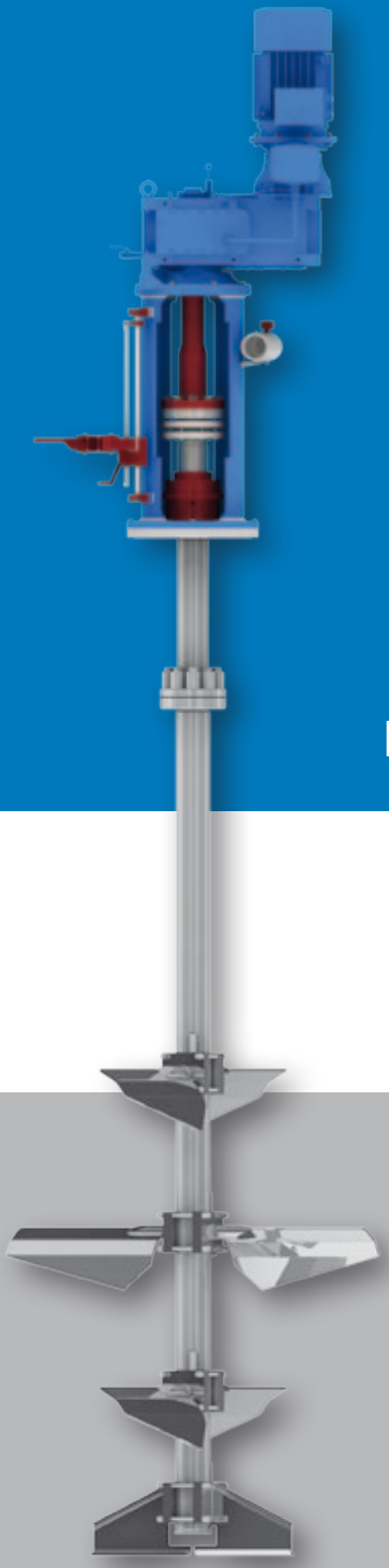
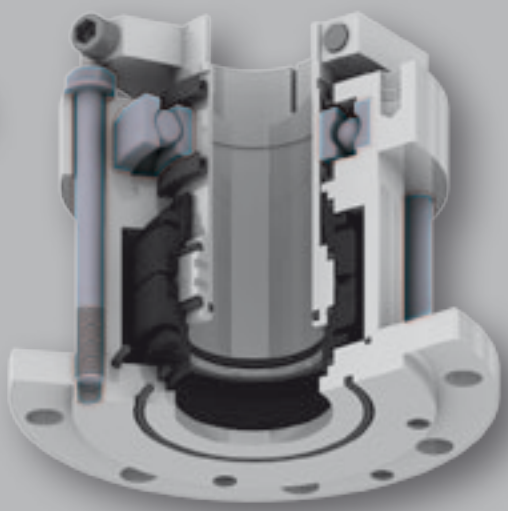


