



PROMIX

Solutions



KEY COM-
PONENTS FOR
PLASTICS
PROCESSING

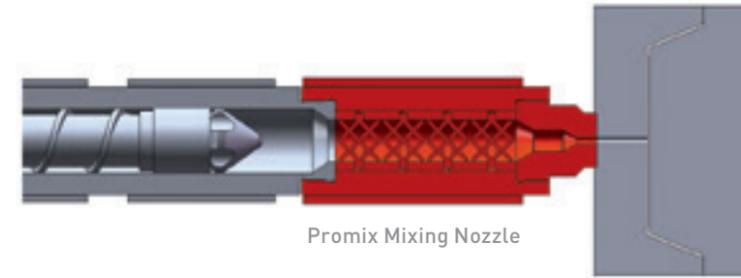
MIXING. FOAMING. COOLING.



HOW YOU BENEFIT TWICE WITH PROMIX

Discover the potential of Promix Mixing Nozzles: Save masterbatch and improve the quality of your parts

Quality problems in injection molding, like color streaking, are often solved by modifying the process parameters. This method often does not help when it concerns the self-colouring of products. Masterbatch concentration and screw back pressure must be increased – which means increased production costs. With the installation of a static mixer, Promix Solutions provides a simple, but efficient solution for companies wanting to manufacture cost-effective, high-quality plastic parts. Static mixers and mixing nozzles from Promix Solutions ensure excellent homogeneity in the melt; our decades of experience are a guarantee for this. The benefits are obvious: higher parts quality, reduced pigment consumption, fewer rejects, lower costs, higher return.



READY-TO-INSTALL SOLUTIONS

The Promix Mixing Nozzle replaces the existing nozzle of your injection molding machine and can be delivered, ready-to-install, within three weeks. The mixing nozzle is installed in no time, so your production can resume immediately following the installation. Benefit from our broad-based application know-how and personal consultation.

HOW STATIC MIXING WORKS

Static mixing is mixing without moving parts. The only thing that moves is the fluid in the flow channel. In plastics processing, the melt is transported by the plasticizing screw or by gear pumps. The mixing elements remain in a fixed position and bring about a constant splitting and transferring of the melt stream across the entire flow cross-section. The result is a homogeneous melt – materially and thermally.



COST SAVINGS WITH STATIC MIXERS FROM PROMIX

The color pigments are better absorbed and distributed in the melt with the installation of a static mixer from Promix Solutions. As a rule, this reduces the masterbatch consumption by 20 to 30%. This can bring cost savings of \$ 1,000 to \$ 10,000 annually. Static mixers from Promix can reduce costs in other ways. Here are a few examples:

- Reduced reject rate thanks to improved dimensional accuracy
- Greater proportion of regrind is possible
- Increased, consistent material strength of parts
- Shorter cycle times

& Facts & Figures

Masterbatch savings and reduced cycle times

\$ 90 000
Yearly savings thanks to Promix Mixing Nozzles due to

30%
Masterbatch savings from 2.2% to 1.5%

9%
Cycle time reduction from 120 sec to 109 sec

! Time for installation:
less than 1 hour

Application:
PP container, shot weight 7000g



YOUR BENEFITS IN INJECTION MOLDING

- Savings equivalent to 20–30% of masterbatch costs
- No color streaking or flow lines
- Shorter cycle times
- Increased admixture of regrind material
- Better tolerances and therefore lower reject rates
- Higher parts strength
- Easy to clean



Roll-on deodorant housing molded without Promix Static Mixer



Roll-on deodorant housing molded with Promix Static Mixer

HOW TO INCREASE YOUR PRODUCTIVITY WITH PROMIX

Find out why many producers equip their production lines with Promix Melt Blenders

The manufacture of high-quality products also has top priority in extrusion processes. Promix Solutions is in a position to optimize your extrusion process using the melt blenders specially developed for it. In addition, many producers can also raise the output of their production lines. Poor surface quality, long cooling times, high thickness tolerances and other quality issues often limit the maximum production rate.

Promix Melt Blenders eliminate such limitations effectively and sustainably, leading to significant cost savings. With Promix, you get a high-quality, ready-to-install melt blender designed to provide optimum performance for your specific application.

Get the maximum benefit thanks to our many years of design experience!



