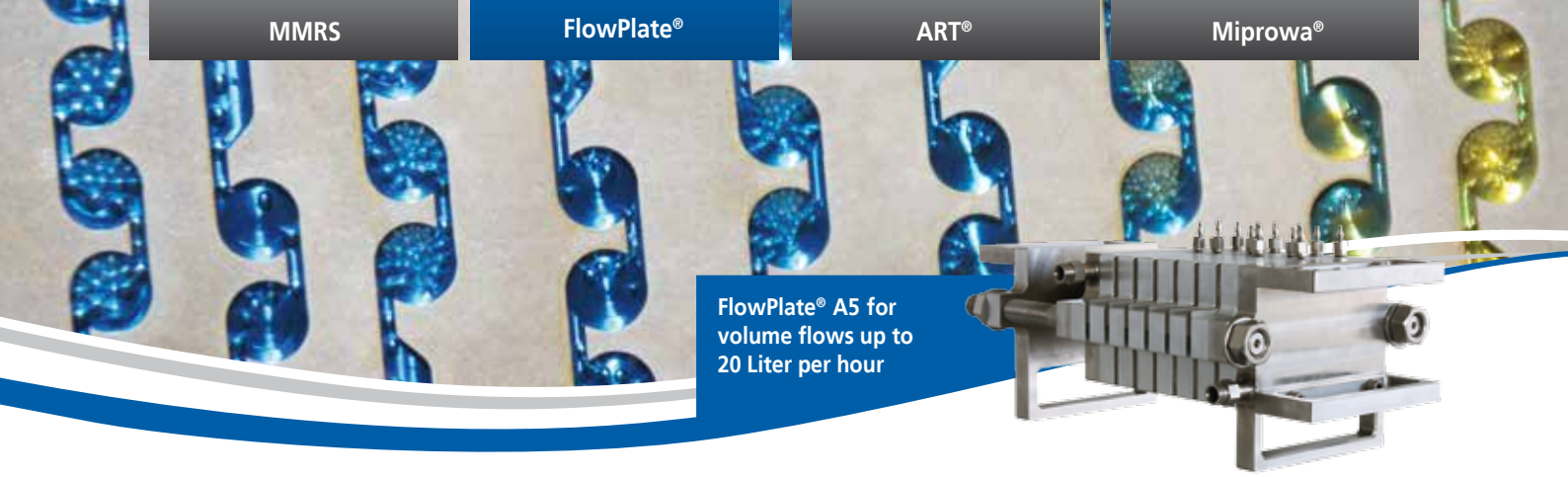


FlowPlate® A5 for volume flows up to 20 Liter per hour

Outstanding Technology

Because FlowPlate® produces highly competitive APIs.

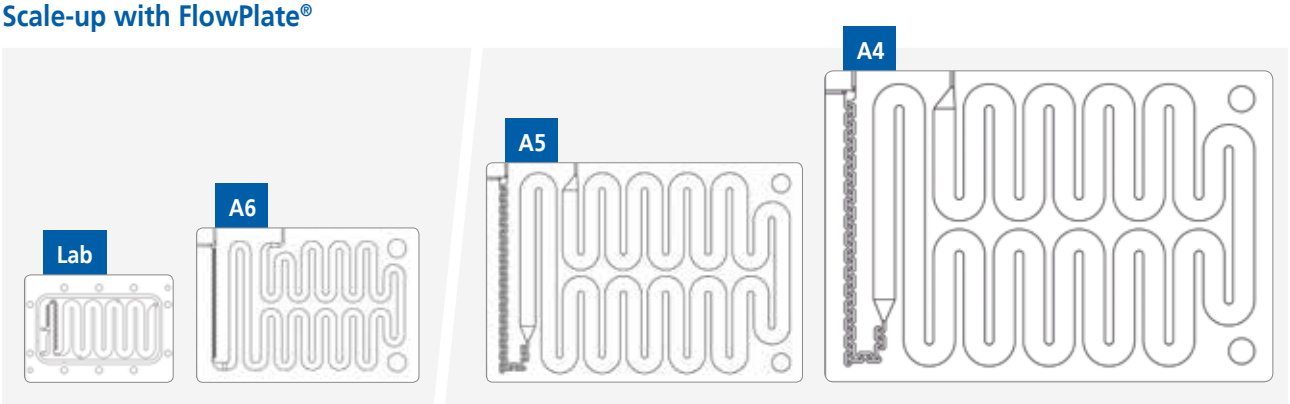
Small and frequently changing product quantities with high quality, a fast time-to-market – these are the major challenges in the pharmaceutical and fine chemical industry. The innovative solution: FlowPlate® MicroReactors. Thanks to this premium toolkit, developed by Lonza and exclusively distributed world-wide by Ehrfeld Mikrotechnik, active pharmaceutical ingredients (APIs) and fine chemicals can be researched and produced more competitively. In this respect, Lonza has received the prestigious Sandmeyer Prize, which was awarded by the Swiss Chemical Society (SCS) for its outstanding work in the field of applied chemistry.

