NOVOPLAST
SCHLAUCHTECHNIK

Tubes for medical technology

A VALUABLE PART OF THE
MASTERFLEX GROUP

Customised medical technology

Novoplast Schlauchtechnik develops and manufactures high quality tubes and offers the suitable connections and components as well as assemblies for demanding applications in medicine. In addition to our extensive know-how in plastics, our customers benefit from many years of expertise in the medical technology industry.

Innovation - customer requirements brought to perfection

We develop **customised** tubing. We adapt to your material ideas, designs and dimensions. We realise a **customer-specific design** such as delivery in fixed lengths, coils with special lengths or tubing on plastic reels according to **your ideas**. In addition to monolumen, multilumen and multilayer tubes, we also offer **high-quality solutions** in the field of microextrusion.

Precision and quality

We realise your individual product developments in class 6 to 8 clean rooms. With special measuring and testing devices, we offer the most modern equipment to ensure product quality.

Our offer:

- Expertise in regulatory and procedural issues
- Support in the approval of medical end products
- Processing of medically certified biocompatible plastics (medical grades) as well as standard plastics
- Production in clean rooms of classes 6 to 8
- Certified quality standards (according to ISO 9001 and ISO 13485)
- Environmental management system certified according to ISO 14001
- Full service for standard medical components and customer projects
- Development of solutions for the medical technology industry in close cooperation with the customer
- In-house toolmaking - from the tool to the product to the subassembly - everything from a single source
- Close cooperation of our expert teams within the Masterflex Group
- Medical technology „Made in Germany“
- Comprehensive range of services across the entire scope from the product idea to complex assemblies

Content

Areas of application

Nutrition

Enteral feeding tubes with full X-ray contrast or X-ray contrasting strips. Also available with surfaces optimised for sliding friction (combination inner/outer tube).

- PVC noDEHP
- Polyurethane
- TPE-S
- Multilayer
- CoExtrusion

Urology

Tubes for urological applications which are used, for example, in the field of ureteral stents, ureteral catheters, pushers or also for deconnectors. Based on the requirement profile, materials are used which allow a implantation time of up to 90 days. Further solution concepts for e.g. tumour splints and other special solutions.

- Polyurethane
- Polyamid
- Polyamide elastomers
- PVDF
- Polymere-blends for the defined adjustment of product properties
- Multilayer

Endoscopy

Versatile tubes with excellent sliding properties and maximum flexibility. For instance, with working channel in multi-layer construction with sliding inner and outer layers as well as a highly flexible middle layer.

- Polyamide
- Polyamide elastomers
- PVDF
- Polyethylene/
- Polypropylene H/C/R
- Polymere-blends for defined adjustment of product properties
- Multilayer

Surgery

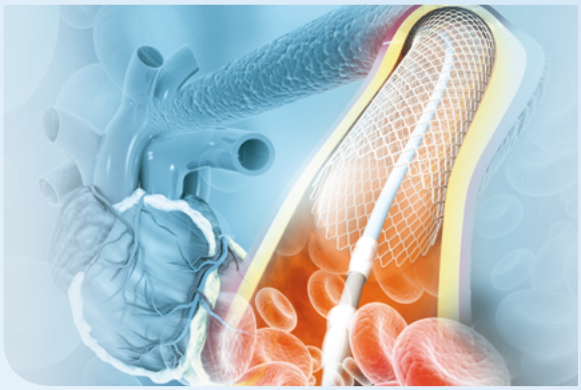
Components for minimally invasive surgical procedures as well as special applications for innovative surgical techniques such as high-frequency surgery, waterjet cutting or laser surgery.

- Polyamide
- Polyethylene/polypropylene H/C
- Polyurethane
- Polyamide elastomers
- Multilayer
- Multilumen
- Polymere-blends for the defined adjustment of product properties

Areas of application

Catheter/ Cardiology

Defined specifications are implemented in production to reproduce product requirements with repeat accuracy, e.g. balloon catheters or catheter shafts.



