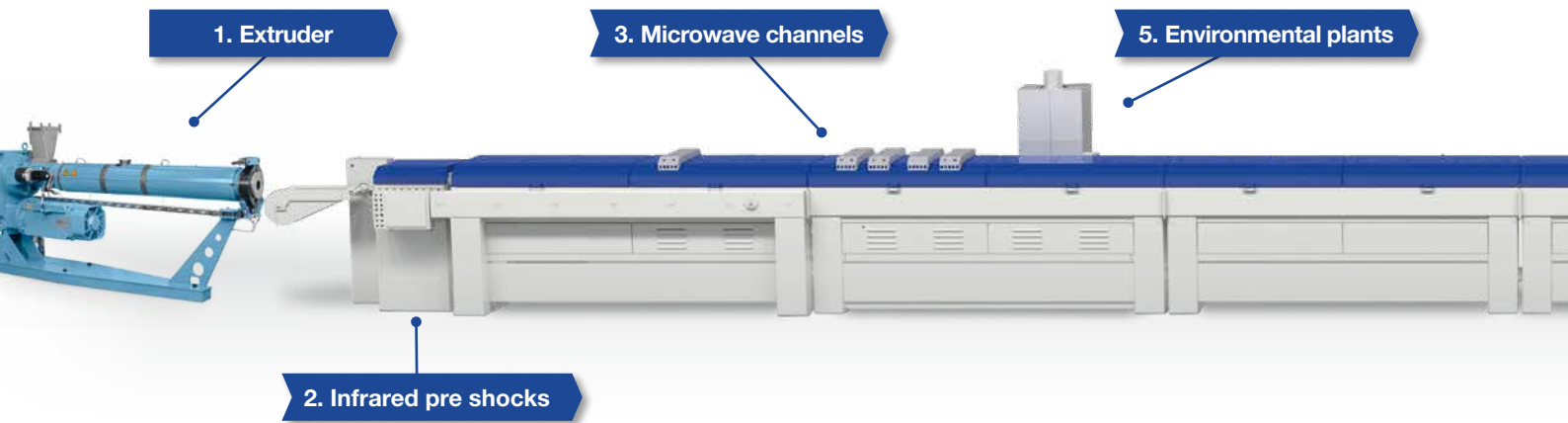




Pioneers in Rubber Processing

Delivery Program

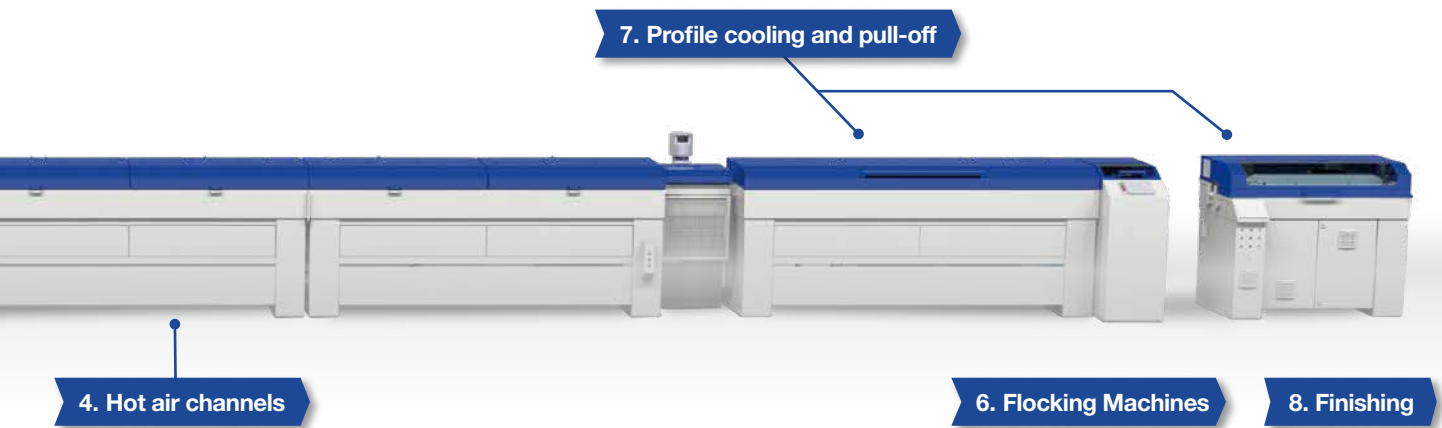
Rubber extrusion and vulcanization machines



