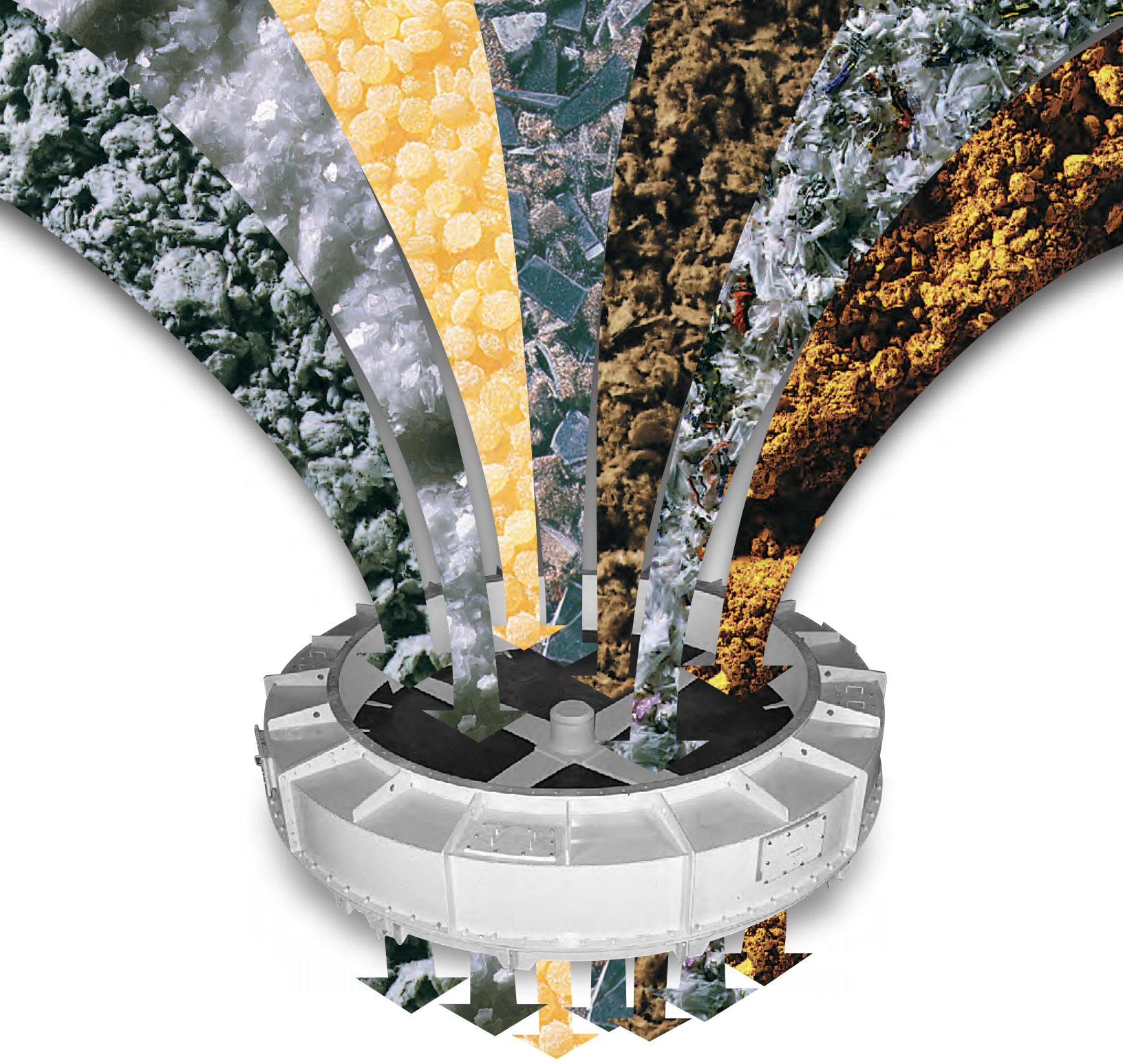


Circle Feeder®
A Mass Flow Feeder

www.circlefeeder.com

Far left: LCI Corporation

Left: Yoshikawa's manufacturing facility

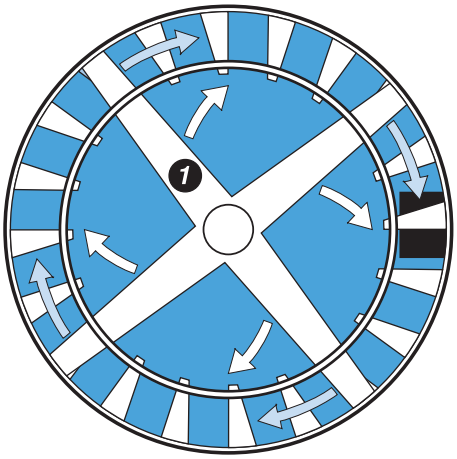
Above: Yoshikawa Corporation

LCI Corporation & Yoshikawa Corporation

LCI Corporation, based in Charlotte NC, formed a partnership with Yoshikawa Corporation, of Kagoshima, Japan, in 1997. LCI is the exclusive supplier to the process industries in North and South America for Yoshikawa's unique, patented Circle Feeder®, the best solution for many difficult-to-flow solid materials .

