

VKIS - VSI - IGM

List of Substances for Cooling Lubricants in accordance with DIN 51385 for Metal Working



VKIS - VSI - IGM - List of Substances Cooling Lubricants in accordance with DIN 51385 for Metal Working

1 General

This List of Substances is intended to assist the environmentally responsible and process-oriented handling of substances and preparations in line with health and safety regulations. It supplements the VKIS data and test sheets and indicates the responsibility of the suppliers and consumers to comply with applicable laws, ordinances and regulations.

This List of Substances includes specific requirements for the following preparations in accordance with DIN 51385:

- Water-miscible (wm) and water-mixed (wg) cooling lubricants
- Non water-miscible cooling lubricants (nw) and in analogy for
- Additives which are added to the cooling lubricant before or during use. These include, for example, antifoaming agents, biocides (for pre- and post-conservation), disinfectants, stabilizers, emulsifiers, corrosion preventives, extreme-pressure additives.

Cooling lubricants usually contain several individual substances and represent preparations as defined by the EU Dangerous Preparations Directive 1999/45/EC. EU safety data sheets are therefore required for cooling lubricants.

Beside the classification and marking, the EU safety data sheet also assists in the assessment of the hazard with a view to the improvement of health and safety at work. For small and medium-sized enterprises (SMEs), in particular,

- the Technical Data Sheet
- the EU Safety Data Sheet and
- the VKIS-VSI-IGM List of Substances

form the basis for working safety activities. The responsible departments in the company using the cooling lubricants should receive the data sheets indicated above whenever samples of new cooling lubricants are submitted.

BGR 143 contains practical rules for handling cooling lubricants.

The working group VKIS/VSI/IGM moderated by the Technical Committee for Mechanical Engineering, Production Systems and Steel Construction (FA MFS) of the Statutory German Accident Insurance examines annually whether the List of Substances is still up to date, and the List is revised as and when required.

For further comprehensive information, refer to "KSS-Komponenten Online-System" at <http://www.fobig.de/arbeitsfelder/KSS.html>.

2 Requirements

The substances indicated below have been listed for reasons associated with occupational medicine/toxicology, the environment or processes. Substances classified as carcinogenic, mutagenic or toxic for reproduction in categories 1 or 2, very toxic, toxic or dangerous for the environment in accordance with EU Directive 67/548/EEC on the classification, packaging and labelling of dangerous substances and the German Hazardous Substances Ordinance (Gefahrstoffverordnung – GefStoffV) shall be avoided in principle, whereby the consideration limits specified in the EU Dangerous Preparations Directive 1999/45/EC apply.

All substances contained in the preparation which are governed by dangerous substance/environmental legislation (e.g. GefStoffV, water legislation) or require the exercise of special caution, shall be indicated in accordance with 1999/45/EC.

The limit values indicated in Sections 3.1 and 3.2 apply to non water-miscible cooling lubricants (nw-KSS) and water-miscible cooling lubricants (wm-KSS) in their supply condition, but for water-mixed cooling lubricants (wg-KSS) after new preparation.

The Annex also contains substances with no final occupational medicine/toxicological assessment. The target is to have these substances examined within two years.

Where cooling lubricants are subject to hazardous material transportation regulations, the specified measures regarding packaging, labelling, declaration and carriage shall be observed. Regulations contained in the German Waste Avoidance, Recycling and Disposal Act (Kreislaufwirtschafts- und Abfallgesetz) shall be observed.

3 Lists of substances

3.1 Prohibited substances and substances with use restrictions

The substances listed under Section 3.1 are prohibited substances and substances with restricted use as defined by the EU hazardous product and environmental regulations and the relevant implementations in German laws and ordinances, and rules below the status of laws (Technical Rules on Dangerous Substances - TRGS).

It is recommended not to use the substances with restricted use listed here in cooling lubricants above the concentration limits which would result in a classification or labelling requirement.

The omnipresent concentration of 10 ppm indicated for some prohibited substances must not be the result of admixtures.