HIGH-QUALITY READY-TO-USE SYSTEMS

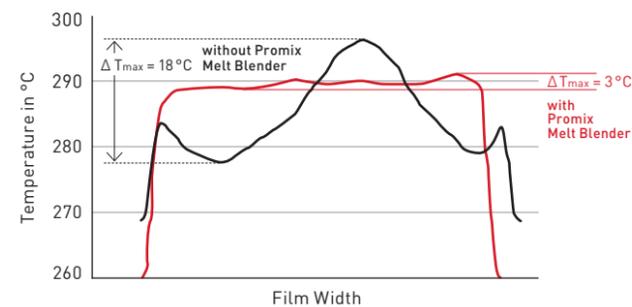
Promix Melt Blenders are installed downstream of the melt pump/screen changer and directly upstream of the die. This ensures outstanding homogeneity of the melt entering the die. The integration of a Promix Melt Blender is a very efficient and economical way to sustainably improve your extrusion process.

Promix Solutions supplies you with ready-to-install systems including housing, adapters and heating for fast and problem-free installation into your existing extrusion process.

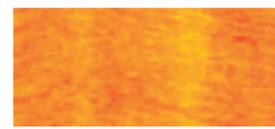
THE KEY TO IMPROVED PRODUCT QUALITY

In extrusion processes, temperature differences in the melt will be generated by the plasticizing process in the screw, melt pump, screen changer and even by empty pipe sections. The diagram below shows how the Promix Melt Blender evens out the temperature across the whole flow channel. A uniform distribution of temperature and velocity is the key to high-quality extrusion products.

Improve your product tolerances and the surface quality of your product and raise the throughput of your production line using a Promix Melt Blender.



Thermoscan of a PE-coating film without Promix Melt Blender



Thermoscan of a PE-coating film with Promix Melt Blender



CONTINUOUS R&D EFFORTS – A MUST FOR THE TECHNOLOGY LEADER

The geometry and construction of the Promix Melt Blender are the result of many years of experience and continuous development. Our latest Melt Blender generation, SMB plus, combines outstanding mixing properties with low pressure loss and a very robust construction. The flow-optimized mixer geometry has been developed with the help of the latest CFD simulation tools and demonstrates unsurpassed self-cleaning properties.

A narrow residence-time spectrum and good inline cleaning are of great importance in extrusion. This is the only way to ensure that the polymer melt does not decompose and that no large scrap quantities due to changes in product or color occur. Despite its complex geometry, the mixer has no dead zones and builds up fewer deposits compared to empty pipe sections. This has been demonstrated in our own technical center. Ask us!

& Facts Figures

Increased throughput thanks to Promix Melt Blender

\$ 300 000

annual saving achieved from

30%

throughput increase from 120 kg/h to 160 kg/h

! Time for installation: less than 4 hours

Application: Table edge strip made from ABS



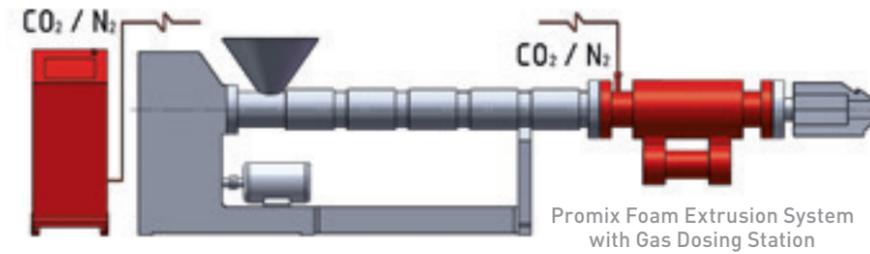
YOUR BENEFITS IN EXTRUSION

- Constant high melt quality
- Higher throughput
- Avoidance of flow lines
- Uniform temperature distribution in the entire melt stream
- Uniform sheet thickness
- Excellent incorporation of additives
- Homogeneous cell structures of foams

HOW TO FOAM SUCCESSFULLY WITH PROMIX

Find out how you can save money and weight with Promix Foam Extrusion Systems and also be ecofriendly

Produce microcellular foam products of the highest quality. Both existing and new extrusion plants can be very easily converted into foam extrusion plants with the Promix Foam Extrusion System. Promix Solutions analyzes your extrusion process and develops an optimum solution to match the application. The patented technology is based on the use of cost-effective and ecofriendly physical blowing agents such as CO₂ and nitrogen. The solutions are suitable both as a substitute for chemical foaming and also for a changeover from non-foamed to foamed extruded products. The investment already pays for itself within a few months and the environmental impact is lowered by the reduction in plastics consumption.



