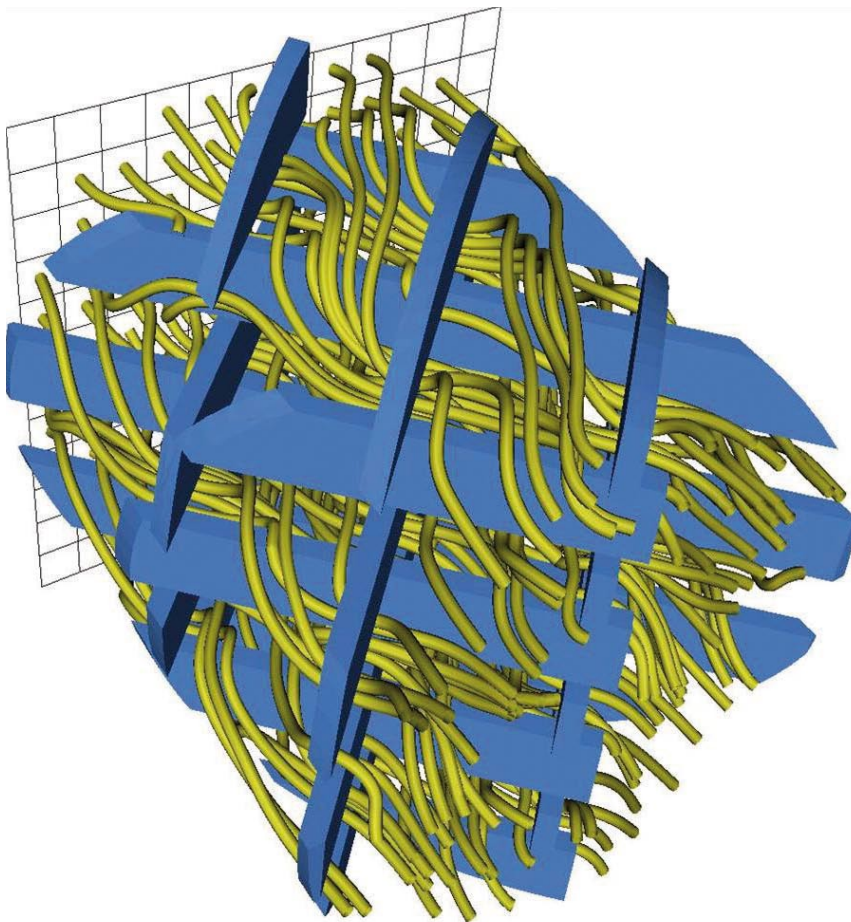


Mixers for the Plastics Processing Industry



Sulzer Chemtech is the world's leading supplier of static mixers and mixing systems. And for very good reason! We provide our customers with innovative and tailored solutions, enabling them to secure clear competitive advantage - as we have been doing for more than 35 years!

Continuous development of our products in close cooperation with customers helps us to be always one step ahead. Research and development work of the highest standard, backed up by tests and studies, own worldwide manufacturing facilities, excellent specialist advisory support and outstanding after-sales service - a sound basis for being able to maintain our No. 1 position in the market.



Homogeneity leads to quality

In polymer processing, perfectly homogenized melt plays a decisive role in achieving high-quality end products. Faults such as colour streaks, uneven wall-thickness or flow lines inevitably result in higher production costs and higher rejection rates.

This is where the static mixers from Sulzer Chemtech come into their own. High mixing efficiency in the shortest overall length, low shear attributes, and a zero maintenance requirement, predestine these mixers for wider use in the polymer processing industry. Both in injection moulding and extrusion processes, they ensure the degree of homogenization necessary to guarantee consistent high-quality plastic end products. One thing is certain, quality pays off. Take advantage of our know-how to shape your success.

