

Alfa Laval LeviMag™ UltraPure, Magnetic Mixer

Levitated Magnetic Mixer

Application

Alfa Laval LeviMag UltraPure magnetic mixers offer effective mixing for multiple processes within Pharmaceutical and Biotech applications - eg. serums, vaccines, plasma fractions, bacteria and cell cultures and API's - where high demands on hygienic and aseptic design are required.

Depending on duty and media properties the LeviMag can be configured to be used in tanks from 30 l. to 40.000 l.

Working principle

A radial turbine installed inside the tank is rotated via the torque from a magnetic coupling. This creates mixing of the fluid inside the tank. The patented levitated design of the impeller makes the mixer fully drainable and able to run dry - hence it can mix to the last drop, securing maximum yield.

Unique features

Levitated design: Makes the bearing fully drainable and minimize wear of the bearing.

Replacable bearings: Both the female and the male bearing can be replaced by the end user on site.

High efficiency impeller: The impeller unit is flow optimized, which creates the possibility of gentle product treatment

Mixing to last drop: Dry running capability makes it possible to achieve maximum yield.

Available versions:

- Impeller with male/female bearing
- Impeller complete, with drive unit

Drive unit versions:

- Painted (fan ventilated)
- Clean room finish, Sealed Surface Conversion Treatment (smooth, closed, none fan ventilated)
- Extended console for insulated tanks



TECHNICAL DATA:

| | |
|--|--|
| Internals: | |
| Product Wetted Surface finish: | Ra <0.5 µm Mech. polished and Electropolished |
| Working pressure: | -1 to 7 bar(g) |
| Impeller diameters: | 100, 150, 200, 250 & 300 mm |
| Weld Plate: | |
| Size WP50: | For impeller size 100 & 150 mm |
| Size WP81: | For impeller size 200, 250 & 300 mm |
| Drive Unit: | |
| Motor: | |
| Integrated Permanent Magnet Synchron Motor (IPMSM) which has to be operated with a frequency inverter for IE4 motors. The frequency converter (not Alfa Laval supply) must be ordered for the voltage available at the place of operation. | |
| Efficiency class: | IE4 |
| Enclosure / Motor protection: | IP66 |
| Configuration: | Blue |
| Nominal Power: | 1.1 kW |
| Nominal Voltage and frequency (from frequency converter): | Output 217 VAC, connected in delta, 70 Hz, 2100 RPM |
| Nominal Current: | 3.59 A |
| Configuration: | Clean room, WP50 |
| Nominal Power: | 0,75 kW |
| Nominal Voltage and frequency (from frequency converter): | Output 199 VAC, connected in delta, 70 Hz, 2100 RPM |
| Nominal Current: | 2.53 A |
| Configuration: | Clean room, WP81 |
| Nominal Power: | 1.1 kW |
| Nominal Voltage and frequency (from frequency converter): | Output 195 VAC, connected in delta, 70 Hz, 2100 RPM |
| Nominal Current: | 3.61 A |
| Country Code: | All (one type covers all) |
| Gear: | |
| High efficiency helical bevel right angle gearbox. | |
| Lubricant: | Food compatible oil |
| Maximum mounting angle acc. to horizontal: | 0° - 45° (Different angle intervals based on configuration - Note: Motor may not point down wards) |
| Surface finish drive unit, standard: | Painted Blue RAL 5010 |
| Surface finish drive unit, Clean Room option: | Sealed Surface Conversion Treatment, Smooth Body (no fan) |
| Console/flange: | |
| Standard height or option for extended height for insulated tanks. | |
| Attachment, Size WP50: | Clamp connection |
| Attachment, Size WP81: | Flange-bolt connection |