PROMIX FOAM EXTRUSION

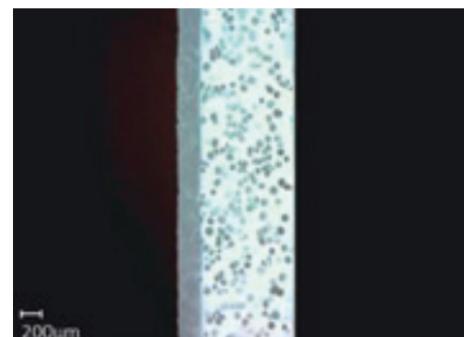
Promix Foam Extrusion Systems are integrated into the extrusion plant and consist of components for dosing and injection of blowing agents as well as homogenization and cooling of the melt. The blowing agent is added in a controlled manner by the high-precision Promix Gas Dosing Station developed specially for physical foaming. Highly efficient, patented static and dynamic Mixing Systems ensure an optimum admixture of blowing agent in a short process length. The unique P1 Cooling Mixer technology is a further key component for producing very fine-celled foam products with exceptionally uniform cell distribution.

ENTRY INTO FOAMING HAS NEVER BEEN EASIER

Promix Foam Extrusion Systems include all components and services necessary to manufacture a very high-quality microcellular foam product.

The Keys to Success

- Promix Gas Dosing Systems for highest dosing precision and very easy operation have been specially developed for physical foaming
- Highly efficient, patented static and dynamic mixing systems with very short installation lengths
- Unique, patented P1 Cooling Mixer technology for outstanding foam results
- Foam compatible screw design
- Comprehensive guidance and project support
- Pilot tests and sample production in our extrusion laboratory

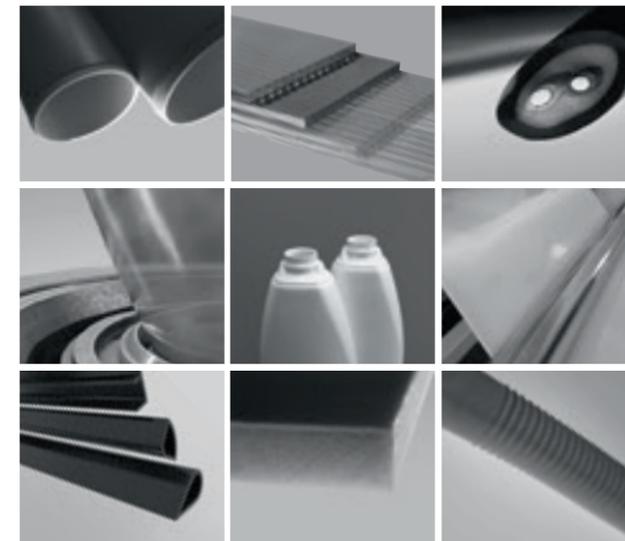


Microcellular foam sheet

MORE THAN 100 SYSTEMS SOLD WORLDWIDE

Promix Foam Extrusion Systems are in use for a very wide variety of applications and for almost all polymers – and for plants with output rates of 5 kg/h to more than 2000 kg/h. By producing very homogeneous microcellular structures, high-quality foam products with very low densities and outstanding mechanical properties can be manufactured:

- | | | |
|-----------------|--------------------|------------------|
| Foam-core pipes | Twin-walled boards | Cables |
| Blown films | Bottles | Flat sheets |
| Profiles | Sandwich boards | Corrugated pipes |



& Facts & Figures

High material savings due to physical foaming

\$ 80 000

monthly savings thanks to the Promix Foam Extrusion System

25%

Density reduction
Extruder capacity 600–1000 kg/h mono and multilayer

! Time for installation:
less than 2 days

Application:
Thermoformed trays in PS and PET



YOUR BENEFITS FROM FOAMING

Considerable cost savings (density reduction 10–70%)

Outstanding foam quality and process stability due to unique technology

Easy installation in existing and new extrusion lines

No licence fees

Easy switch from foamed to non-foamed products

Eco-friendly, light weight products

HOW YOUR LIGHT FOAM BECOMES EVEN LIGHTER WITH PROMIX

Find out with Promix key components how you can make your XPS, EPS, XPE, XPP and XPET light foams even lighter and improve their mechanical properties

Install Promix key components to optimize the production of light foams such as XPS insulation boards, XPE foam sheets, foamed thermoforming sheets made from EPS or XPP.