Content

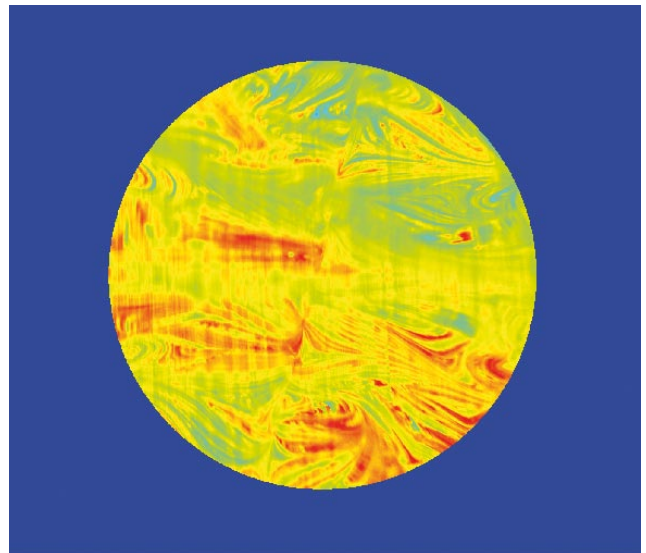
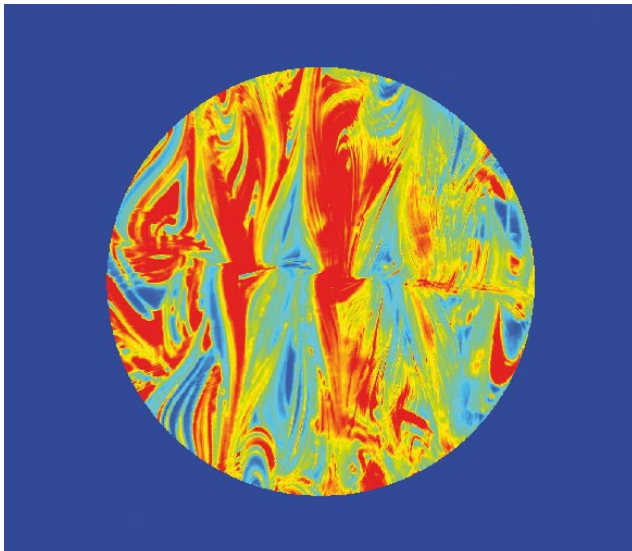
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What is static mixing?

Static mixing is mixing without the use of moving parts. What does move are the components to be mixed. In plastics processing, the components are propelled through the mixer by means of pumps or screws. The mixing elements remain in a fixed position and effect continuous split-off, expansion and redistribution of the melt flow across the full cross-section of the flow path. The result is a fully homogeneous melt.

Sulzer Chemtech maintains a comprehensive range of mixers suitable for special applications. Contact us for further advice, and do not hesitate to ask about possibilities for testing. Exploit the know-how of the best in this field!

SMX™ mixer with 4 mixing elements



SMX™ mixer with 6 mixing elements. Laser Induced Fluorescence shows the mixing effect of high viscous media in a laminar flow

Injection moulding - we identify solutions

Processing problems such as the formation of colour streaks are frequently solved by modifying the process parameters. In cases involving self-colouring of products, this approach is often only partially successful. Masterbatch concentration and screw back pressure have to be increased in such cases, inevitably leading to a substantial inflation of production costs.

Tackling the problem at the root

Through installation of a mixer, Sulzer Chemtech offers a simple but ingenious solution to completely rule out reoccurrence of such problems. In businesses aiming to produce qualitatively high-grade plastic workpieces at reasonable cost, a static mixer from Sulzer Chemtech quickly becomes an essential component of an injection moulding process.

Our mixers assure you of a consistently homogeneous melt, a privilege guaranteed by their patented geometry. The benefits are obvious: better quality of the formed workpiece, reduced colorant consumption, fewer rejects, lower costs, greater return.



Product produced without Mixer



Product produced with Mixer

Sulzer Mixing Heads SMK-X and SMK-R

The Sulzer Mixing Head type SMK-X or SMK-R is fitted directly in the nozzle of the injection moulding machine. It incorporates four to six mixing elements which serve to homogenize the melt during the injection phase. Colour and temperature distribution improve by a previously clearly predefined and exactly calculated factor in relation to the number of mixing elements employed.

The SMK-R is a modular system, an assembly of mixing elements, a middle sleeve and end sleeves. In the case of the SMK-X head, the mixing elements are brazed in a sleeve unit.

