



NANEX WP2 – Exposure Scenarios Summary

Please note this ES was not developed as part of a full risk assessment process, and may not necessarily describe exposure conditions for which there are no risks to human health and the environment

Standard Exposure Scenario Format 1: For Uses Of Substances By Workers

Title:	Production of titaniumdioxide by laser ablation	Date:	08/07/2010
SubstanceType	Ti O2	Entered By:	TNO

Internal reference ID: ES 9

List of all use descriptors related to the life cycle stage and all the uses under it; include market sector (by PC) if relevant:
SU 3; PC ? ; PROC 15, 26

List of names of contributing exposure scenarios and corresponding PROCs/PCs

CES 1: Laser ablation (PROC 15, 26)

CES 1: Name of contributing exposure

Laser ablation (PROC 15, 26)

Further specification

Laboratory is part of the Laser Engineering Department and is situated next to a busy main road. In this workshop-type laboratory high energy cutting lasers (1 KW) are used for research into the ablation of metals and the welding and cutting of metals. In the laser ablation process, plates of pure titanium are placed in a dish under deionised water. Spherical nanoparticles of titanium dioxide in the size range 20 – 80 nm are produced when the titanium plate is irradiated with a laser set at about 250 watts. This scenario involves tests.

Product characteristics

particles in liquid, viscosity unknown

Amounts used

production 3 gr/hour

Frequency and duration of use/exposure

duration task 8 minutes

Human factors not influenced by risk management

not reported

Other given operational conditions affecting workers exposure

Laboratory volume 150 m3. (temperature and RH not reported)

Technical conditions and measures at process level (source) to prevent release

Task performed in screened off area made from a 2x2 m timber framework covered with plasticised fabric and accessed via an open wire mesh door. Laser normally was operated remotely, and nobody is allowed inside the enclosed area during laser operation.

Technical conditions and measures to control dispersion from source towards the worker

LEV (movable capture hood), natural ventilation

Organisational measures to prevent /limit releases, dispersion and exposure

not reported

Conditions and measures related to personal protection, hygiene and health evaluation

disposable nitrile gloves.

Additional good practice advice (for environment) beyond the REACH CSA

not reported

Exposure Estimation

SMPS: particles < 100 nm during activity: 11699 #/cm3 (AM)
particles < 100 nm during non-activity: 11974 #/cm3 (AM)
particles > 100 nm during activity: 1575 #/cm3 (AM)
particles > 100 nm during non-activity: 1675 #/cm3 (AM)

References

Ref Title: D2.2 Report of results and implications of main study to measure nanoparticle concentrations in workplaces - Part 1: Main summary
Author: NANOSH
Journal:
Ref Year: 2010

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