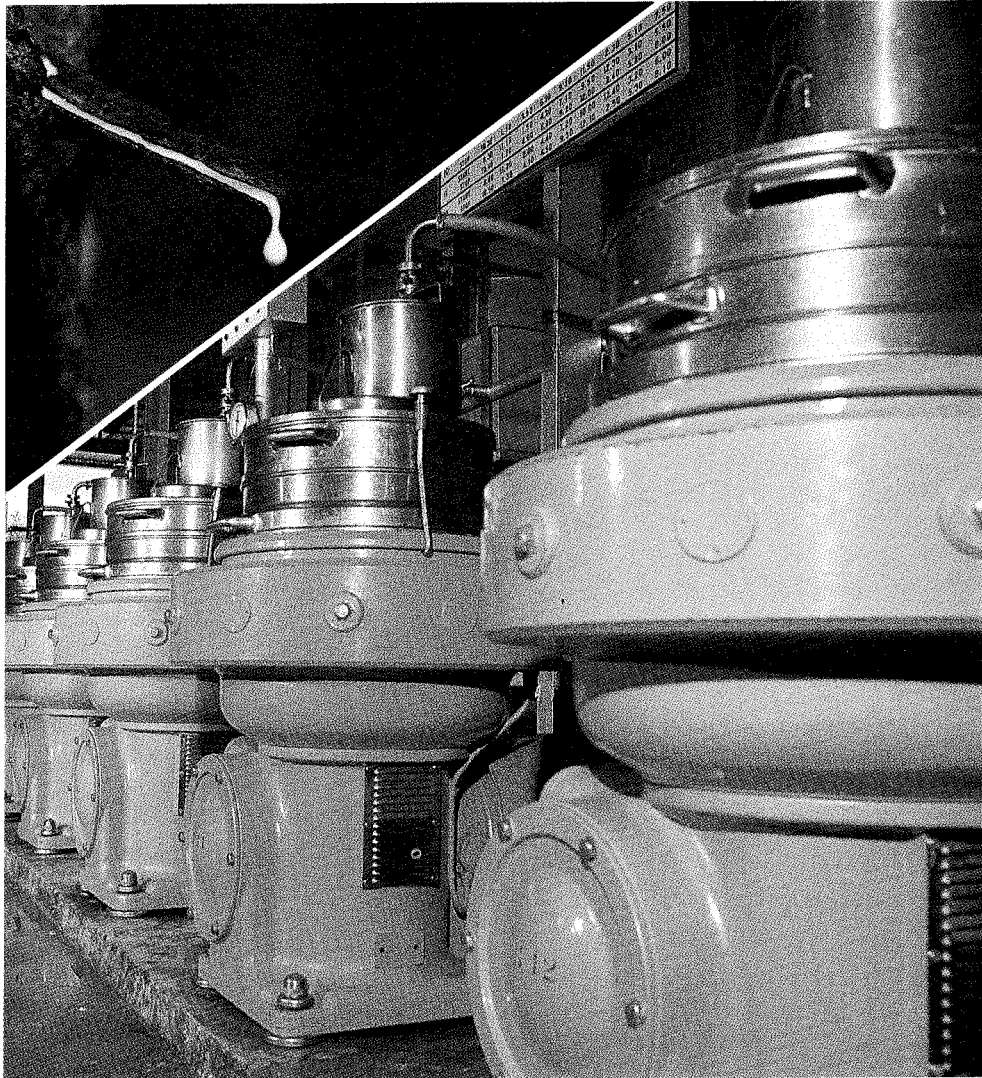


New

 ALFA-LAVAL

The LRB 510 Centrifuge For Concentration Of Natural Rubber Latex



- Higher Capacity
- More Efficient
- Less Maintenance

**NWN**
MACHINERY WORLD

A New Disc-type Centrifuge for Better Product Quality and Process Economics

The Alfa-Laval LRB 510, a new solids-retaining disc-stack centrifuge for concentration of natural rubber latex, is the result of many years of intensive development work in close collaboration with users to produce a high performance machine, superior to any hitherto available.

This latest advance is a further development of the Alfa-Laval LRH 410 disc-stack centrifuge, which was very well received by the market and of which more than 800 are in operation today around the world.

Greater efficiency/ higher capacity

The outstanding feature of the Alfa-Laval LRB 510 centrifuge is the completely new bowl enabling up to 30% higher capacity or alternatively, 2 per cent unit higher efficiency to be achieved, compared with the LRH 410.

The benefits from this unequalled improvement in bowl performance can be reaped by either:

- running the LRB 510 at a *higher capacity* than the LRH 410, but at the same efficiency, or
- running the LRB 510 at the same capacity as the LRH 410, but at a *higher efficiency*.

