

Yifaat Baron
Öko-Institut e.V.
Institute for Applied Ecology
Postfach 17 71
79017 Freiburg

Your ref.:

Your letter dated:

Date:

08.10.2015 / DEB-PM

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Tel.: +49 (0) 7703 930-0 (Reception)
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URL: <http://www.dunkermotoren.com>

Your partner:

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Application for renewal of the exceptions 6c according to Article 5 by the RoHS Directive 2011/65/EU

Dear Ms. Baron,

please find attached the answers to your e-mail from 12.08.2015:

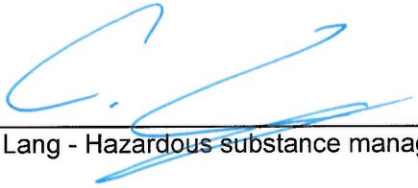
- 1) Translation is attached to this e-mail.
- 2)
 - a) Gear parts and motor parts are made of leaded copper alloys.
Typical leaded copper alloys parts at Dunkermotoren are gear wheels and have a diameter from 20mm to 70mm and a length of about 25mm. The toothing is on the outer diameter. The gear parts are part of a planetary gearbox or of a worm gearbox.
Typical motor parts are bushes. Bushes are used as spacers or as retaining bushes in all motor and gear types.
 - b) Drives are part of the following products:
Slicers, retail scales, printers, woodworking machines, under water scooters, rehabilitation machines, dialysis machines, medical pumps, operating tables, magnetic resonance tomography, cash machines, automatic doors and automatic sun protection.
 - c) IT and telecommunications equipment; Electrical and electronic tools; Toys, leisure and sports equipment; Medical devices; Automatic dispensers and other EEE not covered by any of the categories above.
- 3) We estimate that we place about 1700 kg of lead on the market (2015).
- 4) The lead in leaded copper alloys reduces the sliding property of individual gear parts in gearboxes. The lifetime of a gearbox is thus increased.
The machining process is performed on a turning machine and a gear cutting machine. Without lead the lifetime of the tools will be lower and the process time will increase.
- 5) Dunkermotoren has already identified an alternative material. But the tests were negative. Now we restart the material search.

Various stages for phase out:

- search alternative material
- produce different sample
- building sample drives in all relevant combinations (different gear parts, different oil, different test conditions)
- test the sample (test duration up to 10.000 hours)
- request release of the customer

- changeover in production
- 6) Yes. I heard of two companies with the same issues. But I want to mention any names.
- 7) a) With this threshold we can continue to use the existing material for gear components and we have enough time to search an alternative material.
- b) For our applications of drives a threshold of 1% would be sufficient. Leaded copper alloys with a lead content of 4% may be switched to a material with a lead content of 1%.

Bonndorf, 08.10.2015



Carsten Lang - Hazardous substance manager