3.2 Substances with limit values / concentration limits

Beside the limit values for air according to TRGS 900, List 3.2 also contains the following limit values in the column "Cooling lubricants":

- Limit values from the German Ordinance on Waste Oils (Altölverordnung)
- Concentration limits (for R 43, in particular) according to ATP (EU Adaptation Directives to the technical progress according to Annex I of 67/548/EEC), however only if the individual concentration limit for a substance deviates from the standard concentration limit (e.g. 1 % for R 43).
- Substances with labelling R 42 must be indicated in principle.
- Concentration limits according to manufacturers' specifications.

Any deviating limit values of the Senate Commission of the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) on the Investigation of Health Hazards of Chemical Compounds in the Work Area (MAK Commission) are indicated in the "Comments" column.

3.3 Declarable substances (with occupational medicine/toxicological or ecological relevance)

Please note with regard to List 3.3 that this List contains manufacturers' specifications with regard to substances which may be of occupational medicine/toxicological or ecological relevance.

Animal raw materials must be declared. Assurance of adherence to the latest applicable EU Commission decision with regard to the exclusion of risk material and the thermal treatment of raw materials during the production process must be sought.

3.4 Declarable substances (due to process-related reasons)

According to List 3.4, cooling lubricant manufacturers will supply information on substances which are of significance for the process technology.

Annex

Substances with no final occupational medicine / toxicology assessment

The Annex contains constituents which have not been finally assessed scientifically with regard to their classification/labelling and/or limit value in air.

Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) stipulates that certain minimum data on the toxicity of chemicals and their behaviour in the environment are required for the assessment of their hazards. Pre-empting these requirements, important cooling lubricant constituents are included in the Annex with existing gaps in the data.

As benchmark, 6 minimum requirement tests are defined as basis (acute toxicity, irritating to the mucous membrane, irritating to the skin, mutagenic, sensitizing by skin contact, repeated application), whereby other findings from the fields of toxicology or occupational medicine are taken into consideration as substitute to decide whether a substance should be included. The indication of a substance in this List does not at present signify an obligation to declare it and is intended for information purposes only. Efforts will be made to examine the substances contained in the Annex within two years so that a decision on their adoption in Lists 3.1, 3.2 or 3.3 can be taken. Reasons for such decisions will be provided.

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List 3.1: Prohibited Substances and Substances with Use Restrictions (Cooling lubricants in acc. with DIN 51385 for Metal Working)

Component (<i>CAS No</i>)	Air limit value TRGS 900	Concentration limit Cooling lubricant	Legal foundations, sources, notes	Comments
Amines, secondary, forming carcinogenic N-nitrosamines of categories 1 or 2		≤ 0.2 % (wm)	TRGS 611	
Amides splitting off secondary amines → amines, secondary		≤ 0.2 % (wm)	TRGS 611	
Barium salts, with the exception of barium sulphate (7727-43-7)		≤ 10 ppm (wm) ≤ 2 ppm (wg)	AbwV	
Benzo-(a)-pyrene (BaP), as indicator substance for polycyclic aromatic hydrocarbon (PAH/PAK) (50-32-8)	0.002 mg/m ^{3*}	≤ 50 ppm BaP ≤ 3 % DMSO extract fr the base oil (PAH/PAK)	TRGS 905 21 st ATP 29 th ATP	Method : IP 346 K2, M2, R _E 2, R _F 2
Bis(2-ethylhexyl) phthalate (DEHP) (117-81-7)	10 mg/m ³	≤ 0.5 %		R _E 2, R _F 2
Carbendazim (methyl benzimidazol-2-ylcarbamate) (10605-21-7)		≤ 0.1 %	29 th ATP	M2, R2
Chloroparaffins, short-chain (C ₁₀ -C ₁₃ , SCCPs) (85535-84-8)		1 %	Hazardous Substances Ordinance 2002/45/EC ChemVerbotsV EU Water Framework Directive	PBT substance
Diethanolamine (2,2'-iminodiethanol) (111-42-2)		≤ 0.2 % (wm)	TRGS 611	Previous air limit value (15 mg/m ³) has been withdrawn and is being revised in UA III (MAK of DFG : 1 mg/m ³)

