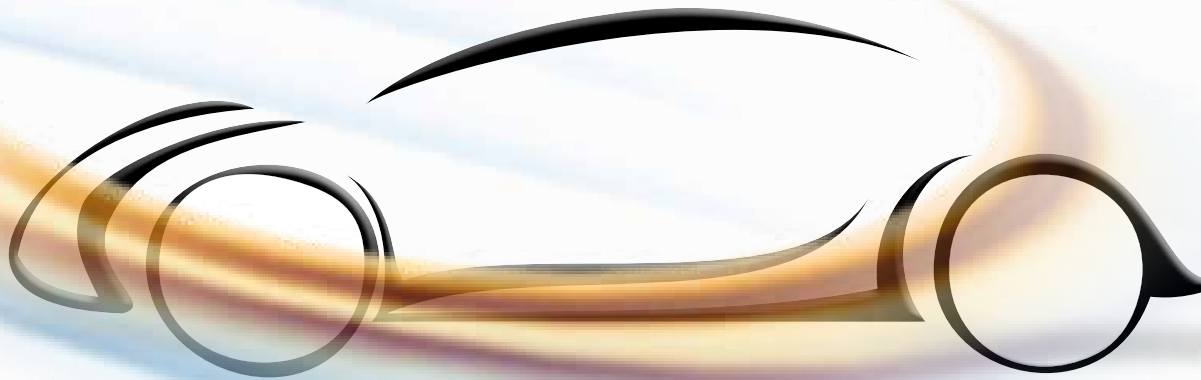




MIXING GROUP



**TECHNICAL
RUBBER GOODS**



EFFICIENT FUTURE SOLUTIONS. Pure Passion – HF MIXING GROUP.

At the HF MIXING GROUP, we develop ideas with the highest benefits for our customers. We use our engineering know-how, our many years of experience and our depth of industry-specific knowledge to create efficient, future-oriented solutions for the rubber processing industry with passion. Our products for the technical rubber goods industry are highly reliable, meeting the demanding requirements of mixtures for applications as varied as sealing profiles, cables, brake pads, high-purity mixtures for the pharmaceutical industry and other fields of the rubber processing industry. Our services go beyond the products themselves. We also offer our customers tailored solutions on-site, ensuring the reliability of standard as well and customised solutions.



EXPERTISE BUILT ON EXPERIENCE. Pure Passion – HF MIXING GROUP.

Since early 2010, the companies Harburg-Freudenberger, Farrel and Pomini Rubber & Plastics have operated together as HF MIXING GROUP. Each company offers both a long tradition and special strengths in building machines for the plastics and rubber industry, all of which have been consolidated and integrated to your advantage. Thanks to the collective skills and experience of the group and a focus on core products at each site, the ability of HF MIXING GROUP to develop solutions grows stronger all the time. As a result, market needs can be met faster and better.

It is our promise to you to create products and services in line with our values of reliability, ambition and sustainability with passion. That is how things began 150 years ago, and it is the same today.



- 1 Upstream equipment**
material feeding system – fillers, plasticisers, rubber
- 2 Mixer**
- 3 Mixing room automation system**
- 4 Drive chain**
- 5 Downstream equipment**
single-screw or twin-screw discharge extruder,
mill(s) and batch-off unit



A SYSTEMATIC MIX. Pure Passion – HF MIXING GROUP.

The HF MIXING GROUP uses its technical expertise to develop compounding facilities and systems while taking into account increasingly stringent safety and efficiency requirements. It is therefore also particularly important for us to optimise mixing line procedures by working on improved coordination between individual line components and the control system. We believe that integrating machines and control systems will continue to gain importance in future, just as we have seen with the development of the automobile. We have therefore set ourselves the goal to optimise the availability of mixing lines, enabling you to plan for unavoidable standstills.

INTERMIX® E SERIES

The INTERMIX® E is a prime example of inter-meshing machine technology. It is the top performer by far in the technical rubber goods industry. The PES5 rotors feature unique inter-meshing wing technology that ensures the homogenous distribution of all mixture components and the highest possible degree dispersion. The rotor design and optimised cooling behaviour also enable all machine components that come into contact with the mixture to efficiently process single-step mixtures in many cases.

