Special Lubricant for The Insulation Industry

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COOMCOOL®

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Coomcool, Fluid Lubricants for The Insulation Material Industry

Coomcool specializes in the maintenance and upkeep of chain and cable equipment, offering lubrication protection for chain and cable devices, and providing services such as energy-saving, kinetic energy improvement, process enhancement, comprehensive condition monitoring, chemical management training, equipment management consulting, third-party testing, and related equipment.

Coomcool offers a range of lubricants, including oil-based lubricants, solid lubricants, dry film lubricants, chain sprays, chain cleaners, chain plate lubricants, cable lubricants, and chain equipment, effectively solving seven major issues related to chains and cables. We provide lubrication solutions for over 100 industries, ensuring efficient operation of chains and cables under conditions of high temperatures, ultra-high temperatures, and acid, alkali, and salt corrosion, while also meeting strict food safety requirements.

Coomcool introduces advanced technology from the UK and the Netherlands to thoroughly address common issues in chain and cable lubrication such as fast evaporation, easy coking, carbon buildup, difficulty in cleaning, poor high-temperature resistance, random dripping, and improper lubrication. This reduces friction and wear, mechanical loss, rust, and breakage during the operation of chains and cables, saving 5% - 7% of electrical energy consumption and extending the equipment's service life.

Coomcool aims to reduce production costs for customers and provide scientific lubrication solutions with high-quality products and a complete service system. We believe that service is an integral part of our products, and we strive to ensure the full realization of high product performance through extensive professional knowledge and timely on-site services, ultimately enhancing value in terms of safety, environmental protection, increased production, reduced consumption, and sustainable development.

Insulation Material Production Conditions

Insulation materials are generally those with a thermal conductivity of less than or equal to 0.2. The development of insulation materials is rapid, and adopting good insulation technology and materials in industry and construction can often achieve twice the result with half the effort.

Insulation materials, also known as thermal insulation materials, can be classified into organic and inorganic types based on their composition, and into fibrous, porous, microporous, foamed, granular, and layered types based on their form.

The common types of insulation materials and their operating temperatures are as follows:

- Thermal insulation materials: 50°C - 800°C
- Cold insulation materials: < 25°C
- Refractory materials: > 800°C

During the production of insulation materials, related equipment is often exposed to the following environments:

- High temperatures
- High pressures
- Friction conditions
- Water

The combined effects of these factors make equipment lubrication extremely complex. This process may lead to early damage to equipment structures, friction issues, and functional failures. These adverse effects will directly impact the production efficiency of the machinery and increase maintenance costs. To ensure safe operation of the factory and extend the lifespan of the machinery, high-performance lubricants play a crucial role.

Additionally, the moisture content of insulation materials is closely related to their thermal insulation performance. Studies have shown that a damp exterior wall restricts insulation performance; the higher the moisture content in the wall, the poorer its insulation performance.

Wall Moisture	Insulation Performance
≈ 1%	≈ 100%
≈ 2%	≈ 80%
≈ 4%	≤ 50%
≥ 10%	≤ 23%

In the production of insulation materials, the addition of water repellents can significantly enhance the hydrophobic properties of the products, thereby improving energy-saving and insulation efficiency.

Rock Wool Industry Lubrication Solution

Rock wool belongs to the category of mineral wool and is primarily made from basalt, diabase, and other materials. These raw materials are melted in a cupola furnace or other smelting furnaces, and the molten stream is then blown by a four-roll centrifuge, rapidly cooling to form a fluffy, short, fine fiber product. It is lightweight, sound-absorbing, thermally insulating, non-combustible, corrosion-resistant, chemically stable, and has abundant raw material sources, making it an excellent insulation material.