Our delivery program includes customized rubber processing and vulcanization machines.

For more than 50 years now we are partner of the rubber processing industry. At our site in Nettetal, Germany, we manufacture technologically sophisticated vulcanization and auxiliary machines for our globally active customers.

We represent the entire value chain on site – design, production and supply. The results are clear: sophisticated vulcanization machines of the highest quality and value, sustained over many years. All under one roof and “Made in GERMANY”.



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Technology Center

Technology center

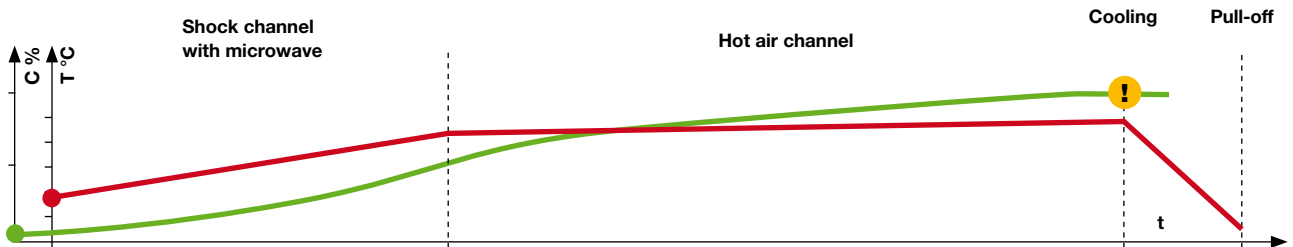
In our technology center we have an extrusion and vulcanization line available, to validate theoretical results or to carry out tests and trials together with our customers. Furthermore, we have various individual machines and test devices on which we conduct material-specific or mechanical engineering investigations.



UHF measuring stand



Product specific design for microwave application



● Profile heating ● Profile curing ! Curing point: t90

Process development based on material rheometer data



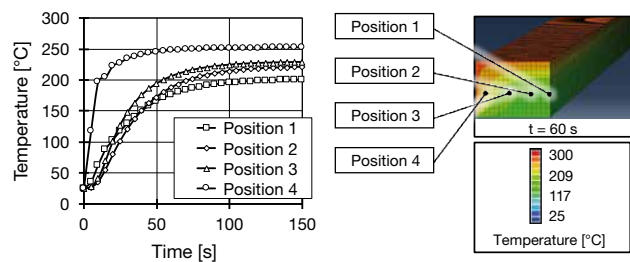
Customer sample in the test

HeatStraD

HeatStraD, laboratory oven

Investigation of the physical crosslinking behavior of elastomers.

Laboratory machine for validation and analysis of the physical crosslinking behavior of elastomers. The results provide information about the optimal energy form combination for the material, required duration of energy exposure, as well as the relevant economic factors of the vulcanization process.

