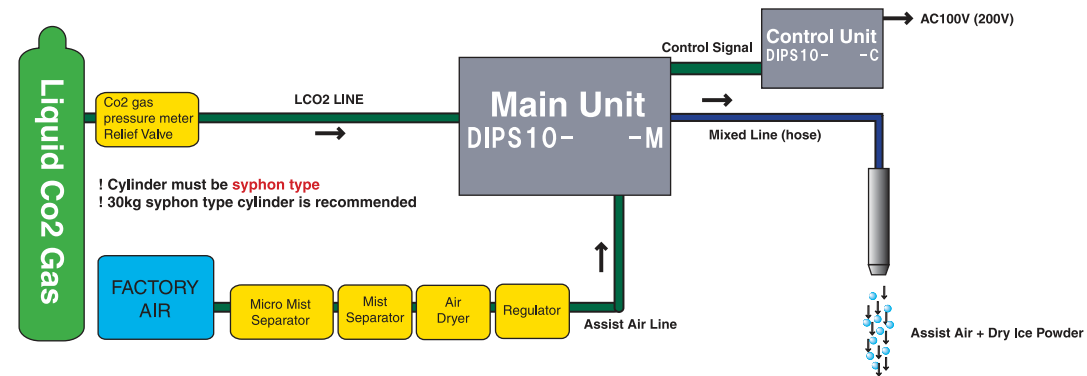


Size And Weight of DIPS10 SERIES

Unit Size      Main Unit:149(W)\*200(D)\*430(H)mm  
                    Control Unit:330(W)\*149(D)\*200(H)mm  
Unit Weight    Main Unit:6.5kg Control Unit:4.5kg

System



# BEYOND THE COOLING



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## DRY ICE POWDER COOLANT SYSTEM DIPS10 SERIES

**DIPS**  
HYPER CUTTING

# BEYOND THE COOLING.



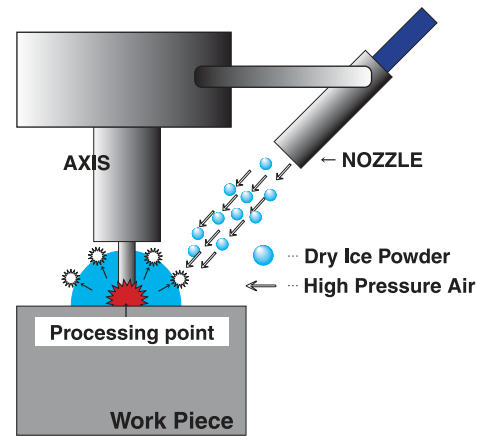
## What is "DIPS"

"Crash", "Vaporize" and "Expand" is key. Brand new type cooling.

Producing Dry Ice Powder by draw in Liquefied CO<sub>2</sub> from Liquefied CO<sub>2</sub> gas cylinder. Jet those Dry Ice powder directly to processing point with high pressure air. Dry Ice Powder will "Crash" into Object, instantly Vaporize, and the volume "Expands" to 750 `800 times as large as original.

By gasification, it will create Inert Atmosphere. In the Atmosphere, the density of O<sub>2</sub> is lower than Flammability limit and it is possible to prevent heat and oxidation of tool by reducing O<sub>2</sub> density relatively.

With those mechanism, DIPS realize, "Longer tool life" and "Better Efficiency".



## Potential of Dry Ice Powder

Why DIPS uses Dry Ice "Powder"

The 30um Dry Ice Powder processed by DIPS will instantly Vaporize and Gasify in barometric pressure, so that nothing will be left as residue.

Besides, Dry Ice Powder doesn't have power except Assist Air.

So that there is no harm for work piece.

As the coolant, DIPS can realize completely DRY processing to make the treatment after processing easy.

## Low temperature without Condensation

Assist air prevents the trouble

DIPS's Air dryer, makes the dew point of assist air under -40 , and with DIPS's internal heater, makes the temperature 60 .

Besides, with special structure of nozzle, Assist Air and Dry Ice Powder will be covered with Shield Air.

Only the Dry Ice Powder, processing point will be cooled in instant.

But with Jetting together with Dry air, it prevent instant cooling and avoiding condensation.

## 3 Types of Driving System

We can offer you specification follows your inquiry

1. The manual type  
Standard type. Operator will control it on manual
2. Timer type  
The timer can control the time of Dry Ice Jetting.
3. NC controlling type  
Controlled by M signal form NC.  
Hose, Length of cable can be follow your inquiry.