Applications

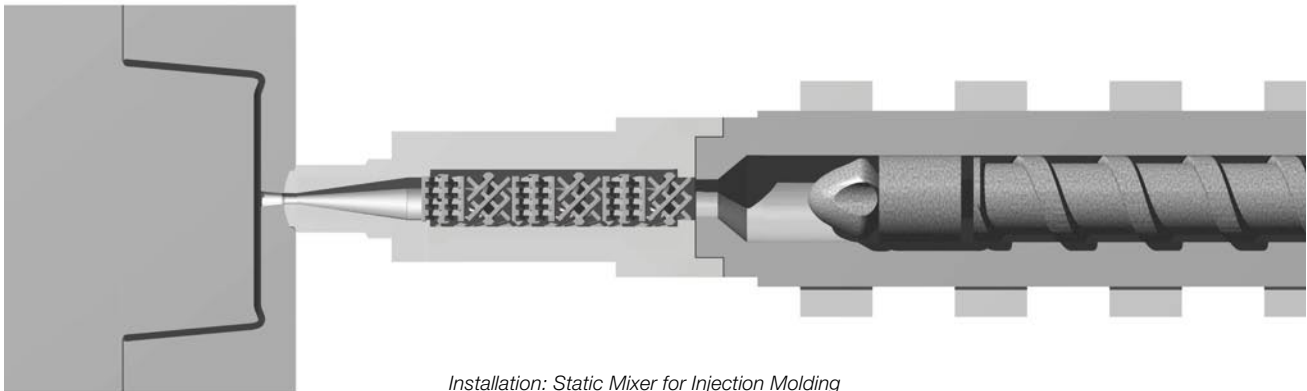
- Colouring of polymers
- Reduction of distortion problems
- Processing of recycled material (regrind)

Your benefits

- Reduced colorant costs of up to 30 %
- Improved cycle times
- Enhanced product quality
- Fewer rejects
- Short pay-back period
- Excellent self-cleaning properties



Sulzer Mixing Head SMK-R



Installation: Static Mixer for Injection Molding

The most suitable product for each application

Sulzer Injection Blender SIB

The injection blender SIB is an all-in-one solution specially developed for use with the Mixing Heads SMK-R and SMK-X. It simply replaces the existing machine nozzle and can be retrofitted to any type of injection moulding machine. Made to your specifications, it can be immediately installed and put into operation. Needless to say, the appropriate heater bands and thermocouples are also included in the scope of supply. In this way, you receive a tailor-made, all-inclusive system from a single source of supply.

Applications

- Colouring of plastic materials
- Solving of distortion problems
- Processing of recycled material (regrind)

Your benefits

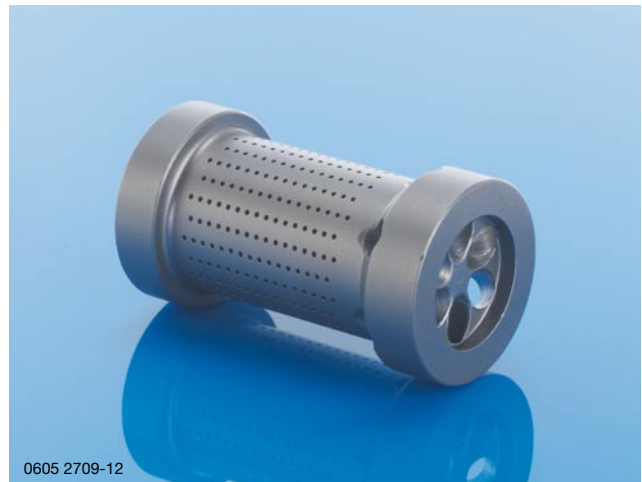
- Reduced colorant cost
- Improved cycle times
- Improved product quality
- Rapid amortization
- Easy installation, proven design



Sulzer Mixing Nozzle SIB with Protector

Additional, optional protection - the Protector

The Sulzer Protector (melt filter) guarantees a smooth, uninterrupted injection moulding process by providing protection against the inflow of coarse impurities. It is compact and fits perfectly into the Sulzer Injection Blender SIB.



Protector

We are happy to supply a test unit on a sale or return basis to allow you to assess the effectiveness of our mixer in your processing machines. If you are not completely satisfied with the results, return the mixer for a full refund of the purchase price.

Sulzer Mix Tip

The Sulzer Mix Tip was developed to correct homogeneity irregularities such as color streaks, poor regrind incorporations and uneven temperature distribution in plastic melts. It was designed for injection molding machines up to 150 tons and is available for the most common machines with individual radii and orifices. The Mix Tip is very easy to install by simply replacing the nozzle tip.