PHYSICAL DATA

| | |
|--|--|
| Materials: | |
| Impeller and Weld plate: | AISI316L (UNS S31603) |
| Drive Rotor, shaft and console/flange: | AISI304 (UNS S30400) |
| Gear motor , Painted: | C2 according to DIN 12944 (NSF/ANSI 51-2009e) |
| Gear motor, Clean room | Permanent Bond Surface (nsd tupH) - compl. w. FDA Title 21 CFR 175.300 |
| Male Bearing: | Zirconia YTZP |
| Female bearing: | Silicium Carbide (EN 12756) |
| Seals: | FEP/FKM |
| Gearbox oil: | USDA H1 |
| Temperatures: | |
| During product Mixing, media: | Max. 90°C |
| During product Mixing, media WFI: | TBA |
| During CIP (max. 50 RPM): | Max. 95°C |
| During SIP (0 RPM): | Max. 150°C |
| Max. speed: | |
| Impeller size 100 | 800 RPM (81 Hz) |
| Impeller size 150 | 480 RPM (48.5 Hz) |
| Impeller size 200 | 480 RPM (83 Hz) |
| Impeller size 250 | 230 RPM (40 Hz) |
| Impeller size 300 | 200 RPM (34.5 Hz) |



Documentation:

As standard with UltraPure Q-Doc including:

- Compliance with Regulation (EC) No.: 1935/2004
- Compliance to the EC Regulation for GMP
- 3.1 Material Certificates acc. to EN10204 (MTR) for all wetted parts
- Compliance to USP Class VI <88> for Zirconia YTZP and FEP/FKM seals
- Compliance to FDA CFR 21 (non-metallic parts) for elastomers, ceramics and gear oil.
- TSE (Transmissible Spongiform Encephalopathy) / ADI (Animal Derivative Ingredient) Declaration
- Surface finish compliance declaration

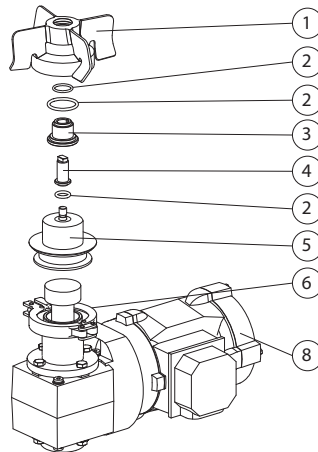
Options:

- Surface roughness measurements included
- Weld Log included

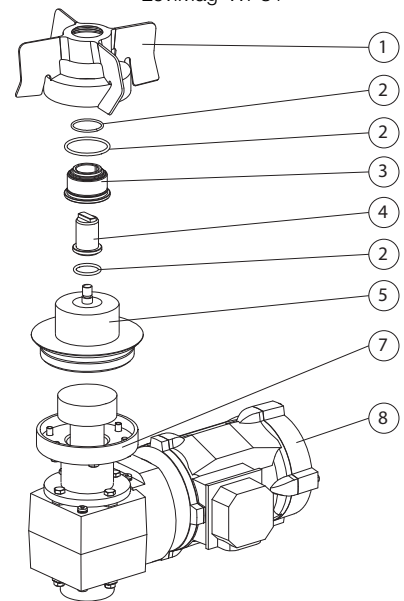
Build up:

1. Impeller
2. Seals
3. Female Bearing
4. Male Bearing
5. Weld Plate
6. Clamp ring connection (WP50 only)
7. Flange-Bolt Connection (WP81 only)
8. Drive unit