The Circle Feeder Principle

As a central vane ❶ slowly rotates, material is radially moved under a flow adjusting ring ❷ and conveyed to the discharge port ❸ . This allows the level of material in the hopper to drop evenly, creating mass flow conditions in the hopper.



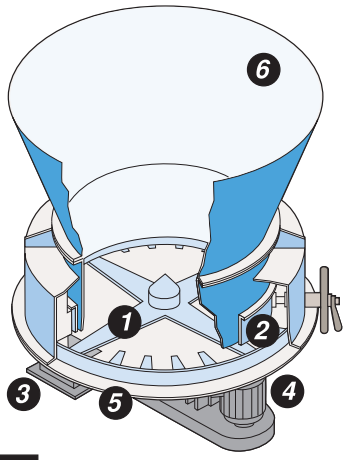
Top view

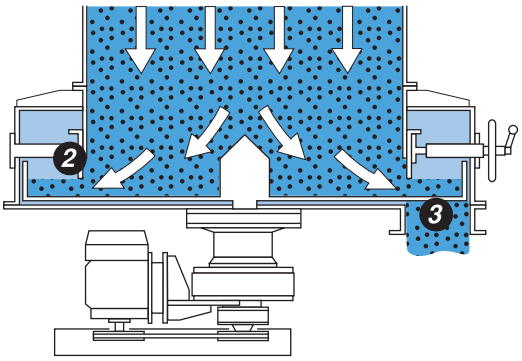
Circle Feeder Components

The Mass Flow Feeder consists of a stationary bottom plate ❺ , flow adjusting ring (weir) ❷ , rotary vane ❶ , drive shaft/speed reducer/motor ❹ , and a discharge port ❸ . The drive shaft runs up through the center of the bottom plate, and is attached to the rotary vane which consists of four evenly distributed blades.

The two parameters that control the Circle Feeder discharge rate are shaft rotation and the height of the flow adjusting ring (weir). The rotation of the central vanes is controlled by a variable speed motor and inverter.

❶ Rotary vane
❷ Flow adjusting ring
❸ Discharge port
❹ Motor
❺ Stationary bottom plate
❻ Hopper (typically supplied by client)





Cross-section view

Features and Benefits

- Consistent discharge rate
- The large inlet exceeds most materials' critical arching diameter, preventing bridging. *No ratholing!*
- The slow rotating vanes move the material radially from the center to the outlet ensuring "first in — first out" mass flow
- Slow rotating parts insure gentle product handling and minimum downtime
- Turndown ratio up to 10:1
- Low maintenance
- Both discharging and metering functions

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Design Options

Circle Feeders can be custom designed with the following options:

- Multiple discharge ports
- High temperature capability
- Special coatings for abrasive materials
- Explosion proofing
- High moisture capability
- Sanitary or GMP
- Loss-in-weight control
- Drive configuration (vertical or horizontal)
- For high bulk density materials
- Washdown or airtight capability

Applications

Chemicals

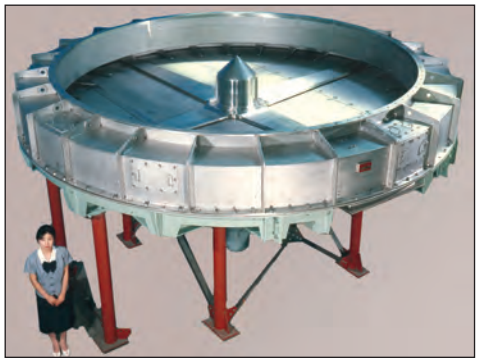
Chemical intermediates
Inorganic salts
Polymer flakes and powders
Soap powders and ingredients
Pigments
Resin flakes
Fertilizer components
Ink