Flexible and more cost-effective

Besides the obvious cost-benefits in terms of greater capacity/recovery of rubber particles, the LRB 510 is a very flexible machine. It is especially suited for the production of consistently high-quality concentrate, and is easily adjusted to meet customer's specific needs and seasonal variations in the field latex.

Less maintenance

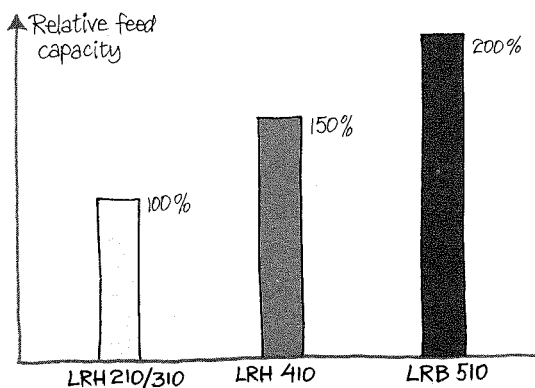
When the LRB 510 is equipped with a controlled torque motor no friction clutch is required. This results in less maintenance and fewer spare parts to stock and replace.

Efficiency comparison

Until now, the LRH 410 represented the state-of-art in latex centrifuges, thus qualifying it as a reference machine. The superior performance achieved by the LRB 510 is therefore unique — significantly better

than that of any other centrifuge on the market.

The relative efficiency and capacity of the LRB 510 compared with the LRH 410, as well as the LRH 310 and 210, is shown in the following graphs.

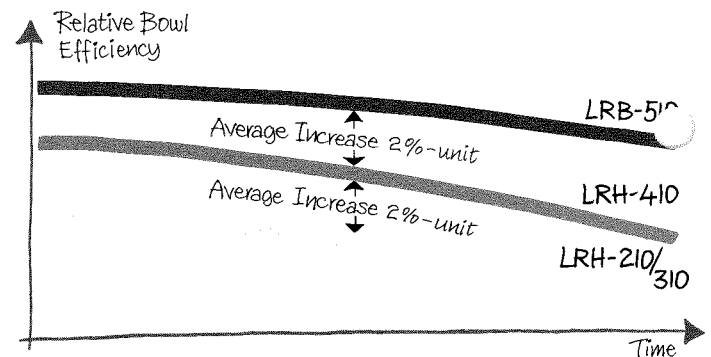


Relative feed rate for different Alfa-Laval centrifuges when running at the same bowl efficiency.

Example:

A typical Malaysian latex gave a bowl efficiency of 90% when running at the following feed rate in the different Alfa-Laval models:

Model	Feed capacity l/h
LRH 210/310	320
LRH 410	480
LRB 510	640



Relative bowl efficiency versus time for different Alfa-Laval centrifuges when running at the same feed rate. Notice that the bowl efficiency for the LRB 510 is maintained at a higher level for a longer period.

Example:

