

DEEP *Cryogenic Processing*

**Makes items stronger,
tougher and more
corrosion-resistant**

*Improves performance by
making materials more uniform
at the molecular level*

The Process

The Cryogenic Treatment Process, as performed by Johnson Packings, utilizes cryogenic liquids to cool the treated material to temperatures approaching Absolute Zero. At these extreme temperatures, a number of atomic changes take place. The atomic structure of the alloy is refined as dislocations (atomic wedges) within the lattice are removed. Following this refinement, the alloy exhibits improved load sharing characteristics that enhance material life. Furthermore, strain within the material is reduced and equalized to give the alloy greater thermal and dimensional stability. There is also a 100% transformation of any retained austenite to martensite.

The Benefits

- Significantly enhances abrasive wear resistance
- Improves corrosion resistance
- Increases dimensional stability before extensive machining
- This process is irreversible, with beneficial properties retained even after resurfacing
- Closes and refines metal grain structures
- Transforms retained austenite into the harder, more desirable martensite
- Reduces retained stresses, as well as wear and surface stresses
- Cuts operating costs and downtime by reducing the need for tool replacement or regrinding and maintenance
- Effective for items ranging in size from tiny drills to dies weighing hundreds of pounds

Johnson Packings is a licensee for the Cryocon, Inc. cryogenic treatment process.



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DEEP Cryogenic Processing



Industries Served

Aircraft	Mining
Automotive	OEM
Chemical Processing	Power Generation
Food Processing	Pulp and Paper
Milling	Waste Water Treatment

Treatable Materials

All Tool Steels
Aluminum
Brass
Carbide
Copper
Nylon
Plastics
Stainless Steel



Industrial Items Enhanced by Treatment

Ash Paddles	Extruders	Knobs	Scissors
Bearings	Face Mills	Milling Inserts	Shafts
Broaches	Gears	Molds	Shear Blades
Chain Saws	Grinders	Pipe Reamers	Shredders
Chippers	Hammer Mills	Pump Parts	Sleeves
Cutters	Hog Mills	Punches	Taps
Dies	Impellers	Roughing Mills	Twist Drills
Drill Bits	Key Cutters	Router Bits	Wear Plates
End Mills	Knives	Saw Blades	Welding Electrodes

Other Applications

Motorsports Increases wear life of racing components, engines, transmissions, brakes, rotors, cams and crankshafts

Sporting Goods Improves performance of aluminum bats, golf clubs and balls, tennis rackets, fish hooks and rifle barrels

Musical Instruments Results in smoother action and cleaner sound

Johnson Packings has cost-saving and improved-performance figures from many of our customers to document the benefits of our DEEP Cryogenic Processing. Please contact us for more information on how this treatment process can benefit your company.



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