Food/Feed

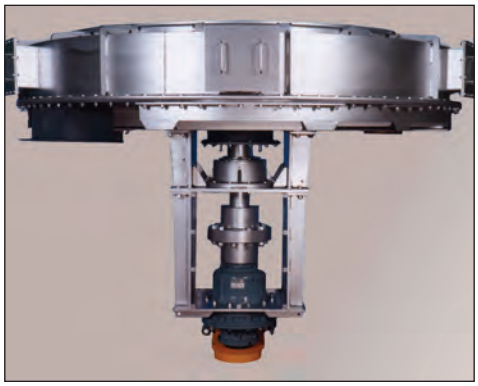
Corn, rice, potato starches
Corn, soybean, wheat flours
Residual vegetable cuttings and pulp
Minced meat
Seed hulls and components
Fermented products
Seasonings

Other

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

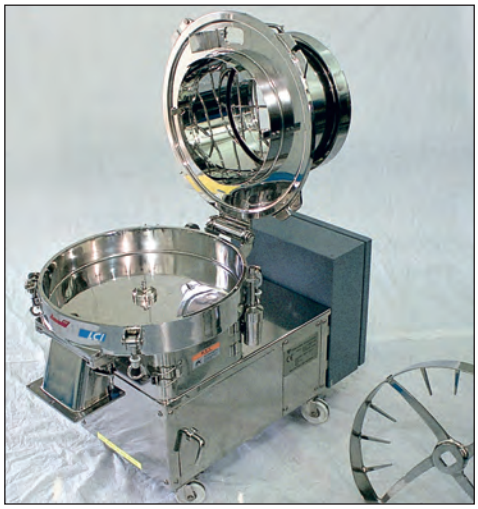


Standard designs are constructed of carbon steel or 304 stainless steel. Other materials are available on request.



High temperature designs.

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.



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

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

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

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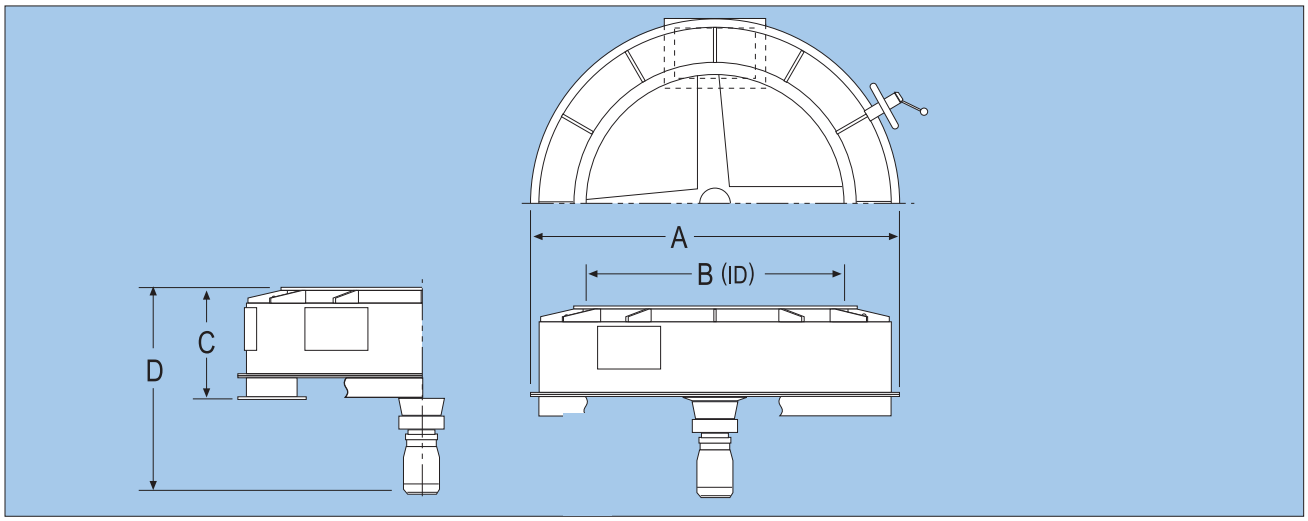
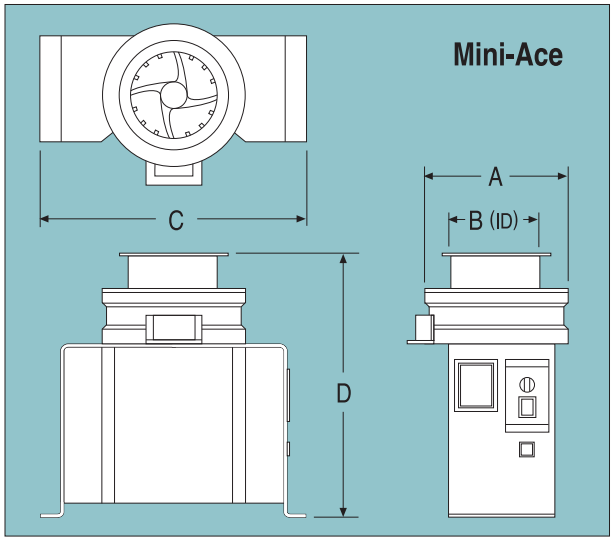


