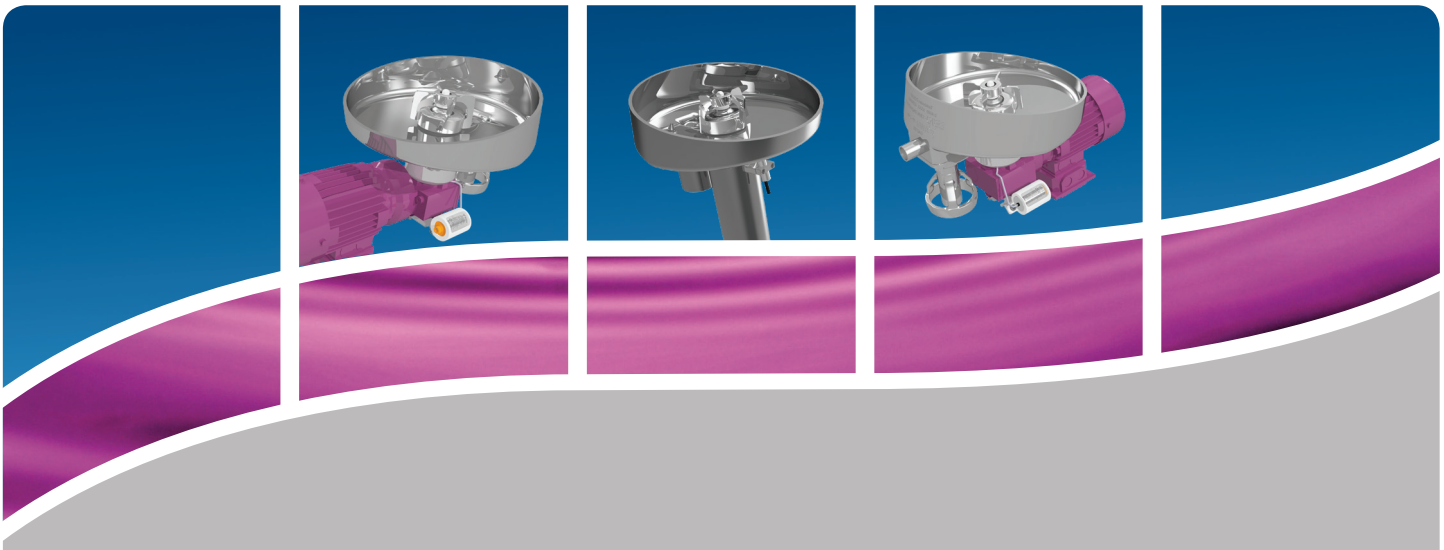
AWH
NEUMO Ehrenberg Group

Additive manufactured Tank Bottom with integrated Components



"Small and laboratory stirred tanks are challenging - especially in production."

As the tank volume becomes smaller, the space available for the components, especially in the tank bottom, becomes more and more limited.

The Result:
The positioning of the components, such as the magnetic mixer, bottom outlet valve and sensors, depends on the available space. Optimum positioning of the magnetic mixer is not always guaranteed.

In addition, the welding work required to connect the components to the bottom of the tank is complex and involves a high risk of welding distortion.

The Solution:
Additive manufacturing of a tank bottom with an integrated VPureMix® tank plate, diaphragm tank bottom valve and optional sensor sleeves.

Dished End with VPureMix® LS50 with Sensor Unit and Diaphragm Valve

The solution for small tank volumes

"Your Advantages at a Glance"

Tank bottom on customer request

High flexibility & high degree of customisation of the tank bottom design up to an outer diameter of 300 mm.

Elimination of all welding work

Complex and risky welding work with the danger of welding distortion is completely eliminated.

Compliant with the Pressure Equipment Directive

The additively manufactured tank bases with integrated tank plate fulfil the requirements of the European Pressure Equipment Directive (PED) 2014/68/EU.

Use of diaphragm valves for sterile processes

Dead space-free, soft-sealing and glandless diaphragm valves from SISTO for hygienic and sterile processes are selected according to customer requirements and taken into account in the tank bottom design.

Optimum & customised positioning of the VPureMix® tank plate

Optimum mixing of the process medium can be ensured by correctly positioning the tank plate and therefore also the VPureMix® magnetic coupled mixer.

Customised integration of additional components

Sensor sleeves can be customised and integrated into the tank bottom design.

