



Challenging Standards

Engineering Services

When you stop trying to get better, you stop being good.



The MASTERFLEX GROUP offers hoses and connection systems for a variety of applications (industrial, medical, aerospace). Across industry boundaries, we stand for quality and versatility. In addition to our extensive product portfolio, our most powerful capability is our high level of consulting expertise. This enables us to customize products for you, our customers, and adapt them to any special requirements.

Now we are going one step further. Within the MASTERFLEX GROUP we are creating an integrated network structure that enables a free transfer of knowledge: with Engineering Services.

All our brands pool their in-depth knowledge and wide-ranging experience within the Group as a whole, providing an unparalleled basis worldwide. This enables us to harness and apply this expertise no other company. The main beneficiaries of this? You, our customers. Because you get exactly what you need: special solutions with real, tangible added value.

Despite all our innovative thinking, we never forget one thing - the values that define all our actions: individuality, high-tech and cost-effectiveness. Why? Because only those who are truly aware of the needs of their customers and are focused on highly individual solutions can satisfy everyone. The high-tech aspect also plays an integral role. At the highest technical level, we produce systems with high-tech properties that effortlessly master even the most difficult conditions. We never lose sight of quality: throughout all stages of development, we ensure down to the smallest detail that our premium solutions not only meet the highest demands, but also always offer real cost-effectiveness.

By living by these values day by day, we as the MASTERFLEX GROUP can guarantee - and deliver - a unique performance promise: CHALLENGING STANDARDS.

A handwritten signature in black ink, appearing to read 'Andreas Bastin' with a stylized flourish at the end.

Dr. Andreas Bastin,
CEO, MASTERFLEX GROUP

The fuel for our concentrated ex

Over the last few years, the MASTERFLEX GROUP has united its strong brands. Brands that have very specialised know-how and vast experience gathered across different locations. Each of them is a specialist for an extremely diverse portfolio of products and industries. With their far-reaching expertise, they provide the fertile ground for developing truly innovative ideas and solutions.

MASTERFLEX

The MASTERFLEX brand is synonymous with the development and production of high-quality spiral hoses made from high-tech polymers and fabrics. In addition to profile extruded hoses, innovative clip, heated and film hoses are developed and produced in Gelsenkirchen, Germany. The hose range is rounded off by connectors and various accessories for a complete package of flexible and unique system solutions.

MATZEN & TIMM

Hoses and products by MATZEN & TIMM are characterized by their hand-crafted production. In Norderstedt, Germany and Plana, Czech Republic, even the most complicated designs are created industrially by hand - from prototypes to mass production - whether special hoses, bellows or moulded parts made of high-quality synthetic rubber materials. The products are applied where special precision, load-bearing capacity and light-weight are required, for example in the aircraft or automotive industries.

NOVOPLAST SCHLAUCHTECHNIK

The NOVOPLAST Schlauchtechnik brand, based in Halberstadt, Eastern Germany, offers hoses, profiles and 2D/3D moulded hoses made from almost all known thermoplastics. The NOVOPLAST brand is particularly well-versed in industrial and medical applications. High-spec medical technology products are produced in ISO Class 6 & 8 clean rooms, especially designed for this purpose, offering our customers a wide range of highly specialised solutions at all times.



ideas: expertise.

FLEIMA-PLASTIC

The FLEIMA-PLASTIC brand from Wald-Michelbach, Southern Germany, specialises in high-quality injection moulding technology. In addition to parts for standard applications in medical technology, cosmetics & food industries, special moulded parts and individualised components are also produced here. The brand's own moulding and tool-making therefore guarantees highly flexible development and production for even the most demanding requirements - especially in medical technology.

MASTERDUCT

With the MASTERDUCT brand, the Masterflex Group offers a broad portfolio of spiral hoses in North & South America. Everything from the automotive, plastics & mechanical engineering industries, through the aerospace and service industries to the US government and NASA - they all belong to MASTERDUCT's vast customer base. Integrating yet another specialist in the Group, the FLEXMASTER U.S.A. product brand are the most renowned specialisits for heating, ventilation & air-conditioning (HVAC) sytems.

