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Dynisco comments on the Stakeholder consultation 2 2021, exemption request 2021-1 for "Mercury in melt pressure transducers for capillary rheometers at temperatures over 300°C and pressures over 1000 bar"

Do the capillary rheometers that your company manufactures incorporate a pressure transducer? - If so, what is the filling of that transducers? Is it mercury?

The model 7000 is a single bore rheometer and has Load Cell measurement capability only. The model 7001 is a single bore rheometer that has simultaneous Load Cell and/or Pressure Transducer measurement capability. The model 7002 rheometer has a dual bore and Twin Pressure Transducers for twin die measurement capability. Bagley and entrance pressure loss measurements can be performed in one test using this instrument.

Generally, the optional pressure transducer improves the accuracy of the rheological measurement. Standard pressure sensors contain mercury as a fill fluid because they offer the best performance at high pressures and the best response time and resolution which is key to an accurate measurement in this application.

How do you ensure proper recycling/disposal?

Dynisco has a recycling program to recover mercury from our products. Pressure transducers can be sent in free of charge to our factory in the USA. Mercury filled transducers are collected in Germany as well in a special container and sent for recovery to the factory in the USA on a regular basis. Dynisco operates under the guidance and advice from IMERC (<http://www.newmoa.org/prevention/mercury/imerc/guidance.cfm>).

Do you consider the capillary rheometers that your company manufactures being RoHS compliant?

We consider the current design of our instruments as being RoHS compliant.

Do you agree to the argumentation of the application for the above RoHS exemption request?

Yes, we agree on the argumentation of the applicant.



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Which alternatives to mercury as a filling in melt pressure transducers exist?

The applicant already stated the most common alternative fill fluids, which are NaK (Sodium-Potassium) and Gallium-Indium-Tin. Besides those different oils are used in pressure transducers. All these have disadvantages over Mercury in terms of compressibility and/or service temperature. Because of accuracy, resolution and service life we are currently only using mercury-filled transducers in capillary rheometers.

Besides fluid-filled technology, fully electrical and optical alternatives exist (no-fill technologies). In certain areas they have limitations over mercury-filled transducers as well. These are concerning pressure range, service temperature and accuracy.

The limitations which apply to almost all alternatives to mercury (alt. fill fluid or no-fill) have been discussed in the argumentation from Netzsch (>1000bar; >300°C).