

VERNIER ENGINEERING C.C.

Ck 1988/031897/23

13 Dyke Street,
Factoria,
KRUGERSDORP.
REP. OF SOUTH AFRICA

P.O. Box 1268,
KRUGERSDORP.1740.
REP. OF SOUTH AFRICA
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Tel. No. 27-11-664-7709/051-9926
Fax. No. 27-11-664-8187
E-mail: vernier@netactive.co.za
V.A.T No. 4190102014

The Managing Director
Product S.A. (Pty.) Ltd.,
P.O. Box2309,
Silverton. 0127.

For Att: Mr. Werner Herselman

Dear Sir.

RE: PRODUCUT MQL

I hereby wish to thank you for the rapid assistance you rendered in solving a machining problem on aluminium extrusions.

We do a lot of CNC machining for an international company, some of which is the machining of a 6063 aluminium extrusion which is supposed to be of grade T6. However we found that the hardness varied a lot over the width of 100 mm, perhaps due to the variation in thickness from 3 to 23 mm over the section. Machining was done using a soluble synthetic coolant mixed at 1:40 on a CNC machining center using 10 mm solid tungsten carbide cutter with 2, 3, or 4 flutes and speeds variation between 4000 and 10 000 rpm with feeds varying from 400 to 1000 mm/min. During the batch before the last we abandon the work after breaking 4 end-mills at approximately R 800 per each. The material was returned to the supplier as it was deemed to be too soft.

A new batch of material was delivered and we suffered the same problem namely that the material "bunch up" in front of the cutter, welds thereon, resulting in the failure of 2 further end mills. Upon your suggestion and with your assistance we installed a Minimum Quantity Lubrication (MQL) Applicator with 2 nozzles, one from the front and one from the rear, and used your MQL lubricant. This proved to be an immediate success with no material build-up on the cutter or job and we finally settled for a speed of 6000 rpm and 500 to 1000 mm/min feed with depths depending on the depth of cut of 3 to 16 mm and full cut with a single fluted polished tungsten carbide cutter. Upon finishing the 2nd batch we collected the first batch and also machined that without any breakages.

In total we machined 250 components, 70 meters at full cutter width and 70 meters of 0.5 mm final cut producing a good finish. The cutter still looks like new. We used less than 3 liters of Producut at R64.04 per liter thus less than R180.

Further considerations for the use of MQL in our opinion are:

1. When we normally tap holes, the machine is programmed to stop to manually apply tapping fluid. That will be done away with once we have added the necessary M-functions to the machine thus eliminating the human factor.
2. The machining of aluminium can possibly be done with soluble oil with high lubricity. Our machines per each require between 600 and 700 litres of coolant which is impractical to replace every time we machine aluminium. We would then use 60 litres soluble oil at the recommended

1:10 ratio at a cost of more than R 30 per liter. We didn't remove our normal coolant from the machine as the small quantity of Product used was considered to be taken away with the swarf accumulated on the chip conveyor which was emptied after the completion of the whole job.

We sincerely thank you for the advice and assistance in solving this problem and that I could retain my customer.

Yours faithfully,



A.J.de Bruijn

MEMBER
