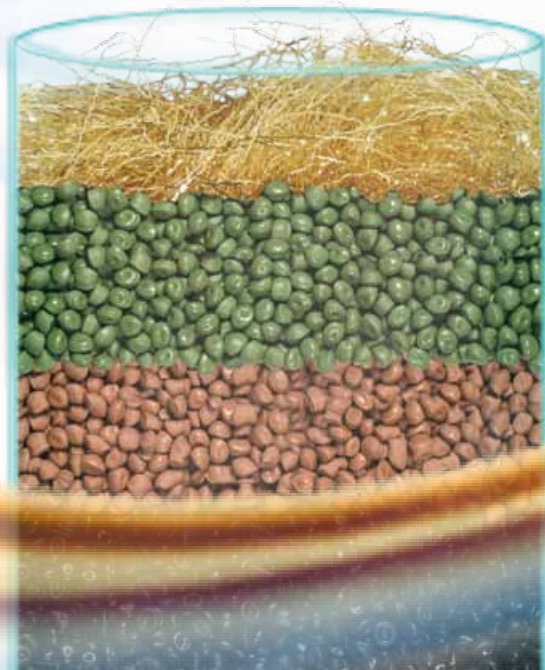




**MIXING GROUP**

**SPECIAL  
APPLICATIONS**





## **INNOVATIVE FUTURE SOLUTIONS. Pure Passion – HF MIXING GROUP.**

We have very high demands on our own products. Rightly so, because our customers expect high-quality products and services in the field of special applications. The high dependability with which we serve as a partner for design questions and customer-specific solutions means that we are always looking forward. Time after time, we have brought innovative products and solutions to market for our customers in the field of special applications. These are developed on our own high-performance production sites with advanced, modern aggregates and components. Our innovative, future-oriented solutions reinforce our position as technology leaders. This has always been our mission.



## **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 of dispersion. The rotor design and optimised cooling behaviour also enable all of the machine components that come into contact with the mixture to efficiently process single-step mixtures. The INTERMIX® E is often operated in its optimised form in the field of special applications. High rotor speeds are helpful for the effective melting of thermoplastics, including extremely abrasive

mixture components such as those contained in brake pad mixtures, which also require specific protective measures against wear. The HF MIXING GROUP is pleased to present the flexible INTERMIX® E series and its wide range of applications.

### 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 interconnected machine technology. This machine type supplies an additional and unique processing parameter that is of great importance for special applications 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, the VIC delivers high specific energy into the mixture in the shortest time thanks to the favourable relationship between volumes and cooling surfaces.

### MORE FEATURES:

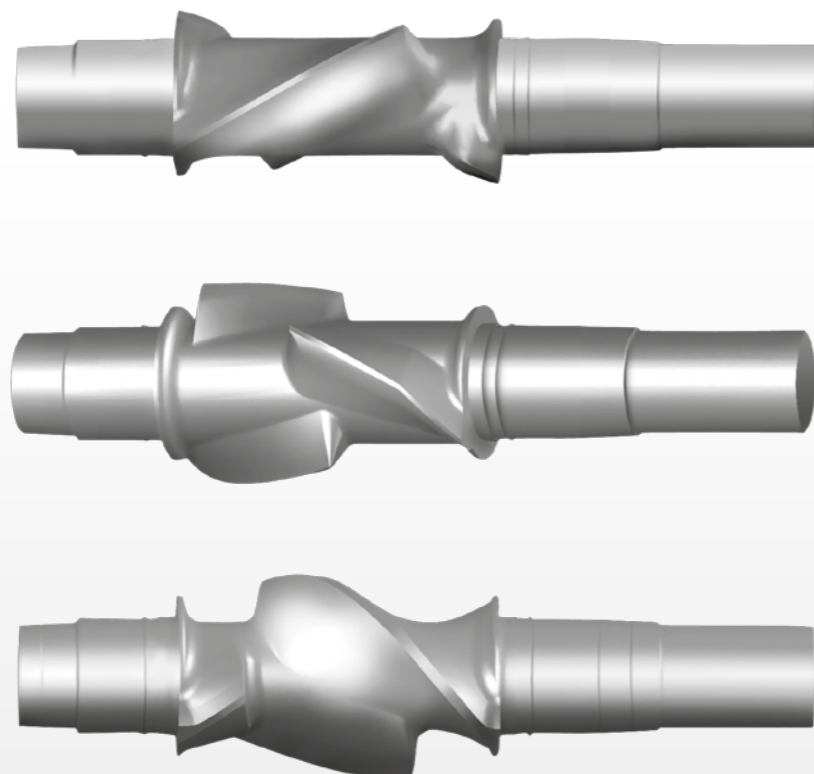
- **Variable distance between rotors for optimal mixing process steps**
- **Fast intake and adjustable shear level**
- **Flexibility for different process applications (mastication, remilling masterbatches and final production)**
- **Durable crack-free hard facing for extended lifetime**
- **Hydraulic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

