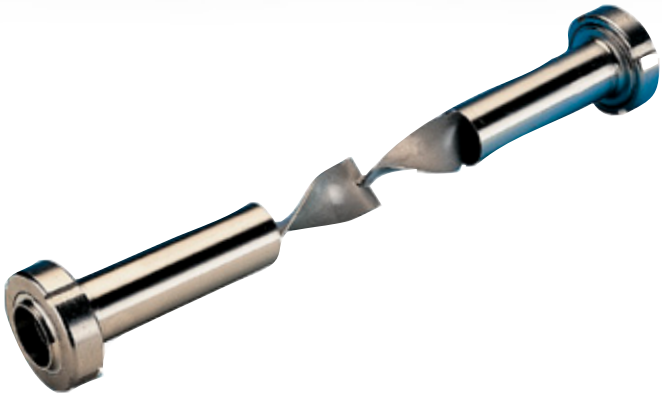
APV Flex-Mix™ TPX

STATIC MIXER TYPE

Application

The static TPX mixer is used for continuous mixing of different combinations of liquids, gasses, and particles. It is also well suited for ensuring an equal mixing temperature by for example direct steam injection. The static mixer can be used for both pre-and post-mixing. It can be used for mixing of dairy products such as cream and milk by standardisation, starter culture and milk, and fat and recombined milk.

The TPX static mixer is characterised by low energy consumption.



CAPACITY

Up to 110,000 l/hour.

STANDARD SPECIFICATION

- All parts in touch with the product are made of acid proof stainless steel AISI 316 L / DIN1.4404.
- Contains of four helical mixing elements. If more mixing elements are required, more mixers can be serial connected.
- Seal material in EPDM or FPM (Viton), FDA quality
- Sanitary design: normal or 3A for CIP cleaning
- Inlet/outlet fittings corresponding to DS/ISO, DIN and Clamp 3A

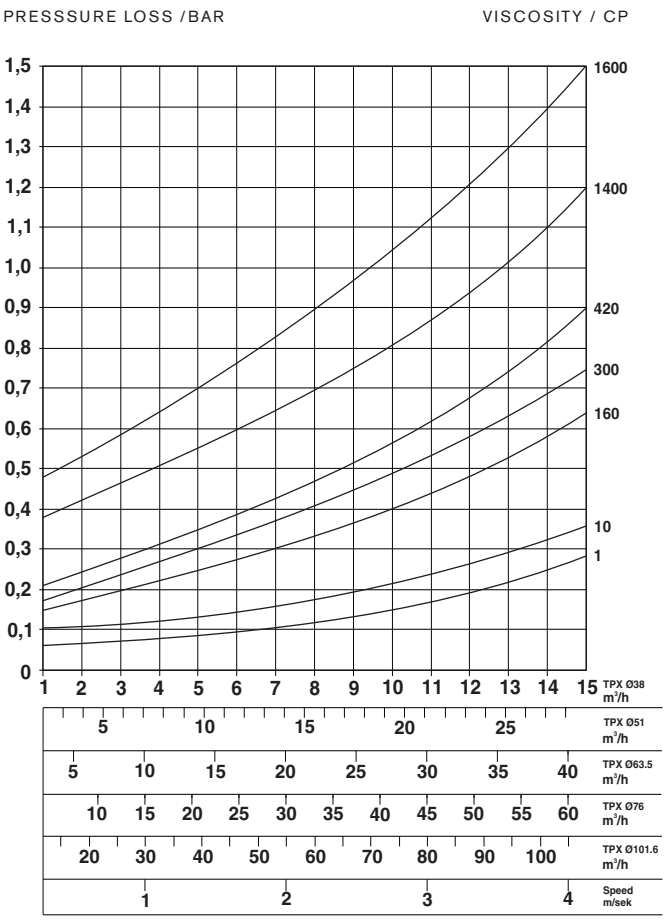
OPERATION

The mixer is an in-line mixer and has no moving parts. The static mixing element in the mixer housing ensures that the liquids are separated, spread, rotated, and whirled so that they are properly mixed. This takes place with a minimum of pressure loss. The liquid flow is ensured by either a pump or by gravitation.

The mixing elements are twisted 180° to the left and right alternately and are adjacent in 90° angles to each other.

The mixing takes place by either laminar or turbulent flow. For high viscosity products the aim is laminar flow, whereas mixing of low viscosity products is preferred by turbulent flow. For low viscosity products and turbulent flow four mixing elements will be sufficient to ensure a homogeneous mixture.

PRESSURE LOSS CURVE



TYPE	FITTING TYPE	PART NO.	D (MM)	L (MM)	WEIGHT (KG)
TPX 38	DS / ISO	L158056	38	420	2.0
	CLAMP 3A	L188326		480	
	DIN	L169938	40	432	
TPX 51	DS / ISO	L145162	51	610	2.7
	CLAMP 3A	L175667		668	
	DIN	L169820	50	622	
TPX 63	DS / ISO	L154002	63,5	692	4.5
	CLAMP 3A	L188437		741	
	DIN	L169937	65	706	
TPX 76	DS / ISO	L168701	76,1	868	5.8
	CLAMP 3A	L182644		952	
	DIN	L169936	80	918	
TPX 101	DS / ISO	L168702	101,6	1364	12.1
	CLAMP 3A	L175668		1405	
	DIN	NA.			

For laminar flow the liquid will be divided in two by each mixing element and simultaneously the direction in which the liquid rotates will change. The division of flow, the number of liquid flow layers and thus the mixing grade can be calculated as follows:

$N=2^n$ where N = No. of liquid flow layers (sections)

and n = No. of static mixing elements

Example:

A standard mixer with 4 static mixing elements => $N = 2^4 = 16$.

Two serial operating mixers mean 8 static mixing elements => $N = 2^8 = 256$ layer separations.

Whether the flow is laminar or turbulent is determined according to the Reynolds figures.

$$Re = \frac{v \cdot \rho \cdot D}{\eta}$$

where

v = liquid speed in mixer housing pipe [m/s]

ρ = density [kg/m^3]

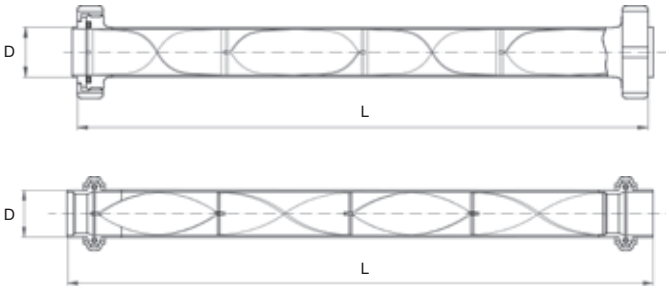
D = diameter of mixer housing pipe [m]

η = dynamic viscosity [Pa·s]

Re < 2320: laminar flow

Re ≥ 2320: turbulent flow

DIMENSIONAL SKETCHES



SPX Flow Technology, Pasteursvej, DK-8600 Silkeborg, Denmark
P: (+45) 70 278 278 F: (+45) 70 278 330

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