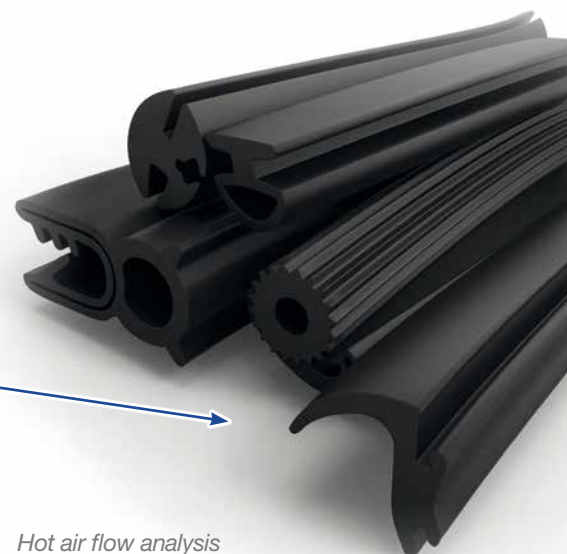
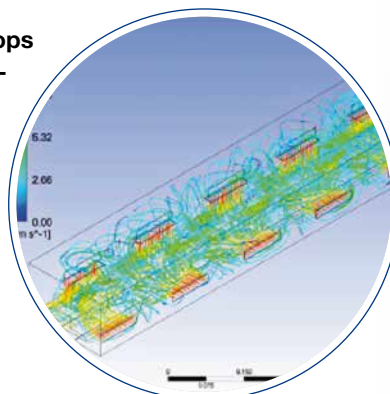


Display of results from material samples

Researching company

Our R&D team investigates and develops pioneering new energy-efficient heating systems, e.g. using new microwave and hot air technologies.

New generations of machines offer scientific sophisticated features. These are developed with our various scientific partners, starting from the prototype phase till the series production readiness.

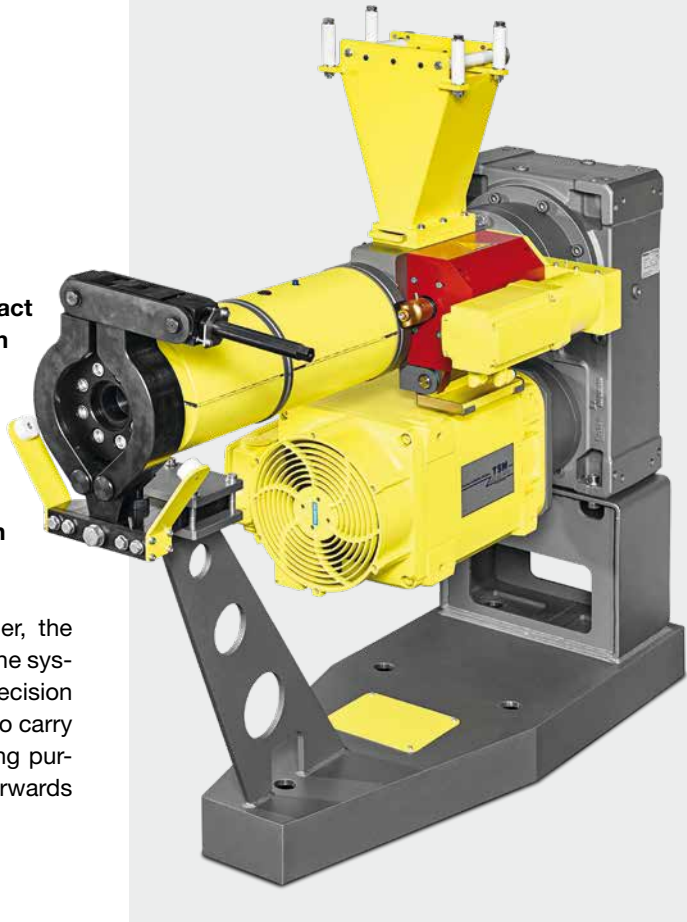


Hot air flow analysis

1. Extruder

For elastomer processing, we supply compact cold feed extruders with screw diameters from Dia. 35 L/D 15 to Dia. 120 L/D 20. Depending on the material specification, different surface treatments of the screw and barrel can be considered. According to the requirement, vacuum extruders, gear pumps as well as single extrusion heads or co-extrusion heads can be supplied.