## BANBURY® SERIES

The use of special mixers from the BANBURY® line is recommended for diverse special applications. We have designed it with the best features of previous models from HF, Farrel and Pomini. We can therefore offer you excellent technical solutions for your special requirements, for instance when the fast collection of materials is required. To round things off, this line provides excellent dispersion during the masterbatch mixing process as well as optimal rotor cooling in the final mixing process.

### 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

## 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. The high temperature execution with degassing zone and vacuum pump is very suitable for WPCs and NFPs.

### 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 material change with twin head technology**



## CONVEX™ SERIES

The HF MIXING GROUP developed the new generation of twin-screw discharge extruder in line with its 'best of the best' philosophy. Its energy-efficient screws, compact and sturdy construction, and newly designed fully hydraulic calender make it a reliable machine for a wide range of applications. These characteristics give it an impressively high throughput performance as well as optimised temperature control without material contamination. The unique features of CONVEX™ guarantee superior quality and mixing line performance. As a result, the CONVEX™ series is already the standard downstream equipment in the tyre industry for masterbatch lines as

well as modern final mixing lines. In addition, the HF MIXING GROUP offers newly developed hard surfaced rolls for processing silica compounds in order to minimise sticking effects and increase the service life of the rolls.

### MORE FEATURES:

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

## 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 special applications. 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
- Long term and certified development partners
- Standardised communication interfaces to ERP and LAB systems
- Very flexible step-by-step control
- Complete material tracking system



