

Długoleka, October 2026

The Exposure Register for Work on Chromate-Contaminated Insulation Systems and Chromium(VI)-Containing Combustion Ashes

Duties of the employer and of the client in maintenance, repair and dismantling work on thermally stressed chromium-alloyed industrial components and in maintenance and cleaning work on combustion furnaces

Regulatory analysis of Directive 2004/37/EC, the German Hazardous Substances Ordinance (GefStoffV), TRGS 400, 401, 410, 500, 561 and 600 and DGUV Regulation 1 · Project Cr6.info - Exposure Register · Regulations checked as of 24 October 2026

Version 1.0 · October 2026

Markus Sommer - The Chromate Expert · The Chromate Experts · www.chromatexperten.de

Employees who carry out maintenance work on thermally stressed chromium-alloyed components fitted with insulation systems made of insulation materials containing alkali or alkaline earth metal oxides must be entered in the exposure register. This applies even where air measurements are unremarkable, where no Chromium(VI) has been detected and where, at first sight, the company sees no reason to do so. The same applies to work in which Chromium(VI)-containing combustion ashes can be released or touched.

This regulatory analysis sets out why this is so for Germany, the Netherlands and Great Britain.

1. Subject

The subject of this analysis is the question whether an exposure register under § 10a of the German Hazardous Substances Ordinance (Gefahrstoffverordnung, GefStoffV) must be kept for maintenance work on thermally stressed chromium-alloyed industrial components fitted with insulation materials that contain alkali or alkaline earth metal oxides. The restriction to oxide-containing insulation materials is deliberate. It adopts the criterion that TRGS 561 names in section 5.9.3 paragraph 3 as a factor influencing the formation of Chromium(VI) compounds, and it separates the subject from insulation systems that do not contain these oxides.

Four follow-up questions are connected with this, each of which is regularly raised in practice as an objection to the register duty. First, whether a rapid test on the component surface triggers the protection regime or can justify its non-triggering. Second, whether an unremarkable air measurement supports dispensing with the register although the dermal exposure route remains unassessed. Third, which duties follow from the substitution assessment. Fourth, how the duties are divided between the insulation contractor performing the work and the plant operator as client. The European level is placed first, because the national provisions implement it and because it forms the common denominator for readers in other Member States. A second field of application, the maintenance of combustion furnaces with Chromium(VI)-containing combustion ashes, is dealt with separately in chapters 12 and 13, because the chain of evidence runs differently there. This document is based on the German regulations. The country-specific derivations for the Netherlands are found in chapters 14 and 15, for Great Britain in chapters 16 and 17; further countries will be added in the same way as chapters of their own.

2. Regulations Examined and Currency

All versions used were checked for validity on 24 October 2026. For none of the regulations has a later amendment or correction been published. The amendment notice of the German Federal Ministry of Labour (BMAS) of 29 September 2026 concerns TRGS 529 and TRGS 540 and does not affect the rules examined here.

Regulation	Version examined
Directive 2004/37/EC	Consolidated version, last amended by Directive (EU) 2024/869; limit value for Chromium(VI) compounds in Annex III 0.005 mg/m ³ since 18 January 2025
Hazardous Substances Ordinance (GefStoffV)	As of February 2026; last amended by Ordinance of 17 December 2025 (BGBl. I No. 337), correction of 20 February 2026 (BGBl. I No. 44)
TRGS 400 Risk assessment	Edition July 2017, GMBI 2017 p. 638 (No. 36), version 08.09.2017
TRGS 401 Risks resulting from skin contact	Edition October 2022, GMBI 2022 p. 895, last amended GMBI 2024 p. 769 (19.09.2024)
TRGS 410 Exposure register	Edition September 2026, GMBI 2026 pp. 528-532 (No. 23) of 25.09.2026
TRGS 500 Protective measures	Edition September 2019, GMBI 2019 p. 1330, corrected GMBI 2020 p. 88, version 01.04.2021
TRGS 561 Carcinogenic metals	Edition May 2026, GMBI 2026 pp. 308-336 (No. 14-15) of 04.05.2026
TRGS 600 Substitution	Edition July 2020, GMBI 2020 pp. 405-418 (No. 21), version 09.07.2024
DGUV Regulation I Principles of prevention	Edition November 2013
MAK and BAT Values List	2025 edition of the German Research Foundation (DFG)
Arbeidsomstandighedenbesluit (NL)	Consolidated version wetten.overheid.nl, „Geldend van 01-08-2026 t/m heden“, retrieved 24 October 2026 (amendment announced for 20 January 2027); amendment status evidenced by Staatsblad 2006, 674; 2015, 300; 2024, 127; 2025, 337
Arbeidsomstandighedenregeling, Bijlage XIII (NL)	Limit value chromium(VI) compounds 1 µg/m ³ , Staatscourant 2016, 57792, in force since 1 March 2017
Nederlandse Arbeidsinspectie	Werkinstructie „Blootstelling Gevaarlijke stoffen“, approved 27 August 2024, last amended 18 December 2024, issued May 2025
COSHH Regulations 2002 (GB)	SI 2002/2677, consolidated version legislation.gov.uk, retrieved 24 October 2026, „no known outstanding effects“ for Reg. 2, 3, 6, 7, 10, 11, 12 and Schedules 1, 6
EH40/2005 Workplace exposure limits (GB)	Fourth Edition 2020, in force since 17 January 2020; current edition according to the HSE publication page (as of 26 February 2026)
RIVM letter report 2024-0176	Advies notaties voor sensibilisatie in de Arbeidsomstandighedenregeling

TRGS 410 was recast in its September 2026 version. The footnote on its first page expressly names among the changes the provision that, for activities involving Chromium(VI) compounds, entry in the exposure register takes place when the concentration of 1 µg/m³ as a shift average is exceeded. This rule is therefore more recent than TRGS 561 and tailored to the situation examined here.

3. The Situation in the Regulations

The German TRGS 561 describes the situation in two places. Section 3.3.4 paragraph 5 states that Chromium(VI) compounds can form on thermally stressed chromium-alloyed industrial components, for example on steam pressure lines or in turbine casings, that these can deposit on the surrounding components, and that work on these components, the dismantling of insulation systems and the maintenance of exhaust systems are named, can lead to a relevant exposure of employees to Chromium(VI). Section 5.9.3 goes into more depth. According to paragraph 2, in thermally insulated industrial components the Chromium(VI) compounds can deposit in the insulation materials or assembly pastes and lead to exposure during dismantling or maintenance work. Paragraph 3 names as influencing factors the steel temperature, the chromium content of the alloy, the reaction time, the presence of alkali and alkaline earth metal oxides, for example from insulation materials or assembly pastes, as well as atmospheric oxygen and humidity close to the steel surface. The TRGS describes the formation mechanism as not yet clarified at present.