Model	CF-200		CF-300		CF-500		CF-700		CF-1000		CF-1200		CF-1400		CF-1600		CF-1800		CF-2000		CF-2400	
Discharge Type[1]	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Max. Capacity ft³/hr	5.3	28	16	39	39	102	208	530	424	848	565	1236	777	1483	848	1624	1130	2048	1271	2507	1695	3673
Min. Capacity ft³/hr	2.1	16	9	21	22	46	81	240	138	314	170	388	226	565	251	636	290	706	353	777	459	1342
Motor Capacity hp	.05	.05	.25	.25	.5	.5	.5	.5	2	2	3	3	5	5	5	5	7.5	7.5	10	10	10	10
Max. Rotation Speed rpm	9.7	9.7	6.4	6.4	7.6	7.6	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	330	410	492	552	766	826	1076	1176	1426	1526	1626	1776	1876	2026	2180	2330	2430	2580	2680	2830	3180	3380
Dimensions mm B	200	200	300	300	500	500	700	700	1000	1000	1200	1200	1400	1400	1600	1600	1800	1800	2000	2000	2400	2400
Dimensions mm C	200	200	265	265	320	350	390	470	450	520	510	570	610	655	615	660	660	725	680	785	745	860
Dimensions mm D	315	315	519	519	608	638	693	773	941	1011	1074	1134	1229	1274	1261	1306	1402	1467	1484	1589	1646	1761
Weight *lb*	35	42	132	154	276	320	540	705	903	1058	1532	1764	2072	2425	2866	3197	3549	3946	4277	4806	6127	6945

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

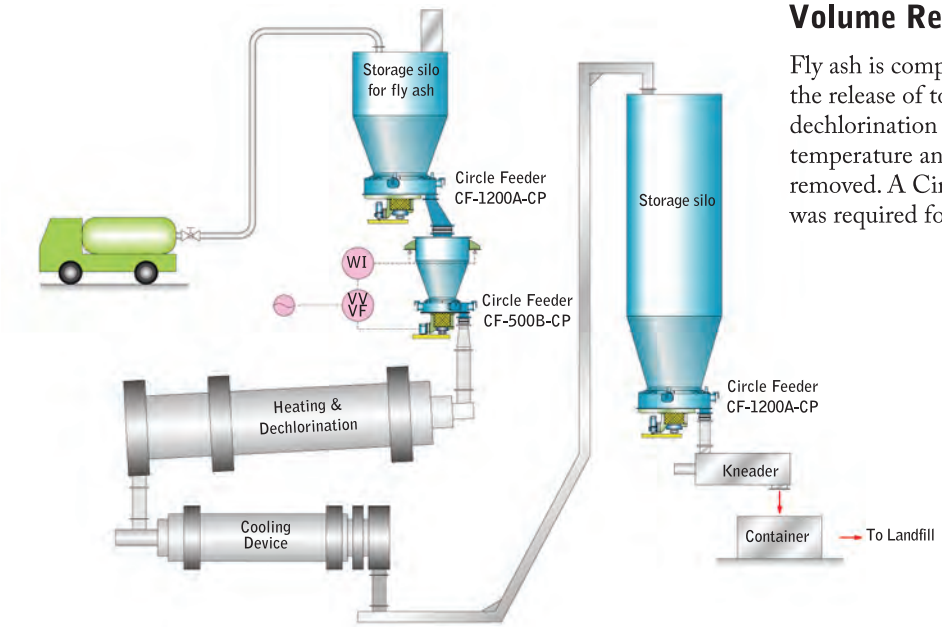
2. The minimum and maximum capacities (turn-down ratio) indicated are based on the height of the flow adjusting ring inside the feeder. This turn-down ratio can be increased to 10:1 for most materials when using a combination of the flow adjusting ring height and a variable frequency drive.



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	16	20	30
	lb	*35*	*44*	*66*

Volume Reduction Facility for Fly Ash

Fly ash is compressed to reduce its volume and prevent the release of toxic substances. The heating / dechlorination machine heats the fly ash to a high temperature and harmful substances such as dioxin are removed. A Circle Feeder with a loss-in-weight system was required for uniform feed.

