MTG Peristaltic Way

MTG's line of hoses for peristaltic pumps

Passion for Innovation

MTG®

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1979 - 2009
30 Years of Passion

MTG Peristaltic Way

The peristaltic pump

This is a volumetric machine whose operation is based on the alternate compression of a rubber hose located within the pump body.

There are **two principal "families"** of peristaltic pumps: **roller pumps** and **sliding shoe pumps**.

In the former, two or more rollers rotating in opposite directions alternately compress the hose against the walls of the pump. As the hose resumes its original cylindrical form, it generates a vacuum that sucks the liquid, which is in turn pushed forward by the subsequent roll. This type of machine is normally dry operated: its sole lubrication is a film of silicone grease on the pressure rollers and the surface of the hose where it comes into contact with the rollers.

The second type of pump operates in a similar manner; in this case the hose is compressed by a sliding shoe system, which is connected to a rotor that compresses the walls of the flexible hose. The pump chamber where the hose is located contains neutral oil (usually glycerine) whose purpose is to lubricate and cool the flexible hose that heats up during pump operation due to the sliding friction on its surface.

The hose... the beating heart of the pump!

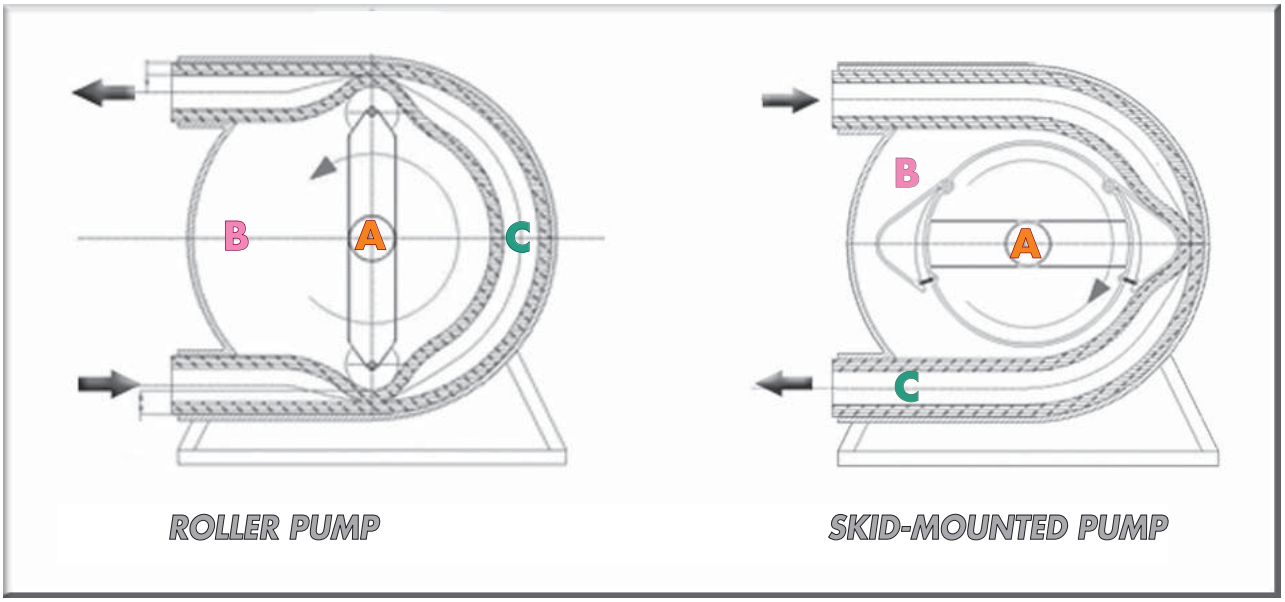
The essential component of the peristaltic pump is the rubber hose located in the pump chamber; it is the **true "beating heart" of the machine**. Its principal function is to guarantee the correct functioning of the peristaltic system.

The mechanical features of the hose and the materials with which it is built are determining factors influencing pump performance:

- its **elasticity** enables liquid suctioning and enhances the machine's capacity to provide a constant flow;
- its **resistance to compression over time** and **chemical compatibility** with the conveyed liquid determines its life span and thus the reliability of the pump.