Less ducumentation and validation work

Metal 3D printing only one batch of material is used and the elimination of all welding work significantly reduces the work involved.

Choice of drive unit for the VPureMix®

Both AC and DC drive units are available.

Advantages

Technical Data

Tank Bottom with integrated Tank Plate and Valve Connection	
Material:	1.4435 (AISI 316L)
Optional Special Materials:	2.4602 (Alloy 22), other materials on request
Internal Surface:	Ra = 0.8 - 0.4 µm (30 - 15 µin), ground, opt. electropolished ; other surfaces on request
External Surface:	Ra = 1.2 µm (47 µin), ground, opt. electropolished; other surfaces on request
Max. External Diameter:	300 mm
Max. Internal Diameter:	290 mm
Application Area:	Suitable for use in unpressurised tanks and tanks designated as pressure equipment (in accordance with Pressure Equipment Directive 2014/68/EU; DIN EN 13445; AD2000 regulations)
Design Temperature:	-20 °C - 160 °C (-4 °F - 320 °F)
Design Pressure:	-1 barg - 7 barg (-14.5 psig - 101.5 psig)
SISTO-C Diaphragm Valve:	Technical data on request

VPureMix® Low Shear Magnetic Coupled Mixer - Product-touched Parts	
Mixing Head with Female Bearing	
Mixing Head:	Material: 1.4435 (AISI 316L), delta ferrit content ≤ 1 %
	Optional special materials: 1.4539 (904L/ UNS N08904); 1.4529 (6Mo/ UNS N08367); 2.4602 (Alloy 22/ UNS N06022)
	Surface: Ra ≤ 0,38 µm (15 µin), hand and electropolished Max. permissible temperature: 150 °C (302 °F)
Female Bearing:	Material: silicon carbide SSiC
	Surface: Ra ≤ 0,5 µm (20 µin) Max. permissible temperature: 150 °C (302 °F)
Male Bearing with O-Ring	
Male Bearing:	Material: zirconium dioxide ZrO2 (Mg-PSZ), socket 1.4435
	Surface: Ra ≤ 0,5 µm (20 µin)
	Max. permissible temperature: 150 °C (302 °F)
O-Ring:	EPDM (standard); FKM, FFKM, VMQ (available as option)

Viskosity Range:	1 - 800 mPa·s (cP)
pH Range of the stirring Medium:	1 - 14

Overview of Tank Bottom Diameter - Tank Volume

The recommended tank bottom diameter (inner diameter) refers to tanks with a filling height to internal diameter (H/D) ratio of 1 to 2. With this H/D ratio, an optimum mixing process can be ensured using VPureMix® magnetic coupled mixers.

Working Volume [L] *		Tank Bottom - Internal Diameter [mm]	Recommended VPureMix® Magnetic Coupled Mixer **
min.	max.		
2.5	5.0	150	LS30
3.5	7.5	170	LS30
5.5	10.0	190	LS30
7.0	14.0	210	LS30
9.0	18.5	230	LS30
12.0	23.5	250	LS30
15.0	29.5	270	LS30
18.0	34.0	290	LS30
35.0	37.0	290	LS50

* Working volume at dynamic viscosity of 1 mPa·s (cP) and density of 1000 kg/m³.

** Recommended VPureMix® magnetic coupled mixer refers to the stated working volume at a dynamic viscosity of 1 mPa·s (cP) and a density of 1000 kg/m³.

Note about the table: The table provides data for orientation purposes only. You will receive binding data with a written request.

Note about H/D ratio: The tank geometry, especially the inner diameter of the tank and the resulting liquid filling level, drives the vortex formation inside the fluid.
In some mixing processes, such as powder or hydrophobic solid dissolution, the vortex formation is essential. In foaming or gas-sensitive processes, vortex formation should be avoided.

Please pay attention to the correct filling height to internal diameter (H/D) ratio in your process:

H/D < 1: No vortex formation, but good degree of mixing
H/D > 1 < 2: Vortex formation, optimal degree of mixing
H/D > 2: No vortex formation, formation of deadzones, bad degree of mixing

Technical Data

Armaturenwerk Hötensleben GmbH
Schulstr. 5-6
D-39393 Hötensleben

Tel: +49 39405 92-0
Fax: +49 39405 92-111
E-Mail: info@awh.eu
http://www.awh.eu

NEUMO Ehrenberg Group