



Öko-Institut e.V.
 Carl-Otto Gensch
 P.O. Box 17 71
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 Germany

11th November, 2013

Dear Mr. Gensch,

Further to our responses to the RoHS stakeholder consultations 2013-2 and 2013-5, Nanoco Technologies Limited and Dow Electronic Materials would like to provide additional comment on 3M's letter (31st October 2013) of support for exemption request 2013-2.

3M states that "[cadmium-containing] quantum dot light control films currently fall under exemption 39". It is our understanding that this is not correct since the original Exemption 39 was requested and granted for "cadmium in colour-converting II-VI LEDs", not remote from the LEDs in capillary tubes or in plastic films elsewhere in the display device.

Our own analysis of the tablet device mentioned by 3M suggests that the product is not RoHS compliant. Apart from the cadmium-containing film being remote from the LEDs, we also found that the cadmium content is approximately 70 µg/mm² of light-emitting area (this being the area of the LED chips that are the light source for the device). This is 7 times greater than the Exemption 39 allowance.

Other points made in the 3M letter were addressed in our response (5th November 2013) to the 2013-2 application, but to re-iterate:

1. We agree that any energy savings realised by use of quantum dots would be realised both by cadmium-containing and cadmium-free quantum dots.
2. Nanoco's own CFQD™ cadmium-free quantum dots are available now and pilot TVs are planned for early 2014, with full commercialisation within 12 months.
3. 3M's proposed wording change of Exemption 39 to allow "< 20 µg of cadmium per cm² of screen area" would vastly increase the amount of cadmium permitted per device compared to that currently allowed, as illustrated for a 40" display with a 16:9 aspect ratio in the following table:

EX. 39 WORDING	ESTIMATED AREA	MAXIMUM Cd CONTENT "ALLOWED"
Existing	48 mm ² (total LED chip area*)	480 µg
3M Proposal	4400 cm ² (screen area [†])	88000 µg

* 96 twin-chip LED chip packages, each consisting of two 0.5 mm x 0.5 mm LED chips, gives 48 mm² light-emitting area.

[†] Screen dimensions for a 40", 16:9 display are 34.86" x 19.61"; 34.86" x 19.61" x (2.54 cm/")² = 4400 cm².

This shows that 3M's proposed wording would increase the amount of cadmium "allowed" per device, under Exemption 39, nearly 200 times. Such a large increase in the amount of cadmium allowed per device could have significant negative health and environmental impacts.

Yours sincerely,



Nigel Pickett
Chief Technology Officer
Nanoco Technologies Limited



Paul Connor
Director, Environmental Health & Safety
Dow Electronic Materials

Dow and Nanoco are separate companies. Dow is the exclusive licensee of Nanoco's CFQD™ cadmium-free quantum dot technology in the field of displays.