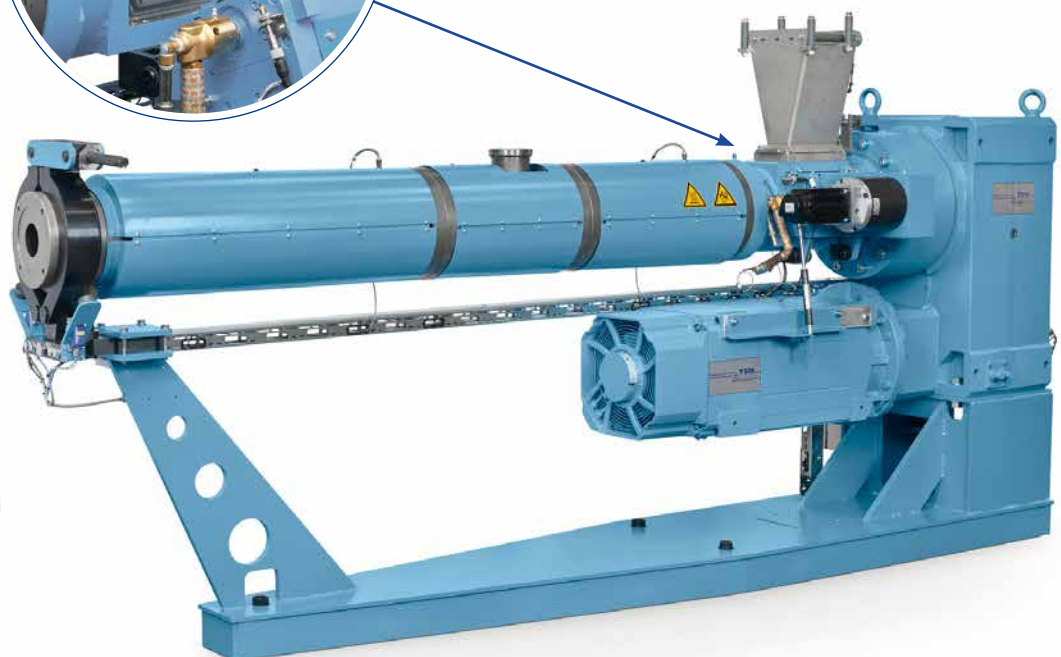
Our extruders have a separately driven feed roller, the torque or speed is controlled via the PLC control. The system thus enables screw conveying with absolute precision and with the necessary amount of rubber. In order to carry out an uncomplicated screw change or for cleaning purposes, the extruder can be electrically moved forwards and backwards.



60 diameter compact extruder



Extruder with open feed roll chute





Horizontal air-cooled infrared pre-shock for 360° application.



Shielded profile support roller

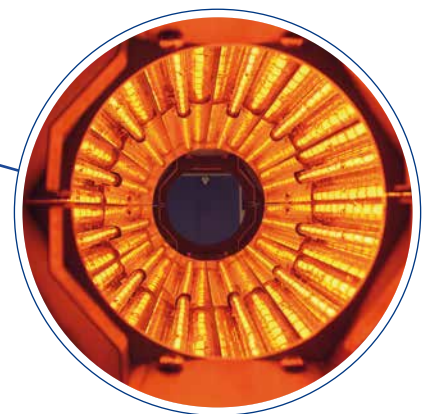
2. Infrared Pre-Shocks

Pre-Shock devices are used when it comes to minimizing belt marks on the profile surface, stabilizing extrusion geometries or ensuring excellent profile surfaces, especially on sponge rubber profiles. The extremely high energy input within a few seconds makes an enormous contribution to increasing productivity.

Our delivery program includes compact electrically operated short wave infrared and hot air pre-shock devices. Depending on the requirements, the material is shocked on one side or on all sides via a 360° application. In order to dissipate the heat generated and at the same time increase the service life of the energy sources, the pre-shock devices are water- or air-cooled.



Vertical short wave infrared pre-shock, for 360° product penetration. The machine has to be water-cooled due to the enormous surface temperature of the lamps of over 1000°C.



Working space of the short-wave IR lamps, in a 360° division. The lamps can be operated optionally.