- Polyurethane
- Multilumen
- Polymere-blends for the defined adjustment of product properties
- Multilayer
- Peba
- Polyamide elastomers

Angiography

Tubes with different pressure resistance up to 1500 psi (103 bar) with excellent flexibility for contrast agent injection for CT/MRI scan

- PVC noDEHP
- Polyurethane
- Multilayer

Hearing aids

Micro-extruded tubes with very narrow manufacturing tolerances for comfortable wearing and best sound transmission.

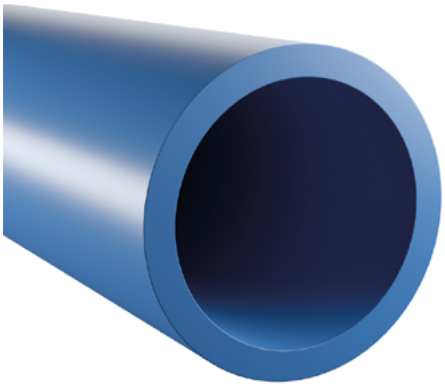
- Polyamide elastomers
- Peba
- Blends for the defined adjustment of Product properties
- PVC noDEHP

Infusion

Customised solutions for roller and peristaltic pumps and gravity infusion lines. Available in UV-absorbing version.

- PVC noDEHP
- Polyurethane
- TPE-S
- Multilayer
- PVC free

Manufacturing range



Monolayer/Monolumen

The classic tubing geometry, essential in all medical fields.

Range of materials

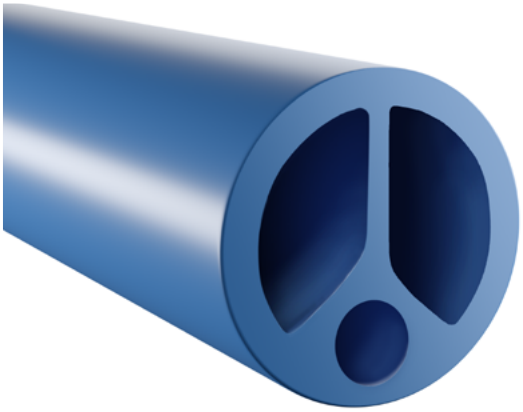
PUR, PVC, PP, LD-/ HD-PE, PA TPE‘s, EVA, PVDF, Peba, blends, specific compounds. Each raw material can be individually adapted to the application through colours and other functional additives.

Fields of application

- High pressure tubes for contrast medium injection
- Feeding tubes
- Ureteral ureteral stents, ureteral catheters
- Infusion lines
- Biliary duct stents
- Hearing aid tubes
- Gas-Sample Lines
- Pump segments
- Shaft sheaths, working channels
- Your individual application

Properties

- Thin/thick-walled
- UV-absorbing
- Resistant to cytostatic drugs
- Pressure-resistant
- Suitable for X-ray contrast
- Sliding behaviour
- Antimicrobial
- Colour-coded
- Profiles according to specification



Multilumen

For the medication of various incompatible drugs, or as a combination solution for working channels.

Range of materials

PUR, PVC, PP, LD-/ HD-PE, PA TPE‘s, EVA, PVDF, Peba, blends, specific compounds. Each raw material can be individually adapted to the application through colours and other functional additives.

Fields of application

- Feeding tubes
- Ureteral catheters
- Electrosurgical instruments
- Central venous catheters
- Acute dialysis catheters
- Right heart catheter
- CSF drainage
- Working channels
- Your individual application

Properties

- Thin/thick-walled
- Insulating
- Resistant against cytostatics
- Pressure-resistant
- Suitable for X-ray contrast
- Sliding behaviour
- Antimicrobial

Manufacturing range

Multilayer

Multiple layers with versatile possibilities.

