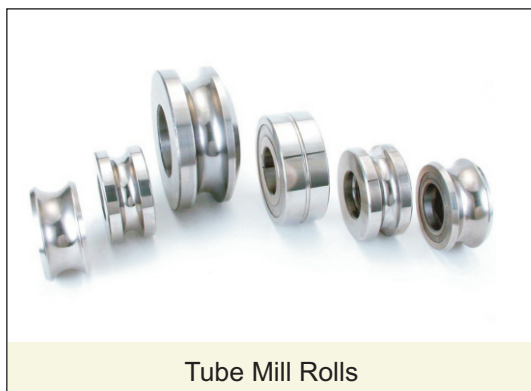




CRYOGENIC TREATMENT



Slitting Cutters



Tube Mill Rolls



20 Hi Mill Rolls

Cold treatment or Cryogenic treatment is an extension of the standard heating / quenching / tempering cycle of conventional metallurgical practice.

It involves lowering of temperature after hardening of tool. Generally lowering of temperature upto -85°C is known as cold treatment. This is done with mechanical refrigeration units with air circulation. Lowering of temperature upto -190°C is known as cryogenic treatment. Temperature of -310°F (-190°C) is attained with the help of liquid Nitrogen. Cryogenic treatment system is controlled by a highly sophisticated microprocessor. This controlled thermal cycle eliminates any possibility of thermal shocks. The tool life is substantially enhanced by three known mechanisms.

- In conventional heat treatment 100 % transformation of Austenite to Martensite is rare. Cryogenic treatment is usually done after short stress relief tempering in period of 50-70hrs. There is conversion of significant amount of Retained Austenite to Martensite, which is the desirable molecular structure for dimensional stability of the material.
- By cooling the material down to -310°F and giving suitable time at this temperature, tools are brought back to room temperature. The material goes through multiple tempering process leading to formation of fine molecular eta (Epsilon carbide particles). The presence of these fine carbide particles in steel Microstructure enhances the wear resistance remarkably.
- Cryogenic treatment causes relief to residual stress as toughness is increased.

Cryogenic treatment can be applied to all known tool materials to increase wear



DeeTee Industries Private Limited

28/33, Pologround Industrial Estate, Indore-452 015 (INDIA) Ph. : (0091-731) 4296777
e-mail: deetee@deeteeegroup.com website : www.deeteeegroup.com

DeeTee stands for total quality movement

resistance. Dee Tee recommends cryo treatment to be carried out after first tempering as most of high alloy steels cannot tolerate cold treatment directly after quenching. Austenitic stabilizing tendency in high alloy steel is more if allowed to remain at room temperature after hardening. Therefore Cryogenic treatment after tempering and attaining room temperature, without delays, offers best opportunity for maximum transformation from Austenite to martensite. Any increase of hardness is for the optimum benefit in the working of the tool material and will not make the tool brittle. It works equally well on coated tools.

Benefits of cryogenic treatment process :

- Cryogenically treated tools show a marked increase in wear resistance.
- While regrounding, less stock is removed from Cryo treated tools resulting in longer tool service life.
- Toughness is increased.
- The process is also used extensively to relieve residual stress.
- The cryo treated material becomes less brittle.

It has been observed, that hardness of Cryo treated tools increase by 1-1.5HRC.

Almost any kind of tool steel or dynamic part, for whatever application, will exhibit some kind of life increase. Hence there is substantial saving in consumption. Additional saving includes less downtime and less maintenance and changeover time, which brings production cost lower.

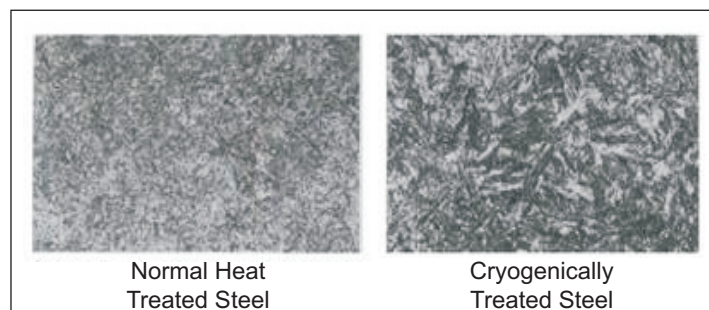
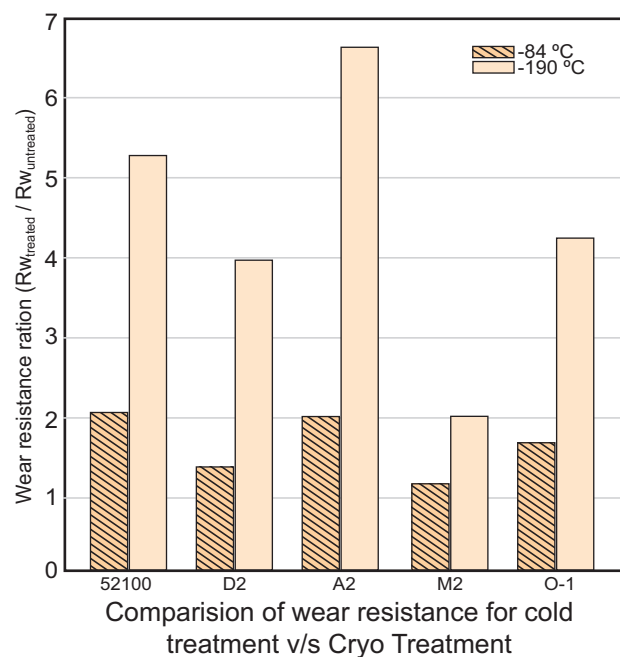
Different material show following improvement in tool life, in terms of wear resistance.

Change of Entire Structure:

Cryo affects the entire structure of the part which is permanent. A tool is not affected by subsequent grinding or sharpening. Only one time treatment is necessary for the life of the tool.

Denser Microstructure:

Since the molecules pack together tighter, the surface is more even. The result is a larger contact area at the surface, reducing friction, heat and wear. The two samples below show this difference in the material density. The treated sample on the right has a much finer and denser microstructure.



• QUALITY POLICY •

We, at **DeeTee Industries Pvt. Ltd.** are committed to provide best quality product at competitive price while maintaining high quality standards for customer delight. We will achieve it by - □ Active involvement and empowerment of our employees □ Continual improvement in our quality systems □ Technological up-gradation.