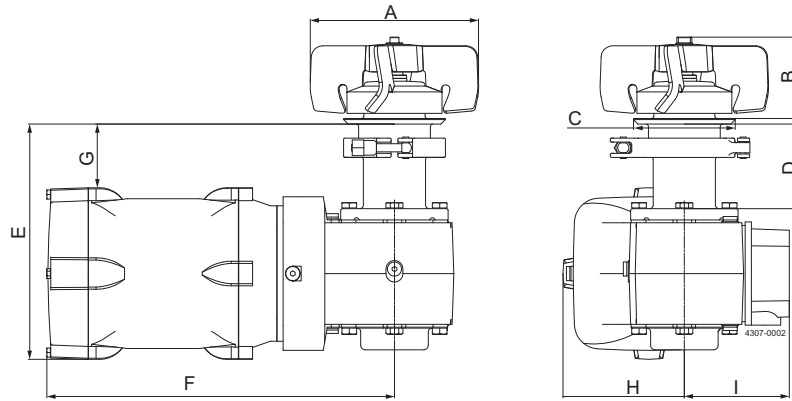
LeviMag WP50



LeviMag WP81

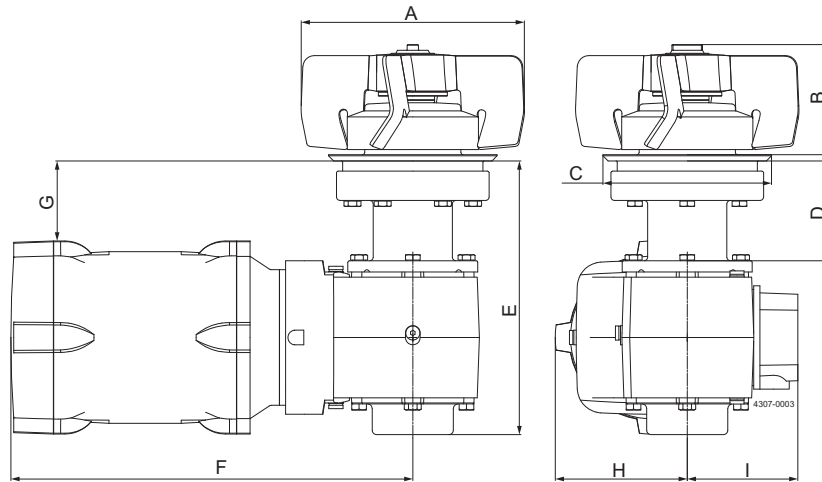


Dimensions:
LeviMag WP50



| Model | Size WP50 - Ø100 impeller | | | | Size WP50 - Ø150 impeller | | | |
|---------------|---------------------------|------------------|---------------------|---------------------|---------------------------|------------------|---------------------|---------------------|
| | Standard console | Extended console | Standard console | Extended console | Standard console | Extended console | Standard console | Extended console |
| Configuration | Height + Painted | Height + Painted | Height + Clean Room | Height + Clean Room | Height + Painted | Height + Painted | Height + Clean Room | Height + Clean Room |
| | Gear Motor | Gear Motor | Gear Motor | Gear Motor | Gear Motor | Gear Motor | Gear Motor | Gear Motor |
| A | Ø100 | Ø100 | Ø100 | Ø100 | Ø150 | Ø150 | Ø150 | Ø150 |
| B | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 72 |
| C | Ø90 | Ø90 | Ø90 | Ø90 | Ø90 | Ø90 | Ø90 | Ø90 |
| D | 75 | 125 | 75 | 125 | 75 | 125 | 75 | 125 |
| E | 215 | 265 | 209 | 259 | 215 | 265 | 209 | 259 |
| F | 340 | 340 | 308 | 308 | 340 | 340 | 308 | 308 |
| G | 50 | 100 | 57 | 107 | 50 | 100 | 57 | 107 |
| H | 114 | 114 | 108 | 108 | 114 | 114 | 108 | 108 |
| I | 111 | 111 | 93 | 93 | 111 | 111 | 93 | 93 |