The P1 Cooling Mixer, the Q1 Annular Die and other key components make the difference here. These can further reduce the density, improve the cell structure and increase the throughput of the plant – so leading to considerable cost savings in production.

Whether you have tandem or twin screw extruders, making thermal insulation boards, packaging film, food trays or pipe insulation, we will analyze your existing plant concept and make suggestions for optimizing your process and increasing your profits.

Our experts will provide support up to the successful start of your production.

A LEAP IN QUALITY FOR YOUR LIGHT FOAM APPLICATIONS

Promix key components are used in many light foam applications and have significantly improved quality and reduced costs for such applications as:



XPS insulation boards

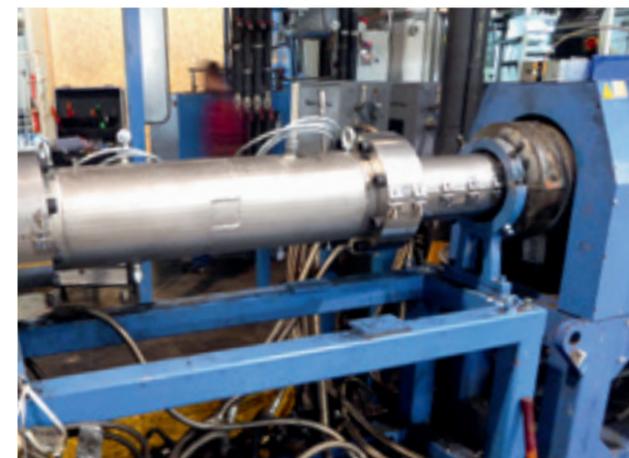
- More uniform and finer foam structure
- Increased line throughput; especially with thick boards
- Lower foam density
- Saving in blowing agent
- Reduced flame retardant concentration

NEW PROCESS OPTIONS THANKS TO P1 COOLING MIXER

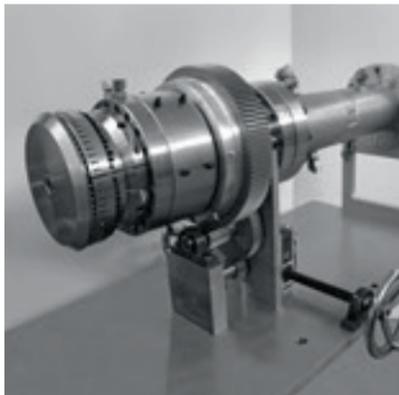
The Promix P1 Cooling Mixer is the unique combination of a very efficient static mixer and a powerful cooler.

The innovative patented technology opens up completely new process technology options for light foam production.

By simultaneously providing mixing and cooling functions in the P1, the precise control of ideal melt temperature for your process is assured. Flow velocity and temperature become uniform across the entire melt stream, creating ideal conditions for producing a high-quality light foam product with very homogeneous, fine cell structure. The P1 cooling mixer technology can be used for all light foam applications with astonishing results.



P1 Cooling Mixer installed in XPS insulation board plant



YOUR BENEFITS WITH LIGHT FOAMS

- Raw material savings thanks to lower foam densities
- Significantly improved, very homogeneous cell structure
- Improved mechanical properties
- Savings in blowing agent and additives
- Higher production throughput
- Much smaller thickness tolerances

XPE foam sheets and profiles

- Lower foam density
- More uniform cell structure
- Smaller thickness tolerances



PS, PP & PET foam food packaging

- Lower foam density
- Greater stiffness
- Better thermoforming behaviour
- Lower thickness tolerance

& Facts & Figures

Significant saving in weight thanks to better cell structure

\$ 70 000

monthly savings by installing Promix Annular Dies and P1 Cooling Mixer technology

23%

weight reduction of 6.5g to < 5.0g per tray with 20% greater strength

! Time for installation: approx. 1 week

Application: Thermoformed food tray made from PS



HOW YOU FOAM WITH PROMIX DOSING SYSTEMS

Learn how you perform high-precision N₂ and CO₂ dosing with Promix Gas Dosing Systems

Dosing nitrogen or carbon dioxide with high precision is a basic prerequisite for the manufacture of premium quality foam products. The Gas Dosing Stations specially developed by Promix for physical foaming set standards in terms of dosing technology. Even the smallest quantities of blowing fluid down to 1 g/h can be dosed very accurately. Operation is simple, safe, easy and reliable – which will be greatly appreciated by the operational staff. Trend charts for pressure and mass flow versus time and definable limits allow comprehensive process monitoring at any time. The dosing systems are available for throughputs up to 3000 g/h and dosing pressures up to 700 bar. Would you like to see the advantages? We will be pleased to offer you a suitable test system.

