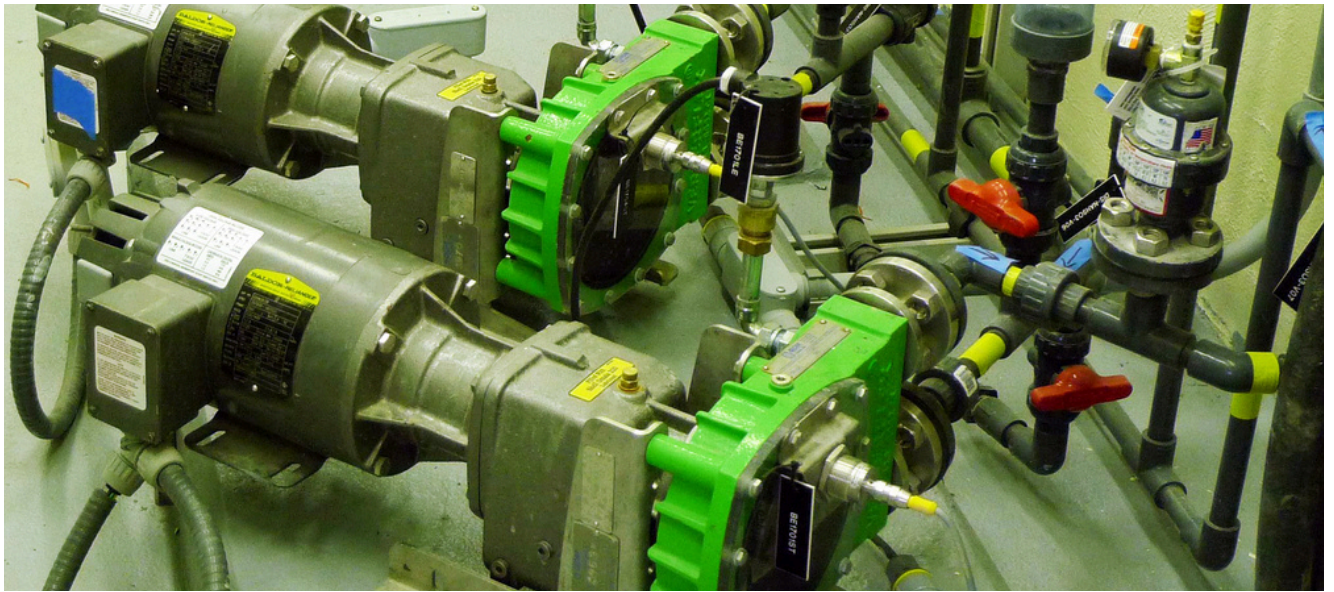


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# PERISTALTIC PUMP LUBRICATION APPLICATION



**COOMCOOL<sup>®</sup>**  
**科美克<sup>®</sup>**

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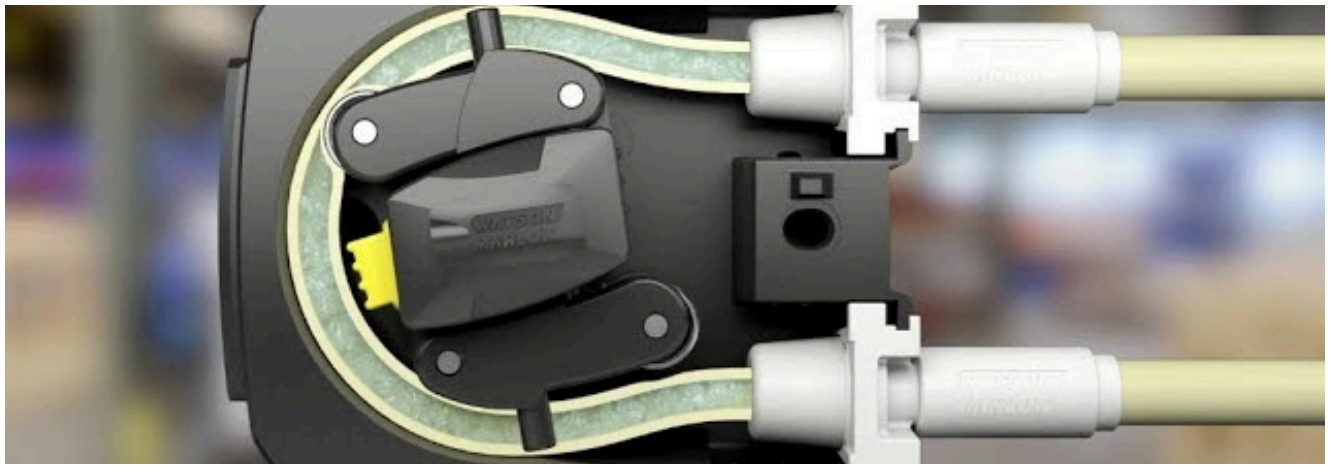
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# Brand Profile

Rui Xian (Shanghai) Chemical Co., Ltd., established in Shanghai, China, focuses on the field of industrial surface treatment chemicals. The research and service priorities are the application of lubricants, anti-corrosion, and anti-rust chemicals under extreme conditions and complex working environments.