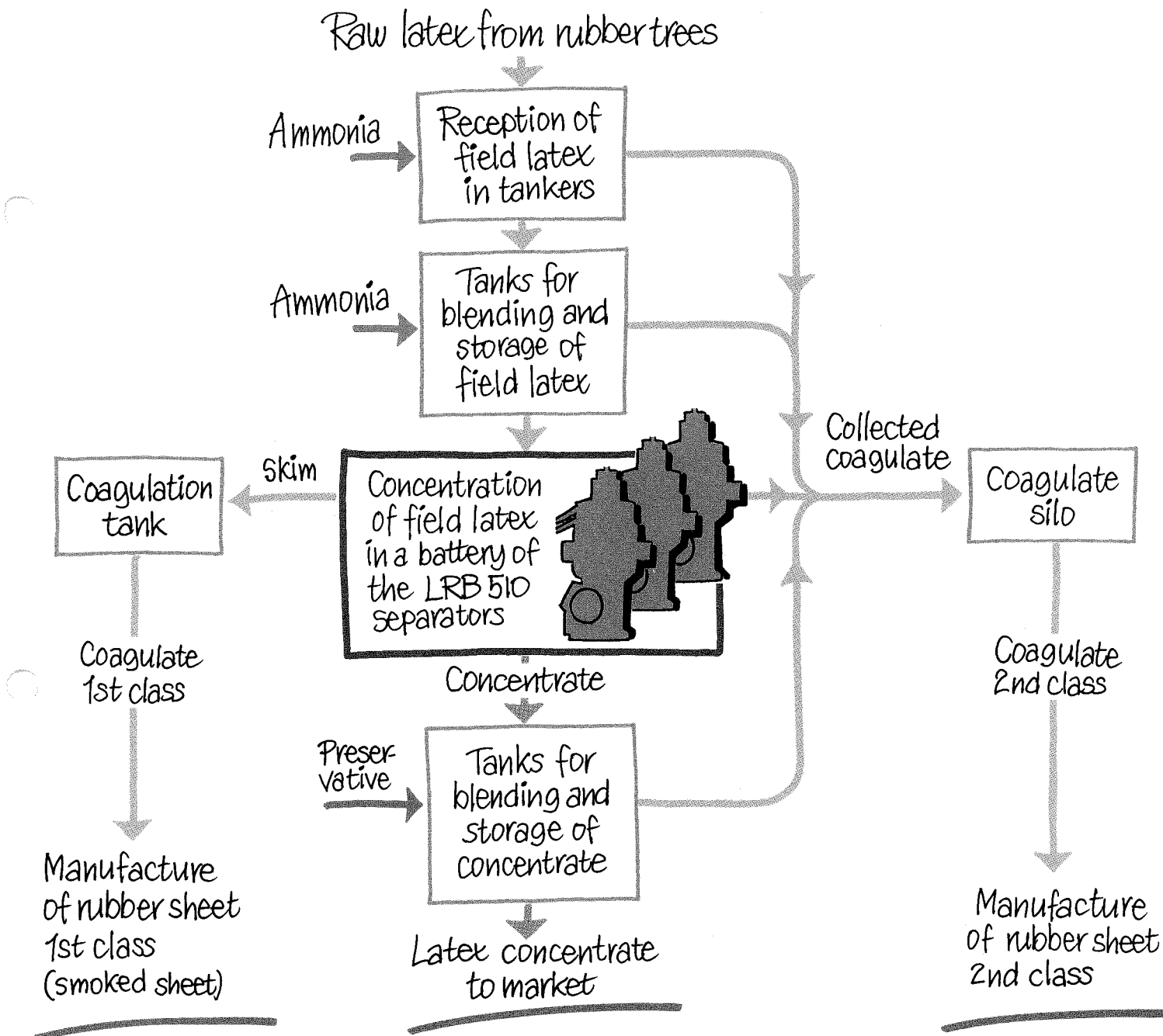
A typical Malaysian latex gave the following average bowl efficiency over a 4 hour period when each centrifuge was run at a feed rate of 480 l/h.

Model	Bowl efficiency
LRH 210/310	87.5%
LRH 410	89.5%
LRB 510	91.5%

Centrifugal concentration of natural rubber latex

The Alfa-Laval LRB 510 centrifuge gets more high quality concentrate out of field latex faster than any other method. Consistently, it recovers latex particles down to 0.2 microns, free from skim and solid impurities. The machine's high standard of hygiene means less need for anticoagulants. Together with the most efficient bowl on the market, this leads to excellent process economics. No wonder that over 80% of the world's latex concentration is made in Alfa-Laval centrifuges.

The latex concentration process



Various batches of field latex are blended together to ensure a uniform product and then concentrated in a battery of centrifuges to a 60% concentrate (cream). The skim latex removed in the process is subsequently converted into dry skim rubber.

Feed rate to the centrifuge can be between 450—700 l/h to give a normal concentrate of 60% DRC from a feed concentration varying between 25 and 30% DRC by weight.

Latex concentration in the centrifuge

The Alfa-Laval LRB 510 centrifuge is a disc-stack solids-retaining concentrator. This means that the separated solids accumulate at the inside surfaces of the bowl and distributor walls, forming layers that are removed manually at intervals. A magnetic braking device reduces the time required for stopping the bowl for cleaning.

The latex (A) is fed to a feed cup (1) on top of the centrifuge where the liquid level is held constant by a float (2). The latex flows by gravity through the feed tube (3) into the centre of the bowl where the centrifugal action forces it through a series of eight

tubes (4) in the distributor (5) to provide efficient distribution to the disc-stack (6) and ensure high bowl efficiency. Here the feed is immediately split into two fractions: the heavy phase, skim (B) and the light phase, concentrate or cream (C).

