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StaMixCo Mixer LMXR for Polyol / Polyurethane Processing
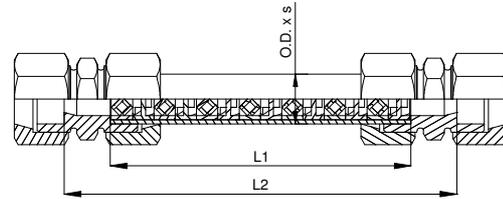
Mixing element LMXR
(licensee of BAYER AG)

Mixing of epoxy resins in an
empty pipe and in an mixer LMXR

Cross-Section of LMXR mixer with
ERMETO screw fittings

Application
- Mixing / loading / dispersing of polyol with gas or liquid blowing agent
- Mixing / dispersing of polyol with isocyanate

Mixer Characteristics
The LMXR mixing unit for polyol / polyurethane applications is used for efficient mixing, dissolving and dispersion of liquid or gaseous blowing agents (e.g. pentane, CO_2, air, FCH, etc.) into polyol and isocyanate. With insoluble or only partially soluble blowing agents a dispersion of fine droplets with a uniform diameter is achieved (large interfacial area between the phases). The results are PUR foams having a uniform cell structure and thin cell walls.

The mixing unit consists of static mixing and shearing elements, which are arranged inside a pipe housing in a special manner to achieve the highest efficiency.

The mixing elements can be removed from the housing simply by pressing on the mixing element sleeve/ring and pushing the mixing element assembly out of the housing. This handling will not damage the mixer grid, even when the mixing unit is completely cured. The individual mixing elements can be easily cleaned and reinstalled into the mixer housing.

Selection of the Mixer Size
When selecting a mixer size it has to be considered that at minimum flow-rate conditions the shear-rate in the mixing elements should not fall short of a minimum value which is decisive for achieving the necessary behaviour of the dispersion. The maximum flow-rate is limited by the maximum allowed pressure drop of the mixing elements installed.

Pressure Drop Calculation
With the factor K given in table „Mixer Data" below the pressure drop can be calculated as follows:

Pressure drop $_{Mixer}$ [bar] = K x volume flow-rate [l/min] x viscosity [Pas]	1 l/min = 0.06 m³/h 1 Pas = 1000 mPas or 1000 cp

Mixer Data

Type	Pipe O.D. x s [mm]	Screw Fittings ERMETO	Nominal pressure [bar]	Mixer Lengths L_1 and L_2 [mm]	Max. allowed Pressure Drop [bar]	Factor for Pressure Drop K	* Minimum Flow-rate [l/min]
PM-12-18	30 x 3	G30SAC3	280	290 / 344	280	1.48	ca. 3 - 5
PM-15-22	38 x 4	G38SAC3	280	330 / 388	280	0.68	ca. 6 - 10
PM-18-27	38 x 4	G38SAC3	280	380 / 438	280	0.33	ca. 15 - 20
PM-22-33	42 x 3	G42LAC3	160	480 / 522	160	0.18	ca. 25 -35

* With the order the minimum and maximum flow-rate as well as thee viscosity of the mixture should
  be indicated. This will allow to check whether the correct mixer size has been selected.

Materials of Construction
- Mixing elements: Stainless steel W.-No.: 1.4542 (= 17-4 PH = A 630)
- Pipe: Carbon steel St 37.4 zinc treated or stainless steel,
                          depending on clients request
- ERMETO screw fittings: Carbon steel, St 35 zinc treated

Other Executions
Executions with flanges, other couplings (e.g. reduction screw fittings) or in other dimensions for smaller or larger flow-rates are available on request.