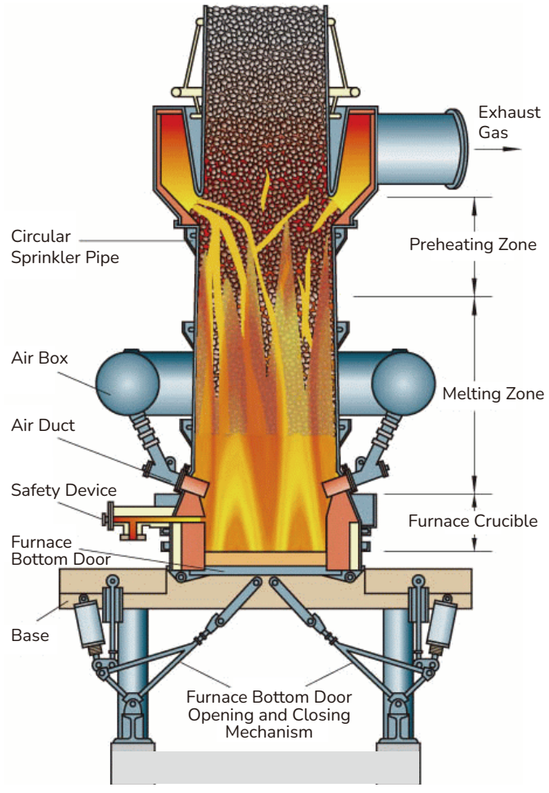
Rock wool products are mainly used for thermal insulation and sound absorption in the walls, roofs, and ceilings of buildings.

Rock Wool Production Process

Application

- Cupola Furnace Fan Bearing Grease - Wallimore HFG Series
- Fiberizer/Four-Roll Centrifuge Bearing Lubricant - Wallimore HCG Series
- Mineral Fiber Surface Wetting Agent/Dust Suppressant Oil - Coomcool DST Series
- Mineral Fiber Water Repellent - Coomcool WRP Series
- Mineral Wool Settling Chamber Fan Bearing Grease - Wallimore HFG Series
- Curing Oven Chain System Lubricant - Coomcool RWL Series
- Curing Oven Conveyor Chain Plate Release Agent - Coomcool CPA Series
- Curing Oven Upper and Lower Wind Chamber Fan Bearing Grease - Wallimore HFG Series

Cupola Furnace



Cupola

Melting Equipment

The melting equipment for mineral wool includes:

- Cupola Furnace
- Flame Pool Furnace
- Electric Capacity Pool Furnace
- Electric Resistance Pool Furnace

Melting Principle

The cupola furnace uses preheated air (400 - 550°C) to assist the combustion of coke. Hot air is blown in from the bottom of the furnace body and reacts with the coke. The heat released from this reaction heats the air in this region, turning it into flue gas, with temperatures reaching over 2000°C. This region is primarily characterized by oxidation reactions and is thus called the melting zone. The downward-moving raw materials are heated and melted into molten material.

The hot flue gas continues to rise, leaving the melting zone. The heat released from the reaction not only heats the raw materials but also contributes to a reduction reaction when the CO_2 in the flue gas encounters the hot coke. This region is known as the reduction zone.

The flue gas continues to rise through the reduction zone and enters the preheating and drying zone of the materials. Through heat exchange, the flue gas heats and dries the materials, preheating them.

The flue gas temperature drops to approximately 150 - 220°C before it is finally discharged from the upper part of the cupola furnace.

Product Recommendations

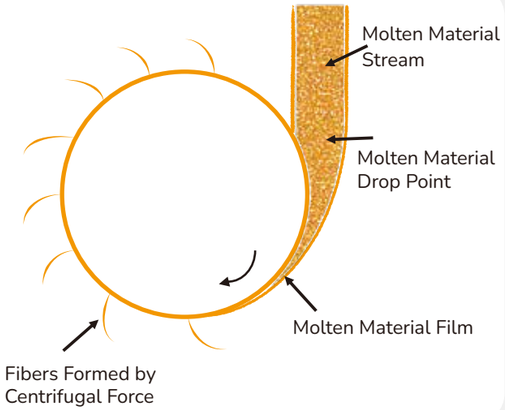
- Cupola Furnace Fan Bearing Grease - Wallimore HFG Series

Four-roller Centrifuge

The rock wool forming process commonly uses the multi-roll centrifugal spinning method, with the equipment typically being a four-roll centrifuge. The molten material sequentially drops from one roll to the next, with each roll operating at its own speed.