Your benefits

- No color streaks
- Very fast and easy installation
- Cost-effective solution



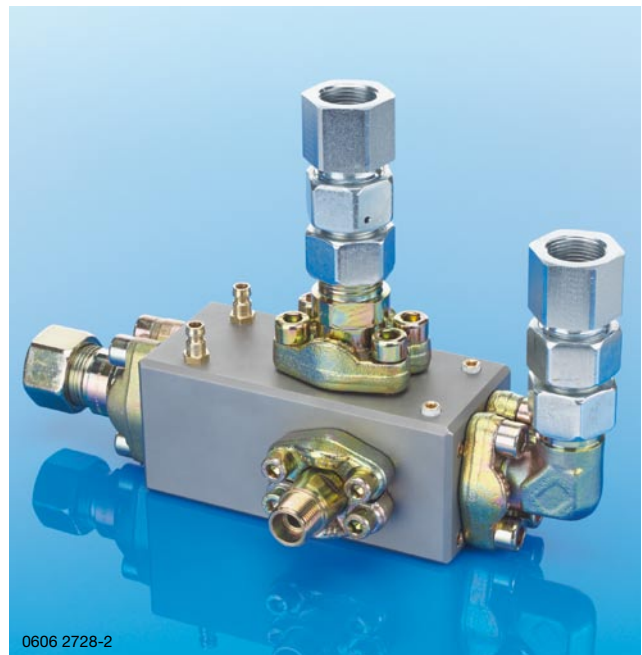
Sulzer LSR Mixing Block

This compact unit offers highly efficient mixing performance for liquid silicone rubber applications and allows the introduction of up to two different additives or colouring agents. It can be built directly into the injection machine, whether of piston or screw-type design. The stainless steel housing of the Sulzer LSR Mixing Block incorporates a Sulzer Mixer made up as standard of eight elements, with check valves as well as an integrated cooling system.

The LSR Mixer guarantees not only consistent high product quality but also complete homogenization of the colouring even at small amounts and low viscosity. The material does not harden, even if production has to be interrupted.

Your benefits

- Simple integration
- Excellent mixing performance
- Maintenance-free processing
- Efficient cooling without material hardening
- Low residence times
- No dead zones
- Long service life



LSR Mixing Block

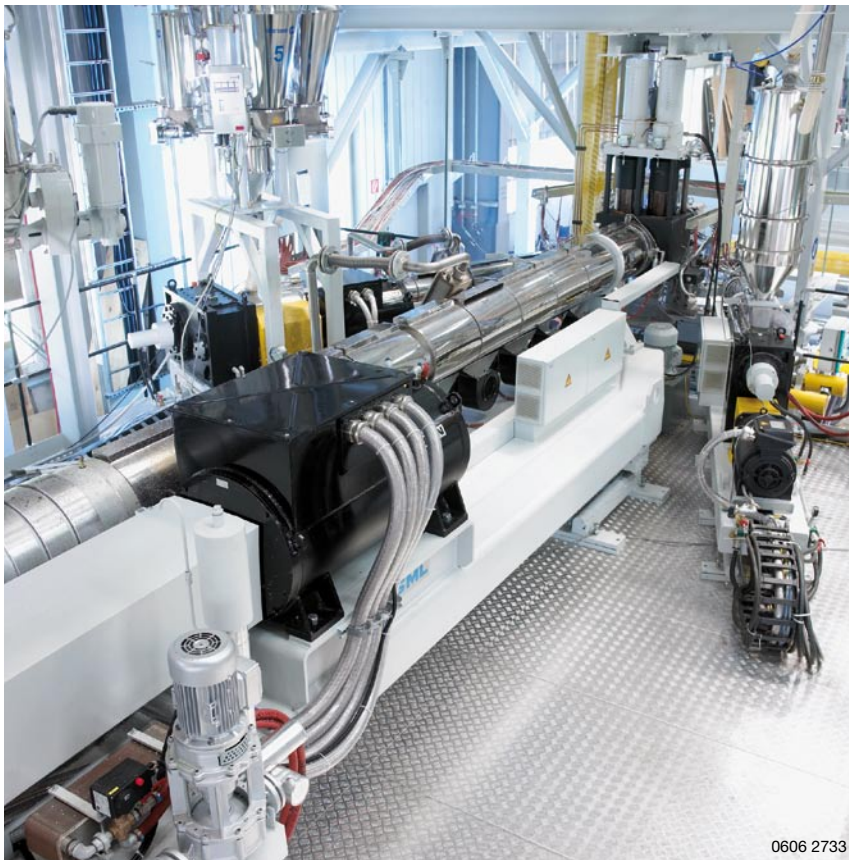
Extrusion

Extrusion - we optimize your process

In extrusion processes, the production of high-quality products also takes top priority. Sulzer demonstrates strong commitment to this field and is able to optimize your extrusion process with its specially developed mixers.