Paragraph 4 contains the finding on exposure level that is decisive for the register duty.

“Workplace measurements during activities on Chromium(VI)-contaminated industrial components indicate that exposure above a concentration of 1 µg/m³ for Chromium(VI) compounds can occur. In particular during plant overhauls (maintenance work), in dismantling and in fault clearance, exposure of employees to Chromium(VI) compounds cannot be excluded.” (TRGS 561, 5.9.3 paragraph 4, author’s translation)

Paragraph 5 lays down the protection regime. For activities on industrial components on which a Chromium(VI) contamination is present or cannot be excluded, the protective measures of chapters 4.1 and 4.2 are to be implemented and supplemented by the minimisation of dust generation and dust spread, type 5 chemical protective suits with hood, nitrile-coated textile gloves and eye protection, respiratory protection of at least FFP2 for short-term activities and half masks with P3 filters for longer activities, and the disposal of contaminated disposable protective clothing. The trigger is the impossibility of exclusion, not the detection.

The classification of the substance follows from section 3.3.4 paragraphs 1 and 2. Chromium(VI) compounds are, with the exception of barium chromate and the compounds listed by name in Annex VI of the CLP Regulation, classified as carcinogenic category 1B and as skin sensitising and in part respiratory sensitising category 1. No exposure-risk relationship has yet been derived; the concentration to be applied is 1 µg/m³ for the inhalable fraction. Above this concentration, according to the TRGS, a high risk exists.

4. The European Level: Directive 2004/37/EC

Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens, mutagens or reprotoxic substances at work is the sixth individual directive under Framework Directive 89/391/EEC.

According to its Article 1(1) it lays down the relevant minimum requirements including limit values, is addressed to the Member States and is implemented in Germany by the GefStoffV. The national level may be stricter and is so for Chromium(VI). Annex III of the Directive sets a limit value of 0.005 mg/m³ for Chromium(VI) compounds; TRGS 561 requires compliance with 1 µg/m³. For the German employer the duty arises from the GefStoffV, the TRGS and the accident prevention regulation; the Directive is the standard for their interpretation and applies equally in all Member States.

Article 3(1) extends the Directive to activities in which workers "are or are likely to be exposed" to carcinogens. Paragraph 2 requires, for every such activity, the determination of the nature, degree and duration of exposure, with a renewed assessment whenever conditions change, and obliges the employer to supply the authorities, at their request, with the information used for the assessment. Paragraph 3 reads:

"When the risk is being assessed, all other routes of exposure, such as absorption into and/or through the skin, shall be taken into account." (Directive 2004/37/EC, Article 3(3))

Article 4(1) obliges the employer to reduce the use of a carcinogen, "in particular by replacing it, in so far as is technically possible, by a substance, mixture or process which, under its conditions of use, is not dangerous or is less dangerous to workers' health or safety, as the case may be". Under paragraph 2 the employer submits the findings of the investigations to the authority on request. Article 5 places the measures in a fixed order of priority: if the assessment reveals a risk, "workers' exposure must be prevented" (paragraph 1); if substitution is not technically possible, a closed system is prescribed (paragraph 2); if that is not possible either, exposure must be reduced "to as low a level as is technically possible" (paragraph 3).

The list of exposed workers is governed by Article 12(c).

"the employer keeps an up-to-date list of the workers engaged in the activities in respect of which the results of the assessment referred to in Article 3(2) reveal a risk to workers' health or safety, indicating, if the information is available, the exposure to which they have been subjected;" (Directive 2004/37/EC, Article 12(c))

Points (d) to (f) secure access for the doctor, the authority, the workers and their representatives. Article 15(1) prescribes that this list and the medical record are to be kept for at least 40 years after the end of exposure in the case of carcinogens and mutagens. § 10a GefStoffV and TRGS 410 implement these two Articles. The Directive ties the list to the result of the assessment, knows no threshold value as a precondition and requires the skin route to be taken into account.

5. Hazardous Substances Ordinance (GefStoffV)

§ 2(5) GefStoffV defines an activity as any work with substances, mixtures or articles including removal as well as operating and monitoring work. The dismantling and the maintenance of an insulation system are therefore activities within the meaning of the Ordinance. § 6(1) sentence 1 obliges the employer to determine “whether the employees carry out activities with hazardous substances or whether hazardous substances can arise or be released during activities”. The objection that no chromate is used misses this wording; the Ordinance covers the hazardous substance that arises or is released during the activity. Under § 6(1) sentence 2 no. 3 the exposure is to be assessed “taking into account all routes of exposure”, under no. 4 the possibilities of substitution are to be examined, and under no. 2a the information from the commissioning party under § 5a is to be included.

§ 6(8) requires the risk assessment to be documented before the activity begins, including under no. 2 the result of the substitution assessment and under no. 3 “a justification for forgoing a technically possible substitution, where protective measures under § 9 or § 10 are to be taken”. § 7(3) places substitution at the top of the measures.

“On the basis of the result of the substitution assessment under § 6(1) sentence 2 no. 4, the employer shall carry out substitution as a priority. He shall replace hazardous substances or processes with substances, mixtures or articles or processes that, under the respective conditions of use, are not dangerous or are less dangerous to the health and safety of the employees.” (§ 7(3) GefStoffV, author’s translation)

The exposure register is governed by § 10a. Under paragraph 1 the employer must, in order to be able to trace the level and duration of an exposure in the event of a later illness, keep a register of the employees who carry out activities with carcinogenic, germ cell mutagenic or reprotoxic hazardous substances of category 1A or 1B “for whom the risk assessment reveals a risk to their health”; the activity and the level and duration of the exposure are to be stated. Under paragraph 2 the register is to be kept up to date during the exposure and, for carcinogenic substances, retained for 40 years after the end of the exposure; on termination of the employment relationship the employee is to be given an extract. Paragraph 3 permits transmission to the accident insurance institution, in practice to the Central Exposure Database (ZED) of the DGUV. Paragraph 5 adds a notification duty, dealt with in chapter 11. § 18(3) no. 1 obliges the employer, for activities with substances of category 1A or 1B, to inform the authority of the result of the substitution assessment on request.

A note on citation is required. Until the amendment of 2 December 2024 the register duty was found in § 14(3) GefStoffV. TRGS 401 in its version of 19 September 2024 still cites this old reference in section 5 paragraph 1 no. 9. What is meant is today’s § 10a.

6. Entry in the Exposure Register under TRGS 410

TRGS 410 gives concrete form to § 10a GefStoffV. Under section 1 paragraph 2 it is to be applied when employees carry out activities with substances classified as carcinogenic category 1A or 1B and the risk assessment reveals a risk to health. Section 3 paragraph 1 repeats the duty from § 10a and requires the register to be kept up to date at all times. The duty is therefore formally tied to the result of the risk assessment and not directly to the combination of materials. What is decisive is therefore whether a risk assessment for the work considered here can arrive at a result other than "risk". Section 4 of TRGS 410 answers this.