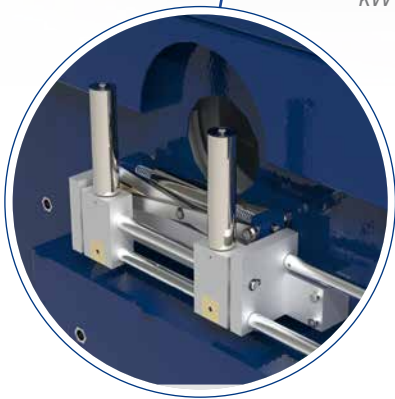


3. Microwave channels

The microwave is an essential component in vulcanization processes to heat up the elastomer compound to be crosslinked from the inner side.

Our delivery program includes self-sufficient machines that are only equipped with microwaves, or combined vulcanization channels that work with hot air and microwave support. Depending on the type of machine, different microwave outputs can be taken into account, so we use outputs of up to 30 KW in our combined channels. The newest generation of UHF machines includes the “guided microwave” which is used in compact UHF modules of type 201 or 205. The enormous energy density of the guided microwave enables extremely efficient heating of standard mixtures and even weakly polar compounds. Furthermore, certain profile areas can be specifically penetrated with the guided wave microwave. All of our UHF machines meet the highest safety standards and are all fitted with isolator systems to increase the lifetime of used magnetrons.

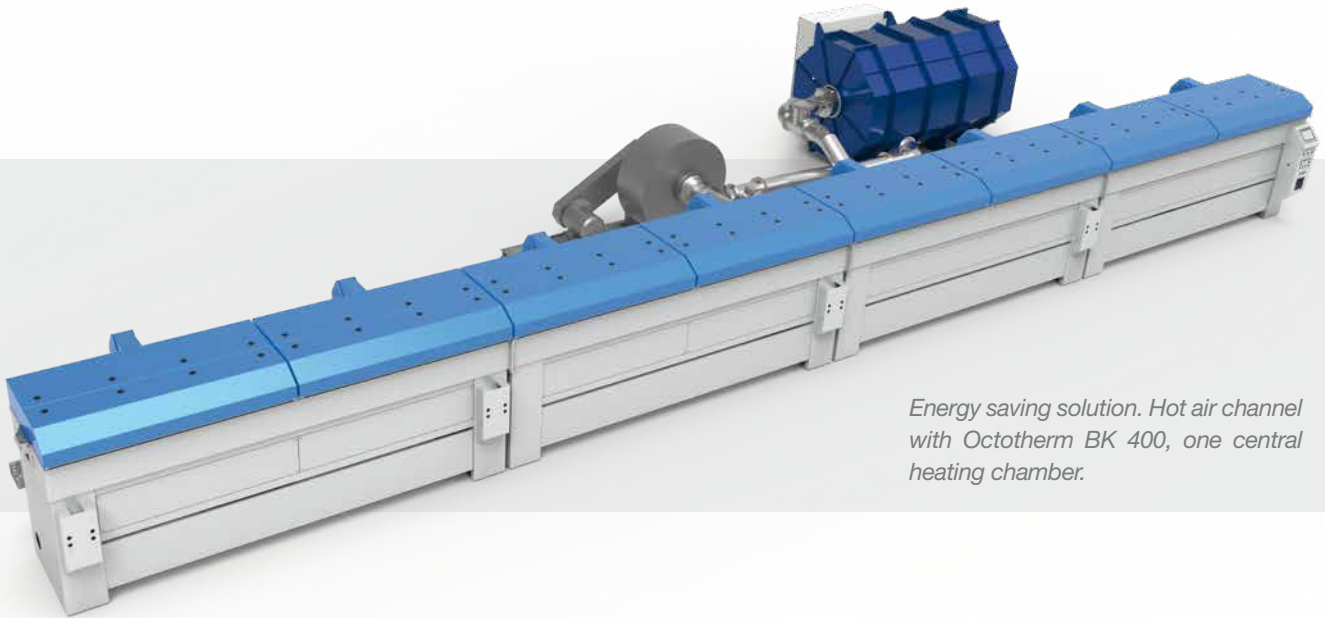
UHF Module 201, equipped with 3 or 6 kW UHF power



Excellent profile adjustment for profile guidance



Hot air vulcanization channel with microwave



Energy saving solution. Hot air channel with Octotherm BK 400, one central heating chamber.