The design principle of Sulzer melt blenders is the result of many years of research and development. The mixing process takes place according to a specific, reproducible geometric pattern in open, crossed flow channels,. The result: consistently excellent mixing effect and minimum of shear forces exerted to the polymer. The extrudate is treated gently with utmost care.

The Sulzer melt blender is installed directly before the die in order to smooth out any flowlines in the melt. This ensures the very highest level of homogeneity of the melt entering the die, a decisive contribution towards achieving a high-quality end product.



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Extrusion Line,
SML Maschinengesellschaft mbH

Sulzer Melt Blender SMB-R

Our high-level standard product is the melt mixer SMB-R. Its application versatility covers the entire range of extrusion processes.

Normally it is installed just before the die after the screen changer and gear pump and consists of four to six mixing elements which mix the polymer melt in a radial direction. Depending upon the number of mixing elements, homogeneity is improved by a predetermined, clearly defined factor.

Upon request, we can supply you with the Sulzer melt blender SMB-R in the form of a complete system including housing, heater bands and thermocouples, and manufactured for installation according to your specifications.

Applications

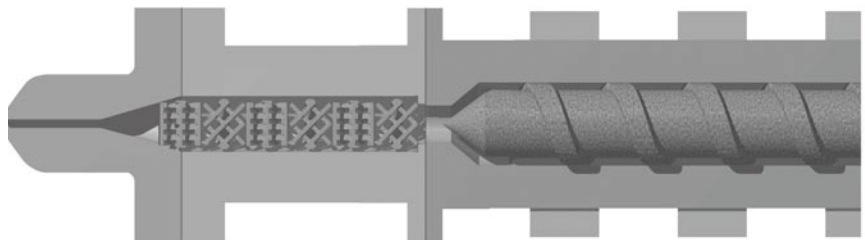
Production of panels, profiles, pipes, blown film, filaments, cable sheathing, fibers, blow-moulded articles

Your benefits

- Consistent quality of melt
- Absence of striations
- Even flow of melt into the die
- Homogeneous temperature and viscosity
- Smoother surfaces on inside of pipes
- Rapid pay-back
- e.g. uniform film gauge, uniform wall-thickness etc.



Sulzer Melt Blender SMB-R



Installation: Static Mixer for Extrusion

Put our claims to the test

Sulzer Melt Blender SMB-H

The Sulzer melt mixer SMB-H is even more robust and more compact than the SMB-R and suitable for extrusion involving higher pressure drops. The greater stability of the mixer enables processing of high-molecular polymers. The Sulzer SMB-H is therefore to be found predominantly in the field of blow moulding where it straightforwardly but effectively increases the quality of the workpieces.

Applications

- Blow-moulding
- Extrusion of up to 150 kg/h

Your benefits

- Elimination of flowlines
- Improved product quality, also with recycled material
- Straightforward installation in existing plant



Sulzer Melt Blender SMB-H

We are always happy to work with our customers to test our mixers on their machines to allow them to see the benefits that Sulzer mixers can bring to their extrusion processes.

Polyguard - your first choice for difficult cases

The new mixer structure of Polyguard stands for optimized flow behaviour with a narrow residence time distribution at a low shear force level. The result is an excellent standard of mixing at the lowest possible pressure drop.

Whether in the production of panels, film, pipes or cables, Polyguard ensures reliable homogenization of the melt, minimizes flowlines, evens out the temperature distribution over the entire cross-section, and eliminates colour striations. This easy-to-clean and easy-to-install mixer is of modular construction and therefore allows adjustment to suit the required degree of homogeneity.

Areas of application

- Extrusion of rigid- and flexible PVC
- Elastomer extrusion
- Extrusion of high and ultrahigh molecular polymers
- Polymers with critical residence time factor

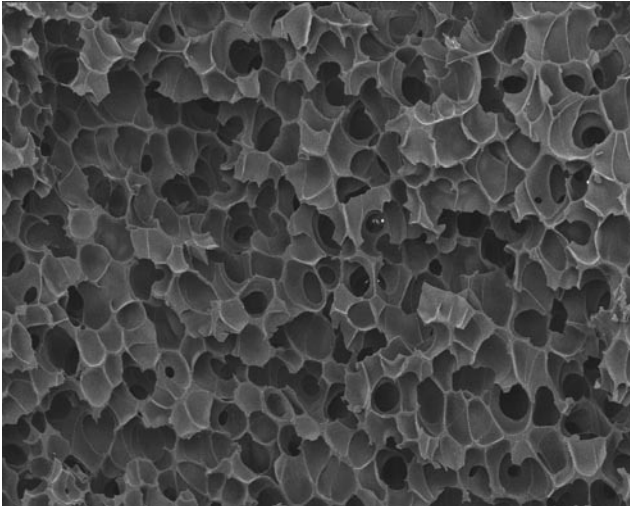
Your benefits

- Equalization of flow differences
- Elimination of temperature differences
- Improved colour distribution
- Low pressure drop
- Excellent self-cleaning behaviour
- Short pay-back time