The flexible hose is thus equipped to withstand the pressing force of the rollers or sliding shoes for as long as possible, thanks to its elasticity. This special ability to resume its original dimensions enables the pump to maintain its flow and suction capacity over time while limiting "spallation" (the release of dust or rubber particles).

The rubber hose is thus responsible for maintaining the efficiency of the pump system.



A. Rotor (rollers/skids) B. Pump head C. HOSE

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Application

FOOD	COSMETIC	CHEMICAL	CONSTRUCTION INDUSTRIAL
Fatty foods, milk, yogurt, ice cream, purée and fruit juice, wine, beverages, syrup, jam, chocolate, eggs, sauces, pasta.	Soap, toothpaste, shampoo, conditioner, hair dye, lotion, creams.	Acids with solids in suspension, caustic soda, latex, resin, adhesive, polymers, detergents, solvents, paste, pigments, bleaching and colouring agents.	Ceramic glazes, sludge, paint, dye, varnish, distilled water, plaster, betonite, lime milk, additives for concrete, slip, grout, wastewater and leachate.

Types of productive sectors using peristaltic pumps.

Peristaltic pumps are suitable for use in all processes in which it is essential that the conveyed media does not **come into contact** with the mechanical parts of the pump, thus **preventing the cross contamination of fluids**.

Principally used to transfer dense and viscous liquids and corrosive, abrasive or flammable products, they are also suitable for transferring pure or impure products, liquids with solid bodies in suspension and products naturally at risk for damage.

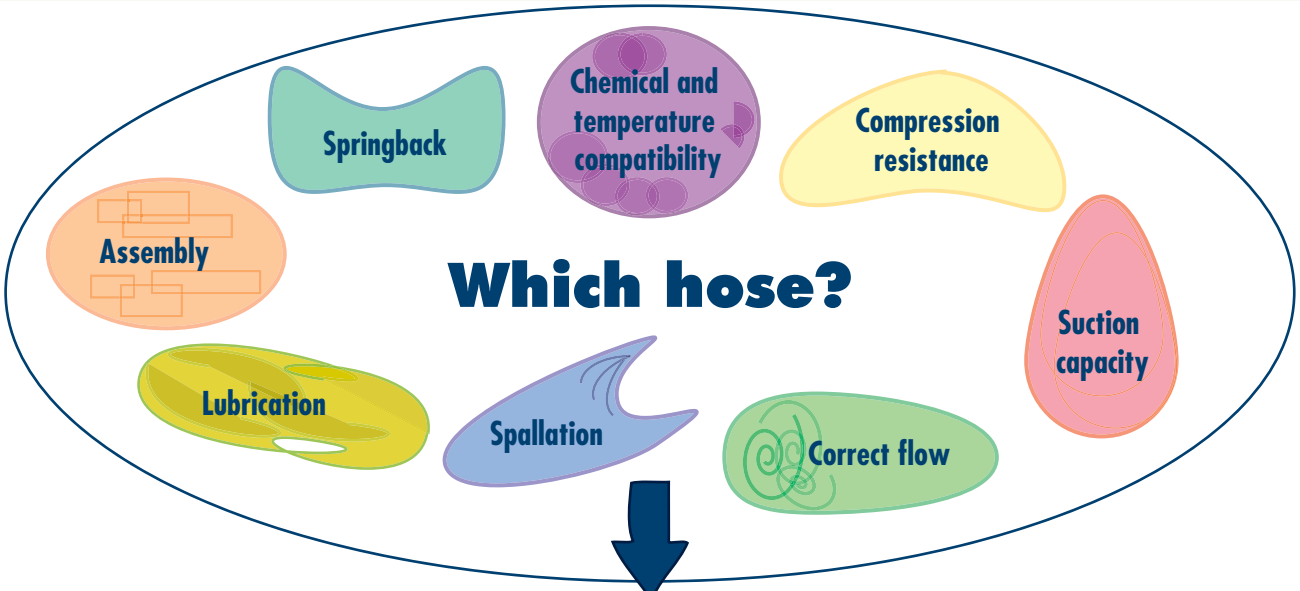
They are excellent dosing, self-priming, silent pumps and do not emulsify or create turbulence.

