



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:	CNT production using Chemical Vapour Deposition (CVD)	Date:	06/07/2010
SubstanceType	CNT	Entered By:	TNO

Internal reference ID:	ES 3
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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 1, 9; AC not relevant

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

CES 1: Sampling from reactor (PROC 1)
CES 2: Bagging from reactor (PROC 9)

CES 1: Name of contributing exposure

Sampling from reactor (PROC 1)

Further specification

Samples for quality control (QC) were taken during the continuous production of carbon nanotubes in the reactor at the production site. The production of carbon nanotubes in the reactor is a closed process and so QC samples were taken by the removal of a tube with the carbon nanotubes from the reactor by a special (closed) system for sampling. The tube is gently emptied in a little bag. Subsequently the tube was placed back in the reactor.

Product characteristics

Powder, dustiness not reported
100 % product

Amounts used

< 10 gram

Frequency and duration of use/exposure

The task took 2 minutes and is performed twice per hour, 24 hours/day, 5 days a week

Human factors not influenced by risk management

The sampling tube is gently emptied in a little bag

Other given operational conditions affecting workers exposure

The reactor is situated on the first floor of the production hall opposite to the side for the production of catalyst. The available ventilation system in the hall was not used.
Temperature 24 degrees celcius, RH 48 %

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

Closed system

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

not reported

Organisational measures to prevent /limit releases, dispersion and exposure

not reported

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

The operator wore disposable latex gloves during the entire task. Disposable respiratory protective equipment (filtering face piece) was used.

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

not reported

Exposure Estimation

CPC: total particle concentration during activity was 9644 #/cm3 with corresponding non-activity period of 8989 #/cm3. Second measurement result during activity was 11934 #/cm3 with corresponding non-activity period of 11997 #/cm3 during non-activity (AM)

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CES 2: Name of contributing exposure

Bagging from reactor (PROC 9)

Further specification

Bagging of the end product was carried out in a fully integrated filling and weighing system located at the end of the reactor on the ground floor. When a bag contains 2 kilograms of carbon nanotubes the bagging hose is closed and the air in the bag is pushed out. Subsequently the bag is closed with a tie-rip and removed from the bagging-point. The weight of the bag is checked and placed in a cardboard box. Then a new bag is connected to the bagging point and the hose is re-opened.

Product characteristics

Powder, dustiness unknown
100 % product

Amounts used

2 kg for each task

Frequency and duration of use/exposure

The task took 2 minutes and is performed twice per hour, 24 hours/day, 5 days a week.

Human factors not influenced by risk management

not reported

Other given operational conditions affecting workers exposure

Bagging of the end product was carried out in a fully integrated filling and weighing system located at the end of the reactor on the ground floor. Ground floor is connected by an open space to the rest of the facility. Total volume > 9000 m3.
Temperature 23 degrees celcius, RH 53 %

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

fully integrated filling and weighing system

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

not reported

Organisational measures to prevent /limit releases, dispersion and exposure

not reported

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

The operator wore disposable latex gloves during the entire task. Disposable respiratory protective equipment (filter face piece) is used.

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

not reported

Exposure Estimation

CPC: total particle concentration during activity 11934 #/cm3
total particle concentration during non-activity 11997 #/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