## Compact System

High portability which can be attach every kind of Machine

DIPS is so compact system that it can be attach to every kind of machines.

It doesn't need remodeling of machine.

Also it is easy to attach on other machine.

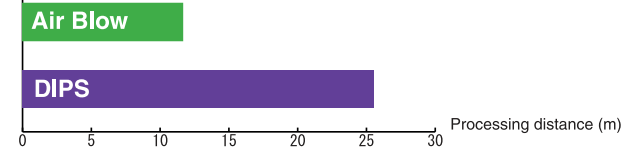
Today is on Machining, and tomorrow might be lathe...

DIPS can be used in many aspect.



## CASE ①

Cemented carbide SA180 (HRA93 correspond to VF20)  
Scanning line processing



Air Blow



DIPS

## CASE ② Cutting Chip

Inconel 718 Scanning line processing

Comparison of Cutting Chip between Air cutting and DIPS under same condition.



Air Blow

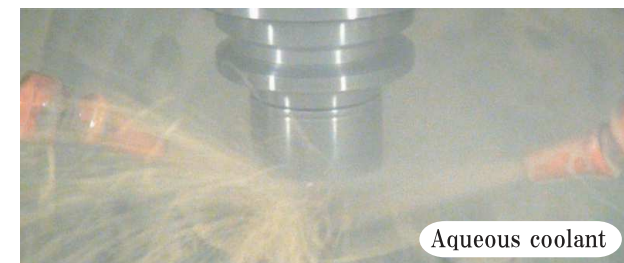


DIPS

## CASE ③

Cemented carbide (HRA87~89), Tool φ8.0 Diamond Tool (#80)

4 times longer tool life is realized compare to aqueous coolant. The number of tool becomes to 12→4 against Tripod Roughing



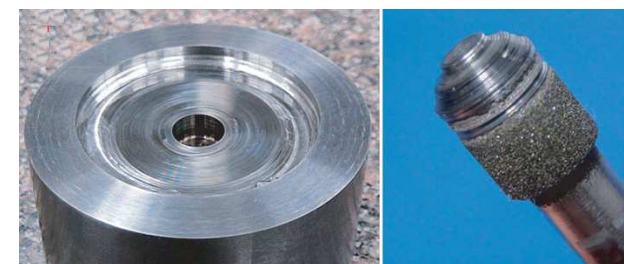
Aqueous coolant

Processing time : 80min



DIPS

Processing time : 440min



Amount of cutting (Volume) 9.20cm<sup>3</sup>

Tip of tool: Melted



Amount of cutting (Volume) 44.16cm<sup>3</sup>

Almost no damage

SPINDLE SPEED: 18,000min<sup>-1</sup> (V=450m/min) FEED RATE: 320mm/min ae: 0.05mm ap: 5.0mm \*Data is from Yasda Precision Tools

## CASE ④

Surprising Speed

Inconel 718, Ceramics End mill, Turbine blade



SPINDLE SPEED: 24,000min<sup>-1</sup>

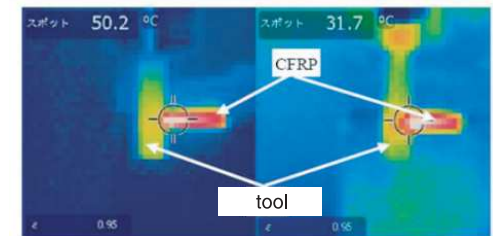
V<sub>c</sub>=603mm/min V<sub>f</sub>=1,440mm/min f<sub>z</sub>=0.015mm/tooth

ae: 1.0mm ap: 0.5mm Overhang length=20mm

Coolant=DIPS

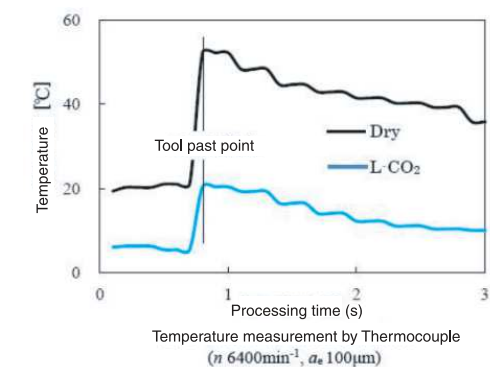
## Measurement CASE

Temperature measurement on CFRP Processing



Courtesy of National Defense Academy Precision Machining Lab.

(a) Dry Temperature measurement by Infrared thermometer (n 6400min<sup>-1</sup>, a<sub>r</sub> 100μm)



<http://www.dips-hc.com>