Each roll of the centrifuge is supported by a hollow shaft, which is cooled by circulating water to protect the roll and bearings. Each hollow shaft is supported by two high-speed bearings. The centrifuge bearings use mist lubrication to meet the high-speed operational requirements of the hollow shafts and to effectively reduce the temperature.

Four-Roll Centrifuge Production Diagram



Single-Roll Fiberization Process

Fiber Formation Principle

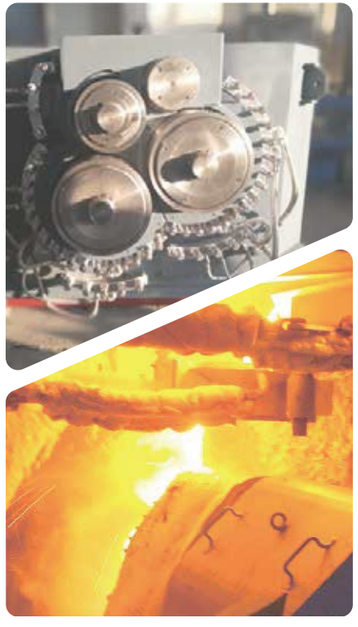
The molten material falls onto the centrifugal roll at a specific angle. Under the influence of centrifugal force and the viscosity of the molten material, an unstable molten material film forms on the roll surface. Due to the centrifugal force, the film fragments into countless molten particles, which are then ejected from the roll surface in a fine stream and stretched and solidified into fibers.

At this point, high-pressure air from the air ring adheres to the surface of the rapidly rotating roll. The fibers formed encounter a strong air curtain, and the molten fibers that have not fully formed are further stretched by the high-pressure air in the axial direction, resulting in finer and longer fibers.

The formed fibers are treated with a binder applied via central spray or multiple point atomization to enhance fiber strength, abrasion resistance, softness, water repellency, and to reduce cotton dust emissions, thereby improving the working environment.

Product Recommendations

- Rock Wool Line Centrifuge Lubricating Oil - Coomcool FRC 10 Series
- Rock Wool Line Centrifuge Grease - Wallimore HCG Series
- Rock Wool Dust Suppressant Oil - Coomcool DST 245 Series
- Rock Wool Water Repellent - Coomcool WRP 3000 Series



Curing Oven

Heat Treatment Process

- Use gas, liquid, or solid fuels to generate hot gas streams in a hot air furnace.
- The hot air fan delivers hot gases at temperatures of 300 - 350℃ into the curing furnace's heating zone, where the gases pass through the cotton layer to evaporate moisture and cure the resin. Approximately 80% of the hot air is returned to the hot air mixing chamber for recycling.
- About 20% of the hot gases are burned and then expelled through the chimney by the boiler induced draft fan.

Typically, the hot air should pass through the cotton layer in the curing furnace at a rate of 30 - 50 times per second, with a hot air temperature requirement of 260 - 300℃.

In the rock wool production process, after the resin-bonded felt exits the settling chamber, it is pre-compressed by pressure rollers and then enters the curing furnace for thermal treatment. This process dehydrates and cures the resin, resulting in a product with fixed structure and shape. This step is the most critical in the manufacturing process of mineral wool slag and rock wool insulation boards.

Product Recommendations

In the Curing Furnace, the chains are exposed to high temperatures of 240 - 280°C, and in extreme cases, up to 300°C.

Most chain oils experience smoking, odor, and carbon buildup at these temperatures, which hinders the effective operation of the chains and can lead to issues such as jamming, elongation, and breakage.