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Polyguard Mixer



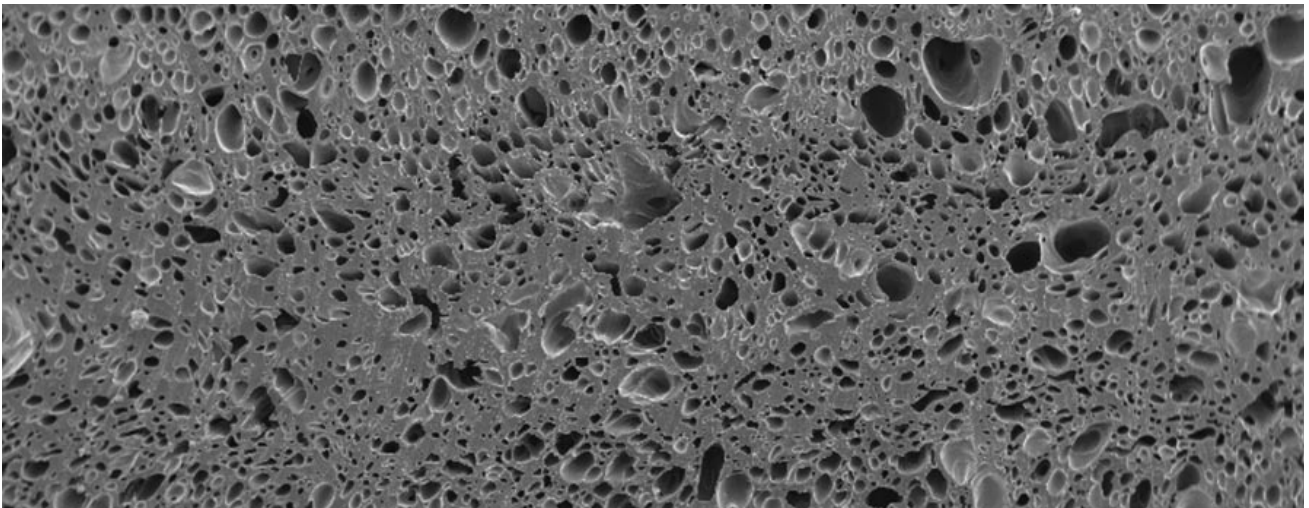
Cell structure of extruded PS

Source: IKV

Physical foaming – retrofitting of Optifoam™

Physical foaming without first having to install a new machine is no longer just wishful thinking. The solution is now available under the name of Optifoam™, a flexible and inexpensive, but above all practicable method of upgrading your existing plant.

The Optifoam™ is a highly versatile solution for foam applications in the plastics industry - one that is easy to implement. Optifoam™ is a modular system designed to suit any extrusion line independent of make or model. You can retrofit Optifoam™ to your machine without any modifications or change of components. The system will be exactly adapted to the requirements of your machine.



Cell structure of injection molded LSR

How can this work?

The Optifoam™ system comprises an injection nozzle, a well-proven Sulzer mixer, and a dosing device for the fluid blowing agent. The system is supplied by Sulzer as a package and can be easily and rapidly installed.

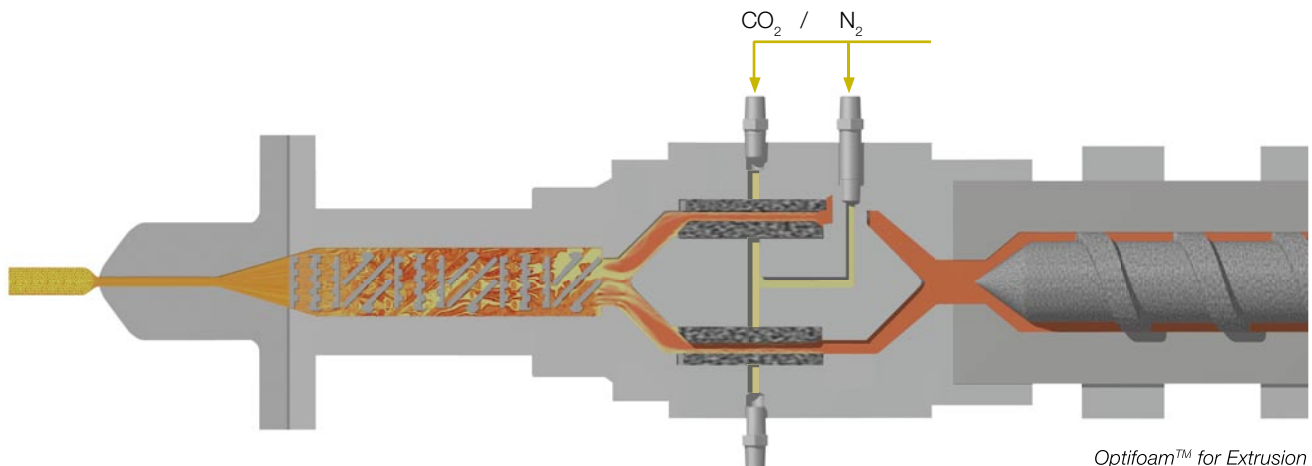
It works like this. An injection/mixing module is fitted to the plasticiser or extruder without any local modifications necessary. In this module, blowing agent is metered into the melt flow over a maximum surface area to ensure good pre-distribution of the blowing agent in the melt. Such mixture of blowing agent and polymer is further homogenized in the static mixer over sufficient residence time to allow for complete dissolution of the blowing agent.

Applications

- Extrusion of pipe and cable
- Film & plate extrusion
- Thermoform sheets

Your benefit

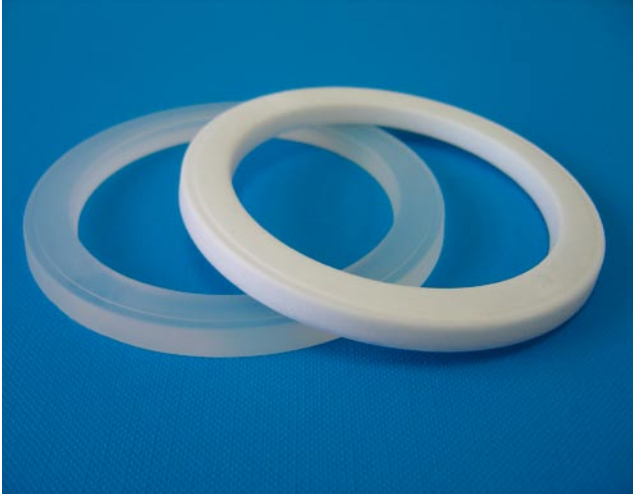
- Retrofitting independent of system
- Utilization of existing extrusion line without need for modifications
- Easy and rapid installation
- Quicker start-up than with other physical foaming process
- Reduced raw material costs



Physical foaming of Liquid Silicone Rubber

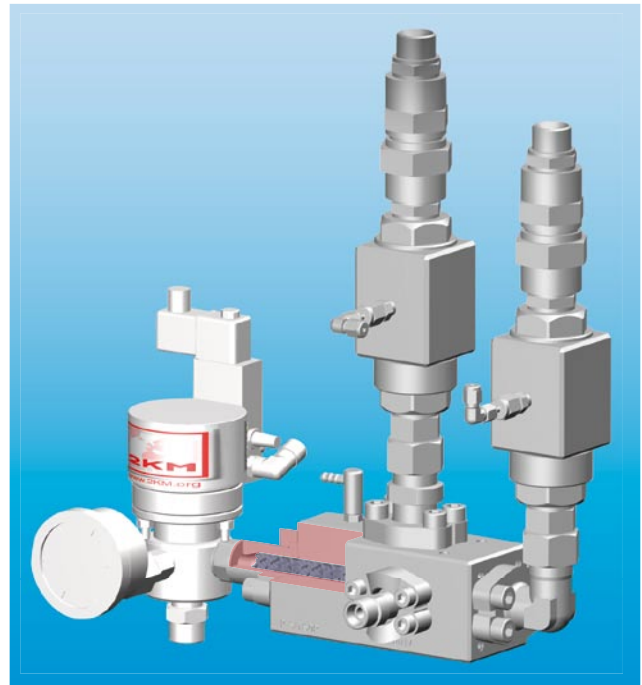
Retrofitting with Optifoam™ – Physical Foaming of Liquid Silicone Rubber

You want to foam LSR? Newly even that is possible. Sulzer's well established LSR mixing block is now offered with an additional module that allows charging the components with a physical blowing agent. The LSR expands to a fine cellular foam in the mold. The essential advantage: a remarkably high density reduction even at low wall thickness. The new system is a retrofit solution and adapts problem-free to conventional injection molding machines for LSR.