CERTIFIED AGITATORS FROM THE MANUFACTURER

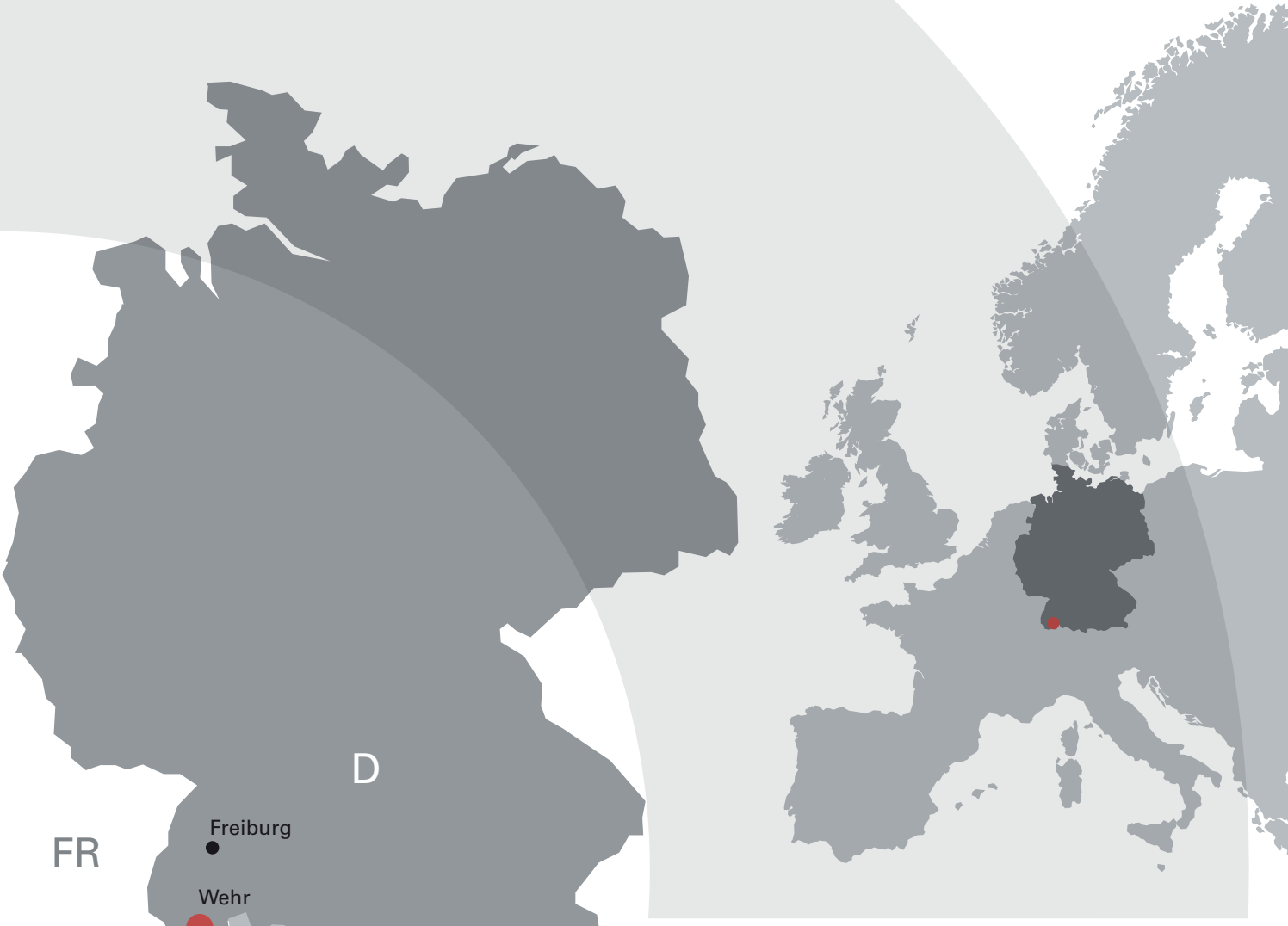
TSCHAMBER
MUT MISCH- UND TRENNTECHNIK



More than 35 years of experience

- Process technology
- Mixing technology
- Project planning
- Manufacturing


TSCHAMBER



FACTS AND FIGURES

1979 Founding of MUT Misch- und Trenntechnik GmbH

1989 Founding of Tschamber Maschinenbau

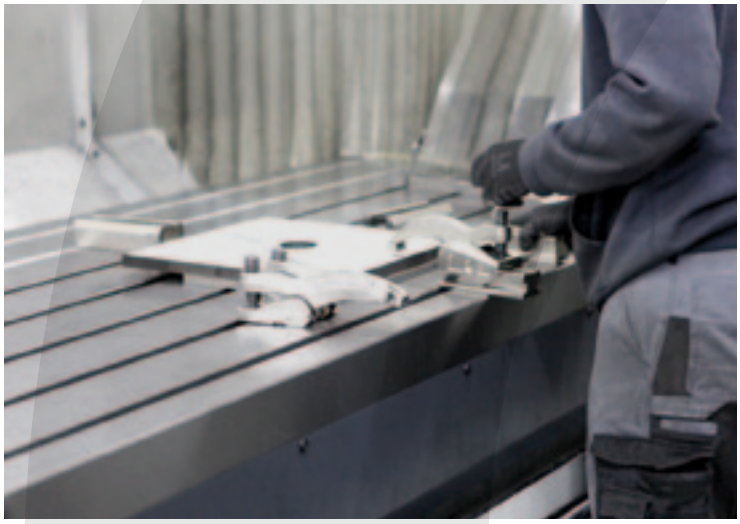
1995 Fusion of both companies MUT Misch- und Trenntechnik & Tschamber Maschinenbau. Founding of MUT-Tschamber GmbH

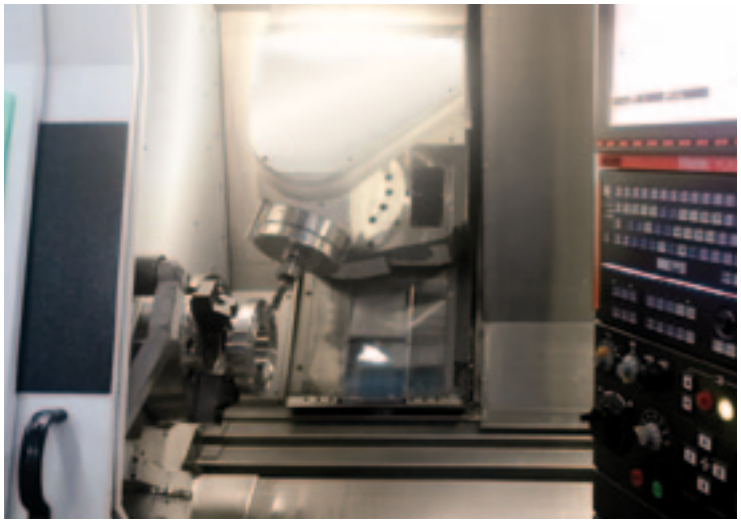
2013 The course for continuing a successful family business is set. Founder Hans-peter Tschamber begins to integrate his MBA educated son-in-law Michael Müller into the company's leadership position

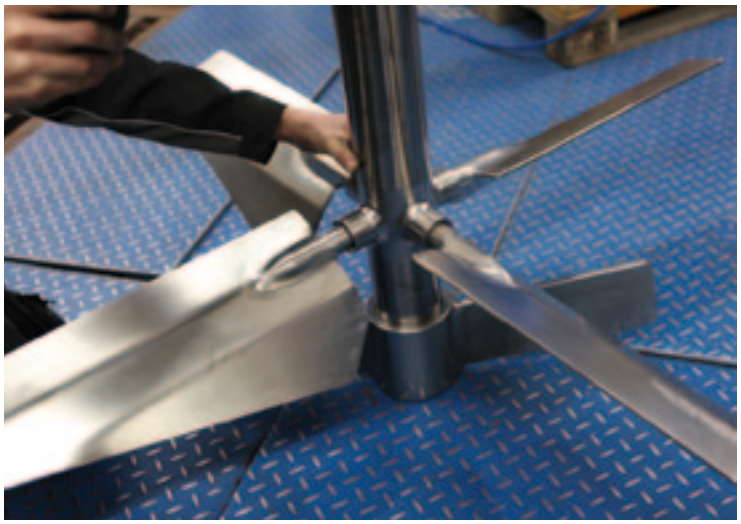
30.000 Agitators had been sucessfully set into operation worldwide