LeviMag WP81



| Model | Size WP81 - Ø200 impeller | | | | Size WP81 - Ø250 impeller | | | | Size WP81 - Ø300 impeller | | | |
|---------------|---------------------------|------------------|---------------------|---------------------|---------------------------|------------------|---------------------|---------------------|---------------------------|------------------|---------------------|---------------------|
| | Standard console | Extended console | Standard console | Extended console | Standard console | Extended console | Standard console | Extended console | Standard console | Extended console | Standard console | Extended console |
| Configuration | Height + Painted | Height + Painted | Height + Clean Room | Height + Clean Room | Height + Painted | Height + Painted | Height + Clean Room | Height + Clean Room | Height + Painted | Height + Painted | Height + Clean Room | Height + Clean Room |
| | Motor | Motor | Gear Motor | Gear Motor | Motor | Motor | Gear Motor | Gear Motor | Motor | Motor | Gear Motor | Gear Motor |
| A | Ø200 | Ø200 | Ø200 | Ø200 | Ø250 | Ø250 | Ø250 | Ø250 | Ø300 | Ø300 | Ø300 | Ø300 |
| B | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 |
| C | Ø149 | Ø149 | Ø149 | Ø149 | Ø149 | Ø149 | Ø149 | Ø149 | Ø149 | Ø149 | Ø149 | Ø149 |
| D | 89 | 139 | 89 | 139 | 89 | 139 | 89 | 139 | 89 | 139 | 89 | 139 |
| E | 243 | 293 | 243 | 293 | 243 | 293 | 243 | 293 | 243 | 293 | 243 | 293 |
| F | 354 | 354 | 357 | 357 | 354 | 354 | 357 | 357 | 354 | 354 | 357 | 357 |
| G | 74 | 124 | 70 | 120 | 74 | 124 | 70 | 120 | 74 | 124 | 70 | 120 |
| H | 114 | 114 | 117 | 117 | 114 | 114 | 117 | 117 | 114 | 114 | 117 | 117 |
| I | 111 | 111 | 98 | 98 | 111 | 111 | 98 | 98 | 111 | 111 | 98 | 98 |



Machine Selection:

LeviMag UltraPure can be sized and configured in Alfa Laval configurator.

Selection of size can also be done by use of the below selection charts.

Needed information for selection of size:

- Media Viscosity
- Tank Volume
- Tank diameter
- Duty (see below Duty Levels)

| Duty Level | Duty | Description |
|------------|-----------------------|--|
| 1 | Keep media homogenous | Keeping fluids homogenous & low gradient heat transfer |
| 2 | Mild blending | Simple blending of miscible fluids & high gradient heat transfer, no specific request to mixing time, create suspension if deposit velocity is below 0.015 m/s |
| 3 | Mixing | Mixing of fluids, relative low mixing time, create suspension if deposit velocity is below 0.03 m/s |
| 4 | Powerful mixing | Dissolving solids, very low mixing time, create suspension if deposit velocity is below 0.06 m/s. |

Preconditions for using the selection charts:

- Liquid height must be equal to or lower than 2 times the tank diameter
- if duty involves suspension of particles (see deposit velocity limits in the duty levels), the tank diameter D must be:

$$D \leq \sqrt[3]{\frac{V * 4}{\pi}}$$

where V is the net. Volume.