Range of materials

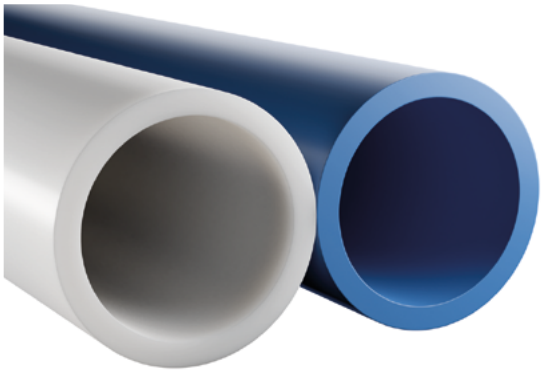
PVC/EVA/PE, PUR/PA, PUR/EVA/PP, PUR/EVA, PP/SEBS/PP, Peba/PA, functional layers. Each raw material can be individually adapted to the application through colours and other functional additives.

Fields of application

- High pressure tubes
- Feeding tubes
- Catheter tubes
- Cytostatic administration
- Tubes for bag systems
- CO_2 Gas-Sample Lines

Properties

- Soft/hard combination
- UV-absorbing
- Suitable for X-ray contrast
- Anti-adhesive layers
- Antimicrobial layers
- Wall thickness and material reduction
- Pressure-bearing layers
- Inert inner layers
- Encapsulated layers



Twin tube

Combination of two tubes which can be separated at any point without leaving any residue. For a wide range of applications, the combination of different tube sizes and durometers is possible.

Range of materials

PVC, PUR
Each raw material can be individually adapted to the application through colours and other functional additives.

Fields of application

- Suction tubes
- Irrigation / aspiration tubing
- Differential pressure measuring line
- Ventilation tubes
- Exudate line
- IV tubing

Properties

- UV-absorbing
- Suitable for X-ray contrast
- Colour-coded
- Colour combinations
- Combination of different dimensions

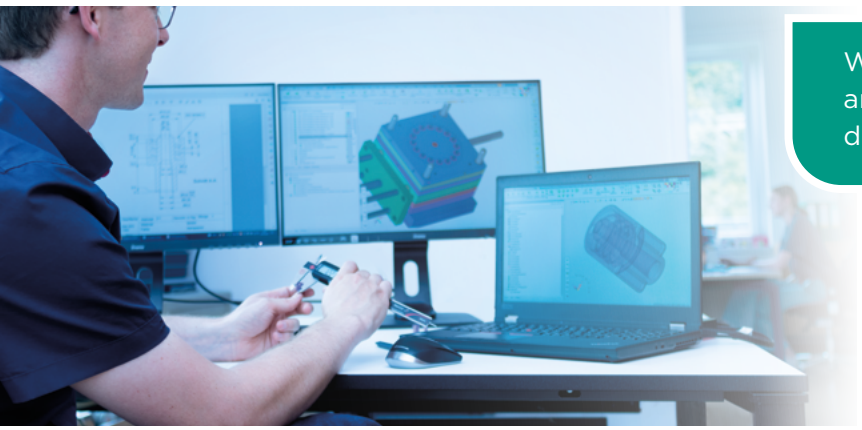
Engineering services

Our customized solutions

We support our customers at every stage of a project. Our customers appriciate us as a technology partner and solution creator.

We realise feasibility analyses based on specific requirement profiles.

We deal with your individual task and develop tube solution for your application. Customers trust in the many years of material know-how of our employees - from the raw material to the end product.



We consider the mechanical, chemical and regulatory specifications and develop individual solutions.

We analyse the operating conditions of your products in detail. This is the basis for the selection of the right plastic and the constructive design of the tube.

We develop plastic compositions and test them in subsequent product qualification runs.

The materials and dimensions specified in the consultation phase are implemented under real production conditions in such a way that initial samples of your product are available promptly.