The number of sectors in which they are used include: food, pharmaceuticals, cosmetics, oenology, dairy products, paper, ceramics, tanning, construction, mining, galvanic treatments, iron and steel, textiles, chemicals and petrochemicals, water and sludge treatments, glue, varnish, paint and printing ink production.

Selecting the hose

The complexity of the peristaltic system and the wide variety of liquids with which it can be used call for **careful consideration when selecting the most suitable hose** for the needs of a particular sector.

It is thus essential to evaluate a series of parameters:



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Key benefits

Quality

MTG Peristaltic Way hoses are produced by specialized personnel, specifically trained in the construction of this particular type of flexible hose.
All the rubber blends used for these hoses are **produced directly by MTG**, which designs them at its research centre and continually tests their properties so as to guarantee compliance with set standards.

Design

MTG has **more than twenty-five years of experience** in the construction of rubber hoses specifically designed for use with peristaltic pumps.
The MTG technical office normally works together with peristaltic machine manufacturers to determine the dimensional tolerance of hoses, recognizing its importance in the correct functioning of the peristaltic system.

Artisan manufacturing

MTG's special structural technology enables **careful and precise control of dimensional tolerance.**
Unlike extruded hoses, adjustments are not strictly necessary but are available upon request.
In this case the wall thickness will have a dimensional tolerance of ± 0.3 mm.

Fatigue resistance

The rubber and textiles used are carefully selected to provide hose structure with the optimal elasticity and **highest fatigue resistance** so as to guarantee stronger adhesion between rubber and textile supports.

Customised design

MTG produces **customized hoses** for customers in a wide range of diameters. All hoses are handmade so as to ensure complete compliance with structural specifics.
A wide variety of processed polymers complete the company's customized solutions.

MTG Silicone

MTG-Peristaltic/Clearway:
completely produced in non-toxic silicone, it represents an innovative solution that ensures pharmaceutical grade performance **without releasing rubber particles** into the conveyed liquid (spallation) over the lifetime of the hose.
Also available in non-standard diameters.

Research and Development

The goal of the MTG Research and Development department is the continuous enhancement of the features and performance of its products: **new rubber hoses are regularly tested** on real peristaltic pumps at the MTG Laboratory.

Customer assistance

The experienced staff at the MTG Technical Sales Office **supports customers** as they select the most suitable hose for their specific needs.

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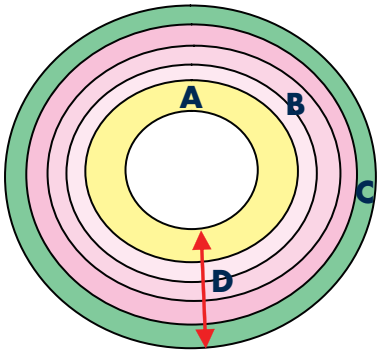
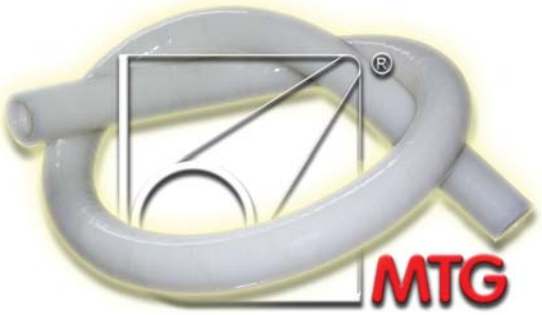
MTG PERISTALTIC cross section



A. Tube
B. Rubber cord plies
C. Cover
D. Wall thickness



Solutions

Among the various offers from the **MTG Peristaltic Way** line, **natural rubber (NR)** hoses represent the best-performing solution from a mechanical point of view, given their:

- resistance to the alternating compression in the peristaltic system;
- elasticity to ensure quick and complete recovery of the original shape following compression;
- abrasion resistance, both as concerns transported liquids and the pressure components in the machine;
- softness, which reduces the amount of output power required to compress the flexible hose;
- resistance to fatigue produced by cyclic mechanical stress;

The result? = A long life for the hose + constant flow over time;

Natural rubber is not, however, suitable for all applications.
There are situations in which the temperature and/or chemical aggressiveness of liquids are more **critical factors** (more destructive) than mechanical factors.

Critical conditions

- Use at temperatures exceeding 70°C or steam sterilization;
- Use with oxidizing acids (nitric, hydrochloric, peracetic...);
- Use with apolar products such as fuels, oils (industrial and food) and animal and vegetable fats;
- Use with cosmetic or pharmaceutical products destined to come into contact with the skin, face, body in general;
- Use at maximum safety levels when absolutely no contamination of dust or rubber particles ("spallation") is allowed.

In these cases, the most suitable alternative is **synthetic rubber**, which offers specific solutions for various applications in industrial processes.
MTG offers the **widest range of specific polymers in the sector**, categorized by application field:

NBR **HNBR** **EPDM** **CSM** **SILICONE**

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Polymer	MTG's solutions	Technical characteristics	
	MTG-PERISTALTIC/NR	Natural Rubber Black interior Black exterior	• Excellent mechanical performance. • Ideal to convey abrasive, non-aggressive liquids and liquids with solid bodies in suspension. • Used for most applications and particularly in the construction sector.
	MTG-PERISTALTIC/NR-food	Natural Rubber Clear interior Black exterior	• Food version. • Used primarily in the food industry and especially in oenology. • For food contact acc. to FDA Standards.
Temperature: from -10°C to +80°C			
	MTG-PERISTALTIC/NBR	Acrilonitrile Butadiene Rubber Black interior Black exterior	• High resistance both chemical and mechanical. • Ideal for transferring oily and fatty liquids (including mineral oils).
	MTG-PERISTALTIC/NBR-food	Acrilonitrile Butadiene Rubber Clear interior Black exterior	• Specifically designed for transferring animal and vegetable products, fatty and oily foodstuffs. • For food contact acc. to FDA Standards.
Temperature: from -10°C to +80°C			
	MTG-PERISTALTIC/HNBR	Hydrogenated Nitrile Rubber Black interior Black exterior	• Excellent mechanical features. • Excellent resistance to mineral and lubricating oils, fuels and liquids with an aromatic content of up to 60%. • Mainly used for application in the oil and automotive sectors.
Temperature: from +15°C to +150°C			
	MTG-PERISTALTIC/EPDM	Ethylene Propylene Diene Monomers Black interior Black exterior	• Ideal for transferring a wide range of chemical products* and corrosive liquids. (*) Contact the MTG Technical Sales Office to verify chemical compatibility with the products.
Temperature: from -10°C to +100°C			
	MTG-PERISTALTIC/CSM	Chlorosulfonated polyethylene (Hypalon®) Black interior Black exterior	• Its carcass exhibits a good mechanical performance and is highly suitable for transferring a wide variety of aggressive chemicals*. (*) Contact the MTG Technical Sales Office to verify chemical compatibility with the products.
Temperature: from -10°C to +80°C			
	MTG-PERISTALTIC/CLEARWAY	Silicone Rubber Clear interior Clear exterior	• Specifically designed to convey high purity liquids (fatty, oily, cosmetic and pharmaceutical) and those with an alcoholic content of up to 96%. • Pharmaceutical validation: complies with USP Class VI, EU Pharmacopeia and FDA Standards. • Does not release rubber particles into conveyed liquid (spallation) during the lifetime of the hose.
Temperature: from -20°C to +150°C			

• Reported temperatures should be considered approximate. The resistance of hoses at a specific working temperature depends on the type of liquid conveyed. We recommend consulting the MTG Technical Sales Office.
• For information on hoses constructed from other types of synthetic rubber, please contact the MTG Technical Sales Office.
• Hypalon® is a registered trademark of Du Pont Dow Elastomers.

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