Gasket

Source: Topsil



LSR mixing block with Optifoam™ components

Applications

- Sealings & gaskets
- Damper rings
- Kitchen ware
- Medical applications

Your benefits

- Retrofitting of existing machines
- Easy and rapid installation
- Reduced raw material costs
- Short pay-back period

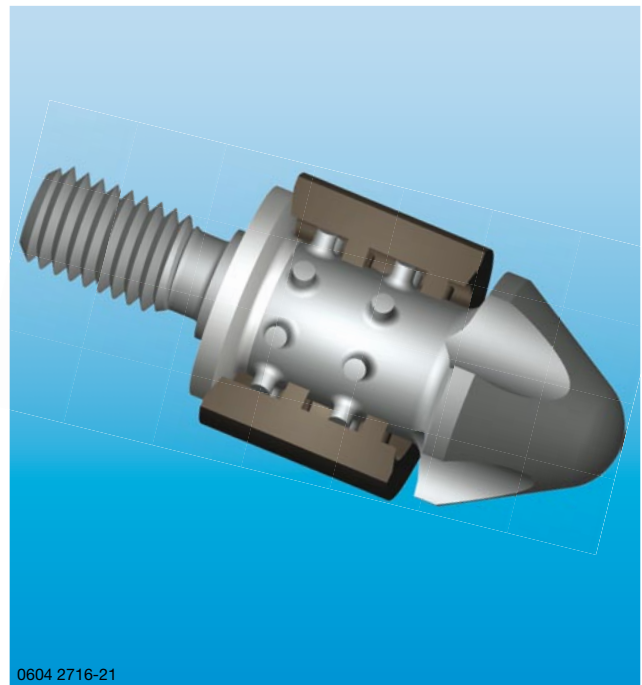
VIP™ - New Dynamic Mixer for Injection Moulding

The all-rounder! With its new VIP Mixer, Sulzer has now added a versatile dynamic mixer to its product portfolio. The VIP („Vortex Intermeshing Pin“) functions with pins which intermesh in cavities.

In injection moulding it simply replaces the standard non-return valve.

Your benefits: ease of installation and maximization of the mixing performance of your injection moulding machine at a minimum of effort and cost.

The VIP Mixer is supplied specifically to suit your machine so that no subsequent reworking is necessary. The result is excellent mixing without pressure drop.



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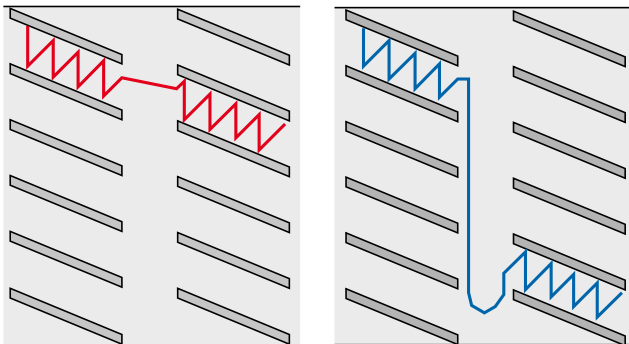
VIP™ Mixer

Applications

- Injection moulding machines with limited injection pressure
- Machines with limited space availability
- Polymers with a critical residence time factor

Your benefits

- Excellent mixing effect
- Easy installation
- Low pressure drop
- Allows full injection pressure
- No hang-ups
- Short pay-back period



Flow path without intermeshing pin Flow path with intermeshing pin

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Sulzer Chemtech Ltd, a member of the Sulzer Corporation, with headquarters in Winterthur, Switzerland, is active in the field of process engineering and employs some 2500 persons worldwide.

Sulzer Chemtech is represented in all important industrial countries and sets standards in the field of mass transfer and static mixing with its advanced and economical solutions.

The activity program comprises:

- Process components such as trays, structured and random packings, internals for separation columns and reaction technology
- Engineering services for separation and reaction technology such as optimizing energy consumption, plant optimization studies, pre-engineering for governmental approval, basic engineering
- Separation and purification of organic chemicals by means of crystallization and membranes
- Mixing and reaction technology with static mixers
- Mixing and Cartridges Technology
- Tower field services

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