Under section 4 paragraph 1 a risk is to be assumed in particular when one of the criteria listed there is met. Three of them apply directly to the situation. No. 10 is the newly inserted substance-specific rule: entry when, in activities with **Chromium(VI)** compounds, the concentration of $1 \mu\text{g}/\text{m}^3$ as a shift average is exceeded; TRGS 561 in 5.9.3 paragraph 4 considers precisely this exceedance possible during overhauls. No. 5 applies independently of any measurement: entry when respiratory protection must be worn as a protective measure; TRGS 561 prescribes it in 5.9.3 paragraph 5 no. 3. No. 7 covers the case that no sufficient information on the level of a possible exposure is available; the flow chart in Annex 1 of TRGS 410 leads this path to entry without further examination. For the company that does not measure, this is the normal case.

Section 4 paragraph 4 adds an activity-related rule that applies "without prejudice to paragraphs 1 to 3".

"Without prejudice to paragraphs 1 to 3, employees are likewise to be entered in the register if the activities listed below or comparable activities are carried out repeatedly and a risk cannot be excluded on the basis of the risk assessment under TRGS 400, 401 and 402 'Identification and assessment of the risks of activities involving hazardous substances: inhalation exposure': 1. repair and overhaul work, 2. maintenance work, 3. cleaning work, 4. sampling in non-closed systems, 5. demolition work, 6. activities in contaminated areas under TRGS 524." (TRGS 410, section 4 paragraph 4, author's translation)

The wording "cannot be excluded" corresponds to the trigger in 5.9.3 paragraphs 4 and 5 of TRGS 561. Section 4 paragraph 7 reverses the burden of justification: the employer must justify in the risk assessment if, in activities with carcinogenic hazardous substances of category 1A or 1B, the employees were not entered in the register. The exceptions in paragraphs 5 and 6, namely process- and substance-specific criteria under TRGS 420, compliance with the occupational exposure limit or acceptance concentration with only a low oral or dermal risk, closed plants under TRGS 500 and low risk owing to small quantity and short duration, do not apply to the dismantling of a contaminated insulation system, because TRGS 561 itself declares an exposure above $1 \mu\text{g}/\text{m}^3$ possible and requires a protective suit and respiratory protection.

TRGS 561 itself names the register duty in 4.1 paragraph 5 no. 2 letter b, albeit shortened to the range above the acceptance concentration, whose place is taken for **Chromium(VI)** by the value of $1 \mu\text{g}/\text{m}^3$. TRGS 500 refers in section 8.1 paragraph 7 to the register and the ZED and otherwise to TRGS 410. The criteria of TRGS 410 go beyond the shortened version in TRGS 561, because they also tie entry to the respiratory protection requirement, to missing exposure information and to repeated maintenance work.

7. Inhalation Exposure: Determination and the Question of the Rapid Test

In none of the regulations examined does a rapid test, a wipe sample, a test strip or a comparable indicative surface method appear as a trigger of the protection regime or as a justification for its non-triggering. A full-text search of the GefStoffV, TRGS 400, 401, 410, 500, 561 and 600 for these terms returns no result.

What the regulations provide is twofold. As a trigger it is sufficient under TRGS 561, 5.9.3 paragraph 5 that a contamination is present or cannot be excluded; detection is not required for this. For the finding that no risk exists, TRGS 561, 3.2 paragraph 1 and 3.3 paragraph 2 require the determination of inhalation exposure under TRGS 402 by workplace measurements or other suitable determination methods; measurement results from comparable workplaces may be used if they were obtained and recorded under TRGS 402. TRGS 410 names in section 5 paragraph 1 no. 5 as methods for the exposure level representative and activity-related workplace measurements, valid estimates by comparison with known exposures of similar plants or activities, screening measurements and suitable calculation models as well as exposure estimates by experts. All of these methods relate to the air at the workplace. Under 3.3 paragraph 3 of TRGS 561 the wearing of personal protective equipment may not be taken into account in the assessment; TRGS 410, section 5 paragraph 1 no. 6 provides the same for stating the exposure level in the register.

A surface rapid test answers a different question, namely whether Chromium(VI) is present on the component or in the insulation material. A positive result proves that a contamination is present and thus supports the triggering of the protection regime under 5.9.3 paragraph 5. A negative result proves under none of the regulations that an exposure is excluded. A spot finding on a surface says nothing about the inhalation exposure during dismantling. The regulations do not name such a method; whether it can count as an "other suitable determination method" within the meaning of TRGS 561, 3.3 paragraph 2 is decided by its informative value for inhalation exposure, and a surface finding has none. A non-entry in the register that is based on a rapid test can invoke no provision of the regulations and does not satisfy the duty of justification under TRGS 410, section 4 paragraph 7.

8. Dermal Exposure under TRGS 401

An air measurement below 1 µg/m³ answers only the inhalation route. The dermal route is not measured under TRGS 401, it is assessed qualitatively. There is neither a limit value nor a measurand for it and consequently no "unremarkable" result. The assessment is made via the risk matrix in Table 2 of TRGS 401 from the hazard characteristic of the substance, the extent and the duration of skin contact. The extent is, under section 3.3.3, "to be determined by an analysis of the activities or the work process"; the duration is divided under section 3.3.4 into short-term (less than 15 minutes per working day) and prolonged, begins with the contamination of the skin and ends only with the effective removal of the hazardous substance from the skin.

Skin contact is broadly defined. Section 2 paragraph 2 includes direct contact with solids as well as contact with contaminated work clothing, contaminated personal protective equipment and contaminated work surfaces. Section 3.3.2 names as direct forms aerosols such as dust and as indirect forms contaminated clothing, contaminated protective equipment when being removed and contaminated surfaces. Under section 4 paragraph 5, even short-term small-area contact with contaminated work surfaces constitutes, depending on the hazard characteristic, a low, medium or high risk. TRGS 401 assumes no dermal risk only where, owing to the activity and the process, skin contact is not to be expected (section 4 paragraph 3). In the dismantling of an insulation system coated with chromate dust this finding is not possible.

Two properties are decisive for placing Chromium(VI) compounds in the matrix. The classification as carcinogenic category 1B and skin sensitising category 1 follows from TRGS 561, 3.3.4 paragraph 1. Skin absorption follows from the 2025 MAK and BAT Values List of the DFG, which lists "Chromium(VI) compounds (inhalable fraction)" with the designation "H" (skin absorption), "Sh" (skin sensitising) and carcinogen category 1; barium, lead, strontium and zinc chromate are excepted from the H designation. Calcium chromate and sodium chromate fall under the designation. TRGS 401 admits in section 3.2.3 paragraph 2 the MAK and BAT Values List as a source for skin absorption where the substance is not listed with "H" in TRGS 900, 905 or 910. Independently of this, substances of category Carc. 1B would in any case, under section 3.2.3 paragraph 3, be treated like skin-absorbable substances where no information is available.