- Semi-Synthetic High-Temperature Chain Oil for Rock Wool Line - Coomcool Chain RWL 300 Series
- Synthetic High-Temperature Chain Oil for Rock Wool Line - Coomcool Chain RWL 900 Series
- Curing Furnace Chain Plate Release Agent - Coomcool CPA 50 Series
- Curing Furnace Chain Plate Release Agent - Coomcool CPA E30 Series

Product Advantages

- No smoking, odorless, environmentally friendly, and non-toxic.
- No carbon buildup or solid coking at high temperatures.
- Eliminates cleaning issues caused by solid accumulation.
- Can significantly reduce energy consumption, saving 5% - 7% on electricity.
- Good high-temperature adhesion, not prone to dripping.
- Recommended for lubrication of high-temperature chains in rock wool, fiberglass, and refractory material production lines.
- Operating temperature > 350℃
- Widely used for lubrication of bearings, chains, slides, and gears.

Glass Wool Industry Lubrication Solution

Glass Wool is made from silicate minerals used to form glass. The raw materials are melted in a glass furnace and flow out from the perforated plate. The molten glass is rapidly spun out from the sidewalls of the centrifuge, forming short, fluffy fibers under the stretching effect of high-temperature, high-speed flames in the combustion chamber. It is classified as an inorganic glass fiber and is an excellent thermal insulation material for temperatures below 400°C.

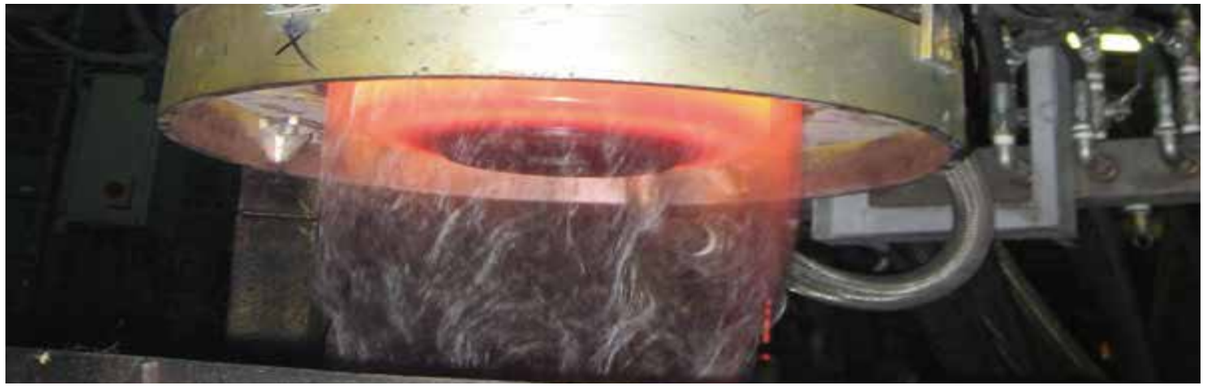
Glass wool products are primarily used in industrial tanks, factory buildings, residential buildings, and pipelines for sound insulation and thermal insulation. They can also be used as thermal and acoustic insulation materials in vehicles such as cars, ships, and airplanes.

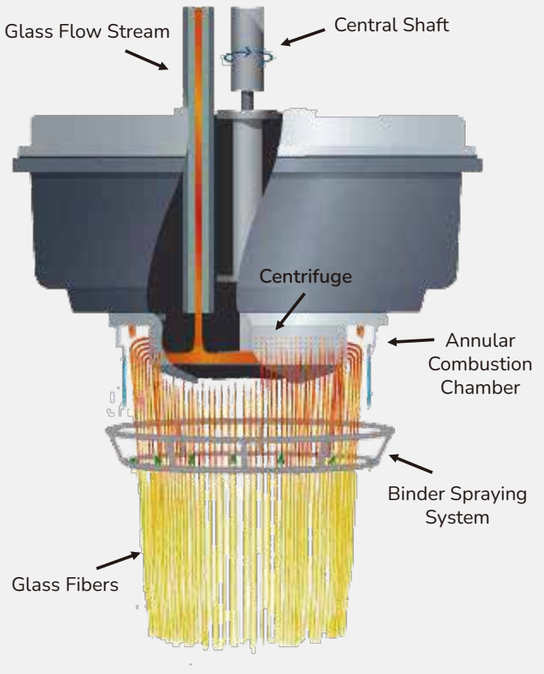
Centrifugal Glass Wool Production Process