4. Hot air vulcanization channels

The hot air vulcanization is one of the most popular vulcanization processes in elastomer processing worldwide. The required vulcanization temperature is achieved with hot air. We use gas burners or electrically operated heaters as hot air generators in our channels. Gerlach hot air machines are characterized by low energy consumption since they work exclusively with the energy-efficient circulating air process. Our hot air channels are used successfully in paint and flock drying at the same time.

Depending on the requirements, high-temperature shock channels are used with hot air injection temperatures of up to 550°C. The hot air channels are operated with temperatures of up to 340°C. The delivery program includes channel lengths from 3 meters to 24 meters with different inner shaft dimensions and the material conveying is managed by PTFE belts or rollers. The hot air ducts can be equipped with additional energy generators such as microwaves or infrared heaters as well as energy-efficient exhaust air cleaning systems.



High-temperature (550°C) shock channel with driven roller for profile transportation



Hot air channel with additional infrared radiators for drying application



Electrostatic filter with two cleaning stages

5. Environmental plants

Vapors, odors and pollutants produced during the vulcanization process can have a significant impact on the environment and health, which is why they must be neutralized and disposed of.

Gerlach offers compact solutions that are already integrated in the machines, as well as self-sufficient exhaust air cleaning systems that can be connected to old machines or third-party machines, for example. The latest generation of exhaust air cleaning machines includes the energy-efficient electrostatic precipitator, where the pollutants, odors and particles in the exhaust air are treated and separated in a high-voltage electrical field. Different exhaust air volumes can be treated by varying the filter stages. Our range of exhaust air cleaning machines also includes machines that use the active principle of thermal or catalytic exhaust air cleaning. These machines work at a higher energy level, which offers a high potential for energy recovery for downstream cooling or heating processes.



Catalytic exhaust air purification



Stand alone Pollution Control Technology (PCT)

6. Flocking machines



Automatic flocking machine with two brush metering units

Our supplementary machines include flocking machines as well as the corresponding machines for mechanical or plasma-based surface pre-treatment.

Profile flocking is based on the principle of electrostatic charging of the flock and the profile surface. Depending on the flocking requirement and production speed, we supply compact automatic flocking machines with electrostatic brush metering unit, flock storage, flock cleaning and processing. Our delivery standard includes air-conditioned cabin with various additional equipment options.

Height adjustable electrostatic proportioning brush



Profile pre-treatment, drum flocking and flock cleaning

7. Profile cooling and pull-off

Gerlach cooling channels are characterized by high cooling performance, easy profile passage through the channel, good water management and a large number of features.

Depending on the product requirements, our cooling channels can be expanded in 3 meter steps and are equipped with a powerful drying station. The product can be dried in a targeted manner using flexible air nozzles or special wide jet nozzles with different setting options. The air is supplied via energy-efficient multi-stage blowers or side channel blowers.

Shown is 6 m cooling channel with a drying station and closed machine covers



Profile cooling

The product is fed through the cooling channel via transport rollers or a driven conveyor belt. The product can be cooled by spray, surge or immersion cooling.

Our wide jet nozzles are maintenance-free, particles or limescale deposits do not cause any problems. By default, our channels are equipped with heat exchangers, circulation pumps and water filters. The inner channel as well as the outer channel have machine covers which protect the water from contamination and the cooling losses and condensate formation are reduced. The cooling channels have a PLC control and are operated via a touch panel.