The row "skin-absorbable and at the same time Carc. 1A or 1B (H350)" of Table 2 is therefore applicable. It shows a high risk in all four cells, that is, for short-term as well as prolonged and for small-area as well as large-area contact. Even the row Skin Sens. 1 (H317) alone would yield a low risk only for short-term small-area contact and otherwise a medium or high risk. The dermal risk in work on chromate-contaminated insulation systems is consequently high under TRGS 401, and this independently of the result of an air measurement.

For the exposure register this has a consequence of its own. TRGS 410, section 4 paragraph 3 requires entry also where employees carry out activities with skin-absorbable carcinogenic hazardous substances of category 1A or 1B and, under the risk assessment pursuant to TRGS 401, a risk from skin contact exists, "for example where the wearing of chemical protective gloves has been specified as a necessary protective measure". TRGS 401, section 5 paragraph 1 no. 9 provides the same. TRGS 561 specifies in 5.9.3 paragraph 5 no. 2 nitrile-coated gloves and type 5 protective suits as the necessary protective measure. Both conditions are therefore met. The air finding does not support non-entry, because the skin risk is not removed by it and, under TRGS 410, section 4 paragraph 7, it would have to be separately justified why no entry is made despite a high dermal risk. Directive 2004/37/EC requires in Article 3(3) the same consideration of the skin route.

9. Substitution Assessment under TRGS 600

TRGS 561 requires in 4.1 paragraph 1 that the employer examines the possibility of substitution by substances or mixtures with a lower health risk and carries it out as a priority, with reference to TRGS 600. Under TRGS 600, section 3 paragraph 1 the identification of substitution possibilities is part of every risk assessment under § 6(1) GefStoffV as soon as a risk can arise during the activity. Forgoing the examination is permitted under section 1 paragraph 3 only in the case of low risk under § 6(13) GefStoffV; this cannot be substantiated under 5.9.3 paragraphs 4 and 5 of TRGS 561.

The concept of substitution in TRGS 600 covers the replacement of the insulation system that is decisive here, although the insulation material itself is not the hazardous substance. Under section 2 paragraph 2 substitution means the replacement of a hazardous substance or a process by a substance, a mixture, an article or a process that leads to an overall lower risk; § 7(3) GefStoffV likewise names articles and processes. Section 1 paragraph 4 of TRGS 600 defines the aim of substitution as eliminating or reducing to a minimum the risk in all activities "including maintenance work as well as operating and monitoring activities". The replacement of an insulation material that contains alkali or alkaline earth metal oxides by an insulation material without these oxides is a process and article substitution that addresses the formation condition which TRGS 561 names in 5.9.3 paragraph 3.

For substances of category 1A or 1B, implementation is a priority under section 5 paragraph 1 "if alternatives are technically possible and lead to an overall lower risk for the employees". Under paragraph 4 the substitution solution must be used if the company-related factors examined under Annex 3 are influenced essentially positively, and "higher costs of a substitution solution can also be accepted". Section 6 governs documentation: the result of the examination is to be documented (paragraph 1); where, in activities for which protective measures under § 9 and § 10 GefStoffV are to be taken, substitution possibilities are identified but not implemented, the reasons are to be documented (paragraph 3); where a technically possible substitution is forgone for business reasons, the considerations are to be documented verifiably (paragraph 4); where no possibilities are found, the sources researched are to be named briefly (paragraph 5); the authority is to be informed of the result on request (paragraph 6, § 18(3) GefStoffV). Whoever claims that there is no substitution possibility must prove under paragraph 5 where he searched.

The substitution assessment links with the register duty at one point. The operator who demonstrates an insulation system without alkali and alkaline earth metal oxides excludes the formation condition named in 5.9.3 paragraph 3. He can thereby exclude the contamination of the component within the meaning of paragraph 5 only if assembly pastes as an oxide source and a pre-existing contamination from earlier insulation systems are also ruled out; otherwise non-entry under TRGS 410, section 4 paragraph 7 presupposes the determination under chapters 7 and 8. The delimitation by oxides thus separates the systems for which the register must be kept from the systems for which non-entry becomes justifiable.

10. Client and Contractor

The duties are divided between two addressees. The duty to keep the exposure register and to carry out the substitution assessment falls on the employer of the exposed employees, in the case of contracted-out work therefore on the insulation contractor. TRGS 410 makes this clear in section 3 paragraph 7.

“The duty to carry out the risk assessment and to keep the register also applies to contractors. They must obtain the necessary information from the client. The client must make the information necessary for this available.” (TRGS 410, section 3 paragraph 7, author’s translation)

Since the 2024 amendment the client’s duty to inform has a basis of its own in the Ordinance. § 5a(1) GefStoffV obliges whoever commissions activities on structural or technical installations to make available to the contractor, before the activities begin, “all information available to him on the construction or use history concerning existing or suspected hazardous substances, in writing or electronically”, and to make use for this purpose, with reasonable effort, of the documents accessible to him. Hazardous substances within the meaning of the provision are those that are released by the activities and can lead to a particular health risk. The Chromium(VI) contamination of an insulation system on a thermally stressed chromium-alloyed component is a suspected hazardous substance of this kind as soon as the operator is aware of TRGS 561. The contractor must include this information in its risk assessment under § 6(1) sentence 2 no. 2a.

DGUV Regulation 1 “Principles of Prevention” binds both undertakings as members of their statutory accident insurance institution (Berufsgenossenschaft). § 2(1) obliges the undertaking to take the necessary measures to prevent occupational accidents, occupational diseases and work-related health hazards and names the state occupational safety provisions as the standard; § 2(2) requires the state regulations and the regulations of the accident insurance institutions to be used as a priority. § 3(4) obliges it to make all information on the measures taken available to the accident insurance institution on request. § 5(3) governs contracting out.

“When awarding contracts to an outside undertaking, the undertaking awarding the contract must support the outside undertaking in the risk assessment with regard to the company-specific hazards. The undertaking must further ensure that activities with particular hazards are supervised by supervisors who ensure the implementation of the specified protective measures. The undertaking must further reach agreement with the outside undertaking as to who is to provide the supervisor.” (DGUV Regulation 1, § 5(3), author’s translation)

§ 5(1) further requires the client, for repair contracts, to specify the relevant requirements to the contractor in writing, and § 6(1) obliges several undertakings working at one workplace to cooperate and, where necessary to avoid mutual endangerment, to appoint a coordinating person with authority to issue instructions. During an overhaul in which insulators, maintenance staff and plant personnel work side by side and chromate dust can be carried over, this is the point of attachment. Neither of the two undertakings can rely on the other: the insulation contractor remains responsible for the register and the substitution assessment, the operator for the information on the contamination and the support in the risk assessment.

