ORLEsol C56

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
Issue date: 3/31/2026 Revision date: 8/3/2026 Supersedes version of: 4/23/2026 Version: 1.3

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form	:	Mixture
Trade name	:	ORLEsol C-56
UFI	:	PC10-E0QU-S008-N4FE
Product group	:	Trade product

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Main use category	:	Industrial use
Industrial/Professional use spec	:	SOLVENT Thinner Paints and Varnishes metal industry Rubber industry tannery Manufacture of adhesives

1.2.2. Uses advised against

Restrictions on use	:	All other uses not recommended above, EU restriction list (REACH Annex XVII)

1.3. Details of the supplier of the safety data sheet

Manufacturer
ORLEN Południe S.A.
Fabryczna 22
32-540 Trzebinia
Poland
T +48 24 201 00 00, F +48 24 367 74 14
E-mail address of competent person responsible for the SDS : reach.poludnie@orlen.pl

1.4. Emergency telephone number

Emergency number	:	+48 24 201 00 00 Emergency number 112

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flammable liquids, Category 1	H224
Skin corrosion/irritation, Category 2	H315
Reproductive toxicity, Category 2	H361f
Specific target organ toxicity – Single exposure, Category 3, Narcosis	H336
Specific target organ toxicity – Repeated exposure, Category 1	H372
Aspiration hazard, Category 1	H304
Hazardous to the aquatic environment – Chronic Hazard, Category 2	H411

Full text of H- and EUH-statements: see section 16

Adverse physicochemical, human health and environmental effects

Extremely flammable liquid and vapour. May be fatal if swallowed and enters airways. Causes skin irritation. May cause drowsiness or dizziness. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure. Toxic to aquatic life with long lasting effects.

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS02 GHS07 GHS08 GHS09

Signal word (CLP) : Danger

Hazard statements (CLP) : H224 - Extremely flammable liquid and vapour.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H336 - May cause drowsiness or dizziness.
H361f - Suspected of damaging fertility.
H372 - Causes damage to organs through prolonged or repeated exposure.
H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements (CLP) : P102 - Keep out of reach of children.
P210 - Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P233 - Keep container tightly closed.
P240 - Ground/bond container and receiving equipment.
P241 - Use explosion-proof electrical/ventilating/lighting equipment.
P242 - Use only non-sparking tools.
P243 - Take precautionary measures against static discharge.
P261 - Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312 - Call a POISON CENTER or doctor/physician if you feel unwell.
P331 - Do NOT induce vomiting.
P370+P378 - In case of fire: Use media other than water for extinction.
P391 - Collect spillage.
P403+P235 - Store in a well-ventilated place. Keep cool.
P405 - Store locked up.
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

EUH-statements : EUH066 - Repeated exposure may cause skin dryness or cracking.

Extra phrases : This product is not to be used under conditions of poor ventilation.
This product is not to be used for carpet laying.

2.3. Other hazards

Other hazards which do not result in classification : Vapour could form explosive mixture with air. Product can accumulate electrostatic charges that may cause fire by electrical discharges.

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
Contains no PBT and/or vPvB substances ≥ 0.1% assessed in accordance with REACH Annex XIII

Component	
Substance(s) not meeting the PBT criteria of REACH regulation, in accordance with Annex XIII	WE:924-168-8 WE:921-577-3

Component	
Substance(s) not meeting the vPvB criteria of REACH regulation, in accordance with Annex XIII	WE:924-168-8 WE:921-577-3

The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or substance(s) are not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0,1 %

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Hydrocarbons, C5, n-alkanes, isoalkanes	CAS-No.: - EC-No.: 921-577-3 REACH-no: 01-2119483622-36-0013	30 – 70	Flam. Liq. 1, H224 Asp. Tox. 1, H304 STOT SE 3, H336 Aquatic Chronic 2, H411 EUH066
Hydrocarbons, C6-C7, n-alkanes, isoalkanes, cyclics, >5% hexane	CAS-No.: 92128-66-0 EC-No.: 924-168-8 REACH-no: 01-2119475133-43-0011	30 – 70	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Repr. 2, H361f STOT SE 3, H336 STOT RE 2, H372 Asp. Tox. 1, H304 Aquatic Chronic 2, H411

Content of substances that may be present in the mixture and limit the use of the product:		
isopentane; 2-methylbutane	CAS-No.: 78-78-4 EC-No.: 201-142-8 EC Index-No.: 601-085-00-2	15 – 45
cyclohexane	CAS-No.: 110-82-7 EC-No.: 203-806-2 EC Index-No.: 601-017-00-1	10 – 20
n-hexane substance listed on REACH Candidate List	CAS-No.: 110-54-3 EC-No.: 203-777-6 EC Index-No.: 601-037-00-0	10 – 15
toluene	CAS-No.: 108-88-3 EC-No.: 203-625-9 EC Index-No.: 601-021-00-3	<0,01
benzene	CAS-No.: 71-43-2 EC-No.: 200-753-7 EC Index-No.: 601-020-00-8	<0,01
pentane	CAS-No.: 109-66-0 EC-No.: 203-692-4 EC Index-No.: 601-006-00-1	15 – 45

Full text of H- and EUH-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Wear suitable respiratory protection. Use protective clothing. Do not leave affected person unattended. Do not induce vomiting. Never give anything by mouth to an unconscious person. Remove all contaminated clothing and footwear.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. Allow the victim to rest. Keep warm and in a quiet place. If unconscious, place in the recovery position and seek medical advice. Give oxygen or artificial respiration if necessary. If experiencing respiratory symptoms: Call a poison center or a doctor. Call a poison center or a doctor if you feel unwell.

First-aid measures after skin contact : After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water. Be careful, the product may remain trapped under clothing, footwear or a wrist-watch. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

First-aid measures after eye contact : Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Consult an ophtalmologist if irritation persists.

First-aid measures after ingestion : If swallowed, seek medical advice immediately and show this container or label. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Do NOT induce vomiting. Provide oxygen and/or ventilation assistance, if needed.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects : May be fatal if swallowed and enters airways. May cause drowsiness or dizziness. Swallowing this material will result in serious health hazard, potentially leading to collapse and death.

Symptoms/effects after inhalation : Depression of the central nervous system, headaches, dizziness, drowsiness, loss of coordination. Shortness of breath.

Symptoms/effects after skin contact : Irritation.

Symptoms/effects after ingestion : Fatal if swallowed. Risk of lung oedema.

4.3. Indication of any immediate medical attention and special treatment needed

If possible, show the doctor this safety data sheet. Failing this, show the doctor the packaging or label. Treat symptomatically. Keep victim under observation. Move the affected person away from the contaminated area and into the fresh air.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Dry chemical, CO2, or water spray or regular foam. Water fog.

Unsuitable extinguishing media : Strong water jet.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Highly flammable liquid and vapour.

Explosion hazard : Vapours may form explosive mixture with air. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

Hazardous decomposition products in case of fire : Carbon oxides (CO, CO2).

5.3. Advice for firefighters

Precautionary measures fire : Keep container tightly closed and away from heat, sparks and flame.

Firefighting instructions : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Prevent fire fighting water from entering the environment.

Protection during firefighting : Wear recommended personal protective equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Stop leak if safe to do so. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Do not breathe vapours. Eliminate every possible source of ignition. Notify authorities if product enters sewers or public waters. Avoid contact with skin and eyes. Use special care to avoid static electric charges. No flames, no sparks. Eliminate all sources of ignition.

6.1.1. For non-emergency personnel

Emergency procedures : Avoid contact with skin, eyes and clothing. Do not breathe vapours. Notify police and fire brigade as soon as possible.

6.1.2. For emergency responders

Protective equipment : For further information refer to section 8: "Exposure controls/personal protection".

Emergency procedures : Do not breathe vapours. Evacuate unnecessary personnel. Wear personal protective clothing (see chapter 8). Remove all sources of ignition. Only engage trained and adequately protected personnel. Large spills/in confined spaces: consider evacuation. See section 5.3. of the SDS for more information. Ventilate area.

6.2. Environmental precautions

Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Toxic to aquatic life with long lasting effects. Notify authorities if liquid enters sewers or public waters. Contain the spilled material by bunding (product is hazardous for the environment).

6.3. Methods and material for containment and cleaning up

For containment : Cover spill with non combustible material, e.g.: sand, earth, vermiculite. Contain large spillage with sand or earth. Collect spillage.