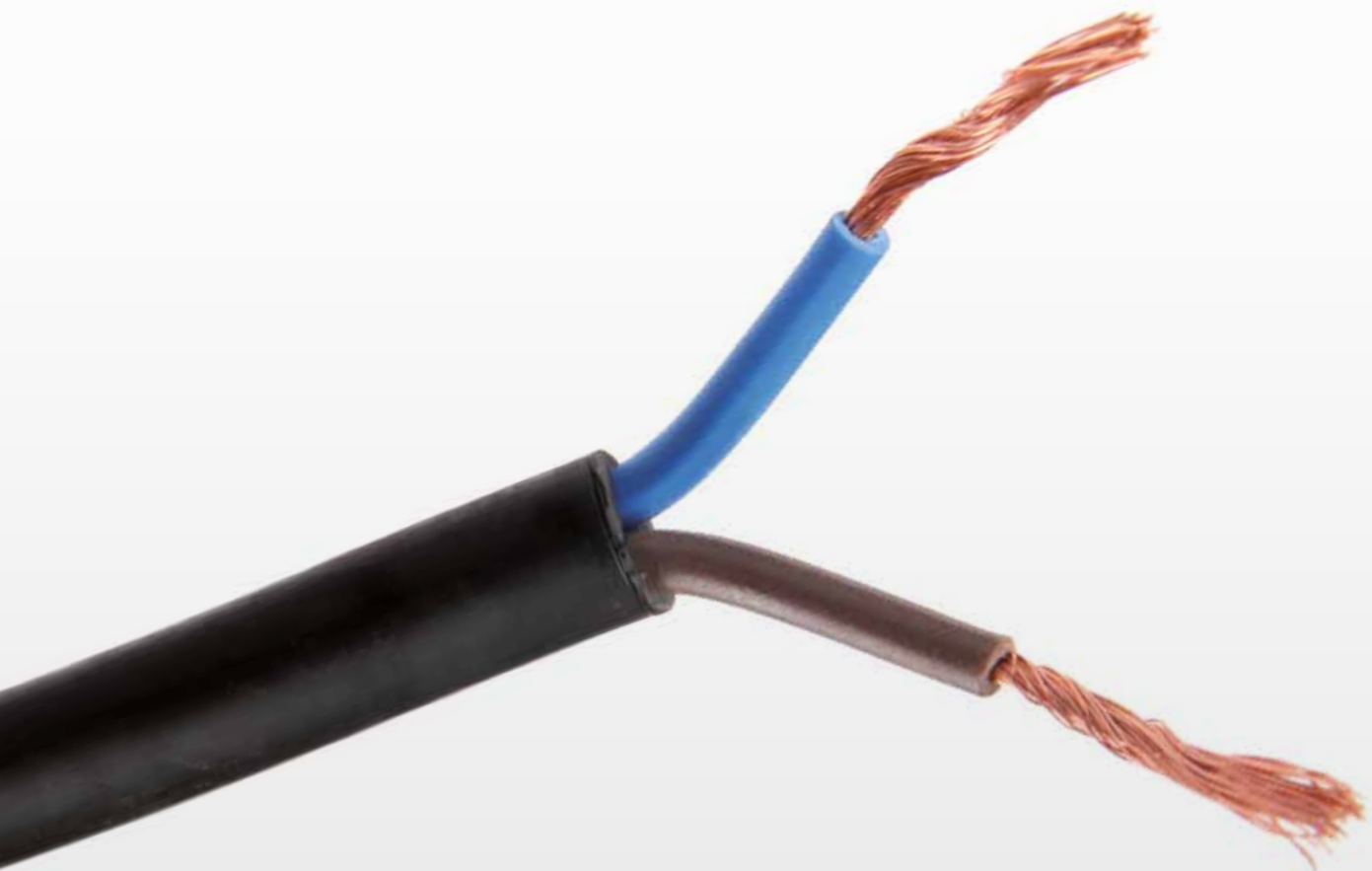


## THERMOPLASTIC APPLICATIONS

In recent years, there has been a clear development towards more intense specialisation with more complex recipes for the manufacturing of plastics. The tasks and demands placed on mixture production are growing as a result. Kneaders with discontinuous operation show their strengths especially well in the fields of plastics and thermoplastic elastomers – particularly interconnected models. These can be seen especially in the process variables such as residence time, rotation speed, or tempering, all of which can be adjusted independently, unlike when continuous mixers are used.

### MORE FEATURES:

- **Optimally suited for difficult mixing tasks**
- **The best possible product characteristics**
- **Any amount of semi-finished parts can be manufactured**
- **A high degree of system flexibility**



## THE CABLE INDUSTRY

The demands put upon mixture quality and purity in the production of high-quality cables are especially high. The compounding facility solutions developed by our group therefore address these requirements with the most modern equipment components. For instance, fully automatic loading systems can be integrated with intermeshing kneaders as well as a single-screw discharge extruder with strainer head and granule or strip cooling systems according to the latest technical understanding. Automated solutions specifically tailored to the needs of special applications and detailed construction design round off our services.

### MORE FEATURES:

- **A single source for all mixing room solutions**
- **Compounds of the highest quality with the latest intermeshing mixing technology**
- **In-line straining and granulation with a single-screw discharge extruder**
- **Persistent and reliable mixing room control system all of a piece**

## WPC AND NATURAL FIBRES

Our group has developed innovative compounding facility solutions for wood plastic composites (WPCs) and natural fibre-reinforced plastics (NFPs) based on internal mixer technology. This allows processes to be optimised for different material requirements quickly and easily. The results in this case are 'ready-to-use' granules for injection moulding or extrusion processes. As an experienced technology partner, we have thereby set new performance benchmarks in this market segment.

### MORE FEATURES:

- No need for the costly pre-handling of fibres, e.g. cutting and pelletising
- No pre-drying of raw materials required – even with moisture content far above 20%
- High filler percentages of 80% or more can be realised
- No thermal damage thanks to the use of modern process controllers
- High degree of system flexibility
- Significantly better production characteristics
- Much lower moisture absorbance of the end product



## RECYCLING

Sustainability and recyclability are indispensable for reaching ecological goals. The recycling of thermoplastics in particular is gaining in importance. Discontinuous internal mixer technology offers a solution that meets industrial standards in this area as well. The large feeding door of the inner mixer allows equally large volumes of plastic components to be added directly to the recycling process without being shredded first. Any impurities that might be contained are filtered out during the process. This method allows the production of plastic granules from 100% recycled materials, polymer blends, and WPC and NFP granules with varying proportions of recycled materials without any difficulty.

### MORE FEATURES:

- Easy material feeding thanks to the large intake door
- No pre-cutting or pre-drying processes necessary
- Extremely robust machine design with adaptable hard surfacing systems
- A single source for all mixing room solutions



## **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](http://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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