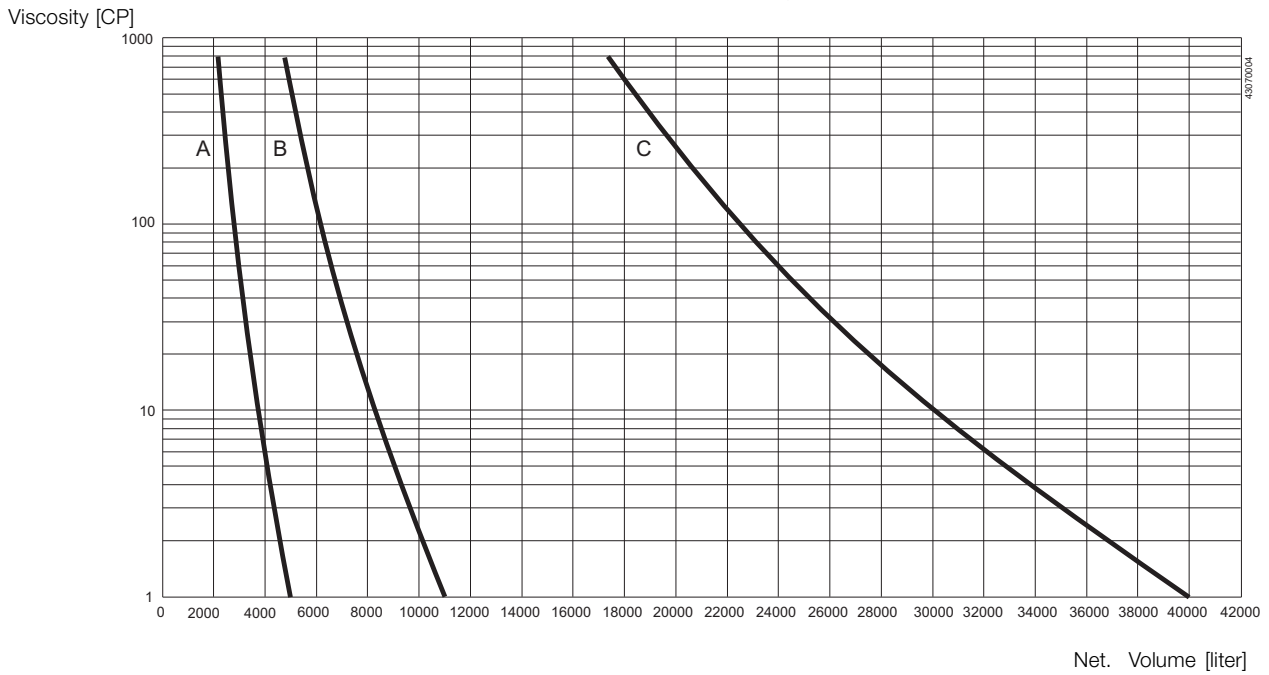
- If preconditions are not fulfilled please contact Alfa Laval Global Technical Support

How to select:

1. Select duty
2. Check preconditions
3. Go to the chart for the chosen duty
4. Read out the point for the requested tank volume (X-axis) and viscosity (Y-axis)
5. Choose the curve to the right from the point
6. If physically possible a larger impeller size can always be chosen - eg. to obtain a gentler product treatment (operating at lower speed)

