

SAFETY REQUIREMENT VV18. Exposure to heavy metals: lead and cadmium	 Balen/Pelt
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1	PURPOSE.....	2
2	SCOPE	2
3	PRESCRIPTION.....	2
3.1	Testing standards for lead in blood and cadmium in urine	2
3.2	Execution of the measurements	3
3.2.1	Assessing external exposure (what am I exposed to?)	3
3.2.2	Assessing internal exposure (how much has my body absorbed?).....	4
3.3	Information for employees.....	4
3.4	Contact details of Nyrstar's Internal Occupational Health Service.....	5

SAFETY REQUIREMENT VV18.

Exposure to heavy metals: lead and cadmium



1 PURPOSE

This regulation describes how we monitor internal exposure to lead and cadmium.

2 SCOPE

This regulation applies to all Nyrstar employees, contractors and their subcontractors if:

1. Work must be carried out in the following departments in Balen & Pelt:

- Roastery
- Leaching & PWZI
- Hydro
- Zinc halls (anodes treatment)
- CGG/Zincdust
- Concentrate shed
- All Maintenance services incl. garage
- All other places where exposure to Lead or Cadmium is not excluded.

and:

2. The employee(s) is or may be present within one of the above departments for more than 20 working days.

The rule does not apply if the activities consist exclusively of administrative activities.

3 PRESCRIPTION

3.1 Testing standards for lead in blood and cadmium in urine

Nyrstar applies the following standards of review/action:

Measured value of lead in blood:	Action
< 10 µg/dl Awareness Level	<u>Annual</u> monitoring of lead in blood
> 10 and < 15 µg/dl	1. Monitoring frequency every six months + Hygiene Action Plan for Lead (HAP), if > average group

SAFETY REQUIREMENT VV18.

Exposure to heavy metals: lead and cadmium



Balen/Pelt

> 15 µg/dl Action Level	2. Consultation with medical service + HAP Monitoring frequency <u>6 weekly</u>
> 25 µg/dl Transfer level	1. Removal from exposure *after control monitoring for confirmation. <u>Monitoring frequency every 6 weeks. Return to exposure as value of control is <15µg/dL.</u> 2. Consultation at the medical service 3. <u>Contractor: no access to places with lead exposure</u>
Measured value cadmium in urine:	Action
< 1 µg/g creatinine	<u>Annual</u> monitoring of cadmium urine value
> 1 and < 2 µg/g creatinine Action Level	1. Monitoring frequency <u>6-monthly</u> + Hygiene Action Plan for Cadmium (HAP)
> 2 µg/g creatinine Transfer Level	1. After confirmation of this value: definitively** no more admission to the risk zone for exposure to cadmium 2. <u>Consultation with medical service</u> <u>Monitoring frequency annually to follow up</u> 3. <u>Contractor: no access to places with cadmium exposure</u>

*A measured value > 25 µg/dl may mean that the Nyrstar employee is (temporarily) unable to continue his work within Nyrstar Belgium. He may return to the environment where there may be exposure to lead if his lead has dropped below 15µg/dl in blood value.

** Given the very long biological half-life of cadmium in urine (>20 years), it is unlikely that a reduction below the Transfer level of 2 µg/g creatinine can be obtained.

3.2 Execution of the measurements

3.2.1 Assessing external exposure (what am I exposed to?)

Periodically, workplace measurements are carried out in the company to assess the external exposure of the workers. These are carried out strictly according to the correct and latest standard (EN 689). The results are tested against the current limit values (laid down in accordance with the Royal Decree) and communicated to the departments. The employees but also the contractors always have the opportunity to inquire about this at the IHS.

SAFETY REQUIREMENT VV18.

Exposure to heavy metals: lead and cadmium



Balen/Pelt

3.2.2 Assessing internal exposure (how much has my body absorbed?)

For non-ferrous metals, it is perfectly possible to determine how much has entered our body. The method is called biomonitoring. We are going to measure the concentration of certain metals in blood and/or urine. These results are compared with reference values (except for lead in blood, for which there is a [legal](#) limit value in Belgium). Within Nyrstar Belgium we have stricter guide Lines (see above)

The frequency of sampling depends on the measured value and is described in the Nyrstar Biomonitoring standard for the different metals. In general, Nyrstar reference values are stricter than the proposed reference values as described in the literature and we apply the principle of Action Values. (ALARA principle)

Contractors who are employed with us for more than 20 working days (4 weeks) must also be followed up with biomonitoring. This is normally done by their external medical service. For explanation, they can always call on our standard Biomonitoring and/or contact the occupational physician of Nyrstar Balen/Pelt. The contact details can be found below. [Nyrstar can always decide to have the biomonitoring carried out by its own BGD in consultation with the contractor and their own external EDPPW.](#)

The minimum frequency for biomonitoring is 1x per year for both our own employees and contractors (who work at our company for a longer period of time)

3.3 Information for employees

Personal hygiene and compliance with PPE requirements play an important role in avoiding exposure to lead and cadmium.

During the recruitment of employees, the occupational physician makes it clear which exposures the person concerned may have and the occupational hygiene measures are discussed in detail. The summary of these measures can be found in a leaflet that is then given to the employee.

If an employee has a biomonitoring value in the blood or urine that is higher than the 'action level' or significantly higher than his colleagues (or the 'transfer level'), a 'HAP (Hygiene Action Plan)' is started together with this employee. The manager of the department concerned is also involved in this. The aim is to find an explanation for this increased value. From then on, this employee will be monitored more frequently to evaluate the further evolution.

The results of the biomonitoring are also always explained by the occupational physician during the annual periodic examination. [In addition, the employees receive their individual results under a closed envelope. No individual results will be communicated to third parties.](#)

The contractor is obliged to inform his employees of the need for hygiene and PPE. In addition, he informs his employees of the dangers of exposure to lead and cadmium. Educational materials may be provided by Nyrstar's Internal Occupational Health Service on request.

SAFETY REQUIREMENT VV18.

Exposure to heavy metals: lead and cadmium



3.4 Contact details of Nyrstar's Internal Occupational Health Service

Occupational physician: Dr De Groof, ☎ 014 81 9475

Nurse: Paul Mentens, ☎ 014 81 9270