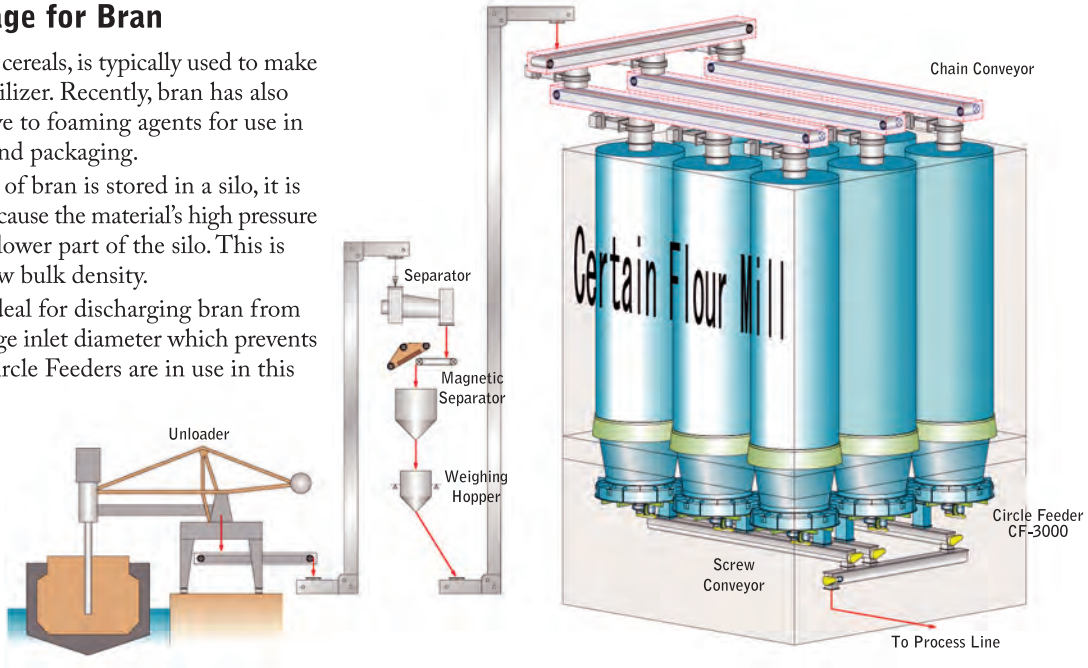


Large Silo Storage for Bran

Bran, the outer husk of cereals, is typically used to make live stock feed and fertilizer. Recently, bran has also been used as an additive to foaming agents for use in health food products and packaging.

When a large quantity of bran is stored in a silo, it is difficult to discharge because the material's high pressure causes bridging at the lower part of the silo. This is aggravated by bran's low bulk density.

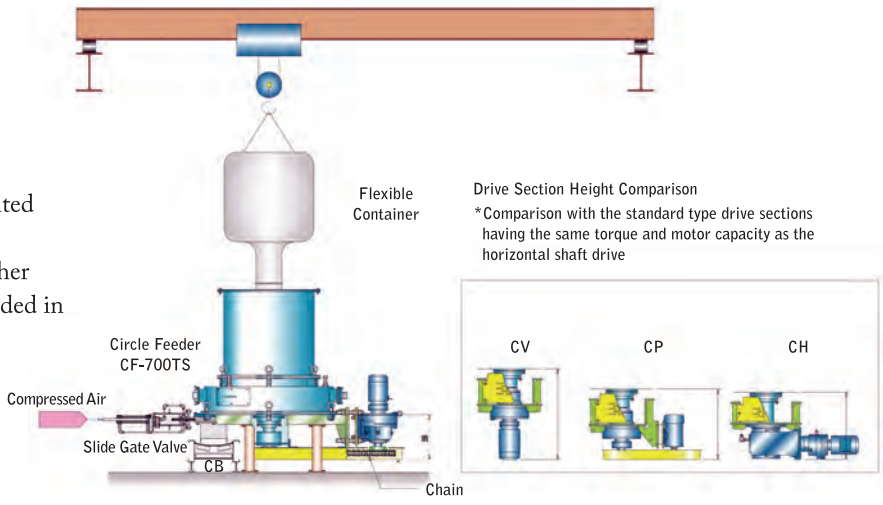
The Circle Feeder is ideal for discharging bran from large silos due to its large inlet diameter which prevents bridging. Over 180 Circle Feeders are in use in this application.



Horizontal Shaft Drive

The coupling can be specially designed to have the lowest possible drive section height for this type, in order to meet the limited installation space.

The drive section height can be reduced further than that of the CV, CP, and CH types provided in the standard specifications.



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