Methods for cleaning up : Notify authorities if product enters sewers or public waters. This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

See Section 8. For further information refer to section 13. Section 15: Regulatory information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Flammable vapours may accumulate in the container. In use, may form flammable vapour-air mixture. No flames, no sparks. Eliminate all sources of ignition. Handle empty containers with care because residual vapours are flammable. Vapour from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally.

Precautions for safe handling : Do not eat, drink or smoke when using this product. Do not breathe vapours. Do not get in eyes, on skin, or on clothing. Wear personal protective equipment. Flammable vapours may accumulate in the container. Keep only in original container. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Prevent the build-up of electrostatic charge. Ensure good ventilation of the work station. Use only non-sparking tools.

Hygiene measures : Take off immediately all contaminated clothing and wash it before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Wear personal protective equipment.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Proper grounding procedures to avoid static electricity should be followed. Comply with applicable regulations. Store in a well-ventilated place. Keep container tightly closed.

Germany

Storage class (LGK, TRGS 510) : LGK 3 - Flammable liquids

Joint storage table :

LGK 1	LGK 2A	LGK 2B	LGK 3	LGK 4.1A
LGK 4.1B	LGK 4.2	LGK 4.3	LGK 5.1A	LGK 5.1B
LGK 5.1C	LGK 5.2	LGK 6.1A	LGK 6.1B	LGK 6.1C
LGK 6.1D	LGK 6.2	LGK 7	LGK 8A	LGK 8B
LGK 10	LGK 11	LGK 12	LGK 13	LGK 10-13

Joint storage not permitted for : LGK 1, LGK 2A, LGK 4.1A, LGK 4.1B, LGK 4.2, LGK 4.3, LGK 5.1A, LGK 5.1C, LGK 5.2, LGK 6.1B, LGK 6.2, LGK 7

Joint storage with restrictions permitted for : LGK 5.1B, LGK 6.1D, LGK 11, LGK 10-13

Joint storage permitted for : LGK 2B, LGK 3, LGK 6.1A, LGK 6.1C, LGK 8A, LGK 8B, LGK 10, LGK 12, LGK 13

Switzerland

Storage class (LK) : LK 3 - Flammable liquids

7.3. Specific end use(s)

See Section 1.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1. National occupational exposure and biological limit values

pentane (109-66-0)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Pentane
IOEL TWA	3000 mg/m³
	1000 ppm
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
Albania - Occupational Exposure Limits	
Local name	Pentan
OEL TWA	3000 mg/m³
	1000 ppm
Regulatory reference	VENDIM Nr. 522, datë 6.8.2014 PËR MIRATIMIN E RREGULLORES “PËR MBROJTJEN E SIGURISË DHE SHËNDETIT TË PUNËMARRËSVE NGA RISQET E LIDHURA ME AGJENTËT KIMIKË NË PUNË”
Austria - Occupational Exposure Limits	
Local name	Pentan (alle Isomeren): n-Pentan
MAK (OEL TWA)	1800 mg/m³
	600 ppm
MAK (OEL STEL)	3600 mg/m³ (3x 60(Mow) min)
	1200 ppm (3x 60(Mow) min)
Regulatory reference	BGBl. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Pentane, tous isomères # Pentaan, alle isomeren

pentane (109-66-0)	
OEL TWA	1800 mg/m³
	600 ppm
OEL STEL	2250 mg/m³
	750 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	n-Пентан
OEL TWA	3000 mg/m³
	1000 ppm
Remark	• (Химични агенти, за които са определени гранични стойности във въздуха на работната среда за Европейската общност)
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
Local name	Pentan
GVI (OEL TWA)	3000 mg/m³
	1000 ppm
Remark	Direktiva: 2006/15/EZ
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Cyprus - Occupational Exposure Limits	
Local name	Πεντάνιο
OEL TWA	3000 mg/m³
	1000 ppm
Regulatory reference	Κανονισμοί του 2007 (Κ.Δ.Π. 295/2007)
Czech Republic - Occupational Exposure Limits	
Local name	Pentan
PEL (OEL TWA)	3000 mg/m³
	1000 ppm
NPK-P (OEL C)	4500 mg/m³ (1) Je brán zřetel na fyzikálně-chemické vlastnosti (například výbušnost).
	1500 ppm
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Pentan, alle isomere: Pentan
OEL TWA	1500 mg/m³
	500 ppm
Remark	E (betyder, at stoffet har en EU-grænseværdi)
Regulatory reference	BEK nr 1619 af 19/12/2024

pentane (109-66-0)	
Estonia - Occupational Exposure Limits	
Local name	Pentaan
OEL TWA	3000 mg/m³
	1000 ppm
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	n-Pentaani
HTP (OEL TWA)	1500 mg/m³
	500 ppm
HTP (OEL STEL)	1900 mg/m³
	630 ppm
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	n-Pentane
VME (OEL TWA)	3000 mg/m³
	1000 ppm
Remark	Valeurs règlementaires contraignantes
Regulatory reference	Article R4412-149 du Code du travail (réf.: INRS ED 6443, 2022; Outil65; Décret n° 2019-1487; Décret n° 2020-1546; Décret n° 2021-434; Décret n° 2021-1849)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Pentan
AGW (OEL TWA)	3000 mg/m³
	1000 ppm
Peak exposure limitation factor	2(II)
Remark	DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission); EU - Europäische Union (Von der EU wurde ein Luftgrenzwert festgelegt: Abweichungen bei Wert und Spitzenbegrenzung sind möglich); Y - Ein Risiko der Fruchtschädigung braucht bei Einhaltung des Arbeitsplatzgrenzwertes und des biologischen Grenzwertes (BGW) nicht befürchtet zu werden
Regulatory reference	TRGS900
Gibraltar - Occupational Exposure Limits	
Local name	Pentane
OEL TWA	3000 mg/m³
	1000 ppm
Regulatory reference	Factories (Control of Chemical Agents at Work) Regulations 2003 (LN. 2018/181)
Greece - Occupational Exposure Limits	
Local name	Πεντάνιο (όλα τα ισομερή)
OEL TWA	2950 mg/m³
	1000 ppm

pentane (109-66-0)	
OEL STEL	2950 mg/m³
	1000 ppm
Regulatory reference	Π.Δ. 90/1999 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	n-PENTÁN
AK (OEL TWA)	3000 mg/m³
	1000 ppm
Remark	EU2 (2006/15/EK irányelvben közölt érték); R (Azok az anyagok, amelyek egészségkárosító hatása RÖVID expozíció hatására jelentkezik)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Pentane
OEL TWA	3000 mg/m³
	1000 ppm
Remark	IOELV (Indicative Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Italy - Occupational Exposure Limits	
Local name	Pentano
OEL TWA	2000 mg/m³
	667 ppm
Regulatory reference	Allegato XXXVIII del Decreto Legislativo 4 settembre 2024, n. 135
Latvia - Occupational Exposure Limits	
Local name	Pentāns
OEL TWA	3000 mg/m³
	1000 ppm
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 191).
Lithuania - Occupational Exposure Limits	
Local name	Pentanas
IPRV (OEL TWA)	3000 mg/m³
	1000 ppm
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
Luxembourg - Occupational Exposure Limits	
Local name	Pentane
OEL TWA	3000 mg/m³
	1000 ppm

pentane (109-66-0)	
Regulatory reference	Mémorial A Nº 226 de 2021 concernant la protection de la sécurité et de la santé des salariés contre les risques liés à des agents chimiques sur le lieu de travail
Malta - Occupational Exposure Limits	
Local name	Pentane
OEL TWA	3000 mg/m³
	1000 ppm
Regulatory reference	S.L. 424.24 - Chemical Agents at Work Regulations (L.N. 356 of 2021) # L.S. 424.24 - Regolamenti dwar Aġenti Kimiċi fuq il-Post tax-Xogħol (A.L. 356 tal-2021)
Netherlands - Occupational Exposure Limits	
Local name	n-Pentaan
TGG-8u (OEL TWA)	1800 mg/m³
	600 ppm
Regulatory reference	Arbeidsomstandighedenregeling 2024
Poland - Occupational Exposure Limits	
Local name	Pentan
NDS (OEL TWA)	3000 mg/m³
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Indicative Occupational Exposure Limit (IOEL)	
Local name	Pentano
IOEL TWA	3000 mg/m³
	1000 ppm
Regulatory reference	Decreto-Lei n.º 1/2021 de 6 de janeiro
Portugal - Occupational Exposure Limits	
Local name	Pentano, todos os isómeros
OEL TWA	1000 ppm
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Pentan
OEL TWA	3000 mg/m³
	1000 ppm
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Serbia - Occupational Exposure Limits	
Local name	пентан
OEL TWA	3000 mg/m³
	1000 ppm
Remark	ЕУ** – напомена да се ради о хемијским материјама за које су утврђене индикативне граничне вредности изложености према Директиви 2006/15/ЕЗ (друга листа)
Regulatory reference	ПРАВИЛНИК о превентивним мерама за безбедан и здрав рад при излагању хемијским материјама („Службени гласник РС”, бр. 106/09, 117/17 и 107/21)