Ethylenediamine tetraacetic acid and its salts (EDTA) (60-00-4)		≤ 1 ppm (wg)	AbwV Annex 40	Assurance of the soundness in waste water environment by falling below the detection limit
Morpholine (110-91-8) morpholine releasing compounds (e.g. methylene-bis-morpholine / 4,4-methylenedimorpholine) (5625-90-1)	36 mg/m ³	≤ 0.2 % (wm)	TRGS 611	
Nitrite and nitrite releasing compounds (e.g. 2-Bromo-2-nitro-1,3-propanediol (52-51-7) trihydroxymethylnitromethane (126-11-4))		prohibition (wm) ≤ 20 mg nitrite/l (wg)	GefStoffV § 18 Annex 4 No. 19 TRGS 611	
Nonyl phenol (25154-52-3) , ethoxylated nonyl phenol (9016-45-9)		≤ 0.1 %	EU Water Framework Directive 2000/60/EC Hazardous Substances Ordinance	
Polychlorobiphenyls - PCB (42 % Cl) (1336-36-3)		≤ 4 ppm	Waste Oil Ordinance (AltöIVO)	K3, R _E 2, R _F 2
Polychlorobiphenyls - PCB (54 % Cl) (1336-36-3)		≤ 4 ppm	Waste Oil Ordinance (AltöIVO)	K3, R _E 2, R _F 2
Polychlorinated terphenyls – PCT (61788-33-8)		≤ 4 ppm	Waste Oil Ordinance (AltöIVO)	

*: This previous technically based air limit value is maintained in this List as a preliminary guideline value to prevent a reduction in the protection level.

List 3.2: Substances with Limit Values / Concentration Limits (Cooling lubricants in acc. with DIN 51385 for Metal Working)

Component (<i>CAS No</i>)	Air limit value TRGS 900	Concentration limit Cooling lubricant	Legal foundations, sources, notes	Comments
2-aminoethanol (ethanolamine) (141-43-5)	5.1 mg/m ³			
2-amino-2-methylpropanol (AMP) (124-68-5)	4.6 mg/m ³			
1-aminopropane-2-ol (isopropanolamine) (78-96-6)	5.8 mg/m ³			
1,2-benzisothiazol-3(2H)-one (2634-33-5)		≤ 0.05 % (wm,wg)	25 th ATP	Labelling requirement for R 43 from 0.05 % Biocidal active substance
2-butoxyethanol (butyl glycol) (111-76-2)	98 mg/m ³			Adherence to MAK of DFG of 49 mg/m ³ is recommended
Boric acid (10043-35-3) (determined as boron)	0.5 mg/m ³ boron (= 2.6 mg/m ³ boric acid)			Labelling with "Y" when AGW is maintained (no developmental toxicity risk)
2-(2-butoxyethoxy)ethanol (Butoxydiglycol) (112-34-5)	100 mg/m ³			Adherence to MAK of DFG of 67 mg/m ³ is recommended
Chlorinated paraffins, medium (C ₁₄ – C ₁₇ , MCCPs) (85535-85-9) and long- chain (≥ C ₁₈ , LCCPs) (chloroalkanes)		≤ 0.2 %	Waste Oil Ordinance (AltöIVO)	Higher contents possible when required following agreement (e.g. forming of stainless steel)
5-chloro-2-methyl-4-dihydroisothiazol-3- one (55965-84-9) and 2-methyl-2,3- dihydroisothiazol-3-one (2682-20-4) mixture in ratio 3:1 (CMI/MI)		≤ 15 ppm (wg)	28 th ATP	Labelling requirement for R 43 from 15 ppm May cause sensitisation by skin contact Not suitable for pre-conservation Biocidal active substance Previous air limit value (0.05 mg/m ³) has been withdrawn and is being revised in UA III. Adherence to MAK of DFG of 0.2 mg/m ³ is recommended
Diethylene glycol (2,2'-oxybisethanol)	44 mg/m ³			

