

## One-time treatment will improve tooling efficiency and save you money



The difference between a treated and un-treated cutting blade, stamping die, or punch is astounding. Cryo-treated tools consistently deliver superior performance. Tools remain sharp three or four times longer because of their dramatically improved wear-resistance, and are less prone to micro-cracking and chipping. Production yield is greatly improved, while productivity and machine through-put are greatly increased. Tools need be treated only once; tool refinishing or regrinding doesn't affect the tool's permanent improvements.

## Why have CryoPlus treat your parts?

- Cutting tools remain sharp three or four times longer
- Longer service life means less down-time for tooling changes, sharpening
- Dramatically increases the process yield from each cutting tool.
- Improves wear-resistance
- Vastly extends tool life
- Increases machine productivity and through-put
- Reduces equipment maintenance
- Treated tools are easier to sharpen
- Deep cryo-processing is compatible with other treatments (tin, chrome, Teflon, etc.)

## Here's proof: CryoPlus treatment extends tool life, reduces production time, and saves money.

*"We used three or four cobalt roughing end mills for a 60-piece run. After CryoPlus treatment, we used one tool to run all 60 parts without any noticeable wear on the tool."*

**—Tom Stugmyer, Ace Precision Industries,  
Tallmadge, OH**

*"The average life for untreated Stanley #11-911 blades was four to five days. CryoPlus-treated blades are lasting 8-14 days."*

**—Ken Bama, Sentinel Consumer Products  
Mentor, OH**

*"We used to change our Zenith slitter blades every 21 to 28 days. After CryoPlus treatment, we now change them every 43 days."*

**—Joe Williamson, Ohio Packaging  
Massillon, OH**

*"CryoPlus-treated end mills maintain better cutting edge capabilities, giving a 5-to-1 ratio over non-treated tooling. Exceptional wear and stability!"*

**—Dan Smarr, Stark Mold  
Canton, OH**

# CryoPlus®

Cool solutions to high tooling costs.

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# CryoPlus®

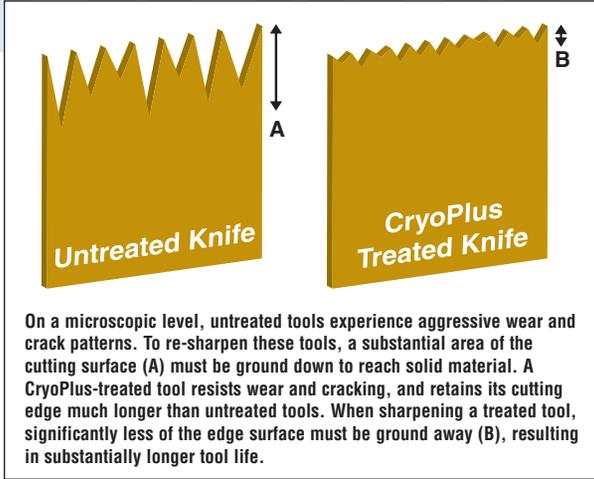
Cool solutions to high tooling costs.

## Tooling & Manufacturing

Cryogenic treatment dramatically extends cutting-tool service life, improves operating efficiency, reduces operation costs, and increases industrial productivity.



# What is Cryogenic Treatment?



Cryogenic tempering of metal parts and tools is a thermal treatment process that greatly improves the metal's physical characteristics. It is not a surface treatment; the entire mass is made stronger, more uniform, and more durable. Cryogenic treatment chambers utilize computer-controlled processors to chill metal parts to -300°F for a prescribed duration—a process known as “cold soaking.” The chamber then returns the parts to ambient temperature, after which they are heated to +300°F for a period of time.

On a molecular level, untreated steel, known as austenite, is a relatively soft metal that contains unevenly spaced iron and carbon atoms. When austenite is subjected to the cryogenic process, the carbon atoms become more evenly distributed among the iron atoms, giving the material a tighter overall grain structure with fewer voids. The harder, more stable metal is called martensite, a material with superior ductility, wear-resistance, and decreased brittleness. Parts subjected to cryogenic tempering are permanently enhanced and develop significantly longer service lives.



# CryoPlus: A Leader in Cryogenic Processing

CryoPlus, Inc., is recognized as one of the leading cryogenics service-providers in the industry. CryoPlus, was established in 1994 to provide cryogenic services for the woodworking, logging, metal-forming, stamping, tool and die, shearing, slitting, welding, punching, musical, shooting, and racing industries. CryoPlus treats a wide variety of materials, including ferrous and non-ferrous metals, alloys, and carbides.

CryoPlus uses a computerized, liquid-nitrogen cryogenics processor engineered for maximum performance and efficiency. Both the cooling and heating cycles take place in the same 8,000-pound-capacity chamber in a microprocessor-controlled batch process. Liquid nitrogen flows through a spray distribution system inside the chamber and is vaporized into an expanded gas. The circulation fan inside the chamber ensures proper heat transfer during the process.

## CryoPlus Service

The CryoPlus treatment process takes approximately 36 hours. Materials received by Friday at noon are processed, repacked, and shipped out on the following Monday. CryoPlus is centrally located in Ohio for easy, cost-effective shipment of tools for treatment from throughout the country. Processing fees are based on the total weight of parts for treatment.

CryoPlus, Inc., is certified as a “Women’s Business Enterprise” by WBENC (Women’s Business Enterprise National Council).

# CryoPlus Cryogenic Processing Applications

*New or used parts may be treated.*

- |                                |                   |
|--------------------------------|-------------------|
| Aluminum baseball bats         | Harrow blades     |
| Bearings                       | Hobs              |
| Blocks                         | Inboard jet pumps |
| Blow molds                     | Jordan knives     |
| Brake rotors                   | Key cutters       |
| Broaches                       | Lathe knives      |
| Bucket teeth                   | Lavel dies        |
| Calendar knives                | Lawn mower blades |
| Cams                           | Milling inserts   |
| Chain saws                     | Pelletizer knives |
| Chipper knives                 | Perforators       |
| Chopper blades                 | Pistons           |
| Circular saws                  | Plow shears       |
| Circular slitters              | Press dies        |
| Connecting rods                | Progressive dies  |
| Copper resistance welding caps | Punch dies        |
| Crankshafts                    | Razor blades      |
| Cultivator points              | Reamers           |
| Drill bits                     | Rocker levers     |
| End mills                      | Rod Pumps         |
| Engines                        | Router bits       |
| Envelope dies                  | Saw Teeth         |
| Extruder barrels & screws      | Sewing needles    |
| Extruders                      | Shear blades      |
| Feed screw tips                | Shredding screens |
| Forging dies                   | Shuttle bobbins   |
| Gears                          | Sickle bars       |
| Golf equipment                 | Skate blades      |
| Granulators                    | Spades            |
| Guillotine blades              | Splicers          |
| Gun barrels                    | Tines             |
| Gun mechanisms                 | Vacuum tubes      |
| Hammermills                    | Wheel saw teeth   |