APT

The APT brand is one of the world's leading processors of high-performance thermoplastics with many years of know-how, particularly in the field of fluoropolymers. The processed components made from PTFE, FEP and PFA are suitable for laboratory, medical, process and painting technologies - as well as household appliances. With its own product development and plant design, APT manufactures its products with utmost precision, ensured by the world's most modern „inline“ testing and measurement technology.



Our drive: to be Thirsty for know

In times of increasingly tough global competition and the challenge of developing technologies at ever shorter intervals, it is essential to constantly rethink and improve business models - for sustainable and long-term success. At the MASTERFLEX GROUP, we certainly don't exclude ourselves from this. We are increasingly opening up our business processes and striving for more agile structures with our customers and partners.

Our Engineering Services are a direct result of our innovative thinking. They enable the MASTERFLEX GROUP to be a partner who provides you, and all of our

customers worldwide, with unparalleled technological and consulting expertise, together with an extensive and unbeatable product portfolio. It is also our goal to use this proactive consulting to encourage you, our customers, to develop innovative projects and customized special solutions together with us as a team.

Our Engineering Services act as an interface between standard and innovative products. What is special about it? The holistic consulting and support we provide you with from the very beginning of the project to the final handover ready for production. You gain truly tailor-made solutions for your very unique challenges.

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We cross boundaries. Side by side.

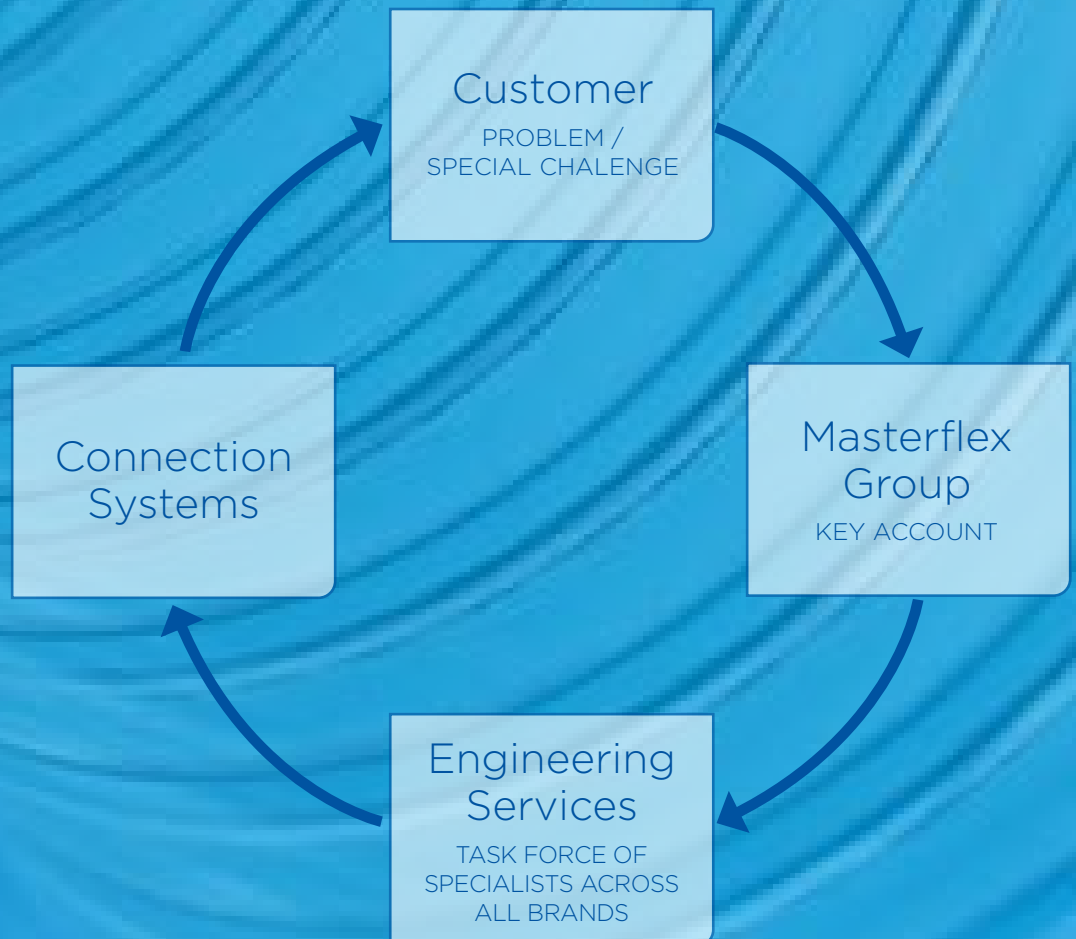
There are certain tasks where more can be achieved through professional and qualified cooperation. Our Engineering Services provide you with flexible and targeted support through all of your requirements. We develop real solutions worldwide for partners from all known industries. All of the services needed to turn your ideas into series products come from a single source - and that's our philosophy. Benefit from the knowledge of the entire Masterflex Group: Our specialists work together in a close network across all disciplines.