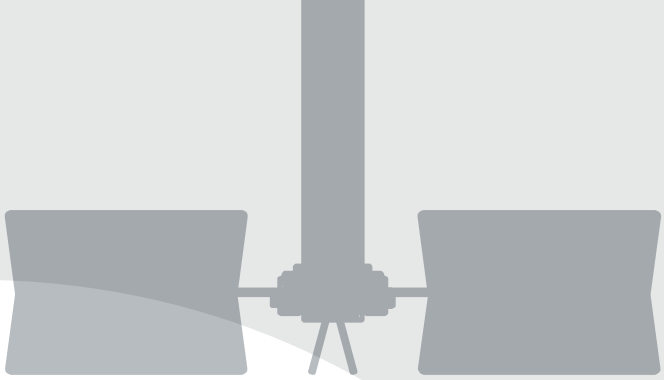
4.000 m² Production Area

EVERYTHING FROM THE SAME SOURCE









AGITATORS / TYPES

- DIN
- Standard
- Compact
- Stand
- Side-Entry
- Magnetic Coupled
- Jet Stream

AGITATOR SEALS

- TD4 double-acting seals
- TD3 single-acting 3-ring seals
- TDSL slurry seals
- TDSL2 FGD seals with shut-off function
- TDST sterilizable seals
- Gland, water trap, shaft seal ring
- Supply systems for seals

ACTIVITIES

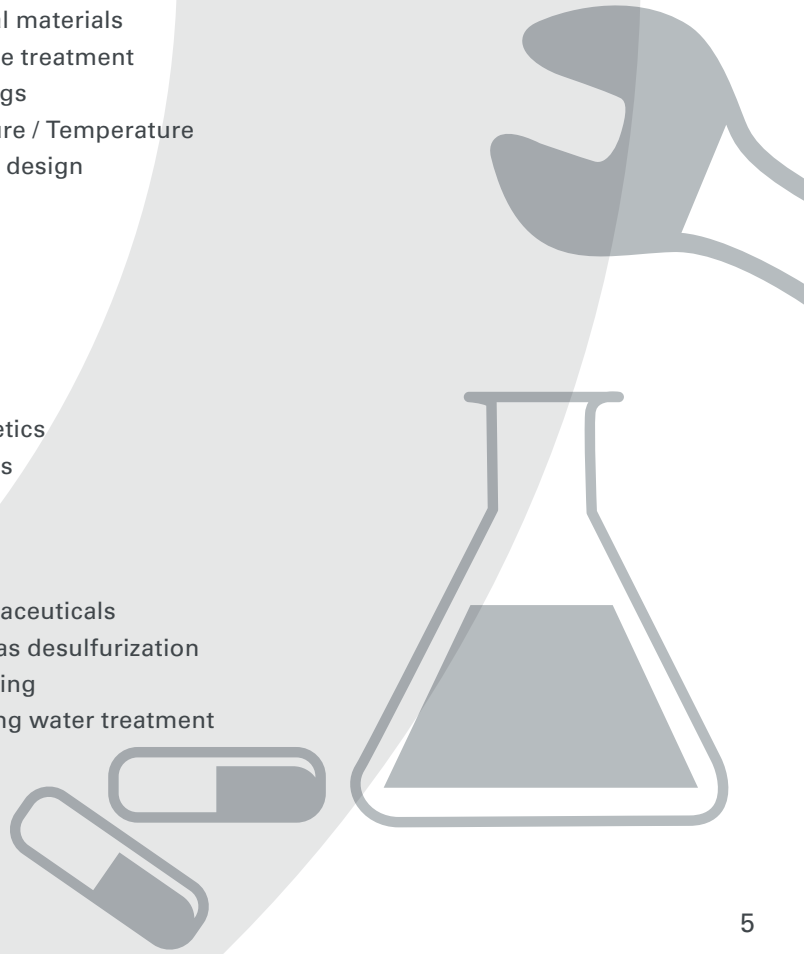
- Planning / Calculation
- Engineering / Design
- Assembly / Construction
- Service / Maintenance
- Support / Assistance
- Modification / Repair
- Retrofit

SPECIAL REQUIREMENTS

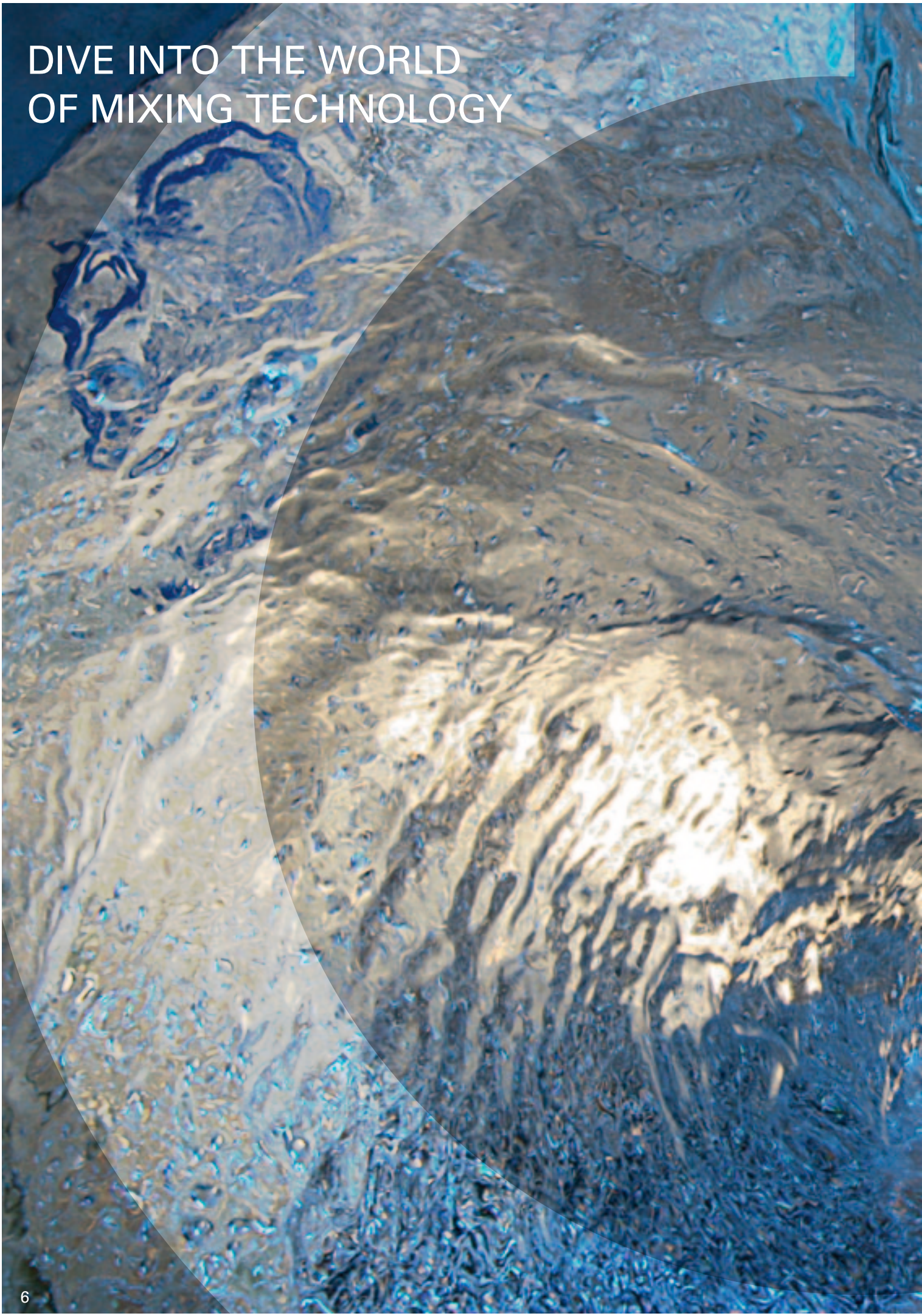
- Explosion-proof equipment / Atex
- Explosion Area zone 0, 1, 2
- Special materials
- Surface treatment
- Coatings
- Pressure / Temperature
- Sterile design