MORE FEATURES:

- **Highly effective cooling (Super Cooled®)**
- **Crack-free special hard surfacing**
- **Innovative ram pressure control**
- **Optimised dust seal system**



INTERMIX® VIC SERIES

The INTERMIX® VIC is another technical highlight for intermeshing machine technology. This machine type supplies an additional and unique processing parameter of great importance for the technical rubber goods industry because it allows the gap between the rotors to be adjusted during the mixing process. A large gap makes it significantly easier to draw the raw materials into the mixing chamber, while a narrow gap increases the quality of dispersion. Thanks to the gap adjustment option, the machine can be used very flexibly. Like the INTERMIX® E, it delivers high specific energy into the mixture in the shortest time thanks to the favourable relationship between volumes and cooling surfaces.

MORE FEATURES:

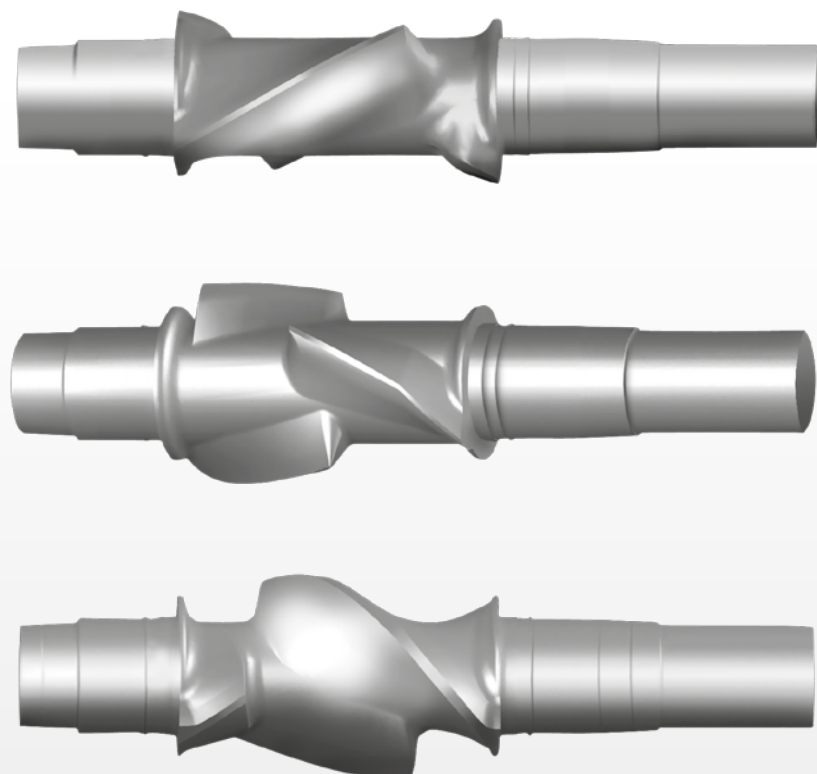
- **Variable distance between rotors for optimal mixing process steps**
- **Fast intake and adjustable shear level**
- **Flexibility for different process applications (mastication, remilling masterbatches and final production)**
- **Durable crack-free hard facing for extended lifetime**
- **Hydraulic ram with highly accurate pressure control**
- **Hydraulic dust seals with multiple cylinder concept (HCD) for a superior seal and easy maintenance**

BANBURY® SERIES

Farrel is the owner of the BANBURY® mixer, which it has now brought to the HF MIXING GROUP. We have optimised the machine within the group, incorporating the best features of previous models from HF, Farrel and Pomini. The BANBURY® mixer is ideally suited to the specific requirements of multi-step mixing applications. Criteria such as good intake behaviour, excellent dispersion and distribution quality, and maximum cooling ability guarantee efficient and profitable masterbatch and final mixing processes. These characteristics meet numerous performance criteria that are of great significance for technical rubber goods.

MORE FEATURES:

- Increased volumes for tangential mixers
- Fully hydraulic hopper with iRam function
- Greater batch size with Keel Bottom™ Weight
- Optimised HCD dust stops and new single-point lubrication system
- Wide variety of hard surfacing systems to meet individual demands



TANGENTIAL ROTORS

The HF MIXING GROUP offers the broadest possible choice of tangential rotors for the most varied of tasks. You can select from the entire range of developments from HF, Farrel and Pomini in our BANBURY® series of mixers. Our product portfolio includes aggressive masterbatch mixing rotors with extremely high specific energy output and all-purpose products such as rotors that are trimmed to the requirements of the final mix. Out of our entire product range of rotors, the balanced mixing characteristics of the NST™ rotor have made it a trusted performer in the industry. Please contact us for detailed information about our range of rotors. We will be happy to advise you.