View of the inner channel with water flush nozzles, profile transport via rollers



Pull-off caterpillar

Gerlach pull-off machines are suitable for the continuous removal of rubber profiles (with and without steel reinforcement), hoses or plastic profiles.

Safety comes first, which is why our machines have a consistent safety concept that protects operator and machines from injury and damage. Depending on the product dimensions and pull-off requirements, different machines are available that differ in terms of pull-off force and equipment functions. Our machines can be made mobile and the production direction can be in both directions. There is a choice of different conveyor or belt qualities depending on customer requirements. The powerful servo drive enables high pull-off forces at constant pull-off speeds from 0 to 60 m/min or according to customer requirements.

If required, our caterpillars can be equipped with a pull-off force measurement, sag control or data storage to ensure reproducible processes. The belt pull-offs are operated via a modern touch screen, here are all the machine features clearly arranged. Parameters such as belt speed, belt height position, loop control options are available to the operator, among of many other operating functions.



Sensor roller for monitoring the synchronous speed between the upper and lower belt



Pull-Off BA 501 for pull-off forces up to 4000 N

8. Finishing



*automatic pneumatic
punching machine*

In the area of finishing, we have various machines at our disposal to tailor the product to a specific dimension, via a saw cut or a punching or to provide a door seal or lid seal with ventilation holes. Depending on the product dimension, material hardness and subsequent production and quality requirements, we determine the right machine for the final end use.

Whether a more precise saw cut or a gap punching process through a metal core, our machines ensure high manufacturing tolerances in perfect quality with a long tool life. The mechanical processing centers can be equipped with additional equipment such as printers or measuring devices. For the connecting of mitered corners on extruded rubber profiles or a butt joint on a door seal, we operate with the FSV 106 film butt joint vulcanization machine.



precise saw cut

Here, two ends of a vulcanized rubber profile will be preheated by an electric heat effect in the mold, and then vulcanized with the help of an extruded rubber film. The machine consists of a robust and compact construction. It is operated for safety reasons via a two-hand operation. All electrical functions are controlled by a PLC. The process parameters are preset via a touch panel.



FSV 106 film vulcanization machine



HEX 330 cable machine with infrared emitters

Cable systems

Our machines for cable production have an extremely low energy requirement, thanks to an innovative energy mix paired with new vulcanization methods.

Our new microwave technology is unique in the networking of cables. The guided microwave technology allows the targeted energy input even in products that previously could not be heated with microwaves.

With guided wave technology and the latest microwave technology, even siliconized cables can be processed. Compared to classic infrared processes, the energy consumption of guided microwaves is often less than 50%.

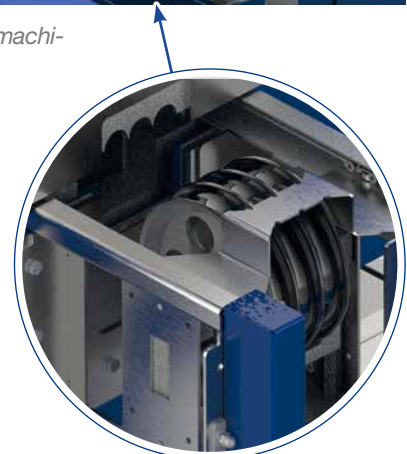
A hot air module with temperatures of up to 500 °C, and just with 2 KW connection power, makes an outstanding contribution to the cable vulcanization. Due to the high flow speed of the hot air, a high heat transfer is realized on the cable.