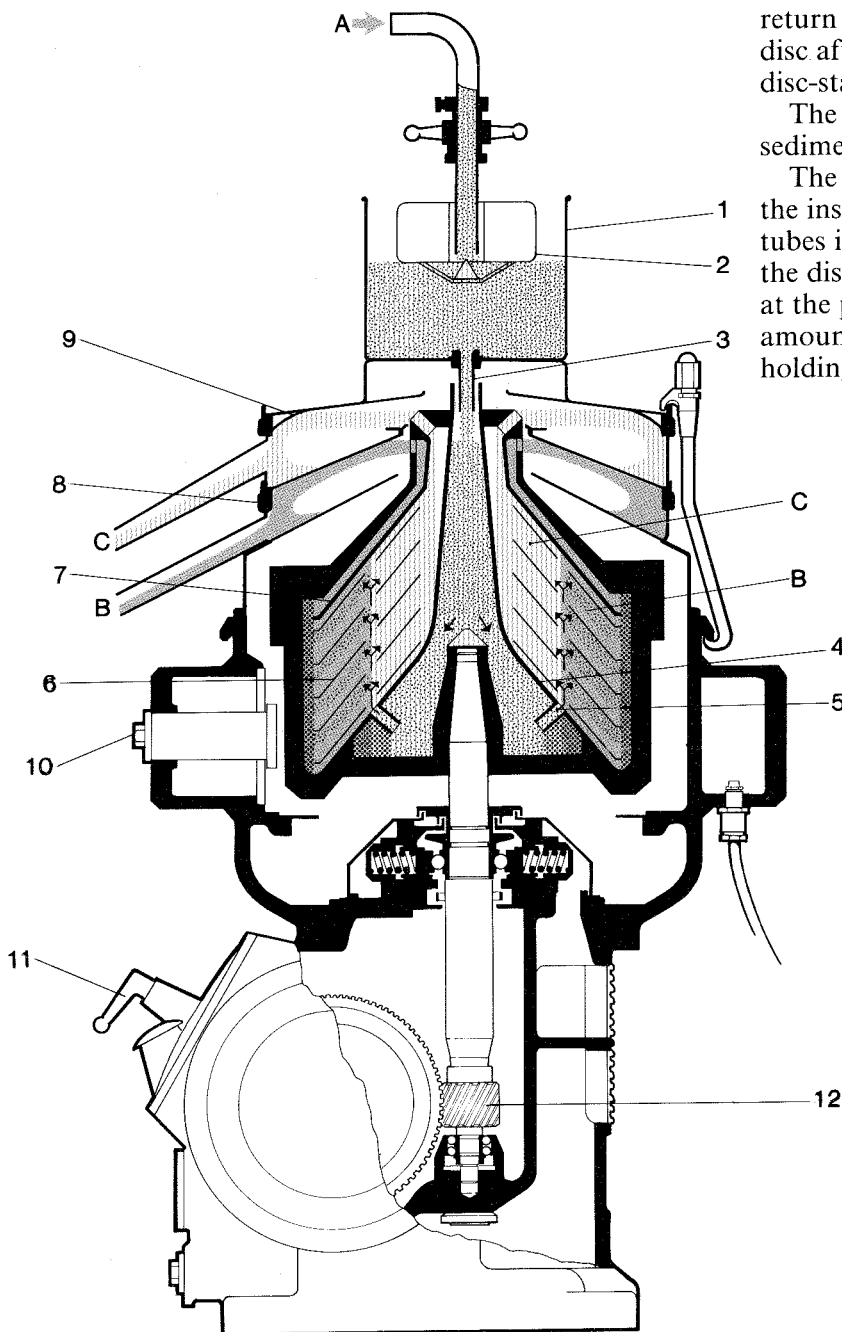
The skim flows to the bowl periphery, passing outside the specially designed top disc (7), and is discharged into the skim cover (8) through two regulating screws.

The concentrate containing the latex particles is displaced towards the centre and over the neck of the top disc, where it overflows into the cream cover (9) through a series of holes.

Those latex particles which do not separate immediately from the skim en route to the periphery return to the centre along the upper surface of each disc after being released at the outer part of the disc-stack.

The discharged concentrate requires no further sedimentation.

The heavy sludge in the feed, already separated at the inside of the distributor, forms a layer around the tubes in the distributor. The light sludge separated in the disc-stack is collected in the solids-holding space at the periphery of the bowl. Only a very minor amount of latex particles escape into the solids-holding space.



1. Feed cup
2. Float
3. Feed tube
4. Distributor
5. Distribution tubes
6. Disc stack
7. Top disc
8. Skim cover
9. Concentrate cover
10. Magnetic brake
11. Mechanical brake
12. Drive arrangement

- A Field latex
 B Skim
 C Concentrate (cream)

Cutaway of the new LRB 510 centrifuge.

Design benefits

Wide capacity range

The feed rate is easily regulated by using feed tubes (3) of different diameters. A set of different tubes is supplied for this purpose. Minor adjustments in feed rate can also be made during operation by simply raising or lowering the float (2) in the feed cup.