MORE FEATURES:

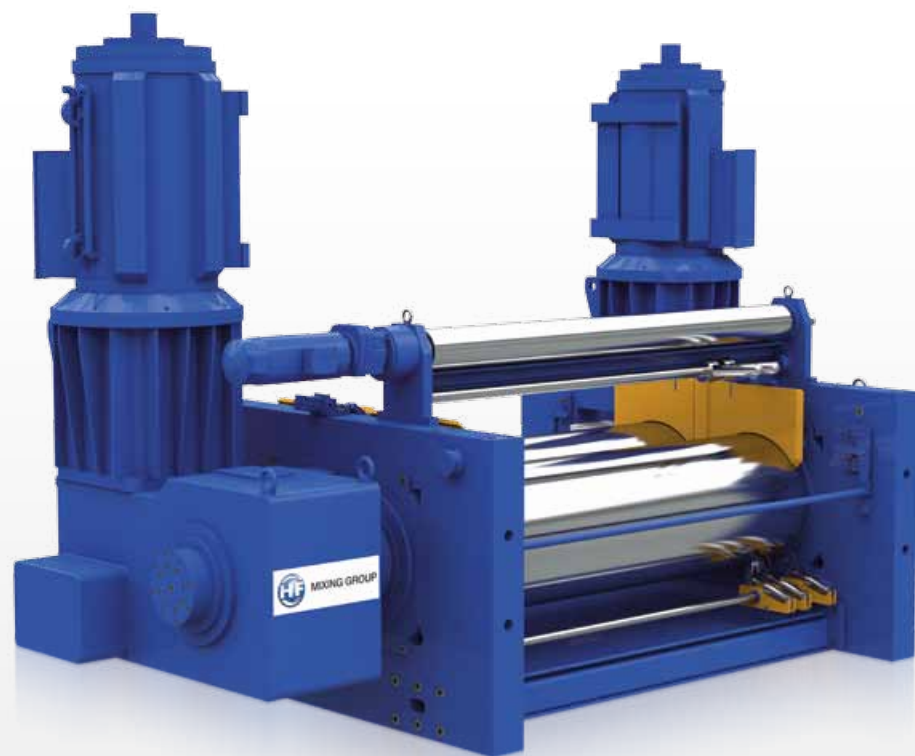
- New rotor geometries for tangential mixers
- Advanced Super Cooled® rotors for excellent temperature control
- Sturdy rotor design that has been tried and tested
- Optimised rotor alignment to eliminate dead zones
- Customised hard surfacing for individual needs

CONVEX™ SERIES

At the HF MIXING GROUP, we developed the CONVEX™ series for customers in line with our 'best of the best' philosophy. It is the new generation of twin-screw discharge extruder. Its energy-efficient screws, compact and sturdy construction, and fully hydraulic calender make it a reliable machine both for conventional and diverse applications. These features give it an impressively high throughput performance with optimised temperature control and very good self-cleaning behaviour. These unique characteristics guarantee the superior quality and performance of mixer lines. As a result, the CONVEX™ series is an interesting alternative to mills in the technical rubber goods industry.

MORE FEATURES:

- Fully automatic sheeting process
- High efficiency and throughput
- Compact layout
- Intrinsically safe process
- Effective compound temperature control
- Good self-cleaning capability



SHEETING AND MIXING MILL

Mills can achieve very high cooling performance due to their large roller surface. This characteristic makes such equipment ideal for mould temperature-sensitive mixtures, which is why mills are very often used in the technical rubber goods industry for moulding in final mix lines. Our mills stand out due to their very compact and sturdy construction, compliance with the current EU standards, and their fully integrated capability of automation. The roller quality can be selected according to requirements. The HF MIXING GROUP also supplies the newly developed plated rollers for special applications for mills.

MORE FEATURES:

- Peripherally drilled cooling channels
- Hydraulic mill gap adjustment
- Overpressure relief valve to protect the mills
- Compact single-drive solution



SINGLE-SCREW DISCHARGE EXTRUDER

The single-screw discharge extruder is a machine with very flexible applications for the technical rubber goods industry. It can be used to generate granules as well as sheets and strips depending on the head technology. Straining is also possible in this mixer line. Reliable and constant intake of the compound into the screw channel is guaranteed by a twin rotary pusher system. This also minimises pressure variations at the extruder head. If operated downstream of a discharge mill, the compound intake can also be effected using feeding rolls.