(111-46-6)				
1-Dodecanol (112-53-8)	155 mg/m ³			
Glutaraldehyde (111-30-8)		≤ 0.5 % (wm,wg)		Labelling requirement for R 43 from 0.5 % Labelling requirement for R 42 from 1 % Biocidal active substance Previous air limit value (0.42 mg/m ³) has been withdrawn and is being revised in UA III Adherence to MAK of DFG of 0.21 mg/m ³ is recommended
1-Hexadecanol (36653-82-4)	200 mg/m ³			
2-hexyl-1-decanol (2425-77-6)	200 mg/m ³			
Isotridecan-1-ol (27458-92-0)	164 mg/m ³			
Sodium pyrithione (2-Pyridinethiol, N-oxide, sodium salt) (3811-73-2)	1 mg/m ³	≤ 5 % (wm)		Labelling requirement for R 22 from 5 % Biocidal active substance
2-Octyl-2H-isothiazol-3-one (26530-20-1)	0.05 mg/m ³	≤ 0.05 % (wm,wg)	24 th ATP	Labelling requirement for R 43 from 0.05 % Biocidal active substance
2-Phenoxyethanol (phenyl glycol) (122-99-6)	110 mg/m ³			Biocidal active substance
Polyethylene glycols (medium molar mass 200-400 or 600)	1000 mg/m ³			
Tetradecanol (112-72-1)	178 mg/m ³			
1,3,5-tris-(2-hydroxyethyl)-hexahydro-1,3,5-triazine (HHT) (4719-04-4)		≤ 0.1 % (wm,wg)	25 th ATP	Labelling requirement for R 43 from 0.1 % Biocidal active substance (formaldehyde depot substance) Residual content of free formaldehyde in biocidal product to be indicated

List 3.3: Declarable substances
 (with occupational medicine/toxicological or ecological relevance)
 Cooling lubricants in acc. with DIN 51385 for Metal Working

Component (CAS No.)	Legal foundations, sources, notes	Comments
Adsorbable organic halogen compounds (AOX)	AbwV Annex 40	
Amines, primary and tertiary, free and masked, with labelling requirement		
Amine, secondary, which do not form carcinogenic N-nitrosamines of categories 1 or 2 (e.g. dicyclohexylamine (101-83-7))	TRGS 552, 611	
1,3-Bis(hydroxymethyl)urea (140-95-4)		Biocidal active substances (formaldehyde depot substance) Residual content of free formaldehyde in biocidal product to be indicated
N-Butyl-1,2-benzisothiazolin-3-one (BBIT) (4299-07-4)		Biocidal active substance
2,6-Di-t-butyl-p-kresol (Butylated hydroxytoluene (BHT)) (128-37-0)		Limit value withdrawn due to insufficient substantiation
Dipropylene glycol (110-98-5)		Adherence to MAK of DFG of 200 mg/m ³ is recommended
Odoriferous substances (odorants)	TRGS 540	Some odoriferous substances/odorants may cause sensitisation by skin contact
Fatty alcohol ethoxylate (C ₁₂ -C ₁₅ , linear with < 5 EO)		Manufacturer classification N, R 50
Fatty alcohol ethoxylate (C ₁₂ -C ₁₅ , linear with 5 -10 EO)		Manufacturer classification under preparation
Formaldehyde (50-00-0) (as contamination or by splitting off from formaldehyde depot substances)		Adherence to MAK of DFG of 0.37 mg/m ³ is recommended
Glycerol (56-81-5)		Adherence to MAK of DFG of 50 mg/m ³ is recommended

