

Separators



- Tetra Centri
- Tetra Pak Milk Separator



Since 1964

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Tetra Centri®
The original dairy centrifuge



HARCO
ENTERPRISES LTD
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Tetra Centri dairy separators for every duty

Centrifugal separation in Tetra Pak has a proven track record for processing efficiency stretching back more than a century. This tradition continues in today's range of energy-efficient models with high quality standards for a wide spectrum of applications.

The Tetra Centri Air-Tight® technology features a completely filled separator bowl. An advanced inlet and outlet design ensures gentle treatment during the entire separation process.

Milk clarification

Although the main aim is to remove milk impurities, this processing stage also reduces the levels of leucocytes and bacteria.

Tetra Centri clarifiers can process cold milk below 46 °F, or hot milk at 122 – 144 °F.

Tetra Centri® Milk clarifiers

	Max. flow rate, lbs/h	Sediment space, gal	Rated motor power, hp
D 407 SGP	20,000	1.4	15
D 510 SGD	45,000	2.4	25
D 610 HGD	55,000	1.8	25
D 413 SGV	65,000	4.0	25
D 714 HGV	80,000	3.2	30
D 618 HGV	130,000	5.5	50
D 718 HGV	140,000	5.5	50
D 918 HGV	150,000	5.5	57
D 617 SGV	165,000	6.6	50/60

Cold milk separation

Cold milk separation at 40 – 46 °F is the alternative when heating milk is undesirable. Cream's viscosity and characteristics at low temperatures make the Air-Tight technology the only feasible form of separation for this task.

The fat content of the skim milk can vary between 0.1 – 0.2 %, and the maximum fat content of the cream at 40 °F is generally 42 %.

Tetra Centri® Cold milk separators

	Flow rate, lbs/h		Rated motor power, hp
	Skimming	Stand.	
C 614 HGV	10,000	30,000	25
C 714 HGV	18,000	40,000	30
C 518 HGV	25,000	50,000	30
C 618 HGV	30,000	70,000	33
C 818 HGV	40,000	80,000	50
C 918 HGV	50,000	110,000	57



Hot milk separation

The objective is to separate the globular milk fat from the serum, the skim milk. The separation process is normally incorporated into a pasteurization line and combined with a Tetra Alfastr in-line fat standardization system. Outgoing cream from Tetra Centri Air-Tight separators can contain up to 70 % fat.

The skimming efficiency of hot milk separators has been enhanced. In a modern dairy, common Tetra Centri skimming efficiency figures are in the range of 0.045 – 0.06 %.

Tetra Centri® Hot milk separators

	Flow rate, lbs/h		Rated motor power, hp
	Skimming	Stand.	
H 407 TGP	10,000	15,000	15
H 510 TGD	15,000	20,000	25
H 610 HGD	20,000	35,000	25
H 814 HGV	35,000	55,000	25
H 714 HGV	45,000	70,000	30
H 518 HGV	55,000	80,000	30
H 618 HGV	70,000	90,000	33
H 718 HGV	80,000	120,000	33
H 818 HGV	100,000	130,000	50
H 918 HGV	120,000	150,000	57



Whey clarification

To maintain optimum fat separation, cheese fines should be removed from the whey before it reaches the whey cream separator. Installing a centrifugal clarifier ahead of the whey separator is the most efficient way to take away cheese fines.

Flow rate and fines content are important parameters for the choice of a clarifier.

Tetra Centri® Whey clarifiers

	Flow rate, lbs/h	Sediment space, gal	Rated motor power, hp
D 407 SGP	25,000	1.0	15
D 510 SGD	45,000	2.4	25
D 610 HGD	55,000	1.8	25
D 413 SGV	65,000	4.0	25
D 714 HGV	80,000	3.2	30
D 618 HGV	100,000	5.5	50
D 718 HGV	130,000	5.5	50
D 918 HGV	150,000	5.5	57
D 617 SGV	165,000	6.6	50/60

USDA accepted whey clarifier

The Tetra Centri USDA HGV clarifier is the solution when fines recovery is required and used for yield improvement. In order to meet USDA standards, the Tetra Centri USDA HGV was designed to provide a highly sanitary treatment, collection and transfer of the cheese fines to be incorporated back into the cheese or used in other products for human consumption.