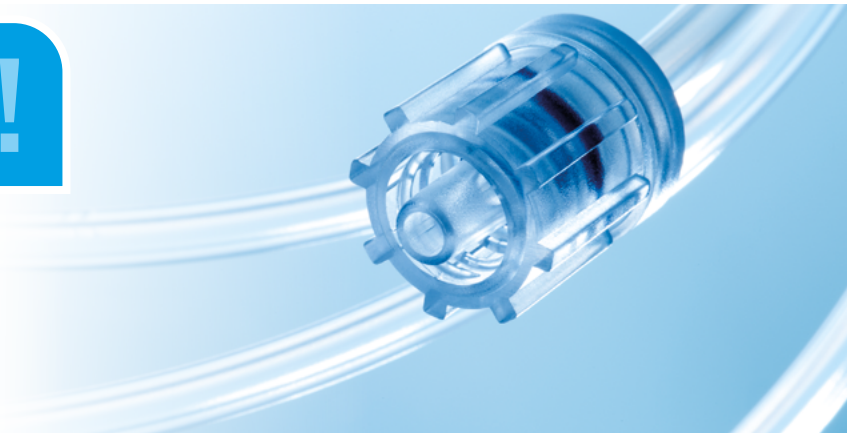
Engineering services

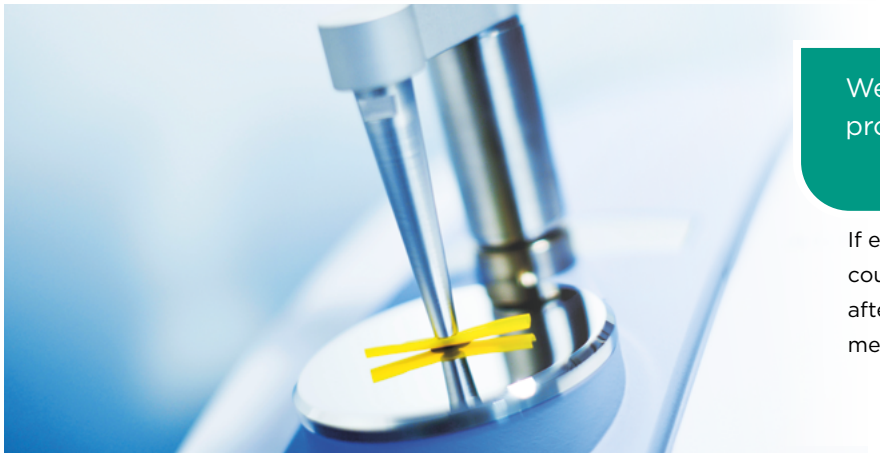
We consider all interfaces and offer advice on manufacuring and bondig or connection processes.

In the course of the product developement, we also consider options for further processing of your product, for example, the design of connectors or joining technologies.

We combine extrusion and injection moulding solutions and manufacture entire assemblies upon request.

By combining our extrusion and injection moulding processes in cooperation with our corporate sister FLEIMA-PLASTIC, we are able to develop individual solutions within the group and implement them through coordinated project management.





We offer tests for product-related process validations.

If extrusion is defined as a critical process during the course of the project, we initiate appropriate test series after jointly defining the variables. We also offer further mechanical and optical tests.

Engineering services

We offer test series to verify ideal combinations of dimensions and materials.

If product dimensions are not defined or known, we can implement a variation of different scenarios. The resulting product dimensions are measured and documented so that they can be used as a basis for further development steps.

We establish individual hybrid solutions.

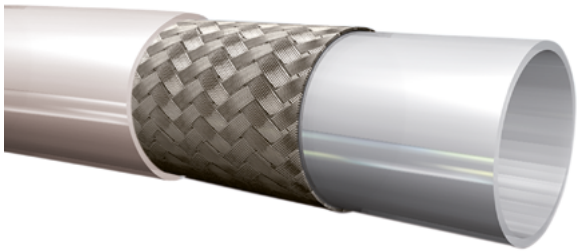
For demanding tasks, we can incorporate non-polymeric elements such as a braiding, wires or even cables into the tube. This allows us to combine opposing requirements (e.g. soft and tensile strength). In this way, we can also enable additional functions such as the transmission of electricity, optical or electronic signals.

We enable a smooth technology transfer.

We are available for process development and material qualification runs with the capabilities and knowledge installed in our company. After successful implementation, the transfer of the products to you can take place.