What does this look like in detail?

Talk to us or let us proactively advise you. Together, we can create an individual design development plan. At the heart of our Engineering Services is a central development and project management team: the entire knowledge of the Masterflex Group is bundled at this interface. Within this group-wide specialist network, wide-ranging resources are available for a huge spectrum of requirements and issues. A project team made up of specialists from the entire Masterflex Group is set up on the basis of the Design Development Plan. They work together in a close network across all technical disciplines, ensuring an extremely efficient workflow. Teamwork and a focused exchange of know-how lead to the best possible solution, which can be extensively tested in the specific application and adapted where necessary.

daries gladly.

Engineering Services Workflow



Pulling together The drive for su

Whether its the close cooperation with you, our partners, the cross-location transfer of knowledge within the Group, or the opportunity of jointly generating highly customized, efficient products and solutions: Our Engineering Services offer a number of advantages. Advantages that take you a decisive step further - and enable you to position yourself even more successfully.

Top priority: **economic efficiency**

We pride ourselves in developing solutions that are highly efficient and successful for our partners. By combining technical quality with a holistic approach, we enable you to work much more economically. Thanks to our specialists' many years of experience, particularly with regard to materials knowledge, we can act more quickly than others, achieving truly agile and economic results for our partners.

The cooperation: **in partnership**

Continuous partnership with our customers in all phases of the product development process plays a decisive role in the success of innovation and reduces the risk of failure. We meet our customers as equal partners and ensure our project work is as transparent as possible for everyone involved. This form of cooperation enables our partners to play a decisive role in the success of the project: through their creativity, their knowledge, their experience and also through their willingness to innovate..



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Products with **individual DNA**

The products and solutions we develop together as a team deliver unrivalled customer value and maximum productivity. Tailored to your specific needs and challenges, we create solutions that fit perfectly into your future applications. Far removed from “off the peg” solutions, our Engineering Services are positioned exactly between standard products and innovative products: as individualized special solutions..

Specialists at work

The multitude of applications, legal requirements and the multitude of media to be transported pose daily challenges for our R&D departments, which we successfully master. The basis for this is the extensive and well-founded knowledge that our staff possess. Our solutions meet the highest national and international quality standards. We have a large number of laboratory, analysis and testing facilities at our disposal. The Finite Element Method (FEM) is just one example to assess the durability and suitability of components before the first prototype is built.

Everybody said Then someone v came along and



Dipl.-Ing. Rita Krossa
Director of R&D, MASTERFLEX GROUP

The Internet of Things (IoT) and artificial intelligence (AI) are the megatrends of the coming years. At the same time, machines are learning to think. As a result, shorter product lifecycles, the ongoing shift towards Industry 4.0 as well as a growing global awareness of the environment and sustainability demand the continual development of new products in ever more rapid succession.

Is the Masterflex Group fit for innovation?