11. Notification Duty towards the Authority

§ 10a(5) GefStoffV obliges the employer to notify the competent authority of activities with carcinogenic hazardous substances of category 1A or 1B in which the occupational exposure limit is not complied with or which are carried out in the high-risk range, stating the exposure determined, within two months of the start of the activity, and to attach a plan of measures under § 10(5). TRGS 561 takes this up in 4.1 paragraph 6 no. 2 letter b. For Chromium(VI) compounds a high risk exists under 3.3.4 paragraph 2 above $1 \mu\text{g}/\text{m}^3$, and 5.9.3 paragraph 4 considers exposures above this value possible during overhauls. Whoever measures and is above $1 \mu\text{g}/\text{m}^3$ must, in addition to the register, make the notification to the authority. This duty presupposes a measurement or an equivalent determination; it does not arise from the mere impossibility of exclusion, but it aggravates the position of whoever determines the exposure and does not pass on the result.

12. Field of Application Combustion Residues: Register Duty

In maintenance, cleaning and repair work on combustion furnaces the trigger is not the insulation system but the combustion ash that contains Chromium(VI) compounds. TRGS 561 does not describe this case. Neither section 3.3.4 nor section 5.9.3 nor the sector sections of chapter 5 name combustion plants, boilers, ashes or filter dusts in connection with Chromium(VI); ashes appear only in 5.1 paragraph 5, there for arsenic and cadmium in non-ferrous metallurgy. Section 3.3.4 supports the classification of the substance but contains no protection regime; the register duty cannot be derived from it alone.

It follows from the general provisions. § 6(1) sentence 1 GefStoffV obliges the employer to determine whether hazardous substances can arise or be released during activities; removal is an activity under § 2(5). TRGS 561 applies under section 1 paragraph 1 to activities with exposure to carcinogenic metals and under paragraph 6 "equally" to comparable activities that cannot be assigned to any of the sectors named. Section 2 paragraph 4 states that carcinogenic metals and their inorganic compounds can arise or be released "also from non-classified substances, ores/mixtures/alloys and articles" in certain activities, "for example by thermal or mechanical processing methods". The general protective measures of chapter 4 therefore apply, and for the register the same criteria of TRGS 410 as for the insulation systems. Section 4 paragraph 4 names maintenance and repair work and expressly cleaning work; boiler cleaning and ash removal fall under this. Paragraph 1 nos. 5 and 7 apply as soon as respiratory protection is specified or no exposure information is available, no. 10 as soon as a measurement is made and $1 \mu\text{g}/\text{m}^3$ is exceeded. The dermal route is the same for ash as for insulation dust (chapter 8).

The difference from the insulation system case lies at the start of the chain. For the insulation systems TRGS 561 itself finds that the exposure cannot be excluded and prescribes the protective equipment. For the ashes the risk assessment must itself introduce the Chromium(VI) content of the ash as information, by analyses of the operator's own plant or by documented literature; the TRGS does not supply this information. With this evidence the duty is as binding as for the insulation systems. A bridge to section 5.9.3 exists via its paragraph 5, which by its wording applies to "activities on industrial components on which a Chromium(VI) contamination is present or cannot be excluded" and is not limited to insulation systems; a boiler with chromate-containing ash deposits is such a component. That is an interpretation of the wording, not a statement of the TRGS.

13. Field of Application Combustion Residues: Substitution and Protection Concept

The substitution question arises differently for combustion residues than for insulation systems. The formation of Chromium(VI) in the ash is a consequence of the combustion itself, in which chromium source, basic oxides, oxygen and temperature come together; this statement of fact is not taken from the TRGS and must be substantiated in the risk assessment. A substance substitution under § 7(3) GefStoffV is ruled out in so far as the operator does not determine the chromium source in the fuel or waste; this is to be set out plant-specifically in the substitution assessment. That does not exempt from the examination, it determines its result, which under TRGS 600, section 6 paragraphs 2 and 5 is to be documented as "no possibilities of substitution" and with the sources researched named. The process level remains unaffected: TRGS 600, section 2 paragraph 2 also covers the replacement of processes, and TRGS 561 requires in 4.1 paragraph 1 and 4.2 low-dust processes and material forms, for ash removal therefore low-dust cleaning and extraction instead of dry mechanical methods. If substitution is not possible, under § 10 GefStoffV and Article 5(2) of Directive 2004/37/EC the closed system follows and after that minimisation. The combustion furnace is a closed system in operation; maintenance, cleaning and overhaul are the activities in which it is opened. For these activities, therefore, the exception in TRGS 410, section 4 paragraph 5 no. 3 (activities on closed, technically tight plants) does not apply either.

In so far as chromate formation during combustion cannot be prevented and a substance substitution is ruled out, a Chromium(VI) exposure is to be assumed in all maintenance, cleaning and repair work in which ash or ash deposits can be released or touched. The protection concept under TRGS 561 chapter 4 is to be applied, and the employees are to be entered in the exposure register (TRGS 410, section 4 paragraph 4 as well as paragraph 1 nos. 5, 7 and 10, paragraph 3). The regulations do not order this as a blanket rule without individual examination; they lead to the individual examination being unable to reach any other result for this work as long as the Chromium(VI) content of the ash is substantiated. The duties of the client (chapter 10) apply to the plant operator without change.

14. Netherlands: Comparison with the German Regulations

The Netherlands implement Directive 2004/37/EC in the Arbeidsomstandighedenbesluit (Arbobesluit), Hoofdstuk 4, Afdeling 2. There is no body of rules below the decree that would correspond to the German Technical Rules for Hazardous Substances; its place is taken by the limit value list of the Arboregeling, the Werkinstructies of the Arbeidsinspectie and the sector Arbocatalogi. Quotations from the Arbobesluit are given in the original with the author's translation in brackets.