These facilities for regulation mean that the centrifuge can always be operated in the optimum way to exploit its higher capacity/greater efficiency. When production needs are low the throughput delivered can be decreased, which will increase the bowl efficiency.

Easily changed concentrate DRC

The dry rubber content in the concentrate is determined by the length of the skim discharge screws used in the bowl. A set of different skim screws are supplied for this purpose. The screw length alters the skim/concentrate volume ratio. A shorter screw gives more skim and less concentrate, causing a higher DRC in the concentrate.

The DRC in the concentrate can also be adjusted to some extent during operation by varying the feed rate by means of the float as explained above.

Minimum downtime for cleaning

The centrifuge is equipped with a highly efficient magnetic braking system (10) which stops the centrifuge from full speed in less than 2 minutes. Production downtime is thereby minimized.

The braking system comprises six iron-cored brake coils fitted in the circular brake housing in the upper frame. When energized, their magnetic fields have a retarding action on the bowl. The system is equipped with a control unit for operating the brakes.

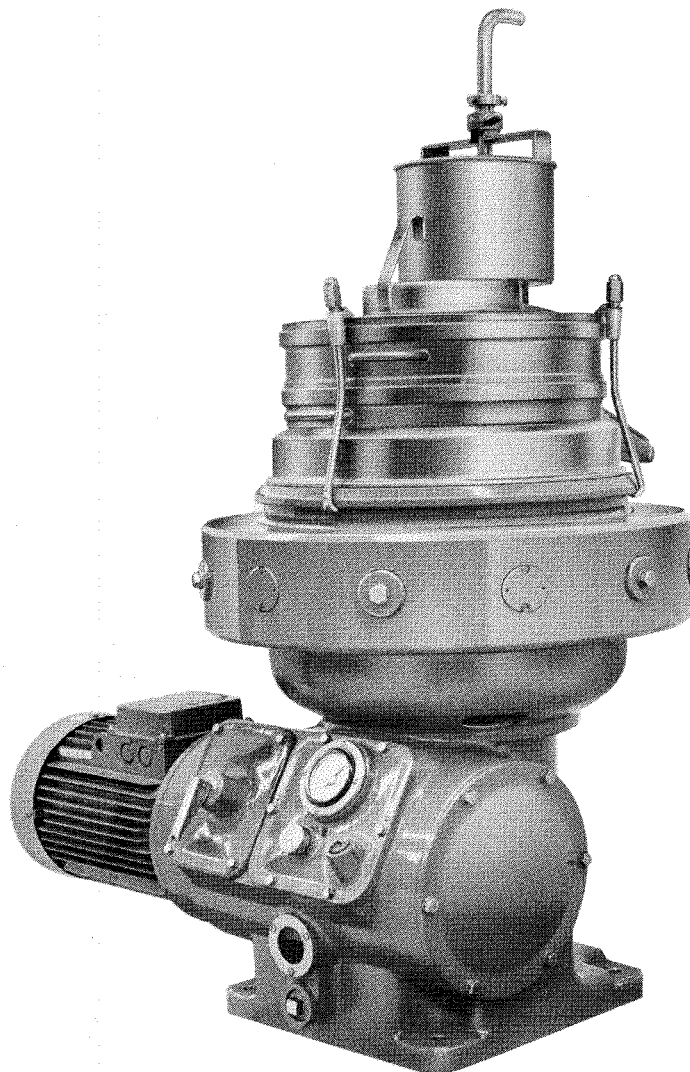
The LRB 510 is also equipped with a standard mechanical brake (11).

The bowl is exchangeable to minimize downtime for cleaning.

Sturdy and easily serviced drive

A standard motor, directly flanged to the centrifuge, is connected to the horizontal drive shaft via a friction clutch. Friction clutches have the advantage of being easily serviced on site and do not require any external cooling system.

The horizontal shaft drives the vertical bowl spindle via a worm gear (12) with an easily exchangeable worm mounted on the spindle. Splash lubrication of all transmission and bearing parts ensures trouble-free operation and long lifetime.



The LRB 510 centrifuge has the motor flanged directly to the frame. Within almost the same dimensions a much higher capacity/efficiency is offered thanks to a larger bowl with better material than the tried and trusted LRH 410.

High efficiency demands special material

The extremely high bowl speed (>7300 rpm) ensures that the smallest latex particles are affected by the centrifugal force field.

To withstand the extremely high forces generated at this speed, a very special high-grade stainless steel alloy is used in the centrifuge bowl and other exposed parts.