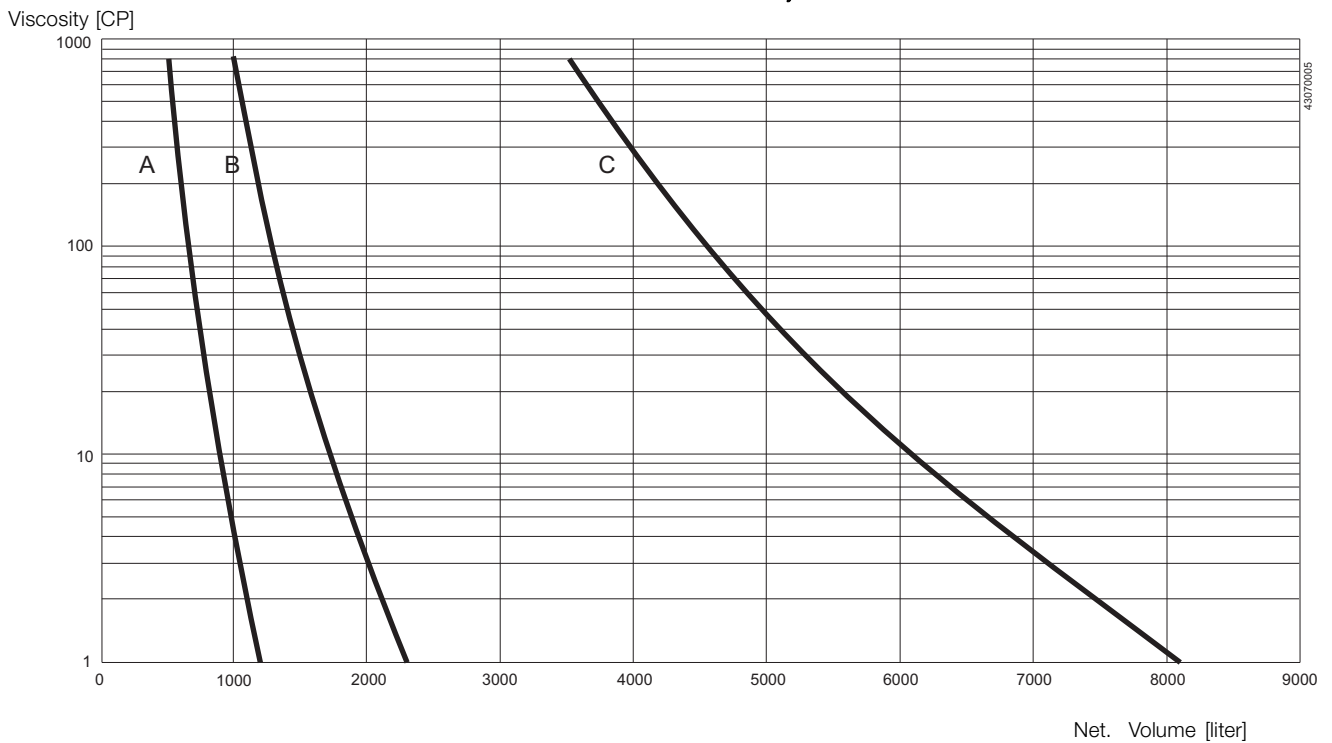


Duty Level 1: Keep media homogenous
Volume vs. viscosity



- A: LeviMag size 100 mm
- B: LeviMag size 150 mm
- C: LeviMag size 200, 250 and 300 mm

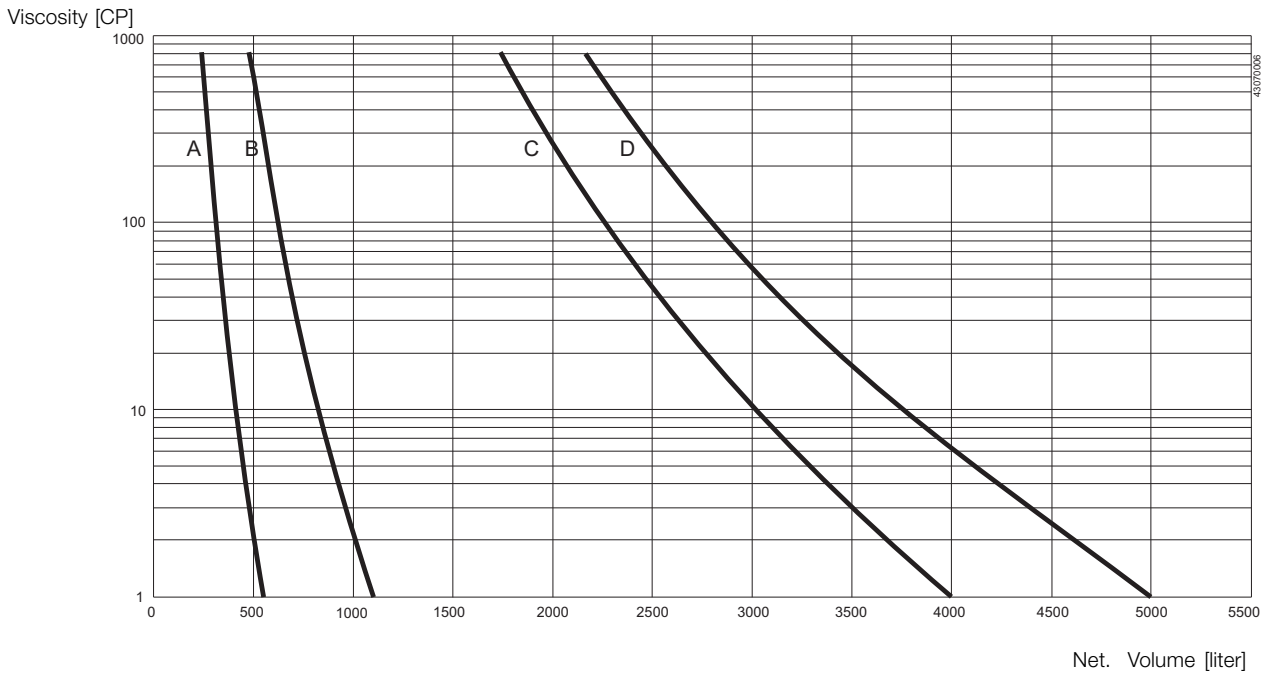
Duty Level 2: Mild blending
Volume vs. viscosity



