

Subject: Re: Acceptable Cutting fluids?

From: Dennis Coyne <coyne@ligo.caltech.edu>

Date: 12/3/2012 2:58 PM

To: sbarnum@ligo.mit.edu

CC: Bob Anderson <anderson_r@ligo.caltech.edu>, Jeff Lewis <jlewis@ligo.caltech.edu>, Calum Torrie <torrie_c@ligo.caltech.edu>, Rich Abbott <abbott@ligo.caltech.edu>

Ref: E1201079-v1, Machining Fluid Waiver Granted for SRI

Sam,

I grant a waiver for SRI from the machining fluid restrictions stated in section 4.3 of specification [E0900364-v8](#), "Metal Components for use in the Advanced LIGO Vacuum System"; SRI may use Fuch's Ecocool S761 cutting fluid.

In order to accommodate this waiver, LIGO Lab vacuum preparation (aka "clean and bake") shall perform a three-step "gross cleaning" prior to "precision cleaning". The three steps are as follows (steps B, C and D in Table 4 of [E960022-v25](#)), in this order:

- (1) a solvent degrease cleaning (with methanol and acetone),
- (2) an acidic cleaning with a mild phosphoric acid (e.g. Protex),
- (3) a detergent pre-cleaning (liquinox plus ultrasonic cleaning)

The [Clean & Bake request](#) submitted, by the cognizant engineer for these parts, to the C&B group shall include the cleaning instructions above.

(An electropolish step is not required.)

Dennis Coyne
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On 12/3/2012 8:29 AM, Sam Barnum wrote:

Dennis,

SRI has flatly refused to consider changing their cutting fluid since they run 24/7, and our job is not that big, relatively speaking.

I assume from your previous reply that we can give them a waiver? What needs to be done to do that?

Thanks

Sam Barnum

On 11/29/2012 10:23 PM, Dennis Coyne wrote:

Hi Sam,

I don't have knowledge of the suitability of Fuch's Ecocool S761 cutting fluid. I've copied a few others in case they do. As far as I know [E0900237](#)-v5 is up to date.

At this link:

http://www.fuchs.com/fuchs_industrial_cutting_grinding_fluids.php

it states that :

*Ecocool (Water-miscible coolants)
Fuchs manufactures a full line of soluble oils,
semi-synthetics and fully synthetic coolants to meet every
need. Our research and development lab is continually
creating new technologies to provide customers with best in
class performance.*

The requirements (which are stated in E0900237-v5) are 100% water soluble (not just water miscible), and free of sulfur, chlorine, and silicone. This typically (perhaps always??) means "fully synthetic".

According to this document (last page):

<http://www.fuchslubricants.com/content/news/docs/warick-research-study.pdf>

Fuch's Ecocool S761 cutting fluid is "semi-synthetic".

According to this document (pg 4):

<http://www.fuchslubricants.com/documents/brochures/Medical%20Brochure.pdf>

Fuch's Ecocool S761 cutting fluid is "water miscible"

I requested an MSDS sheet here:

http://www.fuchs.com/fuchs_msdreq.php

BTW this cutting fluid is specifically designed for titanium. Is SRI Hermetics machining titanium for us?

Some machine shops have quoted us a modest fee for switching their cutting fluid (order of \$500). Others have refused. If it is a problem for SRI hermetics to switch, then I will consider a waiver. It means that we need to take measures in the cleaning of the parts delivered to remove the cutting fluid. This is mostly an issue for large parts.

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On 11/29/2012 1:15 PM, Sam Barnum wrote:

Dennis,

SRI Hermetics has asked me if "[Fuchs Eco-cool S761 coolant](#)" is acceptable to us.

In my relatively quick google search, I have not been able to find any useful information. Unless we already have some knowlege of this coolant I will need to call Fuchs.

Is our list of Acceptable Coolants and Lubricants up to date?

[LIGO-E0900237-v5](#)

thanks

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