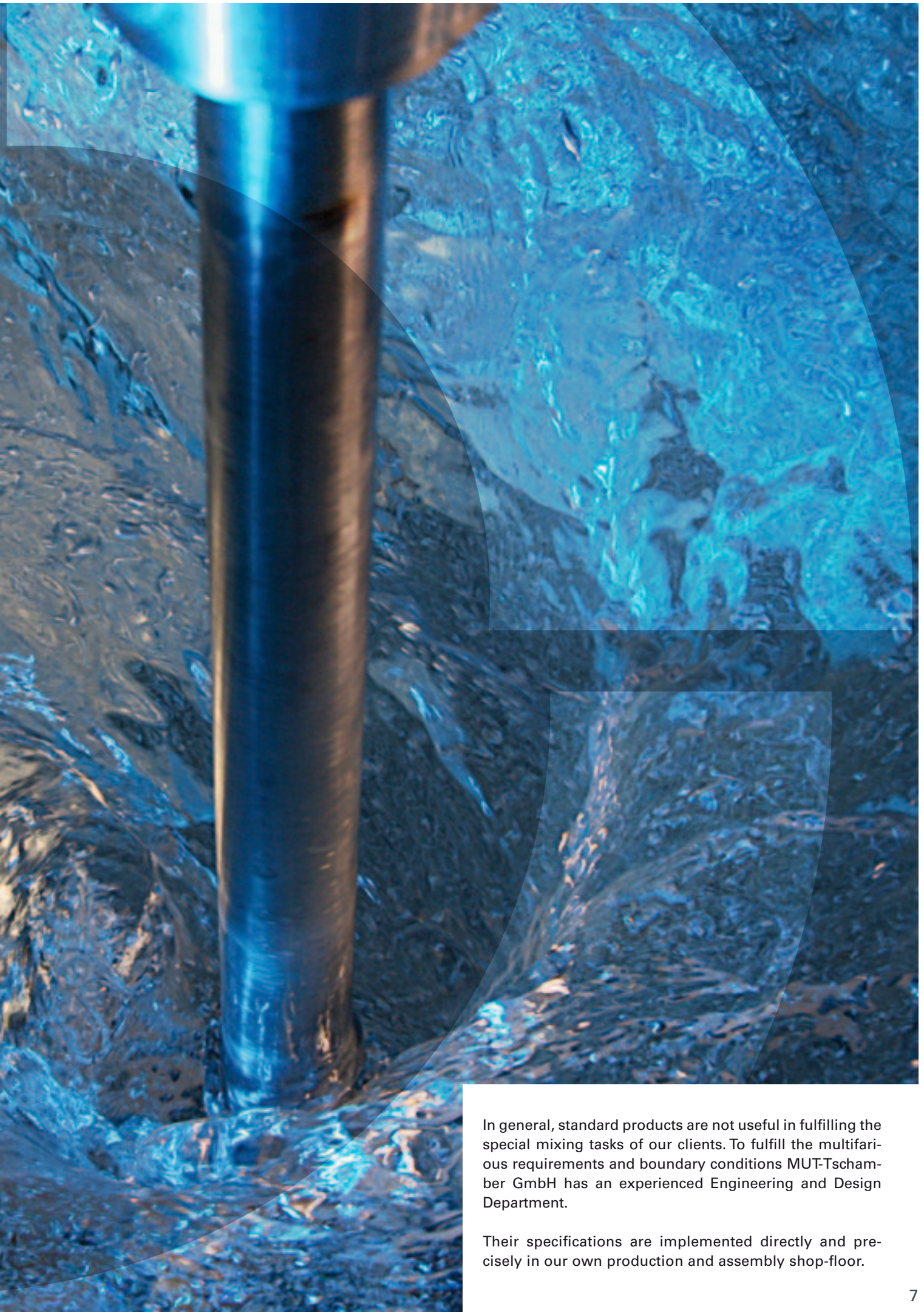
INDUSTRIES

- Waste water treatment
- Mining
- Bioethanol
- Bioreactors
- Biogas
- Biotechnological industry
- Chemical industry
- Dye
- Rubbers
- Resins
- Ceramics
- Cosmetics
- Plastics
- Paint
- Food
- Paper
- Pharmaceuticals
- Flue gas desulfurization
- Recycling
- Drinking water treatment
- Sugar



DIVE INTO THE WORLD OF MIXING TECHNOLOGY





In general, standard products are not useful in fulfilling the special mixing tasks of our clients. To fulfill the multifarious requirements and boundary conditions MUT-Tschamber GmbH has an experienced Engineering and Design Department.

Their specifications are implemented directly and precisely in our own production and assembly shop-floor.

KNOW-HOW IS THE REQUIREMENT FOR A CUSTOMIZED AGITATOR DESIGN

At this juncture there are a lot of boundary conditions to consider, for example vessel geometry, temperature, pressure, material resistance and the product properties. In addition, precise engineering tasks, the mixing tasks of the customers and compliance with the standard rules and regulations must be adhered to.

The well-grounded knowledge of how the different Impellers operate guarantees the successful completion of a mixing task.

DRIVE UNITS

- Motor (direct, belt drive)
- Geared motor (bevel, helical, flat)
- Explosion proof (gas, dust)
- ATEX, CE, NEMA, AGMA
- Speed control (frequency converter)
- Pharmaceutical design

HOUSING

- Double bearing (Standard)
- Bearing support (DIN)
- Sideways seal change
- Swivel device for seal change

SHAFT DESIGN

- Solid bearing shaft
- Solid or hollow agitator shaft
- Flange coupling acc. DIN 28155

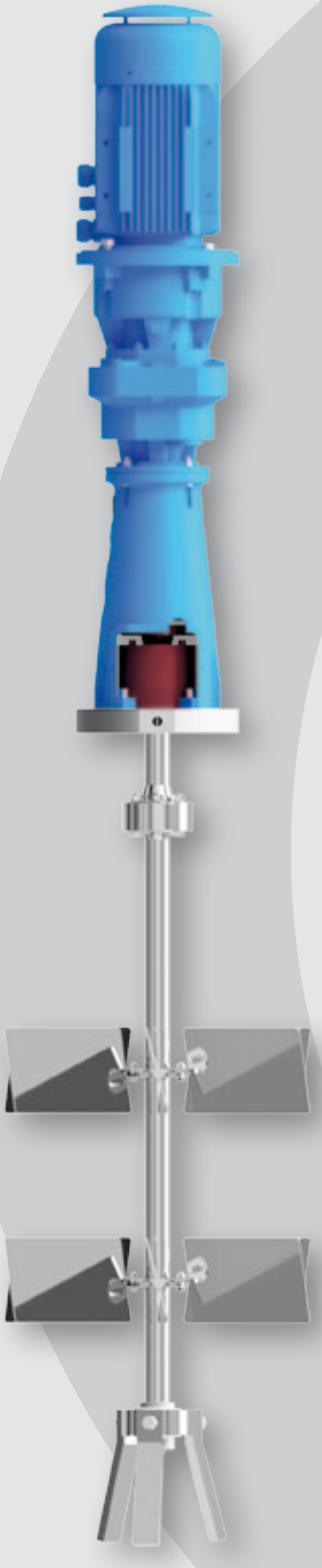
BOTTOM BEARING

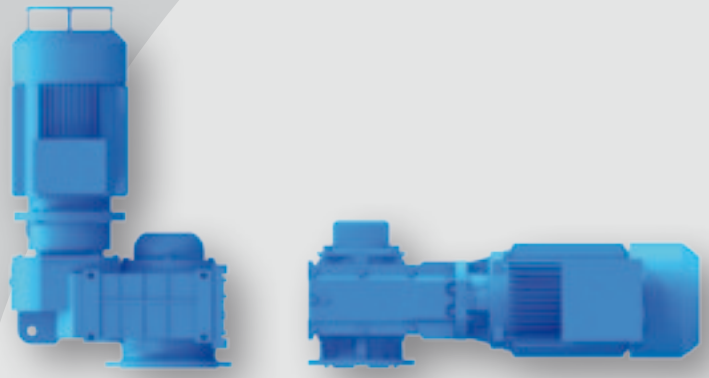
- Floatingly supported
- Various bushing materials
- Sterile design
- ATEX conform

See adjacent examples of our proven variants and modules. These represent only a small selection of our possibilities.

If you would like to learn more... Ask our specialists:

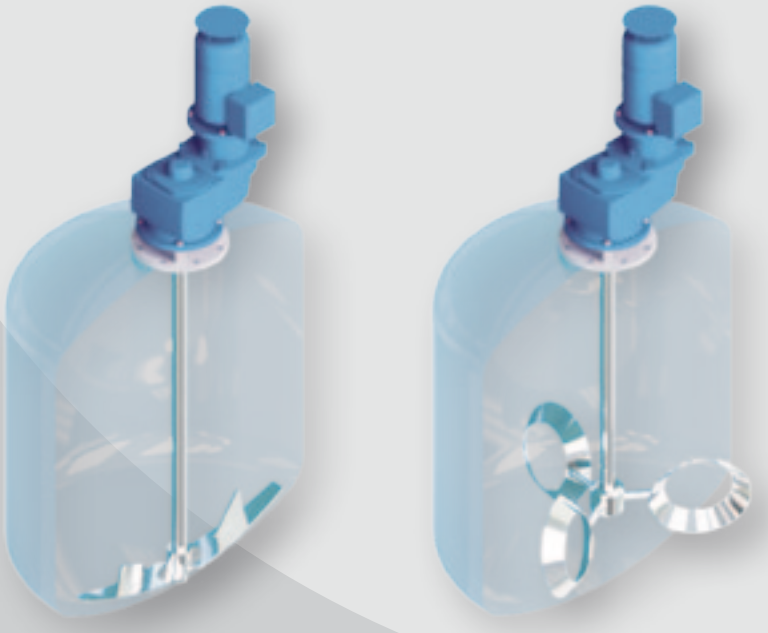
+49 7762/5206-36
sales@mut-tschamber.de





MOUNTING FLANGE

- DIN (EN1092-1, DIN28141...)
- ANSI
- IEC
- Sterile / GMP model
- Mounting plate
- Special dimension



SPECIAL REQUIREMENTS

- Sterile design
- Slurry design
- For abrasive media
- ATEX, TA Luft

MECHANICAL SEALS

- Single acting
- Double acting
- Dry running
- Gas lubricated
- FGD design with shut-off device

SHAFT SEALS

- Radial shaft seal
- Water trap
- Lip seal
- Gland
- Labyrinth seal
- Zone 0

STAINLESS STEEL AND SPECIAL MATERIALS

- 1.4301, 1.4404, 1.4571, 1.4501, 1.4529, 1.4539, 1.4563
- 1.4462 Duplex, 1.4410 Superduplex
- Alloy steel C4, C22, C59, ...
- Carbon steel
- Solid PTFE

COATINGS

- Rubber lining hard / soft
- PTFE, Halar
- PVDF
- PVC / PE / PP
- Epoxy
- Hardfacing

SURFACES

- Glass blasted
- Polished up to Ra 0,1
- Electro polished
- Pickled / passivated
- GMP design

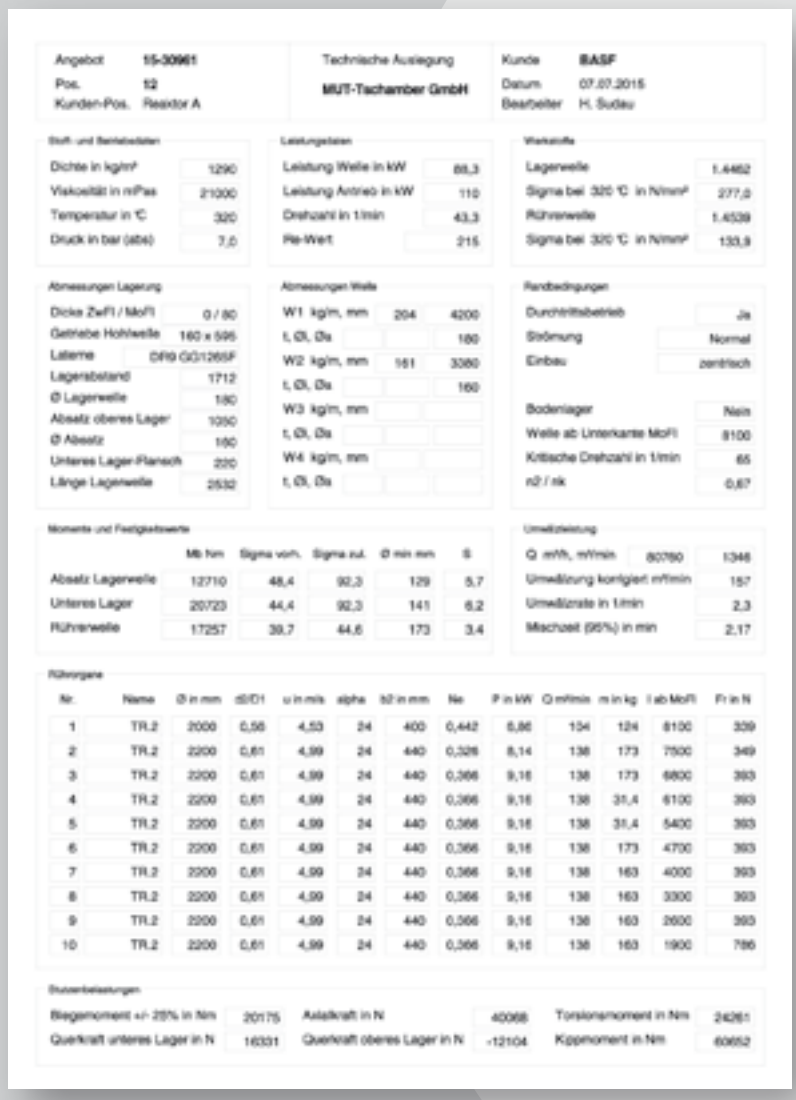
IMPELLERS

1) Anchor
2) Axial Flow Impeller A3.1
3) FGP Impeller C10.3
4) Rushton turbine R10.6
5) Jet stream Impeller
6) Axial flow Impeller A5.1
7) Viscosity Impeller VP2
8) Coil segment Impeller WS
9) Cone Impeller R30.3k
10) Pitchblade Impeller A20.4
11) Trapeze Impeller TR
12) Propeller A10.3

PROCESS ENGINEERING – THE BASICS OF AGITATOR DESIGN

A high level of knowledge of rheology is necessary to understand the wide variety of fluids and their specific features. To compliment this knowledge our process engineers are equipped with a range of tools and methods.

Performance curves, mixing time curves, degree of viscosity, suspension calculations, settling speeds and heat-transfer calculations form the basics.



Angebot 15-30961 | Technische Auslegung | Kunde BASF
Pos. 12 | MIT-Tachamber GmbH | Datum 07.07.2015
Kunden-Pos. Reaktor A | Bearbeiter H. Sudau

Stoff- und Betriebsdaten

Dichte in kg/m³	1290
Viskosität in mPas	21000
Temperatur in °C	320
Druck in bar (abs)	7,0

Leistungsdaten

Leistung Welle in kW	88,3
Leistung Antrieb in kW	110
Drehzahl in 1/min	43,3
Re-Wert	215

Werkstoffe

Lagerwelle	1.4462
Sigma bei 320 °C in N/mm²	277,0
Rührerwelle	1.4539
Sigma bei 320 °C in N/mm²	133,9

Abmessungen Lagerung

Dicke Zwfl / MoFl	0 / 80
Getriebe Hohlwelle	160 x 595
Laterne	DF9 GG/1265F
Lagerabstand	1712
Ø Lagerwelle	180
Absatz oberes Lager	1050
Ø Absatz	160
Unteres Lager-Flansch	220
Länge Lagerwelle	2532

Abmessungen Welle

W1 kg/m, mm		204	4200
t, Øi, Øa			180
W2 kg/m, mm		161	3360
t, Øi, Øa			160
W3 kg/m, mm			
t, Øi, Øa			
W4 kg/m, mm			
t, Øi, Øa			

Randbedingungen

Durchmischbetrieb	Ja
Strömung	Normal
Einbau	zentrisch
Bodenlager	Nein
Welle ab Unterkante MoFl	8100
Kritische Drehzahl in 1/min	65
n2 / nk	0,67

Momente und Festigkeitswerte

	Mb Nm	Sigma vorh.	Sigma zul.	Ø min mm	S
Absatz Lagerwelle	12710	48,4	92,3	129	5,7
Unteres Lager	20723	44,4	92,3	141	6,2
Rührerwelle	17257	39,7	44,6	173	3,4

Umwälzleistung

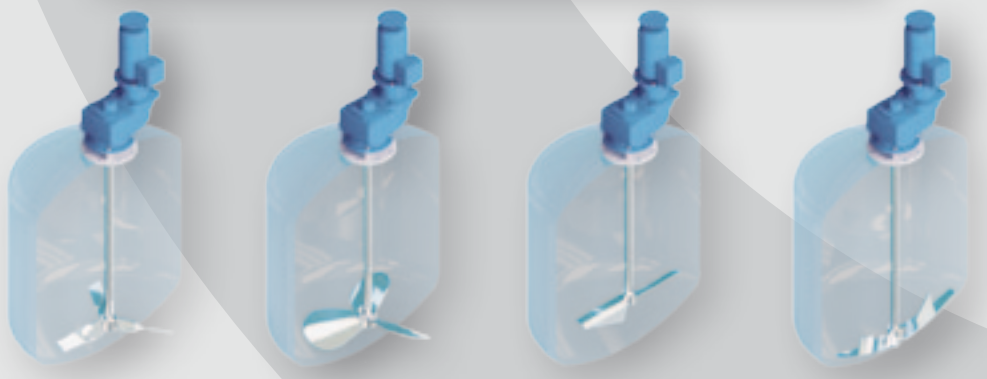
Q m³/h, m³/min	80760	1346
Umwälzung korrigiert m³/min		157
Umwälzrate in 1/min		2,3
Mischzeit (95%) in min		2,17

Rührorgane

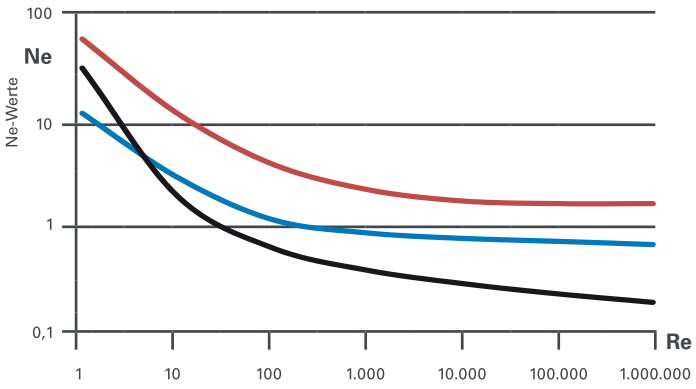
Nr.	Name	Ø in mm	d/D1	u in m/s	alpha	b2 in mm	Ne	P in kW	Q m³/min	n in kg	l ab MoFl	Fr in N
1	TR.2	2000	0,56	4,53	24	400	0,442	6,86	134	124	8100	309
2	TR.2	2200	0,61	4,99	24	440	0,326	8,14	138	173	7500	349
3	TR.2	2200	0,61	4,99	24	440	0,366	9,16	138	173	6800	393
4	TR.2	2200	0,61	4,99	24	440	0,366	9,16	138	31,4	6100	393
5	TR.2	2200	0,61	4,99	24	440	0,366	9,16	138	31,4	5400	393
6	TR.2	2200	0,61	4,99	24	440	0,366	9,16	138	173	4700	393
7	TR.2	2200	0,61	4,99	24	440	0,366	9,16	138	163	4000	393
8	TR.2	2200	0,61	4,99	24	440	0,366	9,16	138	163	3300	393
9	TR.2	2200	0,61	4,99	24	440	0,366	9,16	138	163	2600	393
10	TR.2	2200	0,61	4,99	24	440	0,366	9,16	138	163	1900	786

Rührerbelastungen

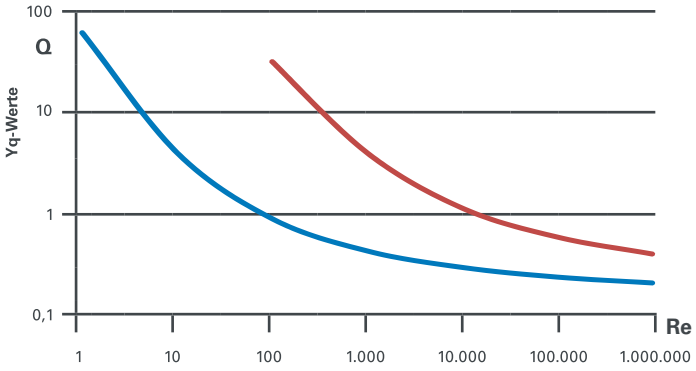
Biegemoment +/- 25% in Nm	20175	Axialkraft in N	40068	Torsionsmoment in Nm	24261
Querkraft unteres Lager in N	16331	Querkraft oberes Lager in N	-12104	Kippmoment in Nm	60652



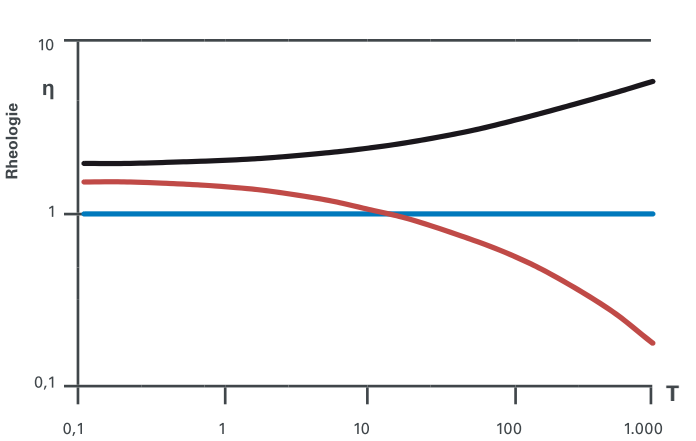
PROCESS DESIGN



Performance curves



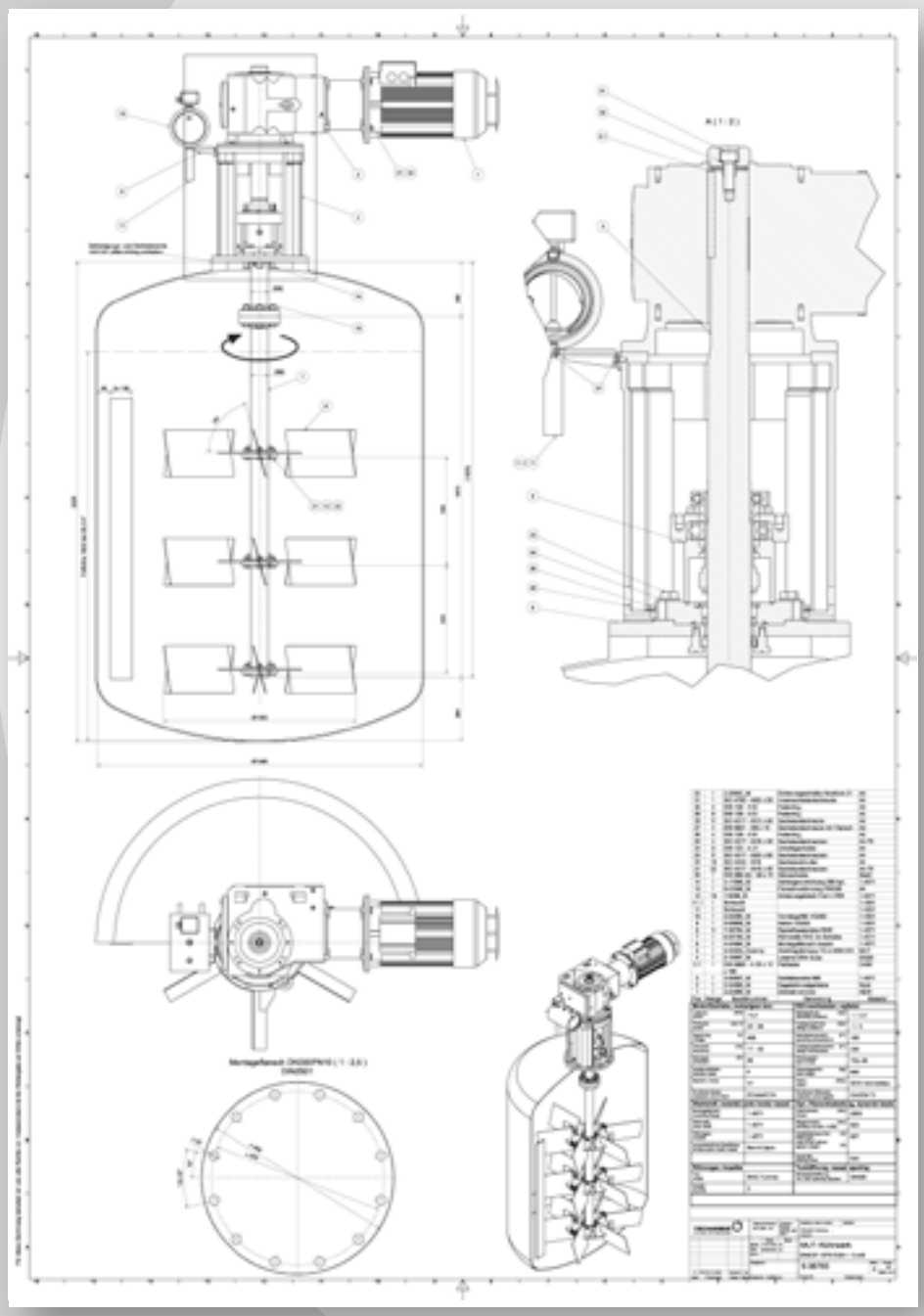
Mixing time curves



Viscosity

DESIGN / ENGINEERING PROCESS ENGINEERING

- Shaft power
- Mixing time
- Suspension performance
- Heat transfer
- Viscosity effect
- Gassing calculation
- Draft tube application



DESIGN / ENGINEE-RING MECHANIC

- Shaft dimension
- Critical speed
- Nozzle load
- Baffle forces
- Thickness of Impeller blade
- Temperature influence
- Material choice
- Hollow shaft dimension
- Impeller geometry

OPTIMIZATION

- Engine power
- Mixing time
- Suspension performance
- Lifetime

RESPECT THE LAWS - FOLLOW THE TECHNICAL STANDARDS - CERTIFICATION

MUT-Tschamber has worked successfully with the ISO 9001 regulations for many years. Due to our QM system each part of the process is carried out to the highest standards.

As such, we adhere to governmental regulations and follow the general and special technical standards. From risk analysis to prototype testing to final confirmation declaration, we document the complete process.

CHOICE

- QM
- Certificate
- Declaration of Conformity
- Welding Test
- Materials Certificate
- Pressure Equipment Directive

- ISO 9001:2008
- OHSAS 18001:2007
- ATEX Zone 0,1,2
- HP 0
- GMP / FDA
- Machine Directive
- China Stamp

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- Gland, water trap, shaft seal ring
- Supply systems for seals

TSCHAMBER
MUT MISCH- UND TRENNTECHNIK

MUT 2.0 EN

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