Duty	Germany	Netherlands
Register of exposed workers	§ 10a(1) GefStoffV: employees "for whom the risk assessment reveals a risk to their health"; criteria in TRGS 410, section 4	Article 4.15 lid 1 Arbobesluit: „lijst ... van werknemers die worden of kunnen worden blootgesteld ... onder vermelding van de blootstelling die zij hebben ondergaan" (list of workers who are or may be exposed, stating the exposure undergone; since Staatsblad 2006, 674; since 22 May 2024 also reprotoxic substances, since 9 April 2026 also mutagenic processes); inspection right lid 2
Retention	§ 10a(2) no. 1 GefStoffV: 40 years after the end of exposure; extract on termination of employment	Article 4.10c lid 4: „tot ten minste 40 jaar na beëindiging van diens blootstelling" (at least 40 years after the end of exposure); lid 5: handover to the inspectorate on cessation of business
Value for Chromium(VI)	1 µg/m³ as risk-based concentration, TRGS 561, 3.3.4 paragraph 2; high risk above; TRGS 410, section 4 paragraph 1 no. 10	1 µg/m³ as statutory limit value, Arboregeling Bijlage XIII (Staatscourant 2016, 57792), since 1 March 2017; on exceedance Article 4.16 lid 3 and 4
Determination of exposure	TRGS 402; TRGS 561, 3.2 paragraph 1 and 3.3 paragraph 2: measurements or other suitable determination methods	Article 4.2 lid 3 and 4: „geschikte, genormaliseerde meetmethodes, dan wel andere voor het doel geschikte meetmethodes of kwantitatieve evaluatiemethodes" (suitable standardised or other suitable measurement methods or quantitative evaluation methods)
Substitution	§ 6(1) sentence 2 no. 4, § 6(8) nos. 2 and 3, § 7(3) GefStoffV; TRGS 600	Article 4.17: replacement „voor zover dit technisch uitvoerbaar is" (in so far as technically feasible); Article 4.13 letter a: justification in the RI&E why the substance „strikt noodzakelijk is en vervanging technisch niet uitvoerbaar is" (is strictly necessary and replacement is technically not feasible)
Hierarchy of measures	§ 7(4), § 10 GefStoffV; TRGS 500	Article 4.18 lid 1 to 3: closed system, collective measures at source, personal protective equipment
Skin route	TRGS 401 with risk matrix; TRGS 410, section 4 paragraph 3; H designation of the MAK and BAT Values List	Article 4.1c lid 1 onder f (Staatsblad 2015, 300): „huidcontact is voorkomen of geminimaliseerd door het dragen van doelmatige persoonlijke beschermingsmiddelen bij mogelijke blootstelling" (skin contact prevented or minimised by effective personal protective equipment in the event of possible exposure), among others for H317; Article 4.2 lid 2: „op welke wijze blootstelling kan plaatsvinden" (how exposure can take place); Werkinstructie, question A5
Hygiene and protective equipment	TRGS 561, 4.1 paragraph 4 and 5.9.3 paragraph 5	Article 4.20: work clothing, separate storage, washing and shower facilities, cleaning of protective equipment after use
Situation chromium-alloyed components	TRGS 561, 3.3.4 paragraph 5 and 5.9.3: formation, deposition, exposure during dismantling cannot be excluded	No normative description; to be introduced by the employer in the RI&E under Article 4.2, TRGS 561 as a source of knowledge (Article 4.2 lid 5 onder a)
Client, notification of the authority	§ 5a, § 10a(5) GefStoffV; TRGS 410, section 3 paragraph 7; DGUV Regulation 1, § 5(3)	No CMR-specific notification in the Arbobesluit; opdrachtgever duties only for bouwwerken (Articles 2.26 ff., 9.6); Article 19 Arbowet not examined (chapter 15)

15. Netherlands: Deviations and Consequences for the Derivation

The comparison yields three deviations of significance for the derivation. The first concerns the trigger of the list. Article 4.15 lid 1 Arbobesluit attaches to employees who „worden of kunnen worden” exposed and dispenses with the intermediate step of § 10a(1) GefStoffV, under which the risk assessment must reveal a risk. The criteria examination of TRGS 410 has no counterpart there; possible exposure suffices. For work on chromate-contaminated insulation systems and with ash contact, the possible exposure established in the RI&E suffices.

The second deviation concerns the status of the value $1 \mu\text{g}/\text{m}^3$: in Germany a risk-based concentration under TRGS 561, in the Netherlands a binding limit value since 1 March 2017. Its exceedance triggers immediate measures under Article 4.16 lid 3; lid 4 ties the continuation of the work to effective protective measures or reduction below the limit value. What TRGS 561, 5.9.3 paragraph 4 describes as possible exposure above $1 \mu\text{g}/\text{m}^3$ is a limit value exceedance in the Netherlands.

The third deviation runs in the other direction. A text that, like TRGS 561, 5.9.3, establishes the formation of Chromium(VI) on chromium-alloyed components, the deposition in the insulation material and the exposure during dismantling that cannot be excluded, does not exist in the Netherlands. The employer must introduce this situation into the RI&E under Article 4.2 himself. TRGS 561 can serve as a technical source of knowledge for this: Article 4.2 lid 5 onder a requires the „voor de risico-evaluatie noodzakelijke aanvullende informatie ... uit andere gemakkelijk toegankelijke bronnen” (additional information necessary for the risk evaluation from other readily accessible sources) to be included in the assessment, without restriction to Dutch sources, and Article 4.1c lid 2 ties the measures to „de stand van de wetenschap en techniek” (the state of science and technology). Transferability to plant and activity is to be examined; the legal duties follow from the Arbobesluit. Since the list attaches to possible exposure, this shifts the demonstration from the regulations to the RI&E but does not change the result. The skin route, by contrast, is governed directly in the decree. Article 4.1c lid 1 onder f, inserted by Staatsblad 2015, 300, requires that skin contact in the event of possible exposure to a hazardous substance be prevented or minimised by suitable personal protective equipment where the substance, among other things, meets the criteria for H317, where its skin absorption is indicated or where this follows from the RI&E; an exceedance of the air limit value is not a precondition. For Chromium(VI) compounds the first element applies via the classification Skin Sens. 1. The Werkinstructie of the Arbeidsinspectie examines this under question A5 and permits a qualitative skin assessment. A risk matrix as in TRGS 401 does not exist; the limit value list carries no H notation for Chromium(VI) compounds (RIVM recommendation SH and SL, 2024).

For the substitution assessment and the hierarchy of measures there are no differences in substance. Article 4.17 requires replacement in so far as technically feasible, Article 4.13 letter a requires the justification in the RI&E why the substance is strictly necessary and replacement technically not feasible, Article 4.18 sets the sequence closed system, collective measures, personal protective equipment. For ash removal chapter 13 therefore applies there as well. On the rapid test question, Article 4.2 lid 4 requires standardised or other suitable measurement methods or quantitative evaluation methods; a qualitative surface finding does not meet this.

The Articles cited have been checked against the consolidated text of the Arbobesluit (Geldend van 01-08-2026, retrieved 24 October 2026). The Arbobesluit contains no CMR-specific notification to the inspectorate corresponding to the notification under § 10a(5) GefStoffV; notification duties exist there for asbestos (Article 4.47c) and biological agents (Article 4.94). The duties of the opdrachtgever in Hoofdstuk 2, Afdeling 5 (Articles 2.26, 2.28, 2.32; addressee under Article 9.6) apply to bouwwerken within the meaning of Directive 92/57/EEC; whether overhaul work on an industrial plant falls under this is to be judged case by case under Annex I of that Directive. Article 19 of the Arbeidsomstandighedenwet (cooperation of several employers) has not been checked here against its wording.