Rita Krossa: Absolutely! We have been the global technology leader for years and are one of the most innovative medium-sized companies in Germany. Innovation is not only an important part of our corporate strategy, but also our personal motivation and goal. We always have our customers' needs in view. There's no point in developing new technologies that nobody needs or is willing to pay for. They have to offer real added value. Only then can we ensure clear competitive advantages for our partners. And at the same time help shape the rapidly changing markets.

How do you respond to the growing pressure to innovate?

Rita Krossa: We asked ourselves the questions: Which new markets do we want to enter in the future? Do we produce products or solutions? How do we want to be seen by our partners and suppliers? We have seen that our customers' wishes are becoming more and more diverse. This is precisely where our Engineering Services come in.

it wouldn't work. who didn't know just did it.

Can you tell us more?

Rita Krossa: On the whole, it should be even easier and faster for our customers. The Masterflex Group provides a wealth of experience and knowledge with regard to materials, manufacturing processes, approvals, etc. This also includes certification-critical industries such as medicine, food, automotive or aviation. In addition, we have high-quality laboratory equipment and a multitude of testing facilities. By bundling expertise in sales, development, production and quality management, our partners benefit from even better support.

At first glance, this cooperation is nothing completely out of the ordinary. The Masterflex Group has been practicing a similar philosophy for many years, right?

Rita Krossa: This is true in parts, because we have been pursuing an Engineering concept for some time now. What is both new and special about our Engineering Services is that the know-how of the entire Group is centralized in one place. To this end, we combine the individual brands into a clear network structure that forms the basis of our Engineering Services. We have adapted our

internal processes to match this, in some cases restructured them, and are working with completely new techniques and methods such as agile working or design thinking.

Aren't you going one step further? Can your partners actively engage in the process of creating an innovative solution?

Rita Krossa: That's absolutely correct. Our concept envisages us working in partnership on individual solutions. Our partners come from a wide range of industries with a multitude of different requirements - and our solutions are just as diverse. We attach great importance to an exchange at eye level. Because only together can we shape the future. Current trends show us that cooperation is becoming increasingly important and is the key to success. A good example of this are our new AMPIUS® digital hose systems, which have been developed within the framework of joint development projects.

The digital hose AMPIUS®

Focussing on customer benefits

- we have the ideal solution for every challenge.

Be it industry, medical technology or aviation - wherever connections are needed for the safe flow of liquids, gases or solids, high-grade hoses are essential. Each application has its own requirements in terms of material and design.

As the leading manufacturer of high-grade hoses, we are a renowned development partner and solution provider for almost known every application. Within the scope of joint development projects, we have designed an AMPIUS® hose system, which automatically determines the wear status of the hose components by means of electronic measurements. This data is transmitted to the operating or maintenance team in a virtually predictive manner.

Such predictive maintenance concepts play an increasingly important role in modern factories. The proactive approach can effectively reduce machine downtime. Ideally, failures can be accurately predicted so that the machine operator can act before real breakdowns occur. Essential for this, of course, is the collection of all relevant data, which in this case can be read out with the help of a mobile or fixed reading device, such as a mobile phone or a tablet.

All digitized hose systems offer a unique identification and further information on the hose itself. The digital product immediately indicate to the user whether they have installed the correct hose and enable optimum tracking throughout the entire life cycle. Depending on the application, the integrated chips can also support different data transmission techniques. The same applies to the amount of sensor data collected on or in the hose. The chips themselves can be individually adapted to the desired functions on the basis of modular hardware and software.

The topic of wear monitoring is only the beginning. In principle, we can give all hose types one or more intelligent functions, which can then be digitally read out and analysed.

Together with our partners, we strive to shape the future - through integrated consulting and a unique service for the best possible solutions.

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*„How can the efficiency of machines be increased further?
How can downtimes be prevented or at least minimized by early
communication of the machine as a whole or of individual intelligent
components? These are the questions that drive our customers.
The topic of wear monitoring is only the beginning.“*

Christian Horstkoetter
Managing Director Sales Europe
Industrial Solutions



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 **MASTERFLEX GROUP**