Application

- Centrifuge Bearing Grease - Wallimore HCG Series
- Glass Fiber Surface Wetting Agent/Dust Suppressant Oil - Coomcool DST Series
- Glass Wool Collecting Machine Fan Bearing Grease - Wallimore HFG Series
- Curing Furnace Chain System Lubricant - Coomcool RWL Series
- Curing Furnace Conveyor Chain Plate Release Agent - Coomcool CPA Series
- Glass Fiber Water Repellent - Coomcool WRP Series
- Curing Furnace Upper and Lower Air Chamber Fan Bearing Grease - Wallimore HFG Series

Centrifuge





Glass Wool Fiber Formation Process

Characteristics of the Centrifuge

The centrifuge is the core device in fiber production. It operates at high temperatures (around 1000°C) and high rotational speeds, and it is subjected to the abrasive and corrosive effects of molten glass and the oxidative effects of high-temperature, high-speed airflows.

Centrifuges come in two types: open-bottom and sealed-bottom. The majority are made of nickel-based alloys and have thousands to tens of thousands of small holes in the sidewalls.

After operating for 200 - 400 hours, the small holes in the centrifuge are eroded by the glass liquid, causing the hole diameters to enlarge. Additionally, the sidewalls may bulge due to high-temperature creep, necessitating replacement.

Fiber Formation Process

Under the force of gravity, molten glass is fed through a perforated plate into the centrifuge's distributor. The molten glass is then subjected to centrifugal force and exits through the small holes in the centrifuge as fine streams.

As the fine streams exit the centrifuge, they are torn and stretched by the high-temperature air currents directed downward from the combustion chamber. During the descent, the temperature of the airflow drops rapidly, increasing the viscosity of the glass streams, which eventually solidify into fiber.

Product Recommendations

- High-Speed Centrifuge Bearing Grease - Wallimore HCG Series
- Glass Fiber Surface Wetting Agent/Dust Suppressant Oil - Coomcool DST 245 Series

Curing Oven

The curing furnace is equipment used for heat-treating resin-bonded glass wool felt according to specifications. To make full use of the heat source and accelerate the curing process, temperature control is adjusted based on different stages of the felt within the curing furnace.

To ensure uniform heating of the product, the curing furnace is generally divided into two zones along its length, with each zone having a different hot air circulation direction.

- The temperature in Zone II is generally higher than that in Zone I.
- The greater the density of the product, the higher the temperature required, which can reach up to 270°C.

Temperature Range for Each Zone of the Curing Furnace

Item	Zone I	Zone II
Lightweight Products 8 - 24kg/m³	230 - 240°C	245 - 250°C
Medium-Density Products 24 - 40kg/m³	240 - 250°C	255 - 260°C
High-Density Products 41 - 120kg/m³	250 - 260°C	270°C

Product Recommendations

In the curing furnace, chains are exposed to high temperatures of 230 - 270°C for extended periods. Some chain oils at these temperatures may produce smoking, odor, and polymer residues such as carbon buildup, which hinders the effective operation of the chains and can lead to issues such as jamming, elongation, and breakage.

- Glass Wool High-Temperature Chain Oil - Coomcool Chain RWL 305 Semi-Synthetic Series
- Glass Wool High-Temperature Chain Oil - Coomcool Chain RWL 350 Synthetic Series
- Curing Furnace Chain Plate Release Agent - Coomcool Chain CPA 50 Series

Gypsum Board Lubrication Solution

Paper-faced gypsum board is a lightweight board made primarily from plaster of Paris. It features qualities such as light weight, sound insulation, thermal insulation, strong workability, and ease of installation. Additionally, it is made from widely available raw materials and has a short production cycle, making it an ideal material for interior walls.
During the production of paper-faced gypsum board, the equipment is exposed to high temperatures and heavy loads, requiring the use of suitable lubricants to ensure long-term optimal operation of the machinery.

Lubrication for Airflow Dryers

Operating Conditions
- Operating Temperature: 60°C - 220 °C, with an average of 183°C
- Operating Speed: Approximately 15 m/s, variable frequency
- Moisture Content: 5% - 10%

Main Lubrication Points
- Roller Drive Chains

Recommended Products
- Coomcool GSB Series High-Temperature Chain Oil

Various Drying and Calcination Technologies

Drying Equipment
- Flash Dryer Crusher
- Shovel Dryer
- Mill Dryer

Calcination Equipment
- Ring Roller Mill (Rapid Calcination)
- Hammer Mill (Rapid Calcination)
- Rotary Kiln
- Tubular Rotary Kiln (Natural Gas Combustion)
- Tubular Rotary Kiln (Uniform Heating)
- Frying Pan
- High-Pressure Frying Pan (Alpha-Type Hemihydrate Gypsum)

Lubrication Solutions for Other Equipment

Wet Board Conveyor Line	Roller Bearings	Wallimore HVE Series Heavy-Duty Water-Resistant Grease
Dry Additive Equipment	Loss-in-Weight Metering Additive Device	Wallimore HSG Series Synthetic Heavy-Duty Grease
Mixing and Forming Devices	Hydraulic Alignment Device	Coomcool HLC Series Oil for Automatic Alignment Devices
Calcination Kilns	Open Gears	Wallimore OMG Series Open Gear Grease
	Calciner Bearings	Wallimore KBG Series High-Temperature Bearing Grease
Screw Air Compressor	Compressors	Coomcool Airl SC Series Screw Air Compressor Oil
Drive Motors	Motor Bearings	Wallimore Supermoly H Series Motor Bearing Grease
Tunnel Furnace Hot Air Fans	Fan Bearings	Wallimore HFG Series Hot Air Fan Bearing Grease

Rubber and Plastic Foam Industry Lubrication Solution

Rubber and Plastic Foam Insulation Materials are closed-cell elastic materials with excellent properties such as flexibility, resistance to bending, cold and heat resistance, flame retardancy, waterproofing, low thermal conductivity, and sound and vibration absorption. They are widely used in various industries, including central air conditioning, construction, chemical, light textile, metallurgy, shipbuilding, automotive, and electrical industries, for insulating pipelines and containers of hot and cold media to reduce cooling and heating losses.

The processing of rubber and plastic products primarily involves managing their plasticity and elasticity. Initially, elastic rubber and plastic are converted into plasticized compounds through a process called plasticization. Various additives are then mixed in to create semi-finished products. These semi-finished products are further treated through vulcanization and foaming, transforming them into rubber and plastic products with high elasticity and excellent physical and mechanical properties.

Vulcanization and Foaming Process

The basic processes in the production of rubber and plastic products include: plasticization, mixing, extrusion molding, vulcanization and foaming, cooling, cutting, and packaging.

Among these, vulcanization and foaming are crucial steps in the manufacturing process. Rubber and plastic products are typically vulcanized using heat vulcanization methods. The material, after passing through the extrusion die, enters the vulcanization oven, where it continuously moves through heating zones at various temperatures. The heating temperature is generally controlled within the range of 125 - 170°C.

Product Recommendations

- Rubber and Plastic Insulation Vulcanizer High-Temperature Chain Oil - Coomcool Chain RBP 200 Semi-Synthetic Series
- Rubber and Plastic Insulation Vulcanizer High-Temperature Chain Oil - Coomcool Chain RBP 220 Synthetic Series

Rubber and Plastic Production Calender Lubrication

Operating Conditions
- Bearing Temperature: Approximately 220°C
- Operating Speed: 3 – 30 RPM (slow speed)