The Coomcool brand, owned by Rui Xian (Shanghai) Chemical Co., Ltd., specializes in fluid lubrication and sealing of various pumps and valves. This includes peristaltic pumps, hose pumps, squeeze pumps, gear pumps, plunger pumps, centrifugal pumps, vacuum pumps, gate valves, butterfly valves, ball valves, plug valves, and other pump and valve equipment. Coomcool focuses on lubrication, anti-corrosion, anti-rust, wear reduction, and sealing applications, providing surface material protection under high temperature, high pressure, and corrosive conditions. This ensures the safe, efficient, and continuous operation of pump and valve equipment.





## PERISTALTIC PUMP CLASSIFICATION AND WORKING PRINCIPLE

### Working Principle

A peristaltic pump is a pump that achieves liquid transport by compressing the flexible tube wall. The tube wall does not come into contact with the rotor. Through the rotation of the rotor, the tube wall is compressed, causing the liquid inside the tube to be pushed forward along the tube. Peristaltic pumps have excellent self-priming capability, the ability to transport high-viscosity fluids, and are free from contamination. They are widely used in industries such as chemical, pharmaceutical, and food processing.

Peristaltic pumps are classified as positive displacement pumps and operate based on the principle of alternating compression of the tube, similar to the action of the human throat or intestines.

- A rotor or cam is set along the length of the tube, compressing it to form a seal and creating a strong vacuum that draws the product into the pump.
- Upon reaching the end of the tube, the medium is "pushed out" through the discharge outlet.

### COMMON CLASSIFICATIONS OF PERISTALTIC PUMPS

#### 1 By Working Principle

- Compression Type
- Vacuum Type

#### 2 By Structural Form

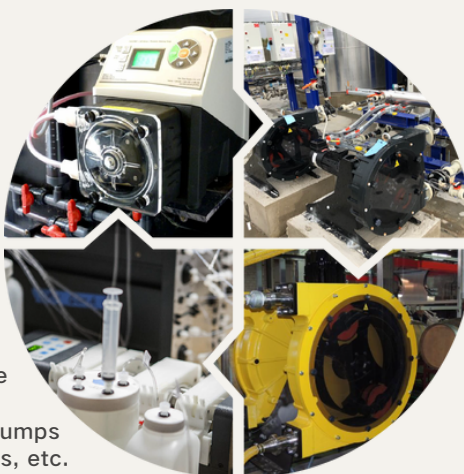
- Internal Type
- External Type

#### 4 By Liquid Transport

- Acid and Alkali Hose Pumps
- Food-Grade Hose Pumps
- Medical Hose Pumps, etc.

#### 3 By Pressure Classification

- Low-Pressure Hose Pumps
- Medium-Pressure Hose Pumps
- High-Pressure Hose Pumps



# PERISTALTIC PUMP INDUSTRY APPLICATIONS

Peristaltic pumps are widely used across various industries, including food and pharmaceuticals, chemicals, water treatment, and oil and gas. In the food and pharmaceutical industries, peristaltic pumps are extensively employed for transporting high-viscosity, perishable, or contaminant-sensitive substances such as pasty foods, cosmetics, and pharmaceuticals. In the chemical industry, peristaltic pumps can be used for transferring high-concentration chemicals, acid and alkaline liquids, and solvents. In the water treatment industry, peristaltic pumps are suitable for transporting wastewater containing solid particles, sediments, and viscous sludge. In the oil and gas industry, peristaltic pumps can be used for transferring high-viscosity oils and for petroleum wastewater treatment. In summary, peristaltic pumps are highly useful in many industries. Their design makes them suitable for transporting various types of liquids, making them an indispensable part of the industry.



## CERAMIC INDUSTRY

- Used for dosing additives and transporting media.
- Prevents the overuse of expensive chemical additives.



## FOOD, BEVERAGE, AND BREWING

- Used for dosing additives and transporting media.



## PACKAGING AND PRINTING

- Circulates various water-based and solvent-based inks and coatings.
- Used for pumping adhesives, cold seal coatings, primers, and other paints, as well as for liquid metering and packaging.



## WATER TREATMENT

- Handles abrasive slurries with high solid content.
- Used for dewatering, flocculation, and chemical dosing.



## MINING INDUSTRY

- Applications involve abrasive and corrosive products.



## CHEMICAL INDUSTRY

- Handles challenging fluids including abrasive, corrosive, and gas-containing fluids.



## PAPER AND PAPERBOARD

- Accurate and reliable dosing of additives and colorants.
- Handles high-viscosity, corrosive, and abrasive fluids, such as coatings, lime slurries, and  $\text{TiO}_2$  slurries.



## CONSTRUCTION AND CIVIL ENGINEERING

- Dewatering and pressure filtration
- Slurry transport
- Sludge treatment (slurries, silt, sand)
- Chemical metering and packaging
- Wastewater and concrete flushing treatment



## APPLICATION OF LUBRICANTS IN PERISTALTIC PUMPS

### Hose: The Heart of the Peristaltic Pump

The hose in a peristaltic pump is one of its most critical components, as it is the only contact point between the pump and the fluid. Due to the frequent compression and relaxation during operation, the hose is prone to wear and aging, which can lead to decreased pump performance or even failure. Using lubricants can create a lubrication film on the hose surface, reducing friction and wear during the compression and relaxation process, thus extending the hose's lifespan. Additionally, lubricants help maintain the hose's elasticity and flexibility, preventing it from becoming hard and brittle, ensuring that it maintains good sealing performance and fluid transport capability throughout the pump's operation. Therefore, using lubricants is crucial for protecting the hose and prolonging the life of the peristaltic pump.

#### Why Recommend Using Coomcool PST Series Peristaltic Pump Lubricants

- ① **Extend Hose Life:** Reduces friction and wear during the compression and relaxation process, thereby prolonging the hose's lifespan.
- ② **Improve Pump Efficiency:** Lowers friction between the pump body and fluid, reducing energy consumption and noise, and enhancing the pump's efficiency.
- ③ **Maintain Hose Flexibility:** Preserves the elasticity and flexibility of the hose, preventing it from becoming hard and brittle, and ensuring it maintains good sealing performance and fluid transport capability throughout the pump's operation.
- ④ **Prevent Pump Corrosion:** Protects the pump body from corrosion and damage caused by the fluid, safeguarding key components and extending the pump's lifespan.
- ⑤ **Enhance Pump Safety:** Reduces operating temperature and friction coefficient, minimizing wear and failure, and improving the safety and reliability of the pump.

#### APPLICATION EQUIPMENT

- Boyser Series Peristaltic Pumps
- VERDERFLEX Series Peristaltic Pumps
- WATSON-MARLOW Series Peristaltic Pumps
- Bredel Series Peristaltic Pumps
- PCM Series Peristaltic Pumps

# PERISTALTIC PUMP HOSE

## Common Causes of Hose Damage

In practical production, the reasons for hose damage or replacement may include the following:

- **Hose Aging:** The lifespan of a hose is limited. Prolonged use leads to aging, which is manifested as hardening, cracking, and rupturing.
- **Wear and Tear:** During media transport, hoses are subjected to friction and wear. Over time, this results in hose wall thinning and visible wear marks.
- **Chemical Corrosion:** Some media are corrosive and can cause chemical damage to the hose, leading to deterioration.
- **Temperature Changes:** Hoses made from certain materials may be affected by temperature variations. Excessive high or low temperatures can cause the hose material to lose elasticity or deform, resulting in damage.
- **Excessive Pressure:** If a hose endures excessive pressure while transporting media, it may deform or burst, necessitating hose replacement.

## COMMON MATERIALS FOR PERISTALTIC PUMP HOSES

### 7. Polyethylene - Chemical Fluid Tubing

- Suitable for fuels and industrial lubricants, resistant to swelling and hardening caused by hydrocarbon fluid chemical attack.
- Temperature Range: 0°C to +50°C

### 8.FKM - Fluoroelastomer - Corrosion-Resistant Chemical Tubing

- Resistant to corrosive acids, alkalis, and solvents.
- Temperature Range: 0°C to +85°C
- Resistant to ozone, sunlight, and weathering.
- The black color helps protect light-sensitive fluids.

### 5.CSM - Chlorosulfonated Polyethylene Rubber

- Suitable for pumping highly corrosive media.
- Temperature Range: -20°C to +85°C

### 6.Silicone - Highly Sterile Tubing

- Translucent medical/food-grade tubing, odorless and non-toxic.

### 1.NR - Natural Rubber

- Suitable for mildly corrosive chemicals, highly abrasive slurries, and inorganic products.
- Temperature Range: -20°C to +80°C

### 2.NBR - Nitrile Butadiene Rubber

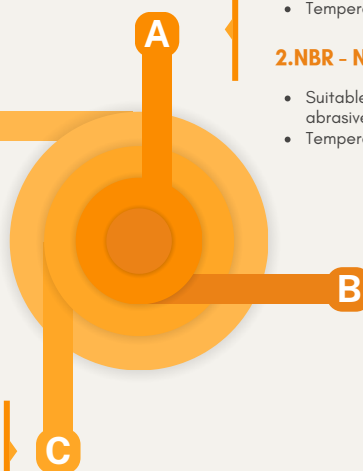
- Suitable for mildly corrosive chemicals, highly abrasive slurries, and inorganic products.
- Temperature Range: -20°C to +80°C

### 3.Food-Grade NBRF

- Food-grade lining, used in sanitary applications.
- Temperature Range: -20°C to +80°C

### 4.EPDM - Ethylene Propylene Diene Monomer)

- Suitable for corrosive chemicals and inorganic media.
- Temperature Range: -20°C to +100°C



## PERISTALTIC PUMP LUBRICANT SERIES Coomcool PST 100



### Description

Coomcool PST 100 is a lubricant/coolant designed for peristaltic pumps or hose pumps.

### Application

Suitable for lubrication of peristaltic pumps or hose pumps, such as the BOYSER RBT series peristaltic pumps.

### Advantages

- Food-Grade
- Non-Corrosive
- Non-Volatile
- Ensures long-term operation of peristaltic pumps and extends their lifespan.

### Typical Characteristics

Property	Unit	Test Method	Value
Appearance	-	Visual	Transparent liquid
Density @ 15°C	kg/m <sup>3</sup>	ASTM D4052	1250
Flash Point	°C	ASTM D92	176

## Peristaltic Pump Lubricant Series Coomcool PST 200



### Description

Coomcool PST 200 is a lubricant/coolant designed for peristaltic pumps or hose pumps.

### Application

Suitable for lubrication of peristaltic pumps or hose pumps that handle nitrogen compounds (such as nitric acid), strong oxidizers (peroxides), and other reactive chemicals.

### Advantages

- Food-Grade
- Non-Corrosive
- Non-Volatile
- Ensures long-term operation of peristaltic pumps and extends their lifespan.

### Typical Characteristics

Property	Unit	Test Method	Value
Appearance	-	Visual	Transparent liquid
Density @ 15°C	kg/m <sup>3</sup>	ASTM D4052	960
Flash Point	°C	ASTM D92	300

## MAINTENANCE OF PERISTALTIC PUMPS

Tasks	Frequency	Plan
Inspect the pump body and gear box for leaks and damage	<ul style="list-style-type: none"> <li>• Before starting the pump</li> <li>• Daily visual inspection</li> <li>• Scheduled intervals during operation</li> </ul>	<ul style="list-style-type: none"> <li>• Repair leaks and damage before operating the pump.</li> <li>• Replace components if necessary.</li> <li>• Clean up spilled liquid.</li> </ul>
Check the lubricant level in the pump body	<ul style="list-style-type: none"> <li>• Before starting the pump</li> <li>• Daily visual inspection</li> <li>• Scheduled intervals during operation</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that the lubricant level is visible through the observation window between the lower base and the first pair of bolts.</li> <li>• If the level is too low or too high, do not operate the pump. Refill the lubricant as required.</li> </ul>
Check the lubricant level in the gear drive motor	<ul style="list-style-type: none"> <li>• Before starting the pump</li> <li>• Daily visual inspection</li> <li>• Scheduled intervals during operation</li> </ul>	<ul style="list-style-type: none"> <li>• Motor Instruction Manual</li> </ul>
Monitor for abnormal temperature or noise during pump operation	<ul style="list-style-type: none"> <li>• Daily visual inspection</li> <li>• Scheduled intervals during operation</li> </ul>	<ul style="list-style-type: none"> <li>• Inspect the pump body, gear box, and bearing box for damage.</li> <li>• Replace worn components.</li> </ul>
Replace the pump body lubricant	<ul style="list-style-type: none"> <li>• Every time the hose is replaced or every six months</li> <li>• As needed, following inspection.</li> </ul>	<ul style="list-style-type: none"> <li>• Refill the lubricant</li> </ul>
Replace the hose	<ul style="list-style-type: none"> <li>• As needed, following inspection.</li> <li>• When the flow rate drops by 25% of its nominal value.</li> <li>• When the hose bursts or is damaged.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace the hose</li> <li>• Replace the flange sealing gasket</li> </ul>
Inspect the pump body and internal rotor	<ul style="list-style-type: none"> <li>• Once a year</li> <li>• When replacing the hose</li> </ul>	<ul style="list-style-type: none"> <li>• Replace worn components</li> <li>• Check bearing clearances and functionality</li> </ul>



Jiuting Industrial Park,  
Songjiang District, Shanghai



tech@runsunsh.com



www.coomcool.com



+86 400 920 5357

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