Engineering services

Braided Tubes



By integrating a metal- or plastic-based braiding into the tube wall, the mechanical properties can be significantly improved. For example, high torsional stiffness or even low bending radii can be achieved with thin wall thicknesses. The classic field of application for such tubes is flexible endoscopy.

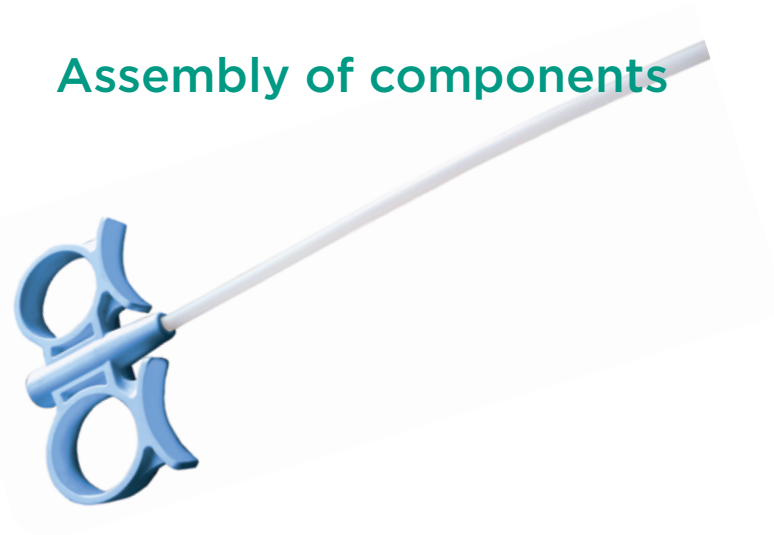
Wire reinforced tubes

The axial insertion of glass fibres, cables or wires in tube profiles enables unexpected of possibilities and the integration of additional functions. In addition to the transport of media in the tube, the transmission of electrical or light signals and voltage is also possible.

Laser marking

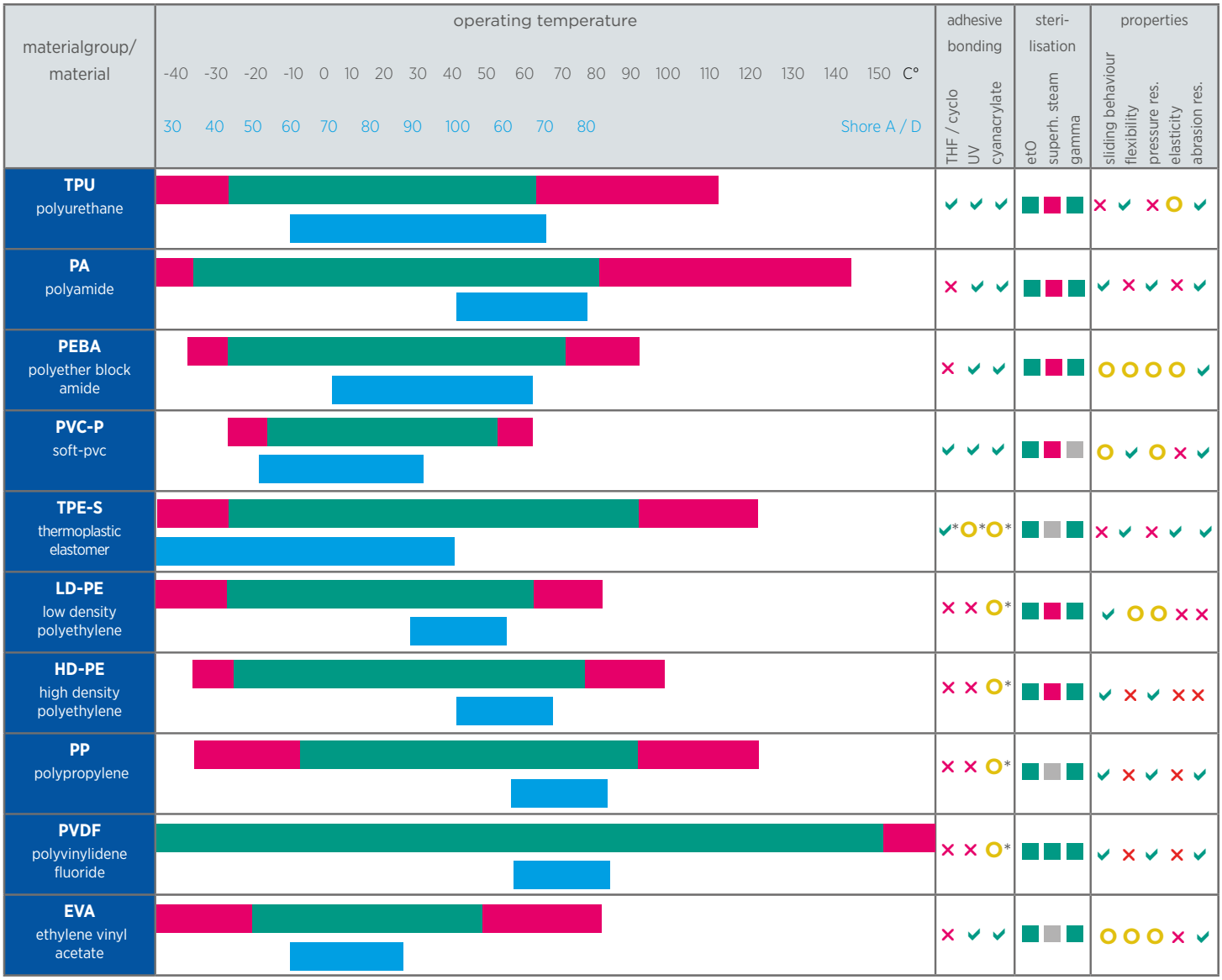
With the technology of laser marking, we offer a solution to meet high requirements regarding the clear identification and traceability of medical products. We offer a safe, clean and sustainable solution for marking injection-moulded products and extruded tubes. Almost all plastic components can be permanently marked with our laser engraving.

