

ACCELERATED WEAR TRIAL
FLOOD COOLANT VERSES
NEAR DRY MACHINING

Environmentally Friendly Lubrication Systems



UNIST Australia threw down the gauntlet to a large machine shop in Bendigo Victoria Australia who manufacture parts for the Australian Defence Forces.

UNIST said there are no limits to Near Dry Machining. The customer offered to run controlled trial on a horizontal mill to prove the point.

Material:	AMS-5643 (17-4PH) Annealed stainless steel
Cutter:	12mm two fluted slot mill (High Speed Steel)
Depth of Cut:	8mm x 3 cuts. (24mm total depth)
Length of Cut:	500mm
Feed rate:	90mm/min
Spindle speed:	405 rpm

The first test was run using traditional flood coolant. Three passes were taken after which we examined the cutter and the slot. The cutter showed signs of wear on both the side and bottom face (see figure 1-4) therefore the cutter would most probably not have done another cut successfully. The customer stated he was happy with this result which they had predicted.



Figure 1



Figure 2



Figure 3

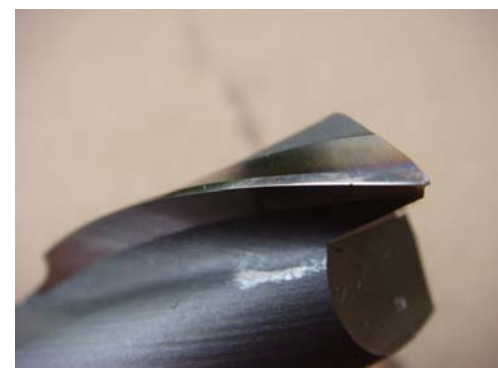


Figure 4

**UNIST
solution at
a glance**

Now it was UNIST's turn.

UNIST fitted up a S102607A special Minimum Quantity Lubrication (MQL) unit. The unit is a standard Coolubricator fitted with an automated air blast pulse "Chip Blower" feature. The lubricant used for the trial was Coolube 2210EP.

First cut, beautiful. Chip color, nil to extremely pale straw. No heat in the Job, No heat in the machine and No heat in the material.



Second cut, as above



Third cut, as above



Results:

The surface finish on all three cuts was absolutely first class.....especially the walls, they were so smooth, and there was no comparison between the Unist finish and the flood finish which looked torn. As expected the cutter did have wear, in fact it was agreed that the wear was just about identical to the cutter that was used with the flood coolant. The outcome was a success, proving that difficult material could be machined using "Near Dry" to eliminate flood coolant. The customer was well impressed.