



We create chemistry

BASF SE, 67056 Ludwigshafen, Germany

OEKO-Institut e.V.
RoHS EXEMPTIONS
Dr. Carl-Otto Gensch
PO BOX 1771
D-79017 Freiburg
Germany

January 08, 2016

Tel. +49 621 60-27907
Fax. +49 621 60-6627907
Email dirk.voeste@basf.com
Page 1 of 1

Re: RoHS Exemption request 2013-2 – QD Vision

Dear Dr. Gensch,

BASF is a leading supplier of Advanced Materials to the semiconductor, display, lighting and photovoltaic industries. We support our customers to develop innovative solutions targeting better performance as well as improved energy efficiency.

BASF has recently invested in QD Vision and signed a joint development agreement with QD Vision for a quantum dot-enhanced backlight and a color filter for use in LCD displays. This cadmium selenide technology is, based on our internal assessment, the benchmark in energy efficiency and will enable displays to show millions more colors than today's Ultra High-Definition (UHD) or 4K displays. By jointly optimizing the technology, we expect to achieve next generation color standards (REC2020) and to improve energy efficiency of display systems in the use phase further.

The EU is currently reviewing the RoHS exemption for the use of cadmium selenide in displays. We support QD Vision's arguments to prolong the RoHS exemption. Confirmed by the assessments provided by QD Vision, cadmium selenide based quantum dots not only enable better color performance but also higher quantum yields and therefore superior energy efficiency compared to indium phosphide based solutions. This results in significantly reduced cadmium and heavy metal emissions from power plants during the use phase of displays and hence a net benefit to the environment. The atmospheric emissions of heavy metals are rated more critical as they are bio-accessible and enter the food chain, whereas the comparably small amount (< 2 mg in case of QD Vision's solution) of cadmium required for a display is hermetically encapsulated and can be easily recycled. We also note that the alternative of indium phosphide has a harmonized classification as carcinogenic, 1B.

We therefore believe that the RoHS exemption for this application is justified and would welcome its prolongation by the EU institutions for a period of 5 years.

Yours truly,

Dr. Dirk Voeste
VP Sustainability Strategy
BASF SE

Dr. Uwe Blumenstein
Communications & Government Relations
BASF SE

Dirk Nachtigal
Managing Director
BASF Venture Capital GmbH

BASF SE
67056 Ludwigshafen, Germany

Phone: +49 621 60-0
Fax: +49 621 60-42525
E-mail: global.info@basf.com
Internet: www.basf.com

Registered Office: 67056 Ludwigshafen
Registration Court: Amtsgericht Ludwigshafen
Registration No.: HRB 6000

Euro Bank details:
Commerzbank Aktiengesellschaft
Account No. 0201000700, Sort code 545 400 33
IBAN DE26 5454 0033 0201 0007 00
SWIFT COBADEFF545

Deutsche Bank Aktiengesellschaft
Account No. 0013302500, Sort code 545 700 94
IBAN DE72 5457 0094 0013 3025 00
SWIFT DEUTDESM545

Chairman of the Supervisory Board:
Jürgen Hambrecht

Board of Executive Directors:
Kurt Bock, Chairman;
Martin Brudermueller, Vice Chairman;
Hans-Ulrich Engel, Sanjeev Gandhi,
Michael Heinz, Andreas Kreimeyer,
Harald Schwager, Wayne T. Smith,
Margret Suckale