Assembly of components



Based on the close cooperation of our cross-brand specialist teams, we have a wide range of experience and expertise in the areas of material selection, tooling technology and manufacturing processes. This enables us to manufacture many of our plastic articles into assemblies according to customer requirements. We offer injection moulding and extrusion know-how under one roof. FLEIMA-PLASTIC has its own mould and tool making facilities and produces injection moulded parts from polymer materials quickly and efficiently. These meet the highest demands in terms of quality, functionality and reliability. Assembly services can be carried out „if required“ in class 7 clean rooms.

Material properties



- long-term temperature resistance
- short-term temperature load capacity
- available hardness grades

- ✔ good
- o conditionally
- ✕ non
- * special types

- suitable
- unsuitable
- special types

all information without subject to change

Material properties

Material combinations during co-extrusion

materialgroup/ material	TPU	PA	PEBA	PVC-P	TPE-S	LD-PE	HD-PE	PP-H	PVDF	COC	EVA
TPU	✓	✓	✓	✓	O*	×	×	×	×	O*	✓
PA	✓	✓	✓	O	O	×	×	×	O*	O*	✓
PEBA	✓	✓	✓	O	O	×	×	×	O*	O*	✓
PVC-P	✓	O*	O*	✓	×	×	×	×	×	×	✓
TPE-S	O*	O	O	×	✓	O	O	✓	O	✓	✓
LD-PE	×	×	×	×	O	✓	O	O	×	✓	✓
HD-PE	×	×	×	×	O	O	✓	O	×	✓	✓
PP-H	×	×	×	×	✓	O	O	✓	×	✓	✓
PVDF	×	×	×	×	×	×	×	×	✓	×	O
COC	O*	O*	O*	×	✓	✓	✓	✓	×	✓	✓
EVA	✓	✓	✓	✓	✓	✓	✓	✓	O	✓	✓

Co-extrusion of incompatible material types is possible through the use of modified polymers as well as through the introduction of adhesion promoting layers.

✓ good
O conditionally
× non
* special types

Notes

Notes

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Masterflex Group
Hoses and Connection Solutions made from High-Tech Polymers

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