pentane (109-66-0)	
Slovakia - Occupational Exposure Limits	
Local name	Pentán
NPHV (OEL TWA)	3000 mg/m³
	1000 ppm
Regulatory reference	Nariadenie vlády č. 355/2006 Z. z. (122/2024 Z. z.)
Slovenia - Occupational Exposure Limits	
Local name	pentan
OEL TWA	3000 mg/m³
	1000 ppm
OEL STEL	6000 mg/m³
	2000 ppm
Remark	Y (Snovi, pri katerih ni nevarnosti za zarodek ob upoštevanju mejnih vrednosti in bat vrednosti), EU
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Spain - Occupational Exposure Limits	
Local name	n-Pentano
VLA-ED (OEL TWA)	3000 mg/m³
	1000 ppm
Remark	VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	n-Pentan
NGV (OEL TWA)	1800 mg/m³
	600 ppm
KGV (OEL STEL)	2000 mg/m³
	750 ppm
Remark	V (Vägledande korttidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Pentane
WEL TWA (OEL TWA)	1800 mg/m³
	600 ppm
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Pentan, allir ísómerar
OEL TWA	1500 mg/m³
	500 ppm

pentane (109-66-0)	
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Pentan
Grenseverdi (OEL TWA)	750 mg/m³
	250 ppm
Remark	E: EU har en veiledende grenseverdi og/eller anmerkning for stoffet.
Regulatory reference	FOR-2024-04-05-581
North Macedonia - Occupational Exposure Limits	
Local name	пентан
OEL TWA	3000 mg/m³
	1000 ppm
Remark	(EU) European Union – гранична вредност, определена на ниво на Европската унија
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанци („Службен весник на Република Македонија” бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	Pentane (tous les isomères) / Pentan (alle Isomere)
MAK (OEL TWA)	1800 mg/m³
	600 ppm
KZGW (OEL STEL)	3600 mg/m³
	1200 ppm
Notation	SS_C / SS_C
Remark	NIOSH
Regulatory reference	www.suva.ch, 01.01.2025
benzene (71-43-2)	
EU - Binding Occupational Exposure Limit (BOEL)	
Local name	Benzene
BOEL TWA	0.66 mg/m³ (Limit value from 5 April 2026) 1.65 mg/m³ (Limit value until 5 April 2026)
	0.2 ppm (Limit value from 5 April 2026) 0.5 ppm (Limit value until 5 April 2026)
Notes	Skin (Substantial contribution to the total body burden via dermal exposure possible)
Regulatory reference	DIRECTIVE (EU) 2022/431 (amending Directive 2004/37/EC)
EU - Biological Limit Value (BLV)	
Local name	Benzene
BLV	28 µg/l Parameter: benzene - Medium: blood - Sampling time: immediately end of shift 46 µg/g creatinine Parameter: phenylmercapturic - Medium: urine - Sampling time: end of exposure/shift
Regulatory reference	SCOEL List of recommended health-based BLVs and BGVs

benzene (71-43-2)	
Albania - Occupational Exposure Limits	
Local name	Benzeni
OEL TWA	3.25 mg/m³
	1 ppm
Remark	Lëkurë (Kontribut thelbësor në barrën e përgjithshme të trupit nëpërmjet ekspozimit të mundshëm përmes lëkurës)
Regulatory reference	VENDIM Nr. 520, datë 6.8.2014 PËR MIRATIMIN E RREGULLORES “PËR MBROJTJEN E SIGURISË DHE SHËNDETIT TË PUNËMARRËSVE NGA RISQET E LIDHURA ME KANCEROGJENËT DHE MUTAGJENËT NË PUNË"
Austria - Occupational Exposure Limits	
Local name	Benzol
TRK (OEL TWA)	3.2 mg/m³
	1 ppm
TRK (OEL STEL)	12.8 mg/m³ (4x 15(Miw) min)
	4 ppm (4x 15(Miw) min)
Remark	H. Krebserzeugend: III A1
Regulatory reference	BGBl. II Nr. 156/2021
Austria - Biological limit values	
Local name	Benzol
BLV	10 g/dl Parameter: Hämoglogin - Untersuchungsmaterial: Blut - Mitarbeiter/innen: Frauen 12 g/dl Parameter: Hämoglogin - Untersuchungsmaterial: Blut - Mitarbeiter/innen: Männer 1.6 mg/l Parameter: t,t-Muconsäure - Untersuchungsmaterial: Harn
Remark	Eignung: Blut: MCV: 79-97 fl; Erythrozyten: 3,2 Millionen/µl für Frauen, 3,8 Millionen/µl für Männer; Leukozyten: unterer Grenzwert: 4.000/µl (davon 2.000 Granulozyten) bzw. 3.700/µl bei nicht pathologischem Differentialblutbild, oberer Grenzwert: 13.000/µl; Thrombozyten: 150.000 bzw. 130.000/µl bei nicht pathologischem Differentialblutbild Eignung mit vorzeitiger Folgeuntersuchung: Bei Unterschreiten bzw. Überschreiten der Grenzwerte im Blut (ausgenommen Differentialblutbild) oder im Harn sowie bei atypischen Morphologien im Blut. Der Zeitabstand zwischen den Untersuchungen beträgt bei Eignung: ein Jahr; bei Arbeiten in Kokereien: drei Monate, für die Blutuntersuchung sechs Monate; bei Eignung mit vorzeitiger Folgeuntersuchung: drei Monate; bei Arbeiten in Kokereien: sechs Wochen
Regulatory reference	Verordnung über die Gesundheitsüberwachung am Arbeitsplatz 2017 (VGÜ 2017)
Belgium - Occupational Exposure Limits	
Local name	Benzène # Benzeen
OEL TWA	0.66 mg/m³ (à partir du 5 avril 2026) # (vanaf 5 april 2026) 1.65 mg/m³ (jusqu'au 5 avril 2026) # (tot 5 april 2026)
	0.2 ppm (à partir du 5 avril 2026) # (vanaf 5 april 2026) 0.5 ppm (jusqu'au 5 avril 2026) # (tot 5 april 2026)

benzene (71-43-2)	
Remark	C: la mention “C” signifie que l’agent en question relève du champ d’application du titre 2 relatif aux agents cancérigènes, mutagènes et reprotoiques du livre VI du code de bien-être au travail, D: la mention “D” signifie que la résorption de l’agent, via la peau, les muqueuses ou les yeux, constitue une partie importante de l’exposition totale. Cette résorption peut se faire tant par contact direct que par présence de l’agent dans l’air. # C: de vermelding “C” betekent dat het betrokken agens valt onder het toepassingsgebied van titel 2 betreffende kankerverwekkende, mutagene en reprotoxische agentia van boek VI van de codex over het welzijn op het werk, D: de vermelding “D” betekent dat de opname van het agens via de huid, de slijmvliezen of de ogen een belangrijk deel van de totale blootstelling vormt. Deze opname kan het gevolg zijn van zowel direct contact als zijn aanwezigheid in de lucht.
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	Бензен
OEL TWA	0.66 mg/m³ (Измерено като елементарен въглерод)
	0.2 ppm (Измерено като елементарен въглерод)
Remark	Кожа (Възможен е значителен принос за общото натрупване в тялото чрез кожна експозиция)
Regulatory reference	Наредба № 10 от 26.09.2003 г. за защита на работещите от рискове, свързани с експозиция на канцерогени и мутагени при работа (изм. и доп. ДВ. бр. 28 от 2 Април 2024г.)
Bulgaria - Biological limit values	
Local name	Бензен
BLV	2 mg/l Биомаркер за експозиция/биомаркер за ефект: Trans, trans-муконова киселина - Биологична среда: урина - Време на пробовземане: В края на експозицията или в края на работната смяна - Специфични ефекти: Кожа (възможна е значителна резорбция чрез кожата) 0.045 mg/g creatinine Биомаркер за експозиция/биомаркер за ефект: S-фенилмеркаптурова киселина - Биологична среда: урина - Време на пробовземане: В края на експозицията или в края на работната смяна - Специфични ефекти: Кожа (възможна е значителна резорбция чрез кожата)
Regulatory reference	Наредба № 10 от 26.09.2003 г. за защита на работещите от рискове, свързани с експозиция на канцерогени и мутагени при работа (изм. и доп. ДВ. бр. 28 от 2 Април 2024г.)
Croatia - Occupational Exposure Limits	
Local name	Benzen
GVI (OEL TWA)	0.66 mg/m³ 1.65 mg/m³ do 5. travnja 2026.
	0.2 ppm 0.5 ppm do 5. travnja 2026.
Remark	Direktiva: 2022/431/EU. Napomena: Koža (razvrstana kao tvar koja nadražuje kožu (H315)), Karc 1A, Muta 1B
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Croatia - Biological limit values	
Local name	Benzen