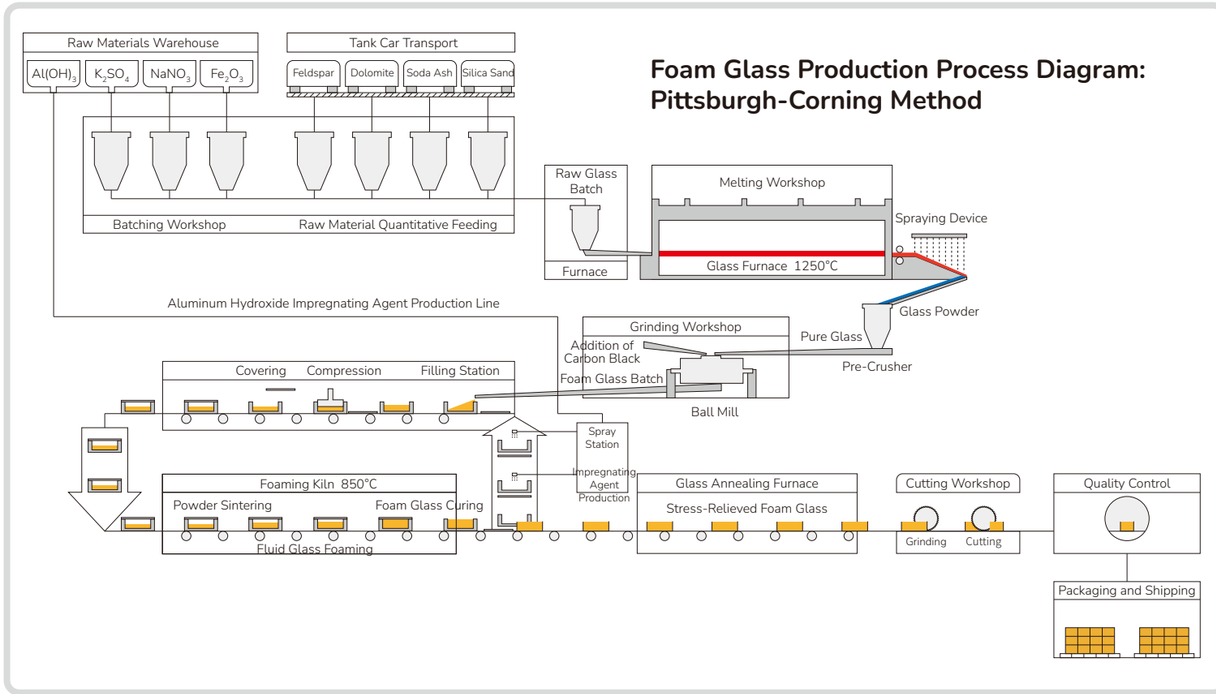
Primary Lubrication Points
- Brake Cylinder Support Bearings (Double-row spherical roller bearings)

Typical End-User Products
- Radial Tires (Steel Wire Cord)
- Non-Woven Fabrics
- PVC/ABS Panels
- Credit Cards
- Simulated Laminated Wood Panels
- Veneered Plywood

Recommended Product
- Wallimore CLD Series Calender Lubricating Grease

Foam glass industry lubrication solution

Foam Glass is a porous material filled with numerous small, uniformly connected or closed air bubbles. It boasts high mechanical strength, low thermal conductivity, stable thermal properties, long service life, a wide operating temperature range, corrosion resistance, water and moisture resistance, pest resistance, and easy processability, including cutting. It is an excellent lightweight, thermal insulation, and sound-absorbing energy-efficient material.
Foam glass can be made from pure glass raw materials or from waste glass and industrial by-products, through processes such as preheating, sintering, foaming, stabilizing bubbles, and annealing.
During its production, there are high-temperature and heavy-load conditions, requiring the use of appropriate lubricants to ensure the long-term effective operation of equipment.



Equipment Lubrication Plan

Batching Conveyor Line	Roller Bearings	Wallimore EPG Series Extreme Pressure Grease
Glass Furnace	Conveyor Chains	Coomcool Chain GSW Series Chain Lubricant
Pre-Crusher	Roller Bearings	Wallimore RG 800 Series Roller Press Grease
Ball Mill	Roller Bearings	Wallimore OMG Series Open Gear Lubricant
Foaming Kiln	Conveyor Chains	Coomcool Chain GSW Series Chain Lubricant
Annealing Furnace	Conveyor Chains	Coomcool Chain GSW Series Chain Lubricant

Customer Case

Background

In the rock wool production process, to polymerize the resin in the fiber mat, hot air with a temperature of 300 - 350°C is introduced into the curing furnace's heating zone using a hot air blower. As a result, the chains in the curing furnace are exposed to high temperatures of 260 - 280°C for extended periods.