3-Iodo-2-propynyl-n-butylcarbamate (IPBC) (55406-53-6)		Method for determining AOX must be revised as false excessive values are shown. Biocidal active substance
Copper (7440-50-8) and copper compounds		Previous air limit value (1 mg/m ³) has been withdrawn and is being revised in UA III Adherence to MAK of DFG of 0.1 mg/m ³ is recommended.
2-Methyl-2,3-dihydroisothiazol-3-one (MI) (2682-20-4)		Biocidal active substance
2-Methyl-2,4-pentanediol (hexylene glycol) (107-41-5)		Limit value withdrawn due to insufficient substantiation
N-Formals (e.g. 5-Ethyl-3,7-dioxa-1-aza-bicyclo[3.3.0]-octane (7747-35-5) , N,N-methylene-bis(5-methyl-oxazolidine) (66204-44-2))		Biocidal active substances (formaldehyde depot substances) Residual content of free formaldehyde in biocidal product to be indicated
Octylphenol (140-66-9) , Octylphenol ethoxylates		Ecological aspects (biodegradability, fish toxicity) Nonylphenol ethoxylates should not be replaced by octylphenol ethoxylates (UBA recommendation)
O-Formals (e.g. Benzyl alcohol-mono(poly)hemiformal (14548-60-8) , 1,6-Dihydroxy-2,5-dioxa-hexane (3586-55-8))		Biocidal active substances (formaldehyde depot substances) Residual content of free formaldehyde in biocidal product to be indicated
Ortho-phenylphenol, sodium salt (2-Hydroxybiphenyl, sodium salt, sodium-2-biphenylate) (132-27-4)		Biocidal active substance Ecological aspects (biodegradability, fish toxicity)
Phenols		Ecological aspects (biodegradability, fish toxicity)
1-Phenoxy-2-propanol (770-35-4) /2-Phenoxy-1-propanol (mixture)		Biocidal active substance
Heavy metals and heavy metal compounds (except Cu, Ba)		Ecological aspects (fish toxicity, bacteria toxicity)

Tall oil distillates		Formation of oxidation products which may cause sensitisation by skin contact
Thiabendazol (2-(Thiazol-4-yl)-benzimidazol) (148-79-8)		Biocidal active substance Ecological aspects (R 50/53)
Animal raw materials	(latest EU publication at the time)	
Triethanolamine (Nitrilo-2,2',2''-triethanol) (102-71-6)		Limit value withdrawn due to insufficient substantiation
Triethylene glycol (112-27-6)		Adherence to MAK of DFG of 1000 mg/m ³ is recommended.

List 3.4: Declarable substances (due to process-related reasons) Cooling lubricants in acc. with DIN 51385 for Metal Working

Component (CAS No.)	Legal foundations, sources	Comments
Amines, primary and tertiary, free and masked, without labelling requirement (group indication)		Stabilisation of pH value
Benzotriazole (95-14-7)		Compatibility with non-ferrous metals
Benzotriazoles, substituted (e.g. tolyltriazole (136-85-6))		Compatibility with non-ferrous metals
Boric acid (10043-35-3) and sodium tetraborates (1330-43-4 , 1332-28-1 , 1303-96-4)		May lead to crystalline precipitation of boric acid salts. In wm KSS, boric acid is only present in neutralized form.
Boron compounds, organic		May result in agglutination in individual cases Residues may remain despite degreasing with organic solvents.
Dipropylene glycol (110-98-5)		May impair ultrafilterability
Colorants		Product colouring is intended to prevent confusion
Complexing agents, relevant with regard to waste-water technology (except EDTA)		Complexing agents relevant with regard to waste-water technology may impair the precipitation of heavy metals and dissolve out heavy metals from sludges.
Silicone oils (Polydimethylsiloxanes, PDMS) (63148-62-9)		Only following agreement with user. Organomodified siloxanes are not subject to this restriction.

Annex: Substances with no final occupational medicine / toxicology assessment Cooling lubricants in acc. with DIN 51385 for Metal Working

Component (<i>CAS No.</i>)	Legal foundations, sources	Comments
2-Amino-1-butanol (13054-87-0)		Toxicological data on sensitisation by skin contact, mutagenicity and repeated application missing
2-(2-Aminoethoxy)-ethanol (Diglycol amine) (929-06-6)		Toxicity following inhalation and sensitisation by skin contact cannot be finally assessed at present
2-Amino-2-ethyl-1,3-propanediol (AEPD) (115-70-8)		Toxicological data on mutagenicity and repeated application missing
Boric acid (10043-35-3) orthoboric acid, sodium salt (13840-56-7), sodium tetraborates (1330-43-4, 1332-28-1, 1303-96-4)	Probably 30 th ATP, from 2006-06-01	Submission for resolution of ECB : R _{E2} /R _{F2} : R 60/61 at ≥ 5.5 %
1,6-Dihydroxy-2,5-dioxahexane (3586-55-8)		Toxicological data on mutagenicity and repeated application missing Biocidal active substance Residual content of free formaldehyde in biocidal product to be indicated
Chlorinated paraffins, medium-chain (C ₁₄ -C ₁₇ , MCCPs) (85535-85-9)	Probably 30 th ATP, from 2006-06-01	Submission for resolution of ECB : N, R 50/53, R 64, R 66
1,3,4,6-Tetra(hydroxymethyl)-1,3,4,6-tetraazabicyclooctane-2,5-dion (5395-50-6)		Toxicological data missing Biocidal active substance Residual content of free formaldehyde in biocidal product to be indicated
1,3,5-Tris-(2-hydroxypropyl)-hexahydro-1,3,5-triazine (25254-50-6)		Toxicological data on mutagenicity and repeated application missing Biocidal active substance Residual content of free formaldehyde in biocidal product to be indicated

Glossary

Abbreviations and definitions:

AGS	Committee on Hazardous Substances (Ausschuss für Gefahrstoffe)
AGW	Workplace limit value (Arbeitsplatzgrenzwert) (statutory, TRGS 900)
ATP	Directive for Adaptation to Technical Progress
BGI	Information of the German Employers' Liability Insurance (Berufsgenossenschaftliche Information)
BGR	Rule of the German Employers' Liability Insurance (Berufsgenossenschaftliche Regel)
Biocidal active substance	Active substance according to EU Biocidal Products Directive, Article 2
DFG	German Research Foundation (Deutsche Forschungsgemeinschaft)
DMSO	Dimethyl sulphoxide (organic solvent)
ECB	European Chemicals Bureau
FA MFS, AK KSS	Technical Committee for Mechanical Engineering, Production Systems and Steel Construction, Working Group Cooling Lubricants
FoBiG	Research and Advisory Institute for Hazardous Substances (Forschungs- und Beratungsinstitut Gefahrstoffe GmbH)
GMBI	Joint Journal of German Government Departments (Gemeinsames Ministerialblatt)
IGM	German Industrial Metal Workers' Union (Industriegewerkschaft Metall)
IVDK	Information Network of Departments of Dermatology (Informationsverbund dermatologischer Kliniken)
IP 346	British standard (Institute of Petroleum) No. 346
KSS	Cooling lubricant (Kühlschmierstoff)
wm	water-miscible (concentrate)
wg	water-mixed (solution, emulsion)
nw	non water-miscible (oil)
KW	Hydrocarbon (Kohlenwasserstoff)
MAK	Maximum allowable workplace concentration (Maximale Arbeitsplatzkonzentration (DFG))
PBT substances	Persistent, bioaccumulative, and toxic substances
TRGS	Technical rules on Dangerous Substances (Technische Regel für Gefahrstoffe)
UBA	German Federal Environment Agency (Umweltbundesamt)
VKIS	Association of Users of Industrial Lubricants (Verbraucherkreis Industrieschmierstoffe)
VSI	Association of the Lubricant Industry

Regulations:

European Union (EU) :

1907/2006/EC	Regulation of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Off. Journal EU L 396/1 dated 2006-12-30
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67/548/EEC	EU Dangerous Substances Directive Off. Journal EU 196 dated 1967-08-16
1999/45/EC	EU Dangerous Preparations Directive Off. Journal EU L 200/1 dated 1999-07-30
2002/45/EC	Amending Directive 76/769/EEC Off. Journal EU L 177/21 dated 2002-07-06
98/8/EC	EU Biocidal Products Directive Off. Journal EU L 123 dated 1998-04-24
2000/60/EC	Water Framework Directive Off. Journal EU L 327 dated 2000-12-22
2001/2445/EC	List of priority substances for Water Framework Directive Off. Journal EU L 331/1 dated 2001-12-15
2003/53/EC	26 th Amendment Directive for 76/769/EG Off. Journal EU L 178/24 dated 2003-07-17
21 st ATP	EU Directive 96/65/EC Off. Journal EU L 265 dated 1996-10-11
24 th ATP	EU Directive 98/73/EC Off. Journal EU L 305 dated 1998-09-18
25 th ATP	EU Directive 98/98/EC Off. Journal EU 355 dated 1998-09-18
28 th ATP	EU Directive 2001/59/EC Off. Journal EU L 225 dated 2001-08-21
29 th ATP	EU Directive 2004/73/EC Off. Journal EU L 152 dated 2004-04-30 in its amended version Off. Journal EU L 216 dated 2004-06-16
30 th ATP	ECB draft dated 14 March 2007 available http://ecb.jrc.it/classification-labelling/
Germany :	
AbwV Anhang 40	Waste Water Ordinance Annex 40: Metal machining industry BGBl I p. 2440 dated 2001-09-20
AltöIV	Waste Oil Ordinance BGBl I p. 1368 dated 2002-04-16
BGR 143	BG-Rule "Tätigkeiten mit Kühlschmierstoffen" ("Activities involving cooling lubricants")
DIN 51385	Lubricants – Metal working fluids - Terms Beuth-Verlag, Berlin (06.1991)
Gefahrstoffverordnung	Hazardous Substances Ordinance Dated 2004-12-23, BGBl I p. 3758 dated 200-12-29 Last amended in BGBl I p. 2382 dated 2007-10-12
TRGS 401	Risks resulting from skin contact – Determination, evaluation, measures GMBI 44/2007
TRGS 440	Determination and assessment of chemical risks at work places: determination of dangerous substances and methods for the assessment of substitutes BArbBl 3/2002 (withdrawn at the time of approval of TRGS 600)
TRGS 552	N-Nitrosamines GMBI 05/2007
TRGS 611	Restrictions in the use of water-miscible and water-mixed cooling lubricants in the case of possible development of N-nitrosamines GMBI 05/2007
TRGS 900	Maximum allowable workplace concentrations GMBI 03/2007

TRGS 905

List of carcinogenic, mutagenic and reproduction-toxic substances
BArbBI 7/2005

Classification, R-phrases

CMR substances	Carcinogenic, mutagenic, reproduction-toxic substances
R _E 2	Substances which should be regarded as causing developmental toxicity to humans.
R _F 2	Substances that should be regarded as impairing fertility in humans.
R _E 3	Substances which cause concern for humans owing to possible developmental toxic effects.
R _F 3	Substances which cause concern for human fertility.
K3	Substances which cause concern for man owing to possible carcinogenic effects but in respect of which the available information is not adequate for making a satisfactory assessment. There is some evidence from appropriate animal studies, but this is insufficient to place the substance in category 2.
Y	No risk of developmental toxicity exists provided that the workplace limit value (AGW) and biological limit value (BGW) are not exceeded
Z	A risk of developmental toxicity cannot be excluded even if the AGW and BGW are not exceeded
R 22	Harmful if swallowed
R 42	May cause sensitisation by inhalation
R 43	May cause sensitisation by skin contact
R 50	Very toxic to aquatic organisms
R 51	Toxic to aquatic organisms
R 53	May cause long-term adverse effects in the aquatic environment
R 60	May impair fertility
R 61	May cause harm to the unborn child
R 62	Possible risk of impaired fertility
R 63	Possible risk of harm to the unborn child
R 64	May cause harm to breastfed babies
R 66	Repeated exposure may cause skin dryness or cracking