16. Great Britain: Comparison with the German Regulations

In Great Britain the Control of Substances Hazardous to Health Regulations 2002 (COSHH, SI 2002/2677) apply in the consolidated version on [legislation.gov.uk](https://www.legislation.gov.uk); Northern Ireland has its own COSHH Regulations (NI) 2003 and is not examined here. Limit values are set by the Health and Safety Executive (HSE) in EH40/2005, currently Fourth Edition 2020. Since leaving the European Union, Great Britain is no longer bound by Directive 2004/37/EC; the HSE has stated that of the outstanding limit values of the Directive it will adopt only three (mining and tunnelling). COSHH knows no register of exposed employees; the 40-year documentation attaches to exposure monitoring and to the health record.

Duty	Germany	Great Britain
Risk assessment	§ 6(1) GefStoffV: hazardous substances that "arise or are released"; TRGS 400	Reg. 6(1): "suitable and sufficient assessment" before work "which is liable to expose any employees"; Reg. 6(2)(e): "activities, such as maintenance, where there is the potential for a high level of exposure"; Reg. 6(2)(l): "such additional information as the employer may need"
Carcinogen	§ 2(5) GefStoffV; TRGS 561, 1 paragraph 1	Reg. 2(1): "carcinogen" is any substance meeting the CLP criteria for category 1A or 1B, "whether or not the substance or mixture would be required to be classified"
Register of exposed workers, retention	§ 10a(1) and (2) GefStoffV; TRGS 410, section 4; 40 years after the end of exposure	No register. Reg. 10(5)(a): monitoring records "where the record is representative of the personal exposures of identifiable employees, for at least 40 years"; Reg. 10(6): individual monitoring record for each employee under health surveillance; Reg. 11(3): health record "for at least 40 years from the date of the last entry"
Health surveillance	ArbMedVV (not examined here); TRGS 410, section 4 paragraph 1 no. 6	Reg. 11(1): duty for employees "who are, or are liable to be, exposed", where "appropriate"; Reg. 11(2)(b): appropriate where an identifiable health effect, "reasonable likelihood" and valid detection techniques exist; Schedule 6 covers chromates only "in manufacture"
Value for Chromium(VI)	1 µg/m³, TRGS 561, 3.3.4 paragraph 2; TRGS 410, section 4 paragraph 1 no. 10	EH40 Table 1: Chromium(VI) compounds (as Cr) 0.01 mg/m³ 8-h TWA, 0.025 mg/m³ "process generated", notations Carc, Sen, BMGV 10 µmol chromium/mol creatinine in urine; EU value 0.005 mg/m³ not adopted
Minimisation	§ 7(4), § 10 GefStoffV; TRGS 561, chapter 4	Reg. 7(7)(c)(i): for H350 control only "adequate" if exposure is "as low a level as is reasonably practicable", regardless of the WEL; Reg. 7(5): designation of areas "which may be contaminated by carcinogens"
Determination of exposure	TRGS 402; TRGS 561, 3.3 paragraph 2	Reg. 10(1): monitoring "in accordance with a suitable procedure" where the risk assessment shows it to be "requisite"; Reg. 10(2): dispensable where "another method of evaluation" demonstrates compliance with Reg. 7(1)
Substitution	§ 7(3) GefStoffV; TRGS 600	Reg. 7(2): "substitution shall by preference be undertaken", replacement by "a substance or process"
Skin route	TRGS 401; TRGS 410, section 4 paragraph 3	Reg. 2(2): exposure without restriction to the air route; Reg. 6(2)(a): "hazardous properties" (H317); Reg. 7(1): prevention or control of exposure by all routes; EH40 carries no Sk notation for Chromium(VI) ; no skin limit value
Contractors	§ 5a GefStoffV; TRGS 410, section 3 paragraph 7	Reg. 3(1): duties apply "so far as is reasonably practicable" also towards other persons who may be affected by the work; health surveillance only for own employees, monitoring and training for others only on the premises

17. Great Britain: Deviations and Consequences for the Derivation

The comparison yields one structural and two substantive deviations. The structural deviation concerns the legal instrument. The regulations examined contain no provision corresponding to the list under Article 12(c) of Directive 2004/37/EC or to the register under § 10a GefStoffV. For Great Britain the question of this document is therefore whether the maintenance work triggers a risk assessment under Reg. 6, exposure monitoring under Reg. 10 and health surveillance under Reg. 11, for it is at these three points that the person-related records with 40-year retention arise. Reg. 6(2)(e) expressly names maintenance work with the potential for a high level of exposure as a subject of the risk assessment; Reg. 6(1) and 12(1) attach to work “which is liable to expose”, Reg. 11(1) to employees “who are, or are liable to be, exposed”. Detection is not a precondition in any of these provisions; possible exposure suffices, as in the Netherlands. For Chromium(VI) compounds health surveillance under Reg. 11(2)(b) is, in the author’s assessment, appropriate, because with skin findings and biological monitoring (BMGV in EH40) valid detection techniques exist for identifiable health effects; Reg. 11(3) and Reg. 10(6) therefore apply. The health record of the individual employee and his individual monitoring record take over in Great Britain the function that the exposure register has in Germany.

The first substantive deviation concerns the air value. EH40 lists for Chromium(VI) compounds 0.01 mg/m³ as the Workplace Exposure Limit, ten times the German and Dutch value of 1 µg/m³, and 0.025 mg/m³ for process-generated compounds. The value of the Directive of 0.005 mg/m³, in force since 18 January 2025, was not adopted. For the duties this is of secondary importance, because Reg. 7(7)(c)(i) recognises control for substances with H350 as adequate only if exposure is as low as is reasonably practicable, and EH40 states in paragraph 84 that this requirement applies “regardless of whether or not the substance has a WEL”. An air measurement below the WEL does not end the minimisation duty and does not release from the risk assessment of the skin route.

The second substantive deviation concerns the skin route, which is regulated more briefly in COSHH than in TRGS 401. EH40 assigns no Sk notation to Chromium(VI) compounds; the Sen notation denotes, under EH40 paragraph 56, respiratory sensitisation. The duty follows from the definition of exposure in Reg. 2(2), which exempts no route of uptake, from Reg. 6(2)(a), which places the hazardous properties of the substance including H317 in the assessment, and from Reg. 7(1), which requires the prevention or adequate control of every exposure. There is no skin limit value; nor is there a risk matrix as in TRGS 401. The derivation holds, but in its reasoning it relies on the general provisions.

