



Metal cutting process

Function to Make Things Slide Facilitating Metal Processing

SANYO
PRODUCT
TOPICS

Metal processing, which is essential to manufacturing components and parts of automobiles, machines, buildings, etc., is conducted widely in various fields. This article focuses on the function to make things “slide,” and reduce the friction that occurs when a metal is processed.



Reducing heat generation and damage caused by friction

Metal processing refers to the technology to shape metallic materials into desired shapes. Strong friction occurs through contact between metal and tool when a metal is ground or drawn, and it may cause heat generation or damage. One of the functions to reduce this friction is to make them “slide.” Making things slide delivers advantages of extending tool life by preventing its damage, reducing the product defect rate, and suppressing heat generation, thus, it has become an essential function in metal processing in the manufacturing of components and parts of automobiles, machines, etc. The function of making things slide is also used in familiar scenes around us. A typical example of this is knife sharpening. We make it easier to slide by splashing water on the grindstone when sharpening a knife, and reduce the friction from contact between knife and grindstone.

Lubricants widely applied in metal processing

The origin of metal processing goes back to the manufacturing of bronze weapons and ornaments, which was done around 4000 to 2000 B.C. While more advanced production technologies have been introduced in recent years in concurrence with technological progress, the principle of metal processing itself has not changed. Metal processing can be roughly classified into processing to “cut or grind” and processing to “change the shape.” Processing to cut or grind includes cutting to cut off parts of the material using a blade, and grinding to shave off the material surface by rotating the



grindstone at a high speed. Processing to change the shape is called plastic working, in which the metallic material is deformed by applying a large force via a shaped tool. This includes various types of method such as rolling, forging, extruding, drawing, and press working. It is the lubricants used as metal machining oils that add the function of sliding in metal processing. In addition to making things slide (lubricating property), functions such as coolability, permeability, rust prevention, deterioration resistance, emulsifying/dispersion, and viscosity index improvement to suppress viscosity change by temperature are also required in lubricants. Furthermore, lubricants come as oil-based, water-insoluble type and water-based, water-soluble type. Each type has its advantages, e.g., the water-insoluble type excels in lubrication and the water-soluble type in coolability. They are used for different purposes depending on the type of metal processing.

Increase in water-soluble lubricants for consideration of the environment

While mineral oil derived from petroleum has been used as a raw material for lubricants since old times, use of water-soluble lubricants has spread widely in recent years, mainly in the cutting of nonferrous metals and steel, due to environmental considerations and work environment quality. The main raw materials of water-soluble lubricants are water, base agent, and surfactant. For both water-insoluble and water-soluble lubricants, extreme-pressure additives, antirust agents, preservatives, friction reducers, etc., are also added to produce

lubricants to improve the lubricating property. While there is an increasing number of cases that use water-soluble lubricants, water-insoluble lubricants with a high lubricating property are still the main lubricants used in special-grade processing, including rolling, cutting of hard alloys and difficult-to-machine materials, and processing with strict finish surface precision. Therefore, there are demands for water-soluble lubricants that can deliver lubrication as high as that of water-insoluble lubricants.

Provision of various additives and base agents

Sanyo Chemical provides various additives for water-insoluble and water-soluble lubricants. These additives include emulsifying and dispersing agents 'NAROACTY' and 'IONET,' rust preventive 'SANHIBITOR,' viscosity index improving agent and pour point depressant

'ACLUBE,' friction reducer 'MOLYVAN,' and degreasing and cleaning agent 'SEDORAN.' Furthermore, we offer a full lineup of water-soluble to water-insoluble 'NEWPOL,' which serves the role of maintaining appropriate viscosity while adding lubrication, as the base agent for lubricants.

In addition to these classic additives, we developed 'BLEMBER,' base agents for water-soluble lubricants with special characteristics. The 'BLEMBER' Series includes 'BLEMBER LUB-90,' which specializes in approaching the lubricating property of water-insoluble lubricants, and 'BLEMBER LUB-65' and 'BLEMBER LUB-82,' with reduced generation of foams, which is an issue with water-soluble lubricants. In the future, Sanyo Chemical will continue to contribute to various industrial fields through improvement in the performance of lubricants that are essential to metal processing.

■ Main products of our company which help in metal processing

Application	Product name	Properties	Features
Base agent	BLEMBER Series	Water-soluble	Base agent for water-soluble machining oil with excellent lubricating property. BLEMBER LUB-90 delivers especially high lubricating property among the base agents for water-soluble machining oils. BLEMBER LUB-65 and BLEMBER LUB-82 are low in foaming property.
	NEWPOL 75H-90000	Water-soluble	Base agent for water-soluble machining oils. Especially high molecular weight. It is also possible to add mold release property.
	NEWPOL 50HB Series	Water-soluble	An orthodox choice as a base agent for water-soluble machining oils.
	NEWPOL LB Series	Water-insoluble	It is possible to add defoaming and mold release properties. Can also be used in water-insoluble machining oils.
	NEWPOL PE Series	Water-soluble to water-insoluble	Pluronic surfactant. Products with different foaming properties, antifoaming properties, emulsifying properties, dispersing properties, water solubility levels, etc. are lined up with different hydrophilic-hydrophobic component ratios. Suited as the base agent for mechanical/metal component cleaners and machining oils.
Rust preventive	SANHIBITOR Series	Water-soluble/ water-insoluble	Organic rust preventive that adsorbs to and protects the metal surface.
Friction reducer	MOLYVAN Series	Water-insoluble	Manufactured by Vanderbilt Chemicals, LLC. Molybdenum-based friction reducer. Excels in abrasion resistance and antioxidant effect.
Others	IONET, EMULMIN, and NAROACTY Series	Water-soluble	Suited as emulsifiers and dispersing agents. IONET S Series also has defoaming property.
	SEDORAN Series	Water-soluble	Suited for degreasing of metal surface before coating, and cleaners for machines and metals. High cleaning property and low foaming property.

Please contact our sales office if you wish to use our products. In addition, please be sure to read the "Safety data sheet" (SDS) before using the product. Suitability and safety in the application for which the product is to be used must be determined as the responsibility of the user.