benzene (71-43-2)	
BLV	0.36 µmol/l Karakteristični pokazatelj: benzen - Biološki uzorak: krv - Vrijeme uzorkovanja: odmah na kraju radne smjene 28 µg/l Karakteristični pokazatelj: benzen - Biološki uzorak: krv - Vrijeme uzorkovanja: odmah na kraju radne smjene 21.7 µmol/mol creatinine Karakteristični pokazatelj: S-fenilmerkapturna kiselina - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene 46 µg/g creatinine Karakteristični pokazatelj: S-fenilmerkapturna kiselina - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 91/2018)
Cyprus - Occupational Exposure Limits	
Local name	Βενζόλιο
OEL TWA	0.66 mg/m³ 1.65 mg/m³ (Οριακή τιμή έως την 5η Απριλίου 2026)
	0.2 ppm 0.5 ppm (Οριακή τιμή έως την 5η Απριλίου 2026)
Remark	Δέρμα. Καρκινογόνοι και Μεταλλαξιογόνοι Παράγοντες
Regulatory reference	Κανονισμοί του 2023 (Κ.Δ.Π. 220/2023)
Czech Republic - Occupational Exposure Limits	
Local name	Benzen
PEL (OEL TWA)	3.25 mg/m³ 0.66 mg/m³ (od 5. 4. 2026)
	1 ppm 0.2 ppm (od 5. 4. 2026)
NPK-P (OEL C)	10 mg/m³
	3.08 ppm
Remark	B - u látky je zaveden biologický expoziční test (BET) v moči nebo krvi, D - při expozici se významně uplatňuje pronikání faktoru kůží, I - dráždí sliznice (oči, dýchací cesty) resp. kůži, K - karcinogen kategorie 1A a 1B (s větou H350, H350i), M - mutagen v zárodečných buňkách kategorie 1A a 1B (s větou H340), P - u látky nelze vyloučit závažné pozdní účinky (s větou H372, H373).
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Czech Republic - Biological limit values	
Local name	Benzen
BLV	0.05 mg/g creatinine Ukazatel: S-Fenylmerkapturová kyselina - Biologicky vzorek: moči - Doba odběru: konec směny 0.024 µmol/mmol Creatinine Ukazatel: S-Fenylmerkapturová kyselina - Biologicky vzorek: moči - Doba odběru: konec směny 1.5 mg/g creatinine Ukazatel: t,t-Mukonová kyselina - Biologicky vzorek: moči - Doba odběru: konec směny 1.2 µmol/mmol Creatinine Ukazatel: t,t-Mukonová kyselina - Biologicky vzorek: moči - Doba odběru: konec směny
Regulatory reference	Vyhláška č. 107/2013 Sb. (kterou se mění vyhláška č. 432/2003 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Benzen

benzene (71-43-2)	
OEL TWA	0.66 mg/m³ Fra den 5. april 2026 1.6 mg/m³
	0.2 ppm Fra den 5. april 2026 0.5 ppm
Remark	E (betyder, at stoffet har en EU-grænseværdi); H (betyder, at stoffet kan optages gennem huden); K (betyder, at stoffet anses for at kunne være kræftfremkaldende og omfattet af bekendtgørelse om foranstaltninger til forebyggelse af risici ved arbejde med stoffer og materialer, der kan være kræftfremkaldende, mutagene eller reproduktionstoksiske)
Regulatory reference	BEK nr 1619 af 19/12/2024
Estonia - Occupational Exposure Limits	
Local name	Benseen
OEL TWA	0.66 mg/m³ (kehtib alates 06.04.2026) 1.5 mg/m³ (kehtib kuni 05.04.2026)
	0.2 ppm (kehtib alates 06.04.2026) 0.5 ppm (kehtib kuni 05.04.2026)
OEL STEL	9 mg/m³ (kehtib kuni 05.04.2026)
	3 ppm (kehtib kuni 05.04.2026)
Remark	A (Naha kaudu kergesti imenduv aine), C (Kantserogeenne aine)
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	Bentseeni
BOEL TWA	0.66 mg/m³ (Raja-arvoa sovelletaan 5 päivästä huhtikuuta 2026) 1.65 mg/m³
	0.2 ppm (Raja-arvoa sovelletaan 5 päivästä huhtikuuta 2026) 0.5 ppm
Remark	Iho. Syöpäsairauden vaaraa aiheuttavat ja perimää vaurioittavat tekijät
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö). Valtioneuvoston asetus (113/2024)
France - Occupational Exposure Limits	
Local name	Benzène
VME (OEL TWA)	0.66 mg/m³ (À partir du 5 avril 2026) 1.65 mg/m³
	0.2 ppm (À partir du 5 avril 2026) 0.5 ppm
Remark	Valeurs règlementaires contraignantes. Cancérogène de catégorie 1A, Mutagène de catégorie 1B, Risque de pénétration percutanée
Regulatory reference	Article R4412-149 du Code du travail (réf.: INRS ED 6443, 2022; Outil65; Décret n° 2019-1487; Décret n° 2020-1546; Décret n° 2021-434; Décret n° 2021-1849; Décret n° 2024-307)
Germany - Occupational Exposure Limits (TRGS 910)	
Local name	Benzol
Acceptable concentration (Volume conc.)	0.06 ppm
Acceptable concentration (Weight conc.)	0.2 mg/m³
Notes	b) Akzeptanzkonzentration assoziiert mit Risiko 4:10000

benzene (71-43-2)	
Tolerance concentration (Volume conc.)	0.6 ppm
Tolerance concentration (Weight conc.)	1.9 mg/m³
Tolerance concentration excess factor	8
Remark	H - Hautresorptiv
Equivalence value for acceptable concentration	0.8 µg/l (3) 3 µg/g creatinine (3)
Equivalence value for tolerance concentration	5 µg/l 25 µg/g creatinine 500 µg/g creatinine
Parameter	Benzol S-Phenylmerkaptursäure Trans, trans-Muconsäure
Testing material	U - Urin
Testing time	b - Expositionsende bzw. Schichtende
Regulatory reference	TRGS 910
Gibraltar - Occupational Exposure Limits	
Local name	Benzene
OEL TWA	3.25 mg/m³
	1 ppm
Remark	Skin
Regulatory reference	Factories (Control of Carcinogens and mutagens at Work) Regulations 2003 (LN. 2020/47)
Greece - Occupational Exposure Limits	
Local name	Βενζόλιο
OEL TWA	0.66 mg/m³ Οριακή τιμή έκθεσης έως την 4η Απριλίου 2026 1.65 mg/m³
	0.2 ppm Οριακή τιμή έκθεσης έως την 4η Απριλίου 2026 0.5 ppm
Remark	Δέρμα (Είναι πιθανή η σημαντική αύξηση της συνολικής επιβάρυνσης του λόγω δερνατικής έκθεσης)
Regulatory reference	Π.Δ. 48/2024 - Προστασία των εργαζομένων από τους κινδύνους που συνδέονται με την έκθεση σε καρκινογόνους παράγοντες, μεταλλαξιογόνους παράγοντες ή τοξικές για την αναπαραγωγή ουσίες κατά την εργασία
Hungary - Occupational Exposure Limits	
Local name	BENZOL
AK (OEL TWA)	1.65 mg/m³
	1 ppm
Remark	k(1A) (rákkeltő), b (Bőrön át is felszívódik), i (ingerlő anyag, amely izgatja a bőrt, nyálkahártyát, szemet vagy mindhármat), BEM (biológiai expozíciós mutató); EU6 (2019/130 EU irányelvben közölt érték); T (Azok az anyagok, amelyek egészségkárosító hatása TARTÓS expozíciót követően jelentkezik)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről

benzene (71-43-2)	
Hungary - Biological Exposure Indices	
Local name	Benzol
BEI	0.04 mg/g creatinine Biológiai expozíciós (hatás) mutató: S-fenilmerkaptursav - Biológiai minta: vizeletben - Mintavétel ideje: m.v. (műszak végén) 0.22 µmol/mmol Creatinine Biológiai expozíciós (hatás) mutató: S-fenilmerkaptursav - Biológiai minta: vizeletben - Mintavétel ideje: m.v. (műszak végén)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Benzene
OEL TWA	0.66 mg/m³ LImit value from 5th April 2026 1.65 mg/m³ Limit value until 5th April 2026
	0.2 ppm LImit value from 5th April 2026 0.5 ppm Limit value until 5th April 2026
Remark	BOELV (Binding Occupational Exposure Limit Values), Skin (Substances which have the capacity to penetrate intact skin when they come in contact with it and be absorbed into the body. A substantial contribution to the total body burden via dermal exposure is possible), Carc.1A (Substances known to have carcinogenic potential for humans), Muta.1B (Substances which should be regarded as if they induce heritable mutations in the germ cells of humans)
Regulatory reference	Chemical Agents Code of Practice 2024
Ireland - Biological limit values	
Local name	Benzene
BMGV	25 µg/g creatinine Parameter: S-Phenylmercapturic acid - Medium: urine - Sampling time: End of shift - Notations: B (Background) 50 µg/g creatinine Parameter: t,t-Muconic acid - Medium: urine - Sampling time: End of shift - Notations: B (Background)
Regulatory reference	Biological Monitoring Guidelines (HSA, 2011)
Italy - Occupational Exposure Limits	
Local name	Benzene
OEL TWA	0.66 mg/m³ 1.65 mg/m³ Valore limite fino al 5 aprile 2026
	0.2 ppm 0.5 ppm Valore limite fino al 5 aprile 2026
Remark	Cute
Regulatory reference	Allegato XLIII del Decreto Legislativo 4 settembre 2024, n. 135 - Protezione da agenti cancerogeni, mutageni o da sostanze tossiche per la riproduzione
Latvia - Occupational Exposure Limits	
Local name	Benzols
OEL TWA	0.66 mg/m³ 1.65 mg/m³ AER līdz 2026.gada 5.aprīlim.
	0.2 ppm
Remark	Āda. Carc. 1A; Muta. 1B
Regulatory reference	Ministru kabineta 2008. gada 29. septembra noteikumi Nr. 803 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 190).

benzene (71-43-2)	
Lithuania - Occupational Exposure Limits	
Local name	Benzenas (benzolas)
IPRV (OEL TWA)	0.66 mg/m³ (įsigalioja 2026 m. balandžio 5 d.) 1.65 mg/m³
	0.2 ppm (įsigalioja 2026 m. balandžio 5 d.) 0.5 ppm
TPRV (OEL STEL)	19 mg/m³
	6 ppm
Remark	K (kancerogeninis poveikis); M (mutageninis poveikis); O (medžiaga į organizmą gali prasiskverbti pro nepažeistą odą)
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-82/A1-57, 2024-01-23)
Luxembourg - Occupational Exposure Limits	
Local name	Benzène
OEL TWA	3.25 mg/m³
	1 ppm
Remark	Peau
Regulatory reference	Mémorial A Nº 223 de 2021 concernant la protection des salariés contre les risques liés à l'exposition à des agents cancérigènes ou mutagènes au travail
Malta - Occupational Exposure Limits	
Local name	Benzene # Benżen
OEL TWA	1.65 mg/m³ (Limit value until 5 April 2026 # Valur limitu sal-5 ta' April 2026)
	0.5 ppm (Limit value until 5 April 2026 # Valur limitu sal-5 ta' April 2026)
Remark	Skin # Ġilda
Regulatory reference	S.L. 424.22 - Exposure to Carcinogens, Mutagens or Reprotoxic Substances at Work Regulations (L.N. 102 of 2024) # L.S. 424.22 - Regolamenti dwar Espożizzjoni għall-Carcinogens, Mutagens jew Reprotoxic Substances fuq il-Post tax-Xogħol (A.L. 102 tal-2024)
Netherlands - Occupational Exposure Limits	
Local name	Benzeen
TGG-8u (OEL TWA)	0.7 mg/m³
	0.2 ppm
Remark	Kankerverwekkende stof. H (Huidopname) Stoffen die relatief gemakkelijk door de huid kunnen worden opgenomen, hetgeen een substantiële bijdrage kan betekenen aan de totale inwendige blootstelling, hebben in de lijst een H-aanduiding. Bij deze stoffen moeten naast maatregelen tegen inademing ook adequate maatregelen ter voorkoming van huidcontact worden genomen.
Regulatory reference	Arbeidsomstandighedenregeling 2024
Poland - Occupational Exposure Limits	
Local name	Benzen
NDS (OEL TWA)	0.66 mg/m³
	0.2 ppm

benzene (71-43-2)	
Remark	Skóra (Oznakowanie substancji notacją „skóra” oznacza, że wchłanianie substancji przez skórę może być tak samo istotne jak przy narażeniu drogą oddechową).
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Benzeno
OEL TWA	0.5 ppm
OEL STEL	2.5 ppm
Remark	P (Toxicidade percutânea); A1 (Agente carcinogénico confirmado no Homem); IBE (Índice biológico de exposição)
Regulatory reference	Norma Portuguesa NP 1796:2014
Portugal - Biological Exposure Indices	
Local name	Benzeno
BEI	25 µg/g creatinine Parâmetro: Ácido s-fenilmercaptúrico - Meio: urina - Momento da amostragem: Fim do turno - Notaçao: Vb (Valor basal) 500 µg/g creatinine Parâmetro: Ácido t,t-mucónico - Meio: urina - Momento da amostragem: Fim do turno - Notaçao: Vb (Valor basal)
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Benzen
OEL TWA	0.66 mg/m³ 1.65 mg/m³ Valoare-limită până la 5 aprilie 2026
	0.2 ppm 0.5 ppm Valoare-limită până la 5 aprilie 2026
Remark	P - posibilitatea unei penetrări cutanate importante; C1A - poate provoca apariția cancerului; M1B - poate provoca anomalii genetice
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Romania - Biological limit values	
Local name	Benzen
BLV	25 µg/g creatinine Indicatorul biologic: Acid s-fenil mercapturic - Material biologic: urină - Momentul recoltării: sfârșit de schimb 50 mg/l Indicatorul biologic: Fenoli totali - Material biologic: urină - Momentul recoltării: sfârșit de schimb 500 µg/g creatinine Indicatorul biologic: Acid t,t muconic - Material biologic: urină - Momentul recoltării: sfârșit de schimb
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Serbia - Occupational Exposure Limits	
Local name	бензен
OEL TWA	3 mg/m³
	1 ppm
Remark	ЕУ0 – напомена да се ради о хемијским материјама за које су утврђене обавезујуће граничне вредности изложености према Директиви 1999/38/ЕЗ и Директиви 98/24/ЕЗ
Regulatory reference	ПРАВИЛНИК о превентивним мерама за безбедан и здрав рад при излагању хемијским материјама („Службени гласник РС”, бр. 106/09, 117/17 и 107/21)