- Ordinary high-temperature chain oils cannot withstand temperatures of 260 - 300°C and evaporate quickly in the curing furnace, failing to provide effective lubrication.
- The high ambient temperature and harsh manual application conditions make it difficult to ensure timely lubrication.
- Chains operating with poor or no lubrication produce noise.
- Carbon buildup on the chains affects their operational performance and lifespan.

High-Temperature Curing Furnace

Solution

- Coomcool Chain RWL 900 is formulated with synthetic base oils, offering extremely low evaporation loss and no carbonization at high temperatures. It is specifically designed for the lubrication process in rock wool curing furnaces.
- Manual application often results in uneven or untimely lubrication. To address this, the company engineers have designed a specialized aluminum-cased oil cup, effectively mitigating the impact of high-temperature environments on the equipment.

Curing Furnace Conveyor Chains

Results

- Coomcool Chain RWL 900 high-temperature chain oil has sufficient adhesiveness and penetration. Its adhesiveness prevents dripping, which avoids environmental pollution and waste, while its good penetration allows the base oil to reach the lubrication points, preventing direct contact between rollers and bushings, and pins and bushings, thereby providing effective lubrication.
- Customer feedback over a usage period of up to 3 years indicates that the product performs well and fully meets the lubrication needs of chains under high-temperature conditions.

Rock Wool Products

Products recommended

- Chain RWL 900 High-Temperature Synthetic Lubrican

Problems and Solutions

Short Component Lifespan, Equipment Failures, and Other Issues

To better lubricate chains and bearings and avoid lubrication deficiencies during equipment operation, it is essential to prevent insufficient lubricant addition or the use of lubricants with unsuitable base oils for chains and bearings. Overuse or incorrect types of grease can lead to purchasing more than the required amount annually. Additionally, pollutants and residues can cause equipment failures and unexpected downtime.

Solutions

We will collect on-site data to determine the brand, model, bearing part numbers, operating parameters, and current lubrication methods of the equipment. Based on each equipment's load, temperature, speed, and environment, our technical service team will recommend the most suitable lubricants, lubrication intervals, quantities, and application methods. We will also provide a cost analysis to assess whether the grease change is financially justified.

Insufficient Lubrication

Have you considered the lifespan of your equipment's chains and bearings? Are they experiencing premature wear? Failures during continuous production can result in significant time and production losses. Chain wear and bearing failures are common but avoidable issues during equipment operation, and different lubricants can make a substantial difference. Lubricants may face severe particulate contamination, high temperatures, extreme pressure, and moisture conditions, all of which affect their effective lubrication capabilities.

Solutions

Coomcool and Wallimore high-temperature lubricants are designed for chains and bearings operating near heat sources or high-temperature equipment. They prevent rapid evaporation and dripping of chain oils due to high temperatures and avoid melting and leakage of greases. These lubricants feature appropriate base oil viscosities and the addition of anti-oxidation and anti-wear additives, significantly resisting oxidation, evaporation, and seepage of the grease.

Manual Lubrication

Manual lubrication can be unreliable, often leading to over-lubrication or under-lubrication, both of which can damage the lifespan of chains and bearings and cause premature failures. Manual application of lubricants is usually inconsistent in timing, and the equipment may not always require lubrication at that moment. Additionally, manually adding lubricants while the machine is running makes it challenging to reach the lubrication points effectively.

Solutions

Automatic lubrication systems are highly precise. They deliver the right amount of lubricant at the right time and place, ensuring the maximum lifespan of equipment. These systems are sealed and protected against contamination, which also ensures the safety of operators.