And with good reason, since FlowPlate® features a series of compelling advantages: the easy and quick scale-up exactly meets the demands of global competition. In fact, campaign-based on-demand production under cGMP conditions and production up to ton scale are available within a very short time. High pressure resistance up to 100 bar offers new process windows for users. The compact design can be expanded modularly; plates with different channel design can be replaced easily, even in the case of a built-in reactor. The plate design can be flexibly adjusted to specific customer requirements and process tasks. The Cleaning-In-Place (CIP) process is easy to apply thanks to the process channel, which is free from dead volume with a closed and seal-free single-channel design.

The FlowPlate® range comprises

FlowPlate® Lab – the smallest in the range but superbly equipped: it is optimally suited for feasibility studies in the laboratory, process development and pre-clinical research. The exchangeable micro-structured process plate contains up to 10 inlets and outlets along the reaction channel. This ensures high flexibility for a variety of different processes. The flow process in the entire channel can be visually monitored through a sight glass (made of an outstanding Sapphire glass). →

Scale-up with FlowPlate®



LAB / PILOT
0.06 – 6 L/h; 1 – 10 L/h

PRODUCTION
1 – 20 L/h and up to 40 L/h

Ehrfeld Mikrotechnik GmbH
Mikroforum Ring 1
55234 Wendelsheim
Germany
www.ehrfeld.com

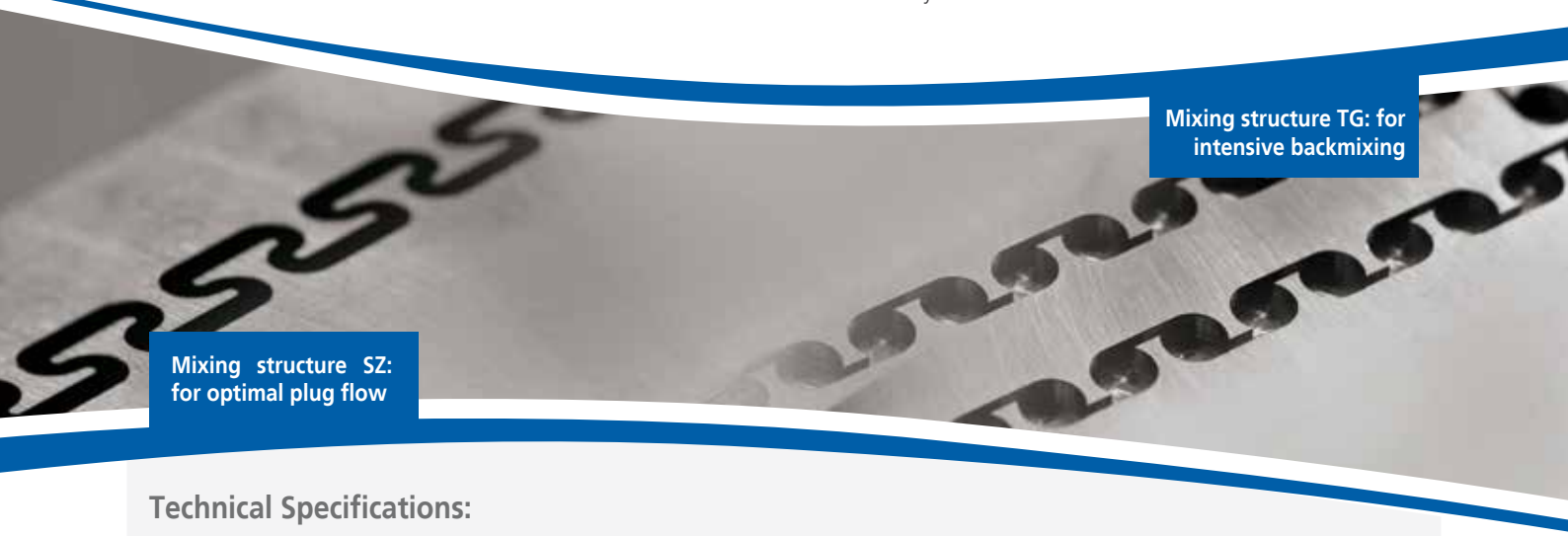
EHRFELD Mikrotechnik

FlowPlate® A6 and A5 – with these sizes, the scale-up continues smoothly: process development and research can therefore be carried out as well as production under cGMP conditions on a pilot scale or for launching a product on the market. The channel design resembles that of the laboratory version: here, the closed process plates feature channel structures for mixing and residence volumes, which can be easily replaced depending on requirements.

FlowPlate® A4 and A2 – they are still in the planning stage but offer promising outlooks: the process plates allow commercial manufacturing of an active pharmaceutical ingredient under cGMP conditions with flow rates up to 40 L/h (A4) and over 150 L/h (A2).

All the advantages at a glance:

- → high pressure resistance up to 100 bar
- → easy and quick scale-up under cGMP conditions
- → modular design that can be rapidly expanded and modified
- → flexible adaptation of the design according to customer requirements
- → simple application of the Cleaning-In-Place (CIP) process through a closed plate design
- → high heat transfer capacity
- → stoichiometric ratios of sensitive reactions can be kept accurately thanks to the single-channel design
- → safe handling of hazardous reagents
- → robust design since all process plates are made of Hastelloy® C



Technical Specifications:

	Lab	A6	A5
Temperature range	-10 – 200 °C	-55* – 200 °C	
Max. pressure process medium (service medium)	35 bar (6 bar)	100 bar (6 bar)	
Volume flows**	0.06 – 6 L/h 1 – 100 mL/min	1 – 10 L/h 15 – 150 mL/min	1 – 20 L/h 15 – 300 mL/min
Retention time/plate	0.5 – 30 s	1 – 75 s	2 – 130 s
Dimension (l x w x h)	149 x 74 x 64 mm^3	400 x 206 x 150 mm^3	450 x 270 x 200 mm^3
Weight	2.5 kg	26 kg	50 kg
Min. channel cross section mixing structure (= width x height of the channel)	0.5 mm × 0.2 mm = 0.1 mm^2	0,5 mm x 1.25 = ~ 0,6 mm^2	0,7 mm x 1.75 = ~ 1.2 mm^2
Channel cross section (retention channel)	0.3 – 2.5 mm^2	2.5 – 10 mm^2	2.5 – 20 mm^2
Number of process plates	1	6	
Process volume/plate	0.4 – 2 mL	3 – 12 mL	7 – 33 mL
Plate design*** (mixing structure)	SZ (homogeneous mixture), TG (gas-liquid mixture), LL (liquid-liquid mixture)		
Plate function(s)	mixing & retention volume (also with multiinjection or scale-up), contin. mixed retention volume	pre-heating, mixing & retention volume (also with multiinjection or for scale-up), retention volume	
Connections/plate	3 – 10	2 – 5	

* with special sealing
** per apparatus, limited by the installed plate(s)
*** see also illustration in the middle of this flyer

Status June 2019. We reserve the right to changes and errors. Illustrations and drawings are only approximately determinant.

EHRFELD Mikrotechnik