



# THE PURE-CUT™ STANDARD

Changing manufacturing standards with a supercritical solution that delivers unprecedented productivity and tool life gains while eliminating water-based coolants and coolant alternatives. Welcome to the revolution.

**PURE-CUT™**  
*The Difference is **Supercritical***

[www.Fusioncoolant.com](http://www.Fusioncoolant.com)

# THE PURE-CUT™ SOLUTION

Pure-Cut™ by Fusion Coolant System's delivers controllable levels of cooling and lubrication to work zones that are difficult to manage and tough to reach.

## Changing the Game

Today's metal working fluids compromise cooling for lubrication: adding oil reduces cooling, adding water reduces lubricity, and oil-in-air minimum quantity lubrication can lubricate but doesn't cool. No more compromises. Liquid nitrogen can cool but doesn't lubricate well.

## A Cool Solution

Pure-cutting offers maximum cooling and lubrication potential at the same time, increasing productivity and reducing system-level costs. Using supercritical carbon dioxide, the product flows to the point of machining as a single-phase system and is released at high pressure, producing a strong cooling effect and delivering dry, enhanced lubrication.

## Faster, Cleaner, and Better

Pure-Cut™ delivers superior heat management and chip control with a dry-cutting process that can also provide enhanced lubrication when needed.

## Cost Saving Benefits of Pure-Cut™

- Faster Production Rates
- Increased Tool Life
- Elimination of Cutting Fluids
- Provides Dry, Clean Parts
- Improved Chip/Swarf Control
- Clean, Bacteria Free Work Environment

**PRODUCTIVITY  
& TOOL LIFE  
INCREASES**

**IMPROVED  
CHIP & SWarf  
CONTROL**

**DRY, CLEAN  
PARTS**

**DECREASED  
CARBON  
FOOTPRINT**

# IT'S ALL IN THE DATA!

## Example: Titanium Medical Implant

### Fusion Product:

Pure-Cut™ PC400i (No Oil)

### Before Fusion:

15-minute cut-time with water-based coolant.

### After Fusion:

10.5-minute cut-time with supercritical carbon dioxide dry-cutting process. The PC400i also reduced downstream cleaning operations and eliminated the cutting fluid waste stream. Tool life was improved by >20% and surface quality improved compared with emulsion.

### Results:

Reduced manufacturing costs by over 25%.

### How We Improved This Process:

Dry-cutting with supercritical carbon dioxide has the lubricity of a semisynthetic cutting fluid. The combination of cooling and lubrication provided by Fusion's PC400i permitted faster feed rates while maintaining or improving tool life. Parts were machined dry and clean.

## Example: A-286 Aerospace Drilling Application

### Fusion Product:

PC400X (with 30 ml/hr oil)

### Before Fusion:

7-second cut-time and 50-cycle tool life with emulsion.

### After Fusion:

0.5-second cut-time and 100-cycle tool life with supercritical carbon dioxide dry-cutting process.

### Results:

14x productivity improvement, >100x tool life improvement, significantly reduced piece-cost and opened a new market.

### How We Improved This Process:

Fusion helped develop a through-tool cutting process with 0.080mm-0.100mm diameter coolant holes. PC400x's unique solution mobility provided highly effective heat management where water-based cutting fluids could not. Supercritical carbon dioxide was able to penetrate, cool and lubricate the critical heat zones at the tool tip.

## Example: 8620 Automotive Milling

### Fusion Product:

PC400x

### Before Fusion:

600 parts per tool with dry-cutting process.

### After Fusion:

1200+ parts per tool with supercritical carbon dioxide and enhanced lubrication.

### Results:

2x tool life improvement, saving the end-user over \$1 million annually in carbide alone.

### How We Improved This Process:

Lubrication was delivered more efficiently with supercritical carbon dioxide and significantly lowered cutting forces while reducing heat. PC400x with enhanced lubrication has MQL-level lubricity with near cryogenic cooling capabilities. Tool life gains were achieved while maintaining a near-dry cutting process.





## Fusion Coolant System's Products

### Pure-Cut™ PC400i:

The PC400i delivers supercritical CO2 with dry lubrication. This is critical for applications where cleanliness is important and for alloys where cooling is essential. Pure-cutting with the PC400i gives you the enhanced lubrication necessary.

### Pure-Cut™ PC400x:

The PC400x is a similar application to the PC400i but offers an additional, selectable lubrication flow rate of 6 to 600 mL per hour of enhanced lubrication. This is critical for applications where controllable enhanced lubrication is necessary.

Fusion Coolant System's is the expert in heat management solutions. Let our experts show you how Pure-Cut™ products can easily be applied to most machining applications. Call us today to get a tour and demonstration of our headquarters in Canton, Michigan.

Visit **FusionCoolant.com** so we can help you improve your bottom line.

**Email:** [Info@fusioncoolant.com](mailto:Info@fusioncoolant.com)

**Location:** Canton, MI