MORE FEATURES:

- Unique twin rotary pusher system for safe material intake
- Customised, individually designed screw shape with optimal temperature control
- Inline strainer option
- Compact design with water-cooled AC drive system
- Easy filter and tool change with twin head technology

STRAINER SOLUTIONS

The straining of mixtures is of great significance in the technical rubber goods industry and is something of a hot topic. Material is pressed through a very fine-meshed sieve during the straining process in order to filter out agglomerates and other impurities. In addition to the sieve package, support plates and perforated plates represent significant users of pressure. The HF MIXING GROUP uses the know-how gained from many years of experience in process design to carry out the straining process with very little shift in temperature.

MORE FEATURES:

- Process-optimised single-screw discharge extruders
- Twin-screw discharge extruders with pressure build-up capability
- Gear pumps for special compounds

ADVISE® MIXING ROOM AUTOMATION

We have consolidated our globally established automation solutions in the ADVISE® product line to offer you 'the best of the best'. With multiple mixer lines, high throughput and complete control of the material flow thanks to a flexible, modular design that can be fully scaled, it is the optimal solution for the technical rubber goods industry. It is therefore very easy to configure ADVISE® to your specific needs and preferences without having to create special solutions – a feature that you will value just as highly as the intuitive operation and the straightforward application of sophisticated technology.

The key to the success of the ADVISE® system lies in its networking capability, which optimally links all machines and workstations in the mixing facility. Our team of experts is constantly working to develop solutions with long-term benefits for you. With the ADVISE® system, we cover the full automation of an entire mixing facility, from raw material storage, automated weighing of small components, and automatic weighing of fillers and softeners to the mixing process itself, open mills, single-screw and conical twin-screw discharge extruders, other downstream components and mixture storage.

MORE FEATURES:

- A coherent, durable and reliable mixing room control system
- Use of latest web-based programming language
- Modular system design with individual configuration
- Full mixing room visualisation for easy maintenance
- Specific closed-loop process controller for improved mixing efficiency
- Full process data acquisition and visualisation
- Strong development team with 'real life' testing capabilities in our technical centre
- Certified, long-term development partners
- Standard communication interfaces to ERP and LAB systems
- Very flexible step-by-step control
- Complete material tracking system