The rated capacity for the Tetra Centri HGV clarifier ranges from 55,000 up to 130,000 lbs/h.

Installing a USDA Tetra Centri clarifier upstream a Tetra Centri separator improves the process efficiency as well as the product quality.

Whey cream separation

Whey contains a small percentage of fat varying between 0.15 – 0.40 %. This fat must be removed before further processing.

The whey characteristics differ from milk, making conditions for whey separation more favourable. If the whey is preclarified, skimming efficiency can be expected to be down to 0.04 – 0.05 %.

Tetra Centri Air-Tight whey separators can produce high-fat cream with a fat content above 30 % at temperatures below 95 °F.

Tetra Centri® Whey cream separators

	Flow rate, lbs/h Pre-filtered	Flow rate, lbs/h Pre-clarified	Rated motor power, hp
H 407 TGP	10,000	10,000	15
H 510 TGD	15,000	15,000	25
H 610 HGD	20,000	25,500	25
W 614 HGV	30,500	35,500	25
W 714 HGV	45,000	50,000	30
W 518 HGV	55,500	60,500	30
W 618 HGV	60,000	70,000	33
W 718 HGV	N.A.	80,000	33
W 818 HGV	N.A.	110,000	50
W 918 HGV	N.A.	130,000	57

Anhydrous milk fat

Anhydrous milk fat (AMF), obtained from fresh raw material, has a milk fat content exceeding 99.8%. Milk fat is concentrated in several steps up to 99.5%, and is then vacuum-treated. The raw material – milk, cream or butter – determines the number of steps required.

Stored butter does not need pre-concentration or buttermilk re-separation. Fresh butter still contains globular fat, and therefore requires a process incorporating buttermilk re-separation.

Tetra Centri® AMF separators

Line capacity lbs oil/h	Pre-concent.	Final concent.	Buttermilk re-separation
4,500	H 614 HGV	A 610 HGD	H 610 HGD
5,500	From stored butter	A 610 HGD	
8,500	H 618 HGV	A 614 HGV	H 614 HGV
11,000	From stored butter	A 614 HGV	
13,000	H 518 HGV+ H 614HGV	A 714 HGV	H 614 HGV
17,500	From stored butter	A 714 HGV	
30,000	From stored butter	A 618 HGV	
30,000	H 718 HGV+ H 718 HGV	A 618 HGV	H 518 HGV



Tetra Pak AB

Buttermilk separation

For separation purposes, buttermilk derived from butter production is classified as either sweet or sour.

In the separation of sweet buttermilk, a standard hot milk separator is used at its nominal flow rate.

Sour buttermilk contains unstable proteins. Consequently, the general guideline is to use a whey or cold milk separator and process at half the nominal flowrate.

A fat content of 0.2 – 0.3 % in the buttermilk is common after separation.

Bactofugation

The Tetra Centri Bactofuge® is used to decrease the bacteria and spores content of milk prior to heat treatment in order to improve the thermal impact.

The bactofugation process, traditionally incorporated in the pretreatment of cheese milk, is also effective in enhancing the quality of powders. The raw milk intended for consumption milk and cream is in many dairies also bactofugated.

Bactofugation efficiency is stated as a percentage reduction of the incoming level of bacteria and spores. Generally, the efficiency ranges between 98 – 99.5 % for anaerobic spores.

Tetra Centri® Bactofuge®

	Flow rate, lbs/h		Rated motor power, hp
	nominal	max	
BB 610 HGD	10,000	20,000	25
BM 714 HGV	35,000	35,000	30
BB 714 HGV	35,000	55,000	30
BM 618 HGV	55,000	55,000	33
BB 618 HGV	55,000	100,000	33
BB 818 HGV	75,000	100,000	50
BB 918 HGV	100,000	110,000	57

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MRPX 214 TGV

Self-Cleaning Milk Separator
Factory Reconditioned

Application

Separation, standardization, and clarification of hot milk. Designed for continuous operation and CIP.