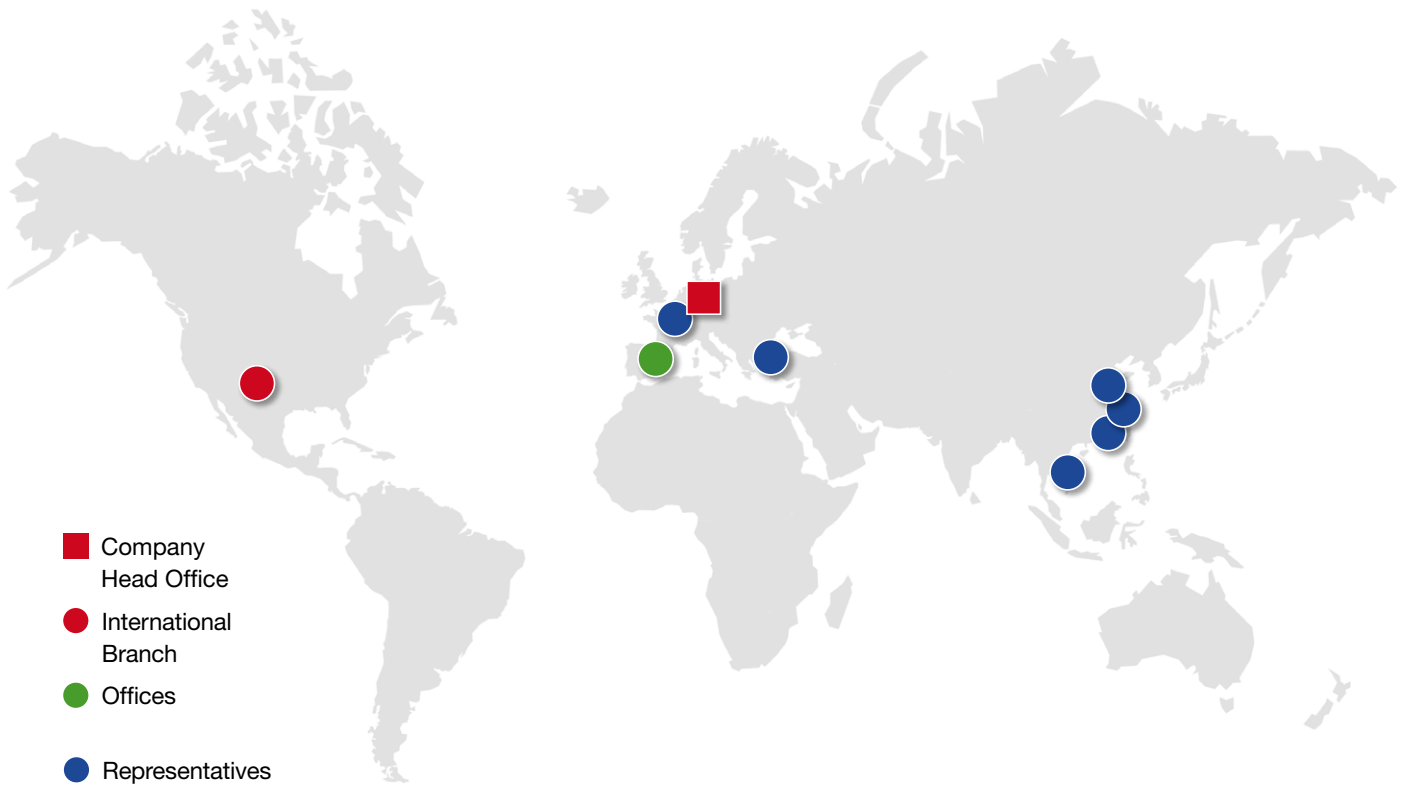
In general, our cable machines have advantages characterized by a modular and flexible machine concept. The energy form according to different modules can so exactly be combined and expanded with each other. They save energy through optimized use of energy, enable faster production speeds, make less rejects and have low investment costs as a result. Whether it is the modular machine series 300 for the vulcanization of cables and with which the forms of energy hot air, infrared technology and microwaves are used, or the machine type HEX 330 for the sintering of banded PTFE cables using only infrared dark radiators, our cable machines impress with their high energy efficiency and the innovative and responsible use of energy resources.



Series 300 module, machine with guided wave microwave

Customized cable guide at the inlet of machine





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www.gerlach-machinery.com



Josef L. Rameckers Maschinenfabrik GmbH & Co. KG
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