- A: LeviMag size 100 mm
- B: LeviMag size 150 mm
- C: LeviMag size 200, 250 and 300 mm

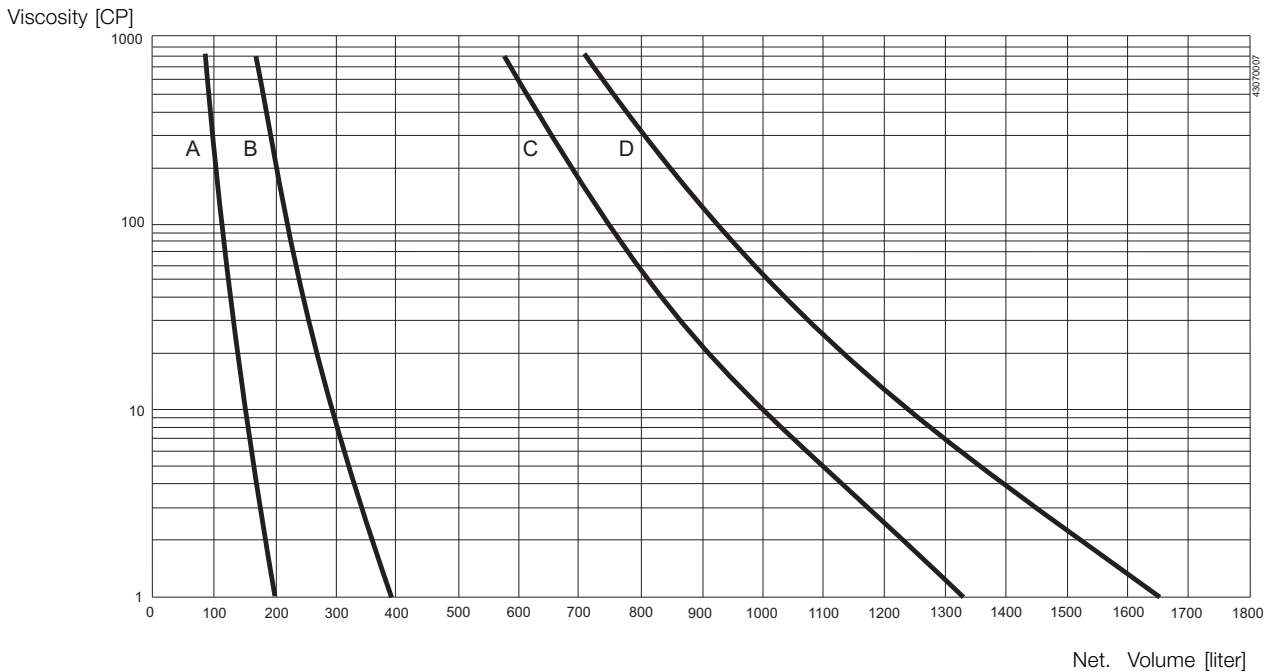


Duty Level 3: Mixing
Volume vs. viscosity



- A: LeviMag size 100 mm
- B: LeviMag size 150 mm
- C: LeviMag size 200, 250 and 300 mm
- D: LeviMag size 300 mm

Duty Level 4: Powerfull mixing
Volume vs. viscosity



- A: LeviMag size 100 mm
- B: LeviMag size 150 mm
- C: LeviMag size 200, 250 and 300 mm
- D: LeviMag size 300 mm



Alfa Laval reserves the right to change specifications without prior notification.

How to contact Alfa Laval

Contact details for all countries are continually updated on our website. Please visit www.alfalaval.com to access the information direct.



CSI

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