FULL INDUSTRY 4.0 CAPABILITY

If you would like to incorporate the Promix Gas Dosing Station into your extruder control system, no problem. We integrate the correct fieldbus system so that all functions of the dosing station can also be operated from a higher-level process control system. And if you need support at any time, our technicians can access systems worldwide using remote maintenance.



Promix N2 Dosing System as part of a foam extrusion line

YOUR BENEFITS FROM DOSING

- Dosing stations developed specially for physical foaming
- High precision dosing of CO₂ and N₂
- Very easy and reliable operation
- Dosing quantities of 1 g/h to > 3000 g/h
- For dosing pressures up to 700 bar

HOW YOU COOL MELTS WITH PROMIX

Get to know more about efficient melt cooling without fouling problems.

Would you like to cool your polymer melts? Promix provides you with very efficient melt coolers and heat exchangers for medium to high viscosity melts and fluids. In cooling processes, polymer melts tend to deposit on cooled wall sections, (fouling), which leads to a lower cooling performance and decomposition of the polymer. In Promix Melt Coolers, the melt flows through the cooler in a single stream and is mixed continuously over the entire flow cross-section. Very efficient cooling without deposits or decomposition problems is the result. Promix Melt Coolers come in different versions, depending on the cooling task to be performed. They are also suitable for very residence time-critical polymers such as polyesters and polycarbonates.

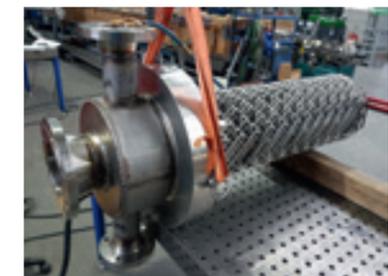
MORE THROUGHPUT THANKS TO MELT COOLING

Quality features such as thickness tolerance or surface finish limit the maximum throughput of the line in many extrusion processes. Install Promix Melt Coolers to increase the capacity of your production line, because in many cases the quality problems are due to a melt temperature that is too high. An exact temperature control is key for high quality products.

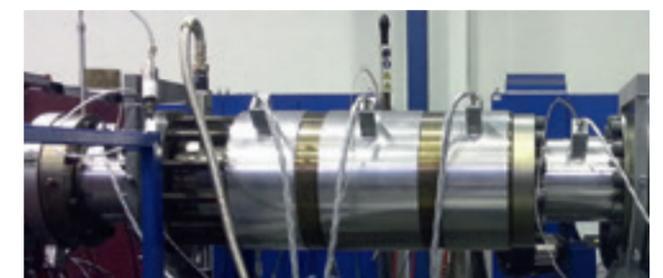


YOUR BENEFITS FROM COOLING

- Very high cooling capacity
- Exact temperature control
- Excellent cross-mixing prevents blocking and fouling problems
- Narrow residence-time spectrum
- Short installation length
- Low pressure drop



Increased throughput in your extrusion line thanks to Promix Melt Coolers





PROMIX

Solutions



PROMIX® SOLUTIONS **THE EXPERTS FOR** **MIXING. FOAMING. COOLING.** **IN PLASTICS PROCESSING**

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Whether it is a retrofit solution or installation in a new plant, Promix Solutions provides outstanding technological key components and system solutions together with broad process knowledge and experience. These include mixing nozzles, melt blenders, foam extrusion systems, gas dosing systems, unique cooling mixers, melt coolers and inline viscosity measuring devices. Optimize your processes, save on raw material costs, raise the production capacity, improve the product quality! More than 50,000 reference applications for static mixers and heat exchangers and more than 100 installed foam extrusion systems worldwide are evidence of this.

The headquarters of Promix Solutions AG is in Winterthur, Switzerland. A second facility with a large delivery warehouse in Wetzlar, Germany can supply you at short notice.

Our customers in the US and Canada are supported directly by Promix Solutions LLC.

A broad and well-established network of sales partners makes it easier for you to make contact – worldwide.