Alfa-Laval's more than 100 years of experience in developing high-speed centrifuges is a guarantee for the choice of correct material.

Materials: Frame — epoxy-enamelled cast iron; covers and feed equipment — stainless steel; bowl body, distributor — stainless steel, discs — highly polished stainless steel.

Standard equipment

Set of inlet pipes, feed cup, set of regulating screws, magnetic braking system with control unit, revolution counter, set of spare parts.

Ancillary equipment necessary for operation

Electric motor, starter, set of tools.

Optional equipment

Spare bowl for operation during cleaning, tiltable bowl holder, set of recommended additional spares for preventive maintenance.

At an additional price the centrifuge can be equipped with a direct-coupled controlled-torque motor, which eliminates the need for the friction clutch. Note that in this case a different starter is required.

Technical data

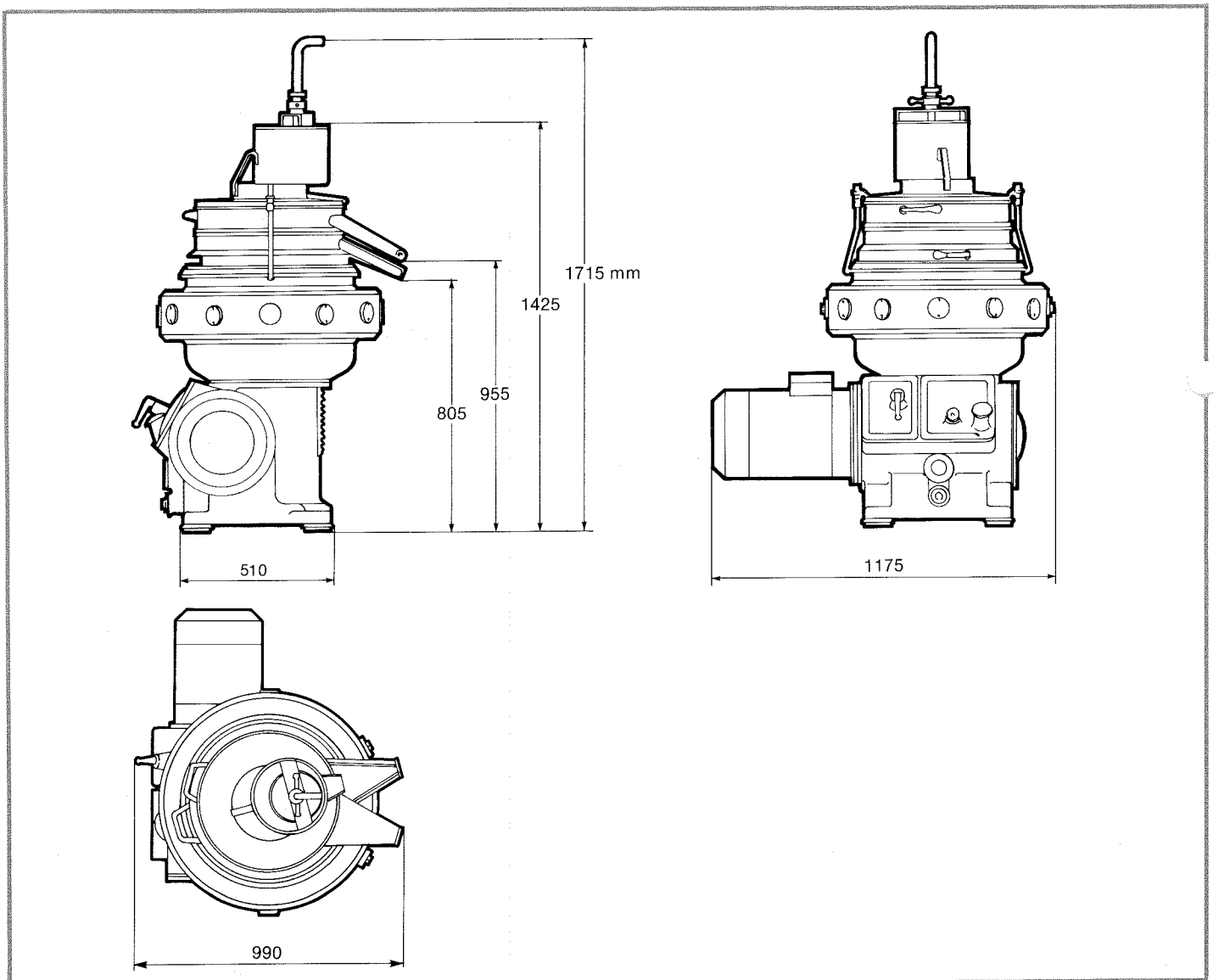
Capacity range:	450— 700 l/h
Motor rating:	11 kW
Starting power:	14 kW
Working power:	5.5—8 kW depending on feed rate
Connections:	Inlet 25 mm