A British official source of knowledge that, like TRGS 561, 5.9.3, describes the formation of Chromium(VI) on insulated chromium-alloyed components was not found; this finding is not an all-clear but a gap in the research and possibly in the British regulations. Reg. 6(2)(l) obliges the employer to include in the risk assessment the additional information he needs to complete it, without restriction to British sources. TRGS 561 and the notices of the German statutory accident insurance institutions can be drawn upon for this with the same reasoning as in chapter 15. For substitution and the hierarchy of measures there are no differences in substance: Reg. 7(2) requires priority replacement by a substance or process, Reg. 7(3) sets the sequence processes and engineering controls, control at source, personal protective equipment. For ash removal chapter 13 therefore applies there as well. On the rapid test question, Reg. 10(1) requires a “suitable procedure” and Reg. 10(2) “another method of evaluation” that demonstrates compliance with Reg. 7(1); a qualitative surface finding does not demonstrate this.

18. Conclusion

In maintenance, repair and dismantling work on thermally stressed chromium-alloyed industrial components fitted with insulation materials containing alkali or alkaline earth metal oxides (TRGS 561, 5.9.3 paragraph 3), the employer must determine in the risk assessment whether hazardous substances can arise or be released (§ 6(1) sentence 1 GefStoffV). Since a Chromium(VI) contamination cannot be excluded in this work under TRGS 561, 5.9.3 paragraphs 4 and 5, the employees are to be entered in the register under § 10a(1) GefStoffV (TRGS 410, section 4 paragraph 1 nos. 5, 7 and 10, paragraph 3 and paragraph 4). The register is to be retained for 40 years after the end of exposure (§ 10a(2) no. 1 GefStoffV; Article 15(1) of Directive 2004/37/EC). Replacement of the oxide-containing insulation materials by insulation materials without these oxides is to be examined (§ 6(1) sentence 2 no. 4 GefStoffV), the result and any decision to forgo a technically possible substitution are to be documented before work begins (§ 6(8) nos. 2 and 3 GefStoffV; TRGS 600, section 6), and substitution is to be carried out as a priority (§ 7(3) GefStoffV; TRGS 561, 4.1 paragraph 1; TRGS 600, section 5 paragraph 1; Article 4(1) of Directive 2004/37/EC). The authority is to be informed of the result of the substitution assessment on request (§ 18(3) no. 1 GefStoffV).

The register duty is averted neither by a surface rapid test nor by an air measurement alone. No regulation examined provides for a rapid test as a determination method. An air measurement below 1 µg/m³ concerns only the inhalation route; under TRGS 401 the dermal route is a high risk for skin-absorbable Carc. 1B substances in every contact constellation and triggers entry under TRGS 410, section 4 paragraph 3 on its own. A non-entry is to be justified under TRGS 410, section 4 paragraph 7. If this justification rests on the absence of the formation condition named, assembly pastes as an oxide source and pre-existing contamination from earlier insulation systems are to be considered in addition to the insulation system.

The plant operator as client must give the contractor in writing, before the work starts, the information available to it on existing or suspected hazardous substances (§ 5a(1) GefStoffV; TRGS 410, section 3 paragraph 7) and support it in the risk assessment regarding the company-specific hazards (DGUV Regulation 1, § 5(3)). An exposure determined above 1 µg/m³ is to be notified to the authority within two months of the start of the activity (§ 10a(5) GefStoffV).

In maintenance, cleaning and repair work on combustion furnaces with Chromium(VI)-containing combustion ashes the same register duty arises via § 6(1) GefStoffV, TRGS 561 section 1 paragraph 6 and 2 paragraph 4 and TRGS 410 section 4 paragraph 4, once the Chromium(VI) content of the ash is substantiated in the risk assessment. Substance substitution is ruled out there in so far as the operator does not determine the chromium source in fuel or waste; the substitution assessment is documented with this result, the examination of low-dust processes remains mandatory, and the protection concept under TRGS 561 chapter 4 is to be applied in all work in which ash or ash deposits can be released or touched.

For the Netherlands the same derivation applies with a shorter chain: the list under Article 4.15 Arbobesluit attaches to possible exposure, 1 µg/m³ is a binding limit value there, and retention under Article 4.10c is likewise 40 years; the employer must introduce the chromate formation into the RI&E himself, because a text corresponding to TRGS 561 is lacking, and may draw on TRGS 561 as a source of knowledge under Article 4.2 lid 5 onder a.

For Great Britain the same derivation leads to different documents: COSHH knows no register, but requires under Reg. 6(1) and 6(2)(e) the risk assessment of the maintenance work before it begins, under Reg. 11 health surveillance of the employees liable to be exposed with a health record and under Reg. 10(6) their individual monitoring record, both retained for 40 years; the higher air value of 0.01 mg/m³ changes nothing because of Reg. 7(7)(c)(i).

These conclusions rest on the wording of the regulations examined. For the insulation systems they presuppose no assumption about the formation mechanism, which TRGS 561 calls unclarified, but solely the TRGS's own finding that exposure in this work cannot be excluded. For the combustion residues they presuppose evidence of the Chromium(VI) content of the ash, which the regulations do not supply and the risk assessment must provide.

Version 1.0, October 2026, first edition. This regulatory analysis is confined to the regulations named in section 2 in the versions stated there and reproduces their wording with references. Assessments are marked as such. Manufacturers and products are not named. Quotations from German legislation and from the Technical Rules for Hazardous Substances are the author's translations; quotations from Dutch legislation are given in the original with the author's translation; quotations from British legislation are given in the original. In all cases the original wording governs.

Sources Examined

Directive 2004/37/EC, consolidated version (German text: Vorschriftensammlung der Gewerbeaufsicht Baden-Württemberg, ArbSch 2.1.06, version 01/2024; amendment status supplemented by Directive (EU) 2024/869). Hazardous Substances Ordinance (GefStoffV), BAuA reading version, as of February 2026. TRGS 400, 401, 410, 500, 561 and 600 in the versions named in section 2 (Committee on Hazardous Substances, BAuA). DGUV Regulation 1 "Grundsätze der Prävention", November 2013. MAK and BAT Values List 2025, German Research Foundation (DFG), DOI 10.34865/mbwl_2025_deu, section II (substance list) and section XVI. Netherlands: Arbeidsomstandighedenbesluit, consolidated version wetten.overheid.nl (Geldend van 01-08-2026), amendment status evidenced by Staatsblad 2006, 674; 2015, 300; 2024, 127; 2025, 337; Arbeidsomstandighedenregeling, Bijlage XIII, Staatscourant 2016, 57792; Nederlandse Arbeidsinspectie, Werkinstructie "Blootstelling Gevaarlijke stoffen", last amended 18 December 2024, issued May 2025; RIVM letter report 2024-0176. Great Britain: The Control of Substances Hazardous to Health Regulations 2002, SI 2002/2677, consolidated version legislation.gov.uk (Reg. 2, 3, 6, 7, 8, 9, 10, 11, 12, Schedules 1 and 6); HSE, EH40/2005 Workplace exposure limits, Fourth Edition 2020 (Table 1, paragraphs 56 and 84, BMGV table); HSE, "Workplace exposure limits" (hse.gov.uk/coshh/basics/exposurelimits.htm), retrieved 24 October 2026.