



Bundesanstalt für Arbeitsschutz
und Arbeitsmedizin

Questionnaire on aspects of worker protection during the production and handling of engineered nanomaterials

- General Part -

Lfd. Number ___A

For a quick and exact processing of this questionnaire that can be read by machine please fill the fields with a thick black or blue pen and avoid touching the margins.

Please use print letters and numbers following this pattern:

(Made anonymous through VCI)

In order to facilitate filling out the questionnaire it is divided into a general and specific part. The general part (e.g., no. 027A for company 27) includes questions relating to the company and only has to be filled out once. The specific part (e.g., no. 027S07 for material 7 in company 27) includes questions related to the material.

If your company / institution produces, uses, or processes several different products with nanomaterials, please fill in the specific part for each of these products (given a total annual use of more than 10 kg).

The definition of engineered nanoparticles in this questionnaire are particles produced as powder, which in at least two dimensions are smaller than 0.1 micrometers, as well as their aggregates and agglomerates (no fumes from soldering or metal and no diesel fumes).

1. What does your company/institution do with nanoparticles (nanomaterials)?
 - a. Produce Yes/No
 - b. Use Yes/No
 - c. Release by processing other products Yes/No
 - d. Unknown or not investigated

If your company/institution does not produce, use or release, you can finish the questionnaire here and return it to VCI.

2. To what extent are you handling nanomaterials?
(Indications of weight relate to the nanomaterials and not to the production process. The indications are independent of the size of the agglomerate and refer to the total amount produced, used or released nanomaterials in the company)
 - a. 10 kg/year up to <100 kg/year
 - b. 100 kg/year up to < 1 ton/year
 - c. 1 ton/year up to <10 tons/year

- d. 10 tons/year up to < 100 tons/year
 - e. 100 tons/year up to < 1,000 tons/year
 - f. 1,000 tons per year and more
3. How many employees are handling nanomaterials in your company/institution?
- a. 1 up to <10 employees
 - b. 10 up to < 50 employees
 - c. 50 up to < 250 employees
 - d. 250 and more employees
4. Are you or have you carried out measurements of exposure while handling nanomaterials?
- a. No
 - b. Yes, orienting measures of alveolar (A-) dust
 - c. Yes, orienting measures of breathable (E-) dust
 - d. Yes, orienting measures on the concentration of particle numbers (presently not standardized)
 - e. Yes, regular measures of alveolar (A-) dust
 - f. Yes, regular measures of breathable (E-) dust
 - g. Yes, regular measures on the concentration of particle numbers (presently not standardized)
5. Would you be interested in participating in a BAuA supported research project intended to evaluate baseline exposure? Yes/No If yes, see contact for BAuA (below)
6. Do you have information about possible health effects about the nanomaterials produced or used by your company/institution? Yes/No
- a. Workplace medical monitoring
 - b. Epidemiological data
 - c. Other indications – if yes, which?
7. Do you know about complaints related to contact or handling particles from the employees in your company/institution? Yes/No If yes, which?
8. Are you interested in voluntary consultation by BAuA concerning the workplace medical aspects while in contact with nanomaterials? Yes/No If yes, please see contact at BAuA (below)
9. How are you transmitting, if this is the case, information to customers about possible dangers of nanomaterials?
- a. Material safety data sheet
 - b. Indications on technical instructions
 - c. Accompanying letter
 - d. Other indications – if yes, which?

Thank you for your cooperation!

Please fill in the specific part (if necessary, several times).

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Questionnaire on aspects of worker protection during the production and handling of
engineered nanomaterials

- Specific Part -

Lfd. Number __S__

Please fill in a copy of this questionnaire (3 pages) for each of your products and attribute an ongoing number to each sheet of the questionnaire, which should be filled in after the letter "S". The first three numbers before the S refer to the company and have to be identical to the number before the A on the first page of the general part.

11. Which nanomaterials (or dusts) are produced, used or released during the work processes?
- Silicic acids
 - TiO₂
 - ZiO₂
 - Chromium Oxide
 - NiO₂
 - AlO₂
 - FeO₂
 - Silicates
 - Carbon black / industry fumes
 - Other inorganic color pigments
 - Nanotubes
 - Metal powder
 - Organic color pigments
 - Vitamins
 - Polymers
 - Other product areas – if so, which
12. Are the sizes of the primary particles of the nanomaterials known (multiple names are possible)? Yes /No
If yes, how big are the primary particles (D50)?
- < 20 nm
 - 20 nm up to < 50 nm
 - 50 nm up to 100 nm
 - > 100 nm
13. How are nanomaterials being handled (brief bullet form description of activities (e.g., charging, filling in, mixing, polishing, etc.)?)

14. Is the extent of workplace exposure (average) known?
- No, not known
 - Yes, gravimetric concentration (breathable (E-) dust) ___ mg/m³
 - Yes, gravimetric concentration (alveolar (A-) dust) ___ mg/m³

At present, there are no standardized measurement processes to investigate concentration of particles. Despite this, did you carry out measurements, e.g., as part of a study?

- Yes, concentration of numbers of particles $_ _ \times 10^{_} _ \text{ p/cm}^3$ (p = particles)

Do you know the distribution of particle sizes in the air at the workplace?

Yes/No

If yes, at which particle size are the maximum?

- < 50 nm, etc.
- 50 up to < 100 nm
- 100 up to < 200 nm
- 200 up to < 500 nm
- 500 up to < 1,000 nm
- 1,000 up to < 5,000 nm
- > 5,000 nm
- No indication possible

15. Which measurement technique was used in your measurement of exposure?
- Gravimetric system (e.g., VC25, MPGII, PM4, PGP-System)
 - Impactors (e.g., Bern Impactor)
 - counter of core condensation (e.g., CPC, SMPS)
 - other measurement systems – if yes, which
 - not known

16. Are you using protection measures while handling nanomaterials? Yes/No

Engineering Measures

- No
- Closed system
- Automation of the manufacturing processes
- Wet processing
- Others – if yes, which?

Air circulation measures

- a. No
- b. Closed setting (e.g., capsule, box)
- c. Half open setting (e.g., cubicle, work table)
- d. Open setting (e.g., suction tube, vent)
- e. Air circulation by machine (mechanical ventilation?)
- f. Free air (outside air)
- g. Others – if yes, which?

Additional and accompanying Measures

- a. Personal protection (respiratory protection)
- b. No
- c. If yes, which?

17. If you are using mechanical ventilation:

- a. Do you have a way of reintroducing clean air? Yes/No – if yes, how is the filtering done (degree of separation – efficiency)?

Many thanks for your cooperation!