Working Principle

The separator has the following four distinguishing features
1. Open milk inlet. 2. Paring discs, 3. Automatic sludge discharge, and 4. Cleaning-in-place:

1. Milk Feed. Milk is fed into the separator bowl from the top through a stationary pipe A. Inside the distributor B, the milk finds its own level depending on feed capacity and outlet pressures. The milk is smoothly accelerated through the centricyclone C and by the time it enters the disc stack it has achieved almost bowl speed. This gentle acceleration eliminates shattering of the fat globules and prevents air being picked up. Both these facts improve the skimming performance of the separator.

2. Paring Discs. The milk and cream outlet flow is achieved by means of paring discs D and E.

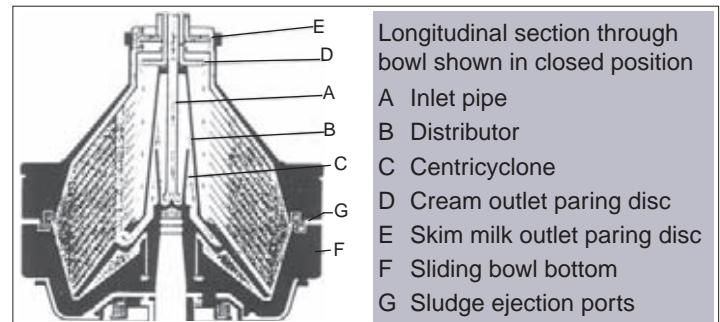
3. Automatic Sludge Discharge. Sludge collecting in the conical sludge space of the bowl is automatically discharged at preset intervals. This is achieved by the sliding bowl bottom F dropping briefly (< 1 second) allowing the sludge to be ejected without disturbing the feed. The opening and closing of the bowl is done with water and controlled by a programmed system unit. The bowl opens for such a brief instant that only sludge escapes (partial discharge). During cleaning the bowl may also be opened long enough for the entire contents to be ejected (total discharge).

4. Cleaning-In-Place. The machine is designed for cleaning-in-place and be incorporated in the plant automatic CIP system. During the water rinsing phases of the cleaning cycle total discharges are effected, while during the detergent phases partial discharges only are employed in order to save detergent. All parts of the separator in contact with milk as well as the outside of the bowl, the inside of the frame hood, and the sludge outlet are cleaned perfectly without the need for any manual labor.

Basic Unit

Material. The upper part of the machine and all parts in contact with milk are of acid-resistant stainless steel. The motor casing and sludge cyclone are also of stainless steel, and the lower part of the frame is encased in stainless steel.

Standard Equipment. Included are motor, base plate, revolution counter, manual brake and cyclone to absorb the kinetic energy of the ejected sludge. *A spare parts kit is also provided.*



Technical Data

Capacity. Hot milk separation: 12,500 l/h. (Standardization and clarification: 18,000 l/h)

Connections. Inlet 51mm. Skim milk outlet 51 mm. Cream outlet 25 mm. SMS unions.

Motor. 15 kW flange motor for 380/660 V, 50 or 60 Hz 3-phase AC. (Other voltages on request). Motor drives separator bowl via a friction clutch and worm gear.

Bowl Speed. 4,450 rpm.

Sludge Space. 9.6 l

Water Consumption. Operating water: Intermittent flow of up to 2.5 l/s (max. 4 seconds) at constant pressure of 400 kPa (4kp/cm²), corresponding to 2 l per partial discharge, 10 l per total discharge, and up to 50 l/h for make-up water.

Sludge flushing water: 25 l per discharge.

Air Consumption. None by basic unit.

Inlet Pressure. 30-40 kPa (0.3-0.4 kp/cm²).

Outlet Pressure. 450 kPa (4.5 kp/cm²) in skim milk outlet.

Overhead Hoist for 10 kN (1000 kp) is required.

Dimensions