Shipping data

LRB 510 with set of tools and motor:

Net weight	1000 kg
Gross weight	1200 kg
Volume	2.2 m ³
Spare bowl:	
Net weight	275 kg
Gross weight	320 kg
Volume	0.23 m ³

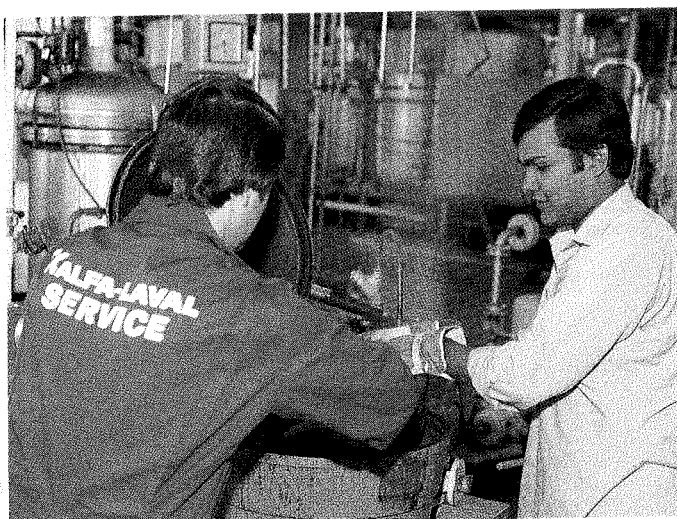
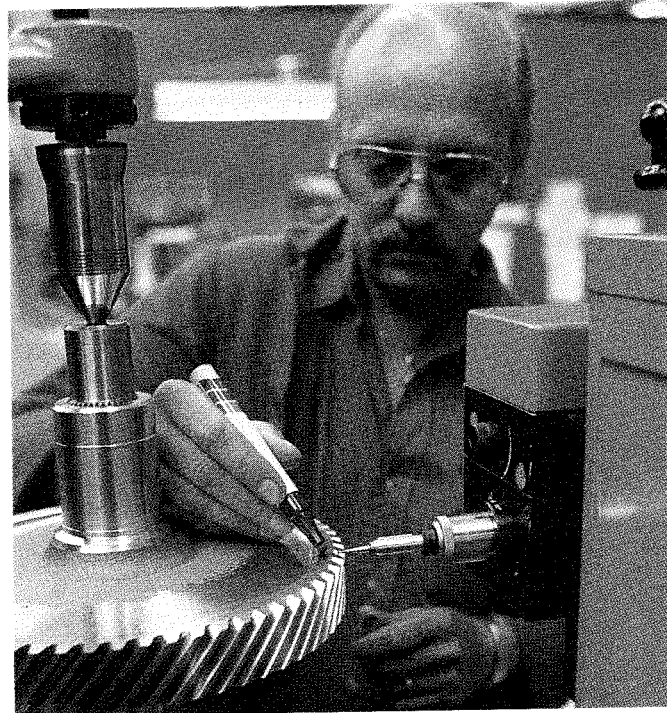
Dimensions



Alfa-Laval quality for long life and reliability

Currently, nearly 1500 Alfa-Laval separators are operating round the clock on this application, and although some of them are 30 to 40 years old, they are still in excellent condition.

Alfa-Laval quality ensures high reliability, easy maintenance, and a high second-hand value.



Alfa-Laval service

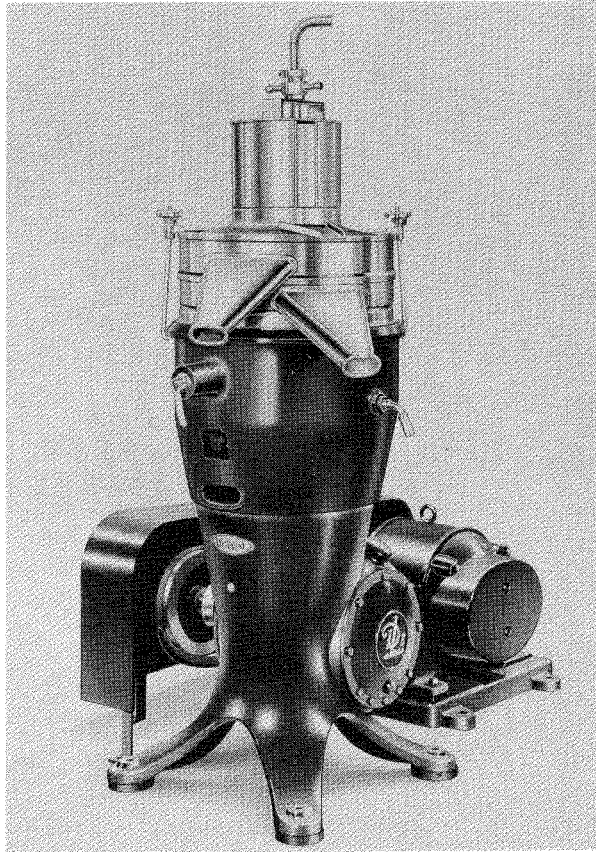
As a result of having manufactured separators for more than 100 years, with over 60 years activity in the business of latex concentration, Alfa-Laval has an extensive service network of associated companies in latex-producing countries.

The service network, comprising Alfa-Laval trained personnel, provides installation, commissioning and start-up assistance, complete documentation and on-the-spot operator training when required. After-sales service includes warranty service, spare parts and repairs; even periodic preventive maintenance programmes can be provided.

Alfa-Laval: from pioneer....

Alfa-Laval developed the first disc-stack centrifuges for latex concentration in conjunction with a major plantation owner and a team of consultant

specialists, resulting in the centrifugal latex concentration process, patented in 1929, that virtually launched the latex industry.

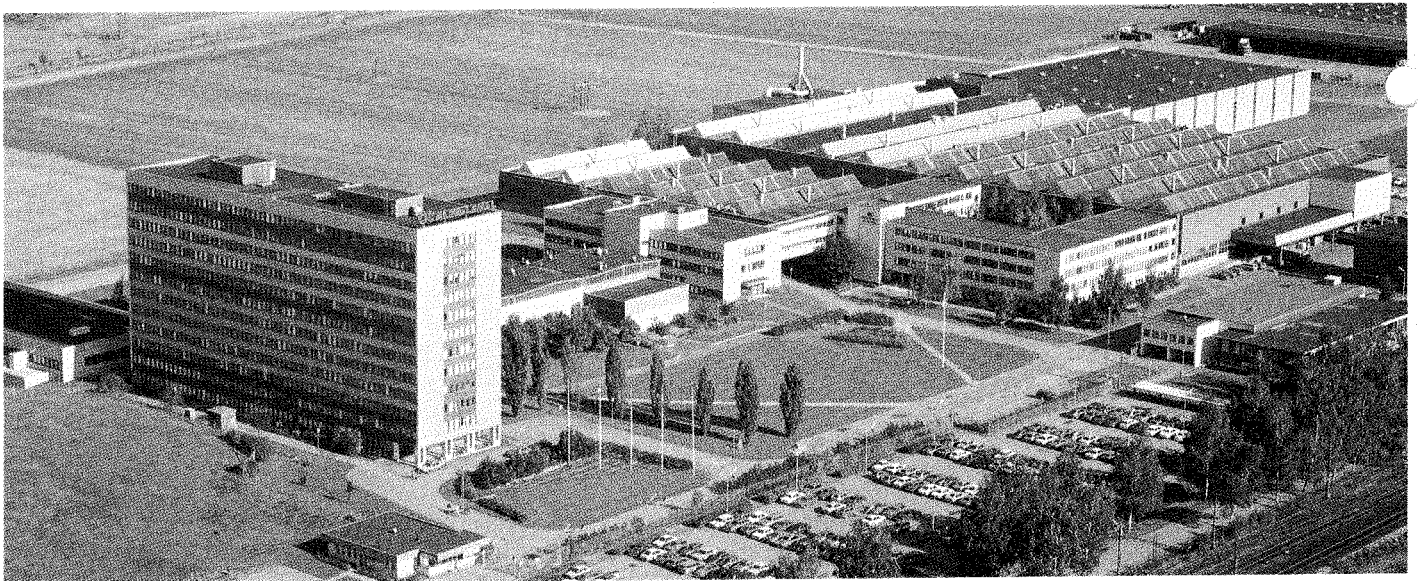


One of the earliest Alfa-Laval latex centrifuges introduced during the '30s.

....to market leader

Alfa-Laval has always retained that head-start gained in the '20s. As an engineering company it has its own research and development facilities. These resources,

coupled with its extensive knowledge of the realities of the latex industry, enable Alfa-Laval to offer the best in latex concentration technology.



Aerial view of Alfa-Laval headquarters at Tumba outside Stockholm, Sweden.

ALFA-LAVAL
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