benzene (71-43-2)	
Slovakia - Occupational Exposure Limits	
Local name	Benzén
NPHV (OEL TWA)	0.66 mg/m³ NPEL sa uplatňuje od 6. apríla 2026 1.65 mg/m³ NPEL sa uplatňuje do 5. apríla 2026
	0.2 ppm NPEL sa uplatňuje od 6. apríla 2026 0.5 ppm NPEL sa uplatňuje do 5. apríla 2026
Remark	Kategória karcinogénnych faktorov 1A – Dokázaný karcinogén pre ľudí; Kategória mutagénnych faktorov 1B – Mutagén cicavčích zárodočných buniek; K – prienik cez kožu: K celkovému zaťaženiu organizmu môže významne prispieť expozícia cez kožu.
Regulatory reference	Nariadenie vlády č. 356/2006 Z. z. (121/2024 Z. z.)
Slovenia - Occupational Exposure Limits	
Local name	benzen
OEL TWA	3.25 mg/m³
	1 ppm
Remark	Rakotvorne snovi – kategorija 1A, Mutagene snovi za zarodne celice – kategorija 1B. EU, K (Lastnost lažjega prehajanja snovi v organizem skozi kožo), BAT (Biološka mejna vrednost), EKA (Zveza med koncentracijo rakotvornih snovi v zraku na delovnem mestu in količino snovi in/ali njenih metabolitov v organizmu)
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4.4.2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti rakotvornim ali mutagenim snovem
Slovenia - Biological limit values	
Local name	benzen
BLV	5 µg/l Parameter: benzen - Biološki vzorec: urin - Čas vzorčenja: ob koncu delovne izmene 0.025 mg/g creatinine Parameter: S-fenilmerkaptonska kislina - Biološki vzorec: urin - Čas vzorčenja: ob koncu delovne izmene 500 µg/g creatinine Parameter: trans, trans-mukonska kislina - Biološki vzorec: urin - Čas vzorčenja: ob koncu delovne izmene
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4.4.2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti rakotvornim ali mutagenim snovem
Spain - Occupational Exposure Limits	
Local name	Benceno
VLA-ED (OEL TWA)	3.25 mg/m³
	1 ppm

benzene (71-43-2)	
Remark	C1A (Carcinógeno para el hombre), M1B (Sustancias de las que se considera que inducen mutaciones hereditarias en las células germinales humanas), vía dérmica (Indica que, en las exposiciones a esta sustancia, la aportación por la vía cutánea puede resultar significativa para el contenido corporal total si no se adoptan medidas para prevenir la absorción. En estas situaciones, es aconsejable la utilización del control biológico para poder cuantificar la cantidad global absorbida del contaminante), VLB® (Agente químico que tiene Valor Límite Biológico), v (Real Decreto 1124/2000, de 16 de junio (BOE nº 145 de 17 de junio de 2000), por el que se modifica el Real Decreto 665/1997, de 12 de mayo, sobre la protección de los trabajadores contra los riesgos relacionados con la exposición a agentes cancerígenos durante el trabajo), r (Esta sustancia tiene establecidas restricciones a la fabricación, la comercialización o el uso en los términos especificados en el “Reglamento (CE) nº 1907/2006 sobre Registro, Evaluación, Autorización y Restricción de sustancias y preparados químicos” (REACH) de 18 de diciembre de 2006 (DOUE L 369 de 30 de diciembre de 2006). Las restricciones de una sustancia pueden aplicarse a todos los usos o sólo a usos concretos. El anexo XVII del Reglamento REACH contiene la lista de todas las sustancias restringidas y especifica los usos que se han restringido), (Ω) Sujeto a la transposición de la Directiva (UE) 2022/431 del Parlamento Europeo y del Consejo de 9 de marzo de 2022.
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Spain - Biological limit values	
Local name	Benceno
BLV	8 µg/g creatinine Parámetro: Ácido S-Fenilmercaptúrico - Medio: Orina - Momento de muestreo: Final de la jornada laboral (Entrada en vigor el 5 de abril de 2026) 2 mg/l Parámetro: Ácido t,t-Mucónico - Medio: Orina - Momento de muestreo: Final de la jornada laboral 0.045 mg/g creatinine Parámetro: Ácido S-Fenilmercaptúrico - Medio: Orina - Momento de muestreo: Final de la jornada laboral
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Bensen
NGV (OEL TWA)	0.66 mg/m³ (Gränsvärdet träder i kraft den 5 april 2026) 1.5 mg/m³
	0.2 ppm (Gränsvärdet träder i kraft den 5 april 2026) 0.5 ppm
KGV (OEL STEL)	9 mg/m³
	3 ppm
Remark	C (Ämnet är cancerframkallande. Risk för cancer finns även vid annan exponering än via inandning. För vissa cancerframkallande ämnen som inte har gränsvärden gäller förbud eller tillståndskrav enligt föreskrifterna om kemiska arbetsmiljörisker); H (Ämnet kan lätt upptas genom huden. Det föreskrivna gränsvärdet bedöms ge tillräckligt skydd endast under förutsättning att huden är skyddad mot exponering för ämnet ifråga)
Regulatory reference	Hygieniska gränsvärden (AFS 2022:5)
United Kingdom - Occupational Exposure Limits	
Local name	Benzene
WEL TWA (OEL TWA)	3.25 mg/m³
	1 ppm

benzene (71-43-2)	
Remark	Carc (Capable of causing cancer and/or heritable genetic damage), Sk (Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Bensen
OEL TWA	0.66 mg/m³
	0.2 ppm
Remark	H (efnið getur auðveldlega borist inn í líkamann gegnum húð), K (efnið er krabbameinsvaldandi)
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 1309/2023)
Norway - Occupational Exposure Limits	
Local name	Benzen
Grenseverdi (OEL TWA)	0.33 mg/m³ Fra april 2028 0.66 mg/m³ Fram til april 2028
	0.1 ppm Fra april 2028 0.2 ppm Fram til april 2028
Remark	H: Kjemikalier som kan tas opp gjennom huden; K: Kjemikalier som skal betraktes som kreftfremkallende; M: Kjemikalier som skal betraktes som mutagene; G: EU har fastsatt en bindende grenseverdi og/eller anmerkning for stoffet.
Regulatory reference	FOR-2024-04-05-581
North Macedonia - Occupational Exposure Limits	
Local name	Бензен
OEL TWA	3.25 mg/m³
	1 ppm
KTV	4
Short time value [mg/m³]	13 mg/m³
Short time value [ppm]	4 ppm

benzene (71-43-2)	
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанци во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусо време. Изложеноста на краткотрајни вредности може да трае највеќе 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m3 или во ml/m3(ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност; (K) својство на полесно пренесување на супстанците во организмот преку кожата; (TDK) техничко достигнување на концентрацијата – е дадено за канцерогените супстанци и значи концентрација на супстанци во воздухот на работното место, кои можат да се достигнат со достапните техники; (EKA) поврзаноста помеѓу концентрацијата на канцерогени супстанци во воздухот на работното место и износ на количината на канцерогените супстанци и/или нивните метаболити во организмот – дадена за канцерогени супстанци (канцерогени); (BAT) биолошка гранична вредност – праг на биолошка гранична вредност, што значи предупредување на опасна хемиска супстанца и нејзини метаболити во ткивата, телесните течности или издишувањето на воздухот, без оглед на тоа, дали опасната хемиска супстанца е внесена во организмот со вдишување, голтање или преку кожата; (EU) European Union – гранична вредност, определена на ниво на Европската унија
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанци („Службен весник на Република Македонија” бр.46/10) и Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на канцерогени, мутагени или супстанци („Службен весник на Република Македонија” бр.110/10)
Switzerland - Occupational Exposure Limits	
Local name	Benzène / Benzol
MAK (OEL TWA)	0.7 mg/m³
	0.2 ppm
Notation	R, $C1_A$, $M1_B$, B / H, $C1_A$, $M1_B$, B
Remark	HSE, NIOSH, DFG, BG
Regulatory reference	www.suva.ch, 01.01.2025
Switzerland - BAT	
Local name	Benzène / Benzol
BAT	8 µg/g creatinine (0.004 µmol/mmol cr.; Paramètre biologique: Acide S-phénylmercapturique; Substrat d’examen: Urine; Moment du prélèvement: Fin de l’exposition, de la période de travail.) / (0.004 µmol/mmol cr.; Biologischer Parameter: S-Phenylmerkaptursäure; Untersuchungsmaterial: Urin; Probennahmezeitpunkt: Expositionsende, bzw. Schichtende.)
Remark	Influence de l’environnement. / Umwelteinflüsse.
Regulatory reference	Ordonnance 832.30 (OPA), article 50 al. 3, www.suva.ch/valeurs-limites / Verordnung 832.30 (VUV), Art. 50 Abs. 3, www.suva.ch/grenzwerte
USA - ACGIH - Occupational Exposure Limits	
Local name	Benzene
ACGIH OEL TWA	0.02 ppm
Remark (ACGIH)	TLV® Basis: Myelodysplastic syndrome; acute myeloid leukemia; leukemia; hematologic eff; chromosomal dam. Notations: Skin; A1 (Confirmed Human Carcinogen); BEI