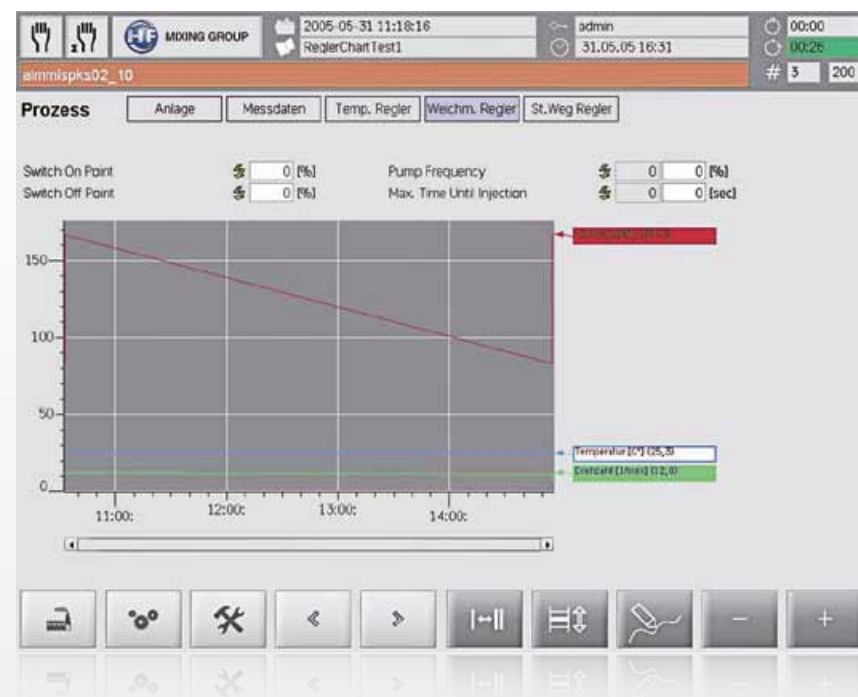
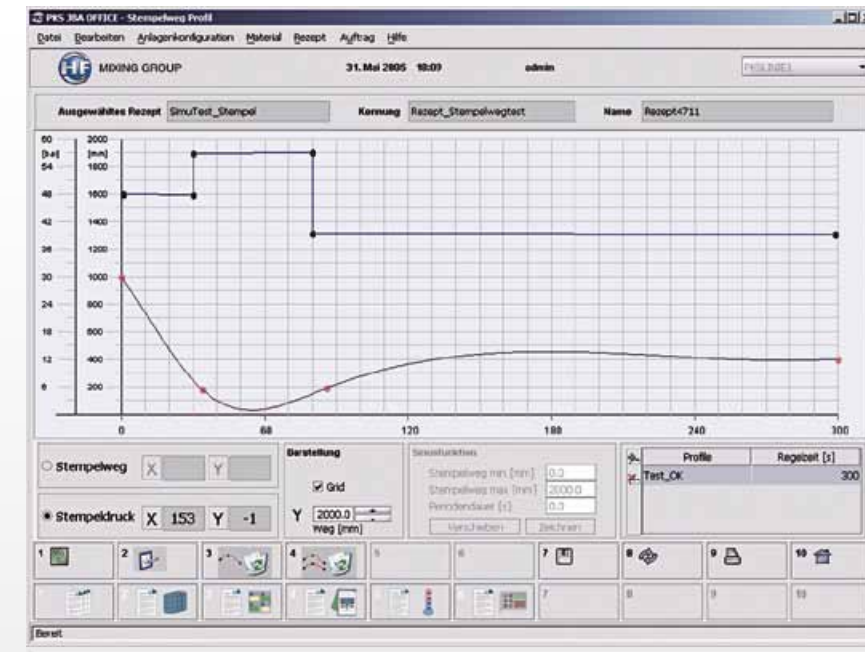


RAM POSITION CONTROLLER

The manner in which the ram moves after the mixture components are added is of great importance in process engineering. It is gaining in significance due to more complex, difficult-to-process recipes and their components. Innovations such as the iRam and the ram movement controller module of the ADVISE® system make it possible to define the ram's path of movement. This enables numerous benefits in terms of process engineering. It is a unique ability that keeps us at the forefront of modern technology and able to serve you.

MORE FEATURES:

- Significant reduction of ram soiling with lower ram down speeds
- User-defined ram position in individual mixing phases
- Pressure reduction possible to reduce load on the dust seal
- Avoidance of ram jams



OIL INJECTION CONTROLLER

Recipes with large quantities of softeners pose a challenge in the technical rubber goods industry. If the softener is added to the mixing chamber together with the filler, sacrifices have to be made to quality. If it is added too late after the filler has been mixed in, on the other hand, then the mixer can 'flood'. The momentum-dependent softener injection controller module makes it possible to eliminate these problems. Softeners can therefore be mixed in effectively with the best possible quality.

MORE FEATURES:

- Automatic selection of the correct amount of oil to be injected
- Freely adjustable procedure parameters such as switch-on and switch-off points for the pumps
- Option to combine ram position and temperature controllers in one mixing step
- Reliable prevention of kneader flooding, allowing a and therefore a long mixing time



STATE-OF-THE-ART TECHNOLOGY. Pure Passion – HF MIXING GROUP.

The former technical centre for discontinuous mixers has been centralised and expanded in the new HF MIXING GROUP technical centre in Freudenberg (Siegerland, North Rhine-Westphalia). Here we have installed the latest technology to test our machines and automation solutions. Training courses and technical consultations can also be held on the premises. It is the most modern testing and development centre for rubber mixing technology – a place that is meant to inspire a passion for new mixing technology methods and experimentation. Technical elements from every company in the HF MIXING GROUP are brought together under one roof in the technical centre.

Find out more – we look forward to hearing from you.



Pure Passion – HF MIXING GROUP.

www.hf-mixinggroup.com

Those who are passionate about their work and devote themselves entirely to a project are winners in every respect – because passion is a powerful quality. It enables unimagined possibilities and potential to be achieved. That is why passion is our key to long-term customer satisfaction and the creation of added business value.

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