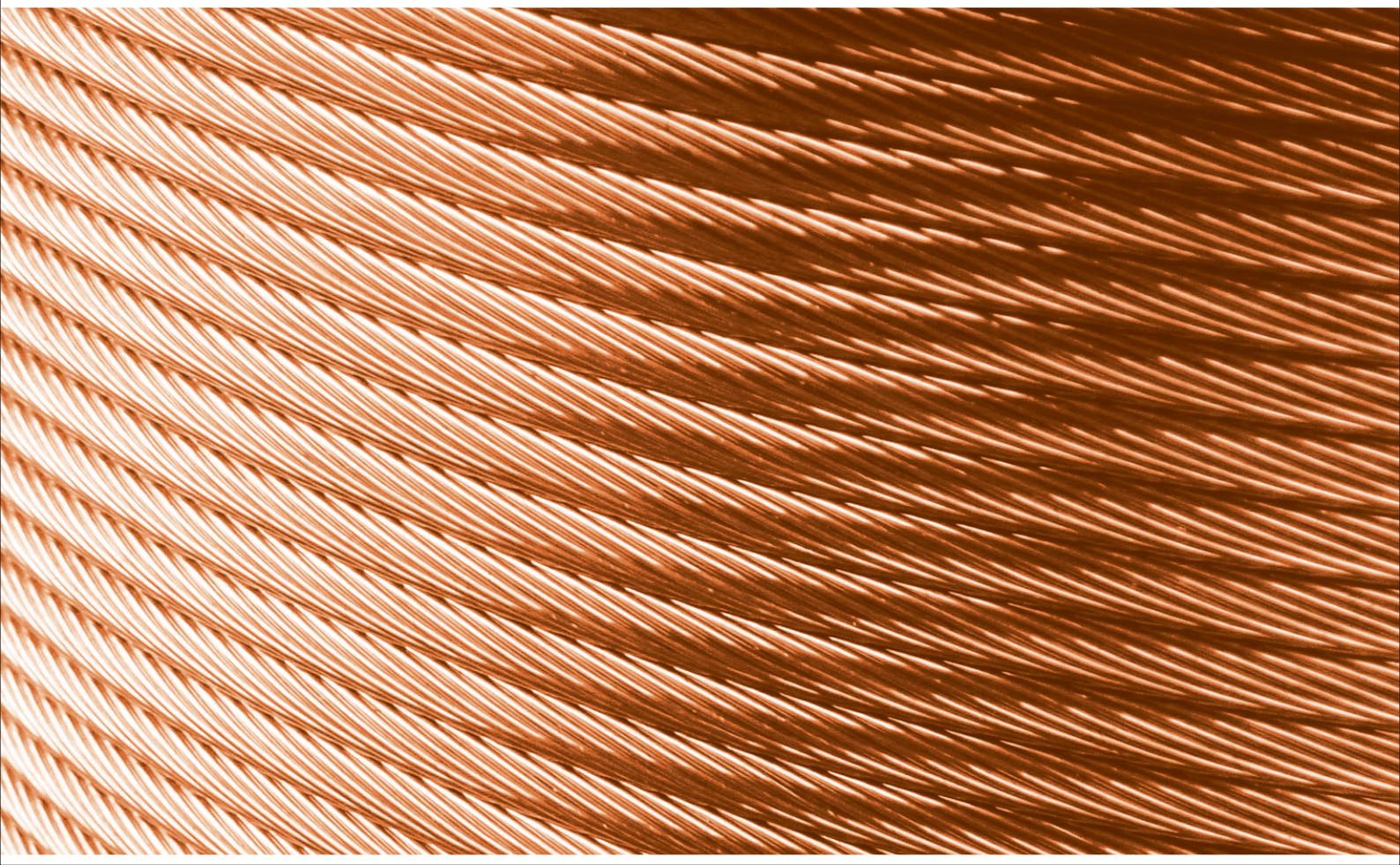
LUBRICANTS FOR COPPER WIRE DRAWING



BELGIN

Member of:

UEIL PETDER ELG

BELGiN provides for the usage of various industries a wide product portfolio over 1000 different products under 32 main groups ranging from metal working fluids, greases, corrosion preventive and engine oils to specific industrial lubricants.

BELGiN produces its products in its modern plant, which operates under SGS ISO 9001-TSE ISO 9001 quality system certificate and laboratory certificate in the scope of TS EN ISO/ IEC 17025 standard. This plant boasts a production with the state-of-the-art technology as well as fully automatic, computer controlled operations, founded on 7800 m2 closed area within 25000 m2 open area at the Gebze Organized Industrial Site.

ZIEHOEL SERIES produced at world standards , are used successfully in copper wire production industry and in other various industries.

With its sectoral experience and awareness, ***BELGiN*** provides its customers best quality products for copper wire production industry with its technical support after sale.

PRODUCTS FOR COPPER WIRE DRAWING

WIRE DRAWING

Wire drawing is a plastic deformation process used to reduce the diameter of a wire by pulling the wire through capstans and dies. For this process, single block and continues wire drawing machines are used. Main difference between them is; at continuous wire drawing machines, there are more than one wire drums which are placed between the dies. Regardless the type of drawing machine; for smooth drawing process, wire drum must pull the wire at constant velocity.

WIRE DRAWING DIES

Drawing dies are made of tungsten carbide, diamond and tool steel. Tungsten carbide die's resistance to wear is high and its friction coefficient is small. Wires that are pulled through tungsten dies, have bright appearance. For drawing of very fine wires, synthetic diamond dies are used.

BELGiN

PRODUCTS FOR COPPER WIRE DRAWING

CAPSTANS, PULLEYS

For an efficient wire drawing process; capstans and pulleys that are used, must have some certain features; like wear resistance, good surface finish and adequate hardness . Otherwise wire breaks can be seen because of the wear.

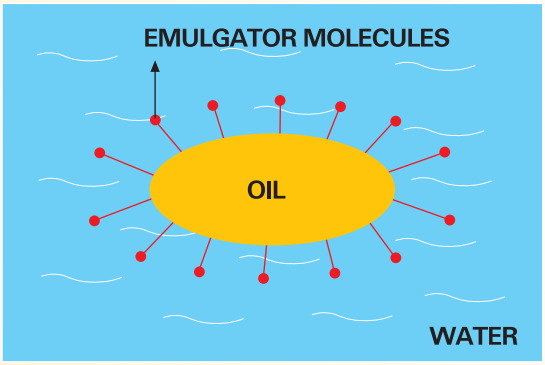
WIRE DRAWING PARAMETERS

There are lots of factors that affect wire drawing performance. But we can say that; die semi-angle, diameter reduction, friction coefficient and drawing speed are major ones. At high speeds, the heat that is generated during the process increases dramatically. And this heat affects wire quality and mechanical properties of dies. For diameter reduction; as this value increases, plastic deformation of wire becomes more homogenous. Decreasing the die semi-angle shows the same effect.

COPPER WIRE DRAWING

With the usage of high speed drawing machines and copper wire drawing lubricants, wire manufacturers are able to reach high speeds and high production rates.

Today most copper wire drawing lubricants are used as emulsions



Wire drawing lubricants are used in emulsions that are formed by adding drawing lubricant to water, creating a heterogeneous mixture. Normally, non-polar oil and polar water don't mix. But the emulgator molecules bond the bridge between normally immiscible water and oil molecules.

There are several advantages of soluble lubricant usage like; lower fire risk, lower consumption, better cooling and washing properties and finally more economical production. But as the water gets in the process, manufacturers have to take cautions against corrosion, microorganism growth and other water based factors. And while working with copper, you must be extra cautious.

EMULSION CONTROL

For a smooth drawing process; specific properties of the emulsion should be checked regularly.

CONCENTRATION

You have to work at concentrations, which are stated by your lubricant supplier; concentration can be easily measured with the refractometer

Should not be below the stated level, otherwise;

- Corrosion
- Microorganism growth
- Die wear, wire break

Should not be above the stated level, otherwise;

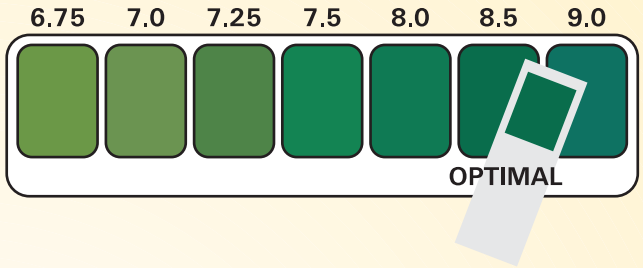
- Die plugging, residue build up

CONDUCTIVITY

Conductivity is the measure of dissolved salts in water. It increases during the life of the emulsion. Salts, which come from makeup water, and copper fines are the most common reasons for conductivity increase. In case of hard water usage for makeup water; when the water evaporates, conductivity of the emulsion increases because of the remaining salts. If the amounts of these dissolved salts exceed optimal levels, instabilities can be seen at the emulsion. Large changes in conductivity can be an indication of emulsion ageing In case of high conductivity, water additions must be done with deionized water.

pH

pH is the measure of the acidity or alkalinity of an emulsion. Most metal working fluids are alkaline in nature to prevent corrosion. For wire drawing process, emulsion's pH level is between 8,0 and 9,0. Emulsions with pH over 9,5 tend to foam, which causes breakdown of lubrication. For the low pH levels, soap formation increases which causes oil separation, dirtiness and reduced filtration.



BACTERIA

Bacteria growth at an emulsion can cause several problems. Like; separation of the oil components thereby affecting drawing performance negatively, reduction of the pH level of emulsion which causes corrosion, clogging of filters and discoloration of copper wire. With the biocide usage, bacteria growth can be controlled.

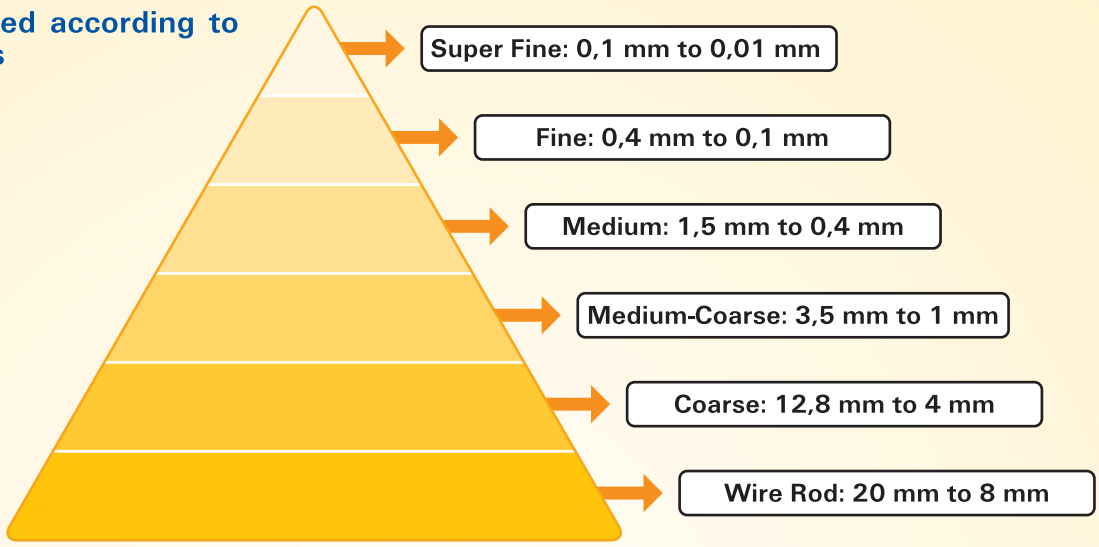
TOTAL COPPER

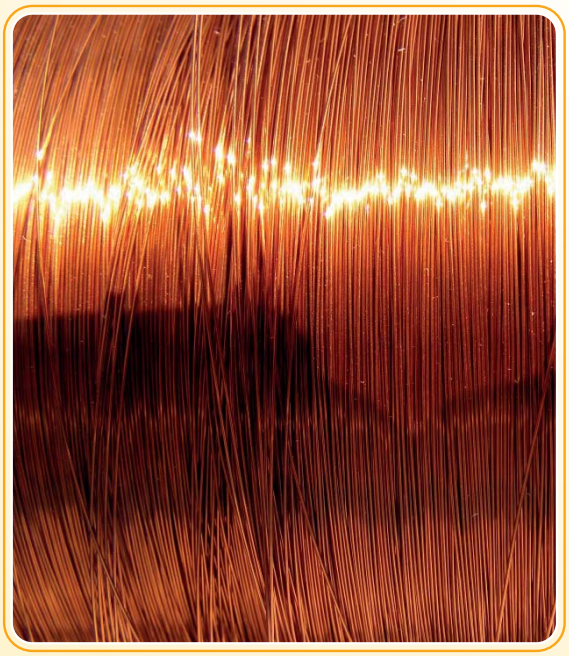
Total copper is the measure of copper in the emulsion; it states, metallic copper in suspension and the copper complexes which are formed from copper-fatty acid reactions. This parameter can be used to determine the aging rate of system. There are several negative effects of copper (II) soaps which are generated during the process. They have high affinity for metal surfaces and stick to the dies. As the time passes, residues build up at die throats, which cause die plugging. For capstans; residue build up causes crossover. One wrap crosses over another and the exiting wire is knotted to the capstan.

Filtration systems keep total copper level at minimum and thereby they optimize performance. Large changes in total copper may indicate a problem in filtration, die shaving and abrasion of the wire on guides or rollers. For the cleanliness and stability of the emulsion, adequate filtration is very important. A good filtration system reduces the amount of copper fines in emulsion thereby preventing dirtiness and reaction of copper with fatty acids. This will improve drawing performance and prolong emulsion life.

PRODUCTS FOR COPPER WIRE DRAWING

Wires are named according to their diameters





COPPER WIRE DRAWING LUBRICANTS

ZIEHOEL AK 830

ZIEHOEL AK 830 is a water-miscible drawing fluid, which is formulated with mineral based oils at high concentrations, strong emulsifiers, foam and microorganism preventive chemicals and forms stable emulsions with water.

ZIEHOEL AK 830 is specially developed for copper, zinc, brass and tin coated materials and galvanized copper materials. It can be successfully used in coarse, medium and wire rod drawing operations. It is also used for rolling of flat products. ZIEHOEL AK 830 doesn't stain the material and provides good surface quality

COPPER WIRE DRAWING LUBRICANTS

ZIEHOEL AK 930

ZIEHOEL AK 930 is a water-miscible drawing fluid, which is formulated with mineral based oils at high concentrations, strong emulsifiers, foam and microorganism preventive chemicals and forms stable emulsions with water.

ZIEHOEL AK 930 is specially developed for copper, zinc, brass and tin coated materials and galvanized copper materials. It can be successfully used in coarse, medium, fine and wire rod drawing operations. ZIEHOEL AK 930 doesn't stain the material and provides good surface quality.

ZIEHOEL AK 2030 / 2040

ZIEHOEL AK 2030 / 2040 are water-miscible semi-synthetic drawing fluids, which are formulated with strong emulsifiers, foam and microorganism preventive chemicals and forms stable emulsions with water.

ZIEHOEL AK 2030 / 2040 are specially developed for medium or fine copper wire drawing operations. They have high lubricity properties, thus they are used in high speed, multi-wire machines. ZIEHOEL AK 2030 / 2040 don't stain the material and provides good surface quality.

ZIEHOEL SYN 330

ZIEHOEL SYN 330 is a high performance synthetic wire drawing fluid, which is used in the drawing operations copper, brass, and tin wires. It can be mixed with water at any concentration.

ZIEHOEL SYN 330 can be used in pure form in heavy operation conditions. It can be successfully used in fine and super-fine wire drawing operations.

COPPER WIRE DRAWING LUBRICANTS

ZIEHOEL NLY

ZIEHOEL NLY is a high performance oil which is used in the annealing operations of copper and tin wires. It can be mixed with water at any concentration. It does not stain the material and provides good surface quality. It also provides machines and tools against corrosion.

ZIEHOEL AK 730

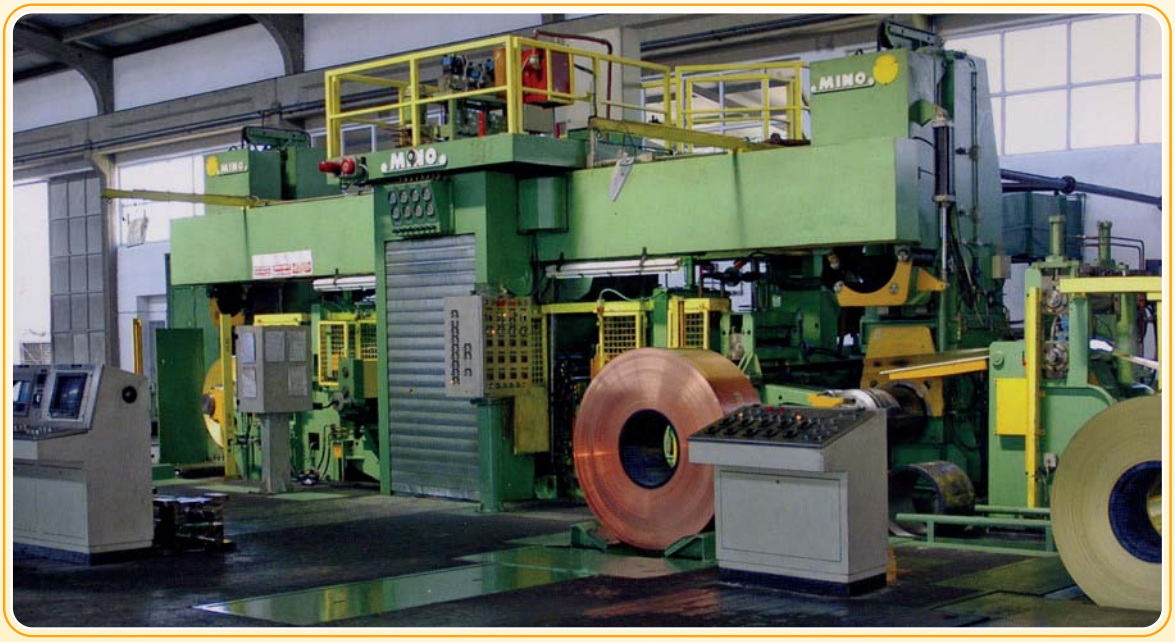
ZIEHOEL AK 730 is a water-miscible drawing fluid, which is formulated with mineral based oils at high concentrations, strong emulsifiers, foam and microorganism preventive chemicals and forms stable emulsions with water.

ZIEHOEL AK 730 is specially developed for copper, zinc, brass and tin coated materials and galvanized copper materials. It can be successfully used in continuous billet casting process for bright billet production.

PROSESOIL PR-7

PROSESOIL PR-7 is a rolling oil produced by blending high quality base oils with the special additives. It is a long-life product due to its high oxidation resistance.

PROSESOIL PR-7 is specially developed for cold-rolled copper production.



CONTINIOUS CASTING

electrolysis

ANODE FURNACE

BLISTER COPPER

ROD BREAKDOWN DRAWING

ZIEHOEL AK 830
ZIEHOEL AK 930

MULTI WIRE DRAWING

ZIEHOEL AK 2030
ZIEHOEL AK 2040

COPPER WIRE

MEDIUM WIRE DRAWING

ZIEHOEL AK 830
ZIEHOEL AK 2030

FINE-SUPER FINE WIRE DRAWING

ZIEHOEL SYN 330
ZIEHOEL AK 2040

ANNEALING

ZIEHOEL NLY

PRODUCT RANGE

- GRINDING FLUIDS
- WATERSOLUBLE METALWORKING FLUIDS
- HYDRAULIC OILS
- GREASES
- NEAT CUTTING OILS
- HONING OILS
- QUENCHING OILS AND FLUIDS
- HEAT TRANSFER OILS
- CIRCULATION AND LUBRICATION OILS
- CORROSION PREVENTITIVE OILS
- NEAT FORMING AND DEEPDRAWING LUBRICANTS
- SOLUBLE FORMING AND DEEPDRAWING LUBRICANTS
- SLIDEWAY LUBRICANTS
- INDUSTRIAL GEAR LUBRICANTS
- OPENGEAR LUBRICANTS
- HOTFORMING AND FORGING LUBRICANTS
- VARIOUS LUBRICANTS
- CLEANERS
- MOTOR OILS
- TRANSMISSION OILS
- PROSES OILS
- TEXTILE LUBRICANTS
- BIOCIDES
- ELECTRO EROSION FLUIDS
- INJECTOR ADJUSTMENT FLUIDS
- SHOCKABSORBER OILS
- MOULD RELEASE LUBRICANTS
- COMPRESSOR LUBRICANTS
- MARINE OILS
- COMPLEMENTARY AUTOMOTIVE PRODUCTS
- CHAIN OILS

BELGİN

BELGİN MADENİ YAĞLAR TİC. ve SAN. A.Ş.
Gebze Organize Sanayi Bölgesi (GOSB), İhsan Dede Cad. No: 125, P.K. 1003, 41480 Gebze - Kocaeli - TÜRKİYE
Tel: +90 262 751 02 92 PBX - 751 01 90 Faks: +90 262 751 01 98 - 751 06 67
e-mail: info@belginoil.com www.belginoil.com