benzene (71-43-2)	
Regulatory reference	ACGIH 2024
USA - ACGIH - Biological Exposure Indices	
Local name	Benzene
BEI	25 µg/g creatinine Parameter: S-Phenylmercapturic acid - Medium: urine - Sampling time: End of shift - Notations: B 500 µg/g creatinine Parameter: t,t-Muconic acid - Medium: urine - Sampling time: End of shift - Notations: B
Regulatory reference	ACGIH 2024
toluene (108-88-3)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Toluene
IOEL TWA	192 mg/m³
	50 ppm
IOEL STEL	384 mg/m³
	100 ppm
Remark	Skin
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
Albania - Occupational Exposure Limits	
Local name	Toluen
OEL TWA	192 mg/m³
	50 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	Lëkurë (tregon mundësinë e një marrjeje të rëndësishme nëpërmjet lëkurës)
Regulatory reference	VENDIM Nr. 522, datë 6.8.2014 PËR MIRATIMIN E RREGULLORES “PËR MBROJTJEN E SIGURISË DHE SHËNDETIT TË PUNËMARRËSVE NGA RISQET E LIDHURA ME AGJENTËT KIMIKË NË PUNË”
Austria - Occupational Exposure Limits	
Local name	Toluol
MAK (OEL TWA)	190 mg/m³
	50 ppm
MAK (OEL STEL)	380 mg/m³ (4x 15(Miw) min)
	100 ppm (4x 15(Miw) min)
Remark	H. Fortpflanzungsgefährdend: d
Regulatory reference	BGBl. II Nr. 156/2021
Austria - Biological limit values	
Local name	Toluol

toluene (108-88-3)	
BLV	10 g/dl Parameter: Hämoglogin - Untersuchungsmaterial: Blut - Mitarbeiter/innen: Frauen 12 g/dl Parameter: Hämoglogin - Untersuchungsmaterial: Blut - Mitarbeiter/innen: Männer 250 µg/l Parameter: Hämoglogin - Untersuchungsmaterial: Blut - Probenahmezeitpunkt: Bei wiederholt erhöhten o-Cresolwerten ist zusätzlich Toluol im Blut am Ende eines Arbeitstages zu bestimmen (der Zeitpunkt der Untersuchung ist anzugeben) 0.8 mg/l Parameter: o-Cresol - Untersuchungsmaterial: Harn
Remark	Eignung: Blut: Erythrozyten: 3,2 Millionen/µl für Frauen, 3,8 Millionen/µl für Männer; Leukozyten: unterer Grenzwert: 4.000/µl (davon 2.000 Granulozyten) bzw. 3.700/µl bei nicht pathologischem Differentialblutbild, oberer Grenzwert: 13.000/µl; Thrombozyten: 150.000 bzw. 130.000/µl bei nicht pathologischem Differentialblutbild Eignung mit vorzeitiger Folgeuntersuchung: Bei Unterschreiten bzw. Überschreiten der Grenzwerte im Blut (ausgenommen Differentialblutbild) oder im Harn sowie bei atypischen Morphologien im Blut. Der Zeitabstand zwischen den Untersuchungen beträgt bei Eignung: ein Jahr; bei Eignung mit vorzeitiger Folgeuntersuchung: drei Monate.
Regulatory reference	Verordnung über die Gesundheitsüberwachung am Arbeitsplatz 2017 (VGÜ 2017)
Belgium - Occupational Exposure Limits	
Local name	Toluène # Tolueen
OEL TWA	77 mg/m³
	20 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	D: la mention “D” signifie que la résorption de l’agent, via la peau, les muqueuses ou les yeux, constitue une partie importante de l’exposition totale. Cette résorption peut se faire tant par contact direct que par présence de l’agent dans l’air. # D: de vermelding “D” betekent dat de opname van het agens via de huid, de slijmvliezen of de ogen een belangrijk deel van de totale blootstelling vormt. Deze opname kan het gevolg zijn van zowel direct contact als zijn aanwezigheid in de lucht.
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	Толуен
OEL TWA	192 mg/m³
	50 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	Кожа (възможна е значителна резорбция чрез кожата); • (Химични агенти, за които са определени гранични стойности във въздуха на работната среда за Европейската общност)
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Bulgaria - Biological limit values	
Local name	Толуен
BLV	1.6 mmol/mmol Creatinine Биомаркер за експозиция/биомаркер за ефект: хипурова киселина - Биологична среда: урина - Време на пробовземане: В края на експозицията или в края на работната смяна - Специфични ефекти: Няма

toluene (108-88-3)	
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
Local name	Toluen
GVI (OEL TWA)	192 mg/m³
	50 ppm
KGVI (OEL STEL)	384 mg/m³
	100 ppm
Remark	Direktiva: 2006/15/EZ. Napomena: Koža (razvrstana kao tvar koja nadražuje kožu (H315))
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Croatia - Biological limit values	
Local name	Toluen
BLV	10.85 µmol/l Karakteristični pokazatelj: toluen - Biološki uzorak: krv - Vrijeme uzorkovanja: na kraju radne smjene 1 mg/l Karakteristični pokazatelj: toluen - Biološki uzorak: krv - Vrijeme uzorkovanja: na kraju radne smjene 0.83 µmol/l Karakteristični pokazatelj: toluen - Biološki uzorak: krajnje izdahnuti zrak - Vrijeme uzorkovanja: za vrijeme izloženosti 20 ppm Karakteristični pokazatelj: toluen - Biološki uzorak: krajnje izdahnuti zrak - Vrijeme uzorkovanja: za vrijeme izloženosti 1.58 mol/mol Creatinine Karakteristični pokazatelj: hipurna kiselina - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene - Napomena: hrana bogata voćem i povrćem te konzervirana Na-benzoatom povisuje nalaz 2.5 g/g creatinine Karakteristični pokazatelj: hipurna kiselina - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene - Napomena: hrana bogata voćem i povrćem te konzervirana Na-benzoatom povisuje nalaz 1.05 mmol/mol Creatinine Karakteristični pokazatelj: o-krezol - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene 1 mg/g creatinine Karakteristični pokazatelj: o-krezol - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 91/2018)
Cyprus - Occupational Exposure Limits	
Local name	Τολουόλιο
OEL TWA	192 mg/m³
	50 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	δέρμα
Regulatory reference	Κανονισμοί του 2007 (Κ.Δ.Π. 295/2007)
Czech Republic - Occupational Exposure Limits	
Local name	Toluen (Methylbenzen)
PEL (OEL TWA)	192 mg/m³

toluene (108-88-3)	
	50 ppm
NPK-P (OEL C)	384 mg/m³
	100 ppm
Remark	B - u látky je zaveden biologický expoziční test (BET) v moči nebo krvi, D - při expozici se významně uplatňuje pronikání faktoru kůží, I - dráždí sliznice (oči, dýchací cesty) resp. kůži, P - u látky nelze vyloučit závažné pozdní účinky (s větou H372, H373).
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Czech Republic - Biological limit values	
Local name	Toluen (Methylbenzen)
BLV	1.5 mg/g creatinine Ukazatel: o-Kresol (po hydrolýze) - Biologicky vzorek: moči - Doba odběru: konec směny 1.6 µmol/mmol Creatinine Ukazatel: o-Kresol (po hydrolýze) - Biologicky vzorek: moči - Doba odběru: konec směny 1600 mg/g creatinine Ukazatel: Hippurová kyselina - Biologicky vzorek: moči - Doba odběru: konec směny 1000 µmol/mmol Creatinine Ukazatel: Hippurová kyselina - Biologicky vzorek: moči - Doba odběru: konec směny
Remark	Je-li hodnota při nálezu kyseliny hippurové vyšší než 1600 mg/g, av šak nepřesahuje 2500 mg/g kreatininu, použije se ke zpřesnění expozice toluenu biologický expoziční test podle ukazatele o-Kresol. Je-li hodnota při nálezu kyseliny hippurové vyšší než 2500 mg/g, považuje se za hodnotu prokazující, že jde o pracovní expozici toluenu, jehož hodnota PEL je překračována a biologický expoziční test podle ukazatele o-Kresol se již neprovádí.
Regulatory reference	Vyhláška č. 107/2013 Sb. (kterou se mění vyhláška č. 432/2003 Sb.)
Estonia - Occupational Exposure Limits	
Local name	Tolueen (metüülbenseen)
OEL TWA	192 mg/m³
	50 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	A (Naha kaudu kergesti imenduv aine)
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	Tolueeni
HTP (OEL TWA)	81 mg/m³
	25 ppm
HTP (OEL STEL)	380 mg/m³
	100 ppm
Remark	Iho, melu
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
Finland - Biological limit values	
Local name	Tolueeni
BLV	500 nmol/l Parametri: Veren tolueeni - Näytteenottoajankohta: Työpäivän jälkeinen aamu

toluene (108-88-3)	
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	Toluène
VME (OEL TWA)	76.8 mg/m³
	20 ppm
VLE (OEL C/STEL)	384 mg/m³
	100 ppm
Remark	Valeurs règlementaires contraignantes. Toxique pour la reproduction de catégorie 2, Risque de pénétration percutanée. Ces valeurs sont assortie de la mention "bruit" indiquant la possibilité d'une atteinte auditive en cas de co-exposition au bruit.
Regulatory reference	Article R4412-149 du Code du travail (réf.: INRS ED 6443, 2022; Outil65; Décret n° 2019-1487; Décret n° 2020-1546; Décret n° 2021-434; Décret n° 2021-1849; Décret n° 2024-307)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Toluol
AGW (OEL TWA)	190 mg/m³
	50 ppm
Peak exposure limitation factor	2(II)
Remark	DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission); EU - Europäische Union (Von der EU wurde ein Luftgrenzwert festgelegt: Abweichungen bei Wert und Spitzenbegrenzung sind möglich); H - hautresorptiv; Y - Ein Risiko der Fruchtschädigung braucht bei Einhaltung des Arbeitsplatzgrenzwertes und des biologischen Grenzwertes (BGW) nicht befürchtet zu werden
Regulatory reference	TRGS900
Germany - Biological limit values (TRGS 903)	
Local name	Toluol
Biological limit value	600 µg/l Parameter: Toluol - Untersuchungsmaterial: B = Vollblut - Probenahmezeitpunkt: g) unmittelbar nach Exposition - Festlegung/Begründung: 05/2024 DFG 75 µg/l Parameter: Toluol - Untersuchungsmaterial: U = Urin - Probenahmezeitpunkt: b) Expositionsende, bzw. Schichtende - Festlegung/Begründung: 05/2024 DFG 1.5 mg/l Parameter: o-Kresol (nach Hydrolyse) - Untersuchungsmaterial: U = Urin - Probenahmezeitpunkt: c) am Schichtende, bei Langzeitexposition nach mehreren vorangegangenen Schichten - Festlegung/Begründung: 05/2024 DFG
Regulatory reference	TRGS 903
Gibraltar - Occupational Exposure Limits	
Local name	Toluene
OEL TWA	192 mg/m³
	50 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	Skin
Regulatory reference	Factories (Control of Chemical Agents at Work) Regulations 2003 (LN. 2018/181)

toluene (108-88-3)	
Greece - Occupational Exposure Limits	
Local name	Τολουόλιο
OEL TWA	192 mg/m³
	50 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	Η ένδειξη «δέρμα» στις οριακές τιμές επαγγελματικής έκθεσης επισημαίνει το ενδεχόμενο σημαντικής διείσδυσης μέσω του δέρματος.
Regulatory reference	Π.Δ. 162/2007 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	TOLUOL
AK (OEL TWA)	192 mg/m³
	50 ppm
CK (OEL STEL)	384 mg/m³
	100 ppm
Remark	b (Bőrön át is felszívódik), i (ingerlő anyag, amely izgatja a bőrt, nyálkahártyát, szemet vagy mindhármat); BEM (biológiai expozíciós mutató); EU2 (2006/15/EK irányelvben közölt érték); R+T (Azok az anyagok, amelyek RÖVID és TARTÓS expozíciója is egészségkárosodást okoz)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Hungary - Biological Exposure Indices	
Local name	Toluol
BEI	1 mg/g creatinine Biológiai expozíciós (hatás) mutató: o-krezol - Biológiai minta: vizeletben - Mintavétel ideje: m.v. (műszak végén) 1 µmol/mmol Creatinine Biológiai expozíciós (hatás) mutató: o-krezol - Biológiai minta: vizeletben - Mintavétel ideje: m.v. (műszak végén)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Toluene
OEL TWA	192 mg/m³
	50 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	IOELV (Indicative Occupational Exposure Limit Values), Skin (Substances which have the capacity to penetrate intact skin when they come in contact with it and be absorbed into the body. A substantial contribution to the total body burden via dermal exposure is possible)
Regulatory reference	Chemical Agents Code of Practice 2024

toluene (108-88-3)	
Ireland - Biological limit values	
Local name	Toluene
BMGV	0.02 mg/l Parameter: toluene - Medium: blood - Sampling time: Prior to last shift of workweek 0.03 mg/l Parameter: toluene - Medium: urine - Sampling time: End of shift 0.3 mg/g creatinine Parameter: o-cresol - Medium: urine - Sampling time: End of shift - Notations: B (Background)
Regulatory reference	Biological Monitoring Guidelines (HSA, 2011)
Italy - Occupational Exposure Limits	
Local name	Toluene
OEL TWA	192 mg/m³
	50 ppm
Remark	Cute
Regulatory reference	Allegato XXXVIII del Decreto Legislativo 4 settembre 2024, n. 135
Latvia - Occupational Exposure Limits	
Local name	Toluols (metilbenzols)
OEL TWA	50 mg/m³
	14 ppm
OEL STEL	150 mg/m³
	40 ppm
Remark	Āda; ietekme uz dzirdi
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 191).
Lithuania - Occupational Exposure Limits	
Local name	Toluenas
IPRV (OEL TWA)	192 mg/m³
	50 ppm
TPRV (OEL STEL)	384 mg/m³
	100 ppm
Remark	R (reprodukcijai toksiškas poveikis); O (medžiaga į organizmą gali prasiskverbti pro nepažeistą odą)
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
Luxembourg - Occupational Exposure Limits	
Local name	Toluène
OEL TWA	192 mg/m³
	50 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	Peau

toluene (108-88-3)	
Regulatory reference	Mémorial A Nº 226 de 2021 concernant la protection de la sécurité et de la santé des salariés contre les risques liés à des agents chimiques sur le lieu de travail
Malta - Occupational Exposure Limits	
Local name	Toluene
OEL TWA	192 mg/m³
	50 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	Skin # Ġilda
Regulatory reference	S.L. 424.24 - Chemical Agents at Work Regulations (L.N. 356 of 2021) # L.S. 424.24 - Regolamenti dwar Aġenti Kimiċi fuq il-Post tax-Xogħol (A.L. 356 tal-2021)
Netherlands - Occupational Exposure Limits	
Local name	Tolueen
TGG-8u (OEL TWA)	150 mg/m³
	39 ppm
TGG-15min (OEL STEL)	384 mg/m³
	100 ppm
Regulatory reference	Arbeidsomstandighedenregeling 2024
Poland - Occupational Exposure Limits	
Local name	Toluen
NDS (OEL TWA)	100 mg/m³
NDSCh (OEL STEL)	200 mg/m³
Remark	Skóra (Oznakowanie substancji notacją „skóra” oznacza, że wchłanianie substancji przez skórę może być tak samo istotne jak przy narażeniu drogą oddechową).
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Indicative Occupational Exposure Limit (IOEL)	
Local name	Tolueno
IOEL TWA	192 mg/m³
	50 ppm
IOEL STEL	384 mg/m³
	100 ppm
Remark	Cutânea.
Regulatory reference	Decreto-Lei n.º 1/2021 de 6 de janeiro
Portugal - Occupational Exposure Limits	
Local name	Tolueno
OEL TWA	20 ppm
Remark	A4 (Agente não classificável como carcinogénico no Homem); IBE (Índice biológico de exposição)
Regulatory reference	Norma Portuguesa NP 1796:2014

toluene (108-88-3)	
Portugal - Biological Exposure Indices	
Local name	Tolueno
BEI	0.02 mg/l Parâmetro: Tolueno - Meio: sangue - Momento da amostragem: Antes do último turno da semana de trabalho 0.03 mg/l Parâmetro: Tolueno - Meio: urina - Momento da amostragem: Fim do turno 0.3 mg/g creatinine Parâmetro: o-Cresol - Meio: urina - Momento da amostragem: Fim do turno - Notaçao: Vb (Valor basal), Com hidrólise
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Toluen
OEL TWA	192 mg/m³
	50 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	P - posibilitatea unei penetrări cutanate importante; R2 - susceptibil de a dăuna fertilității
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Romania - Biological limit values	
Local name	Toluen
BLV	2 g/l Indicatorul biologic: Acid hipuric - Material biologic: urină - Momentul recoltării: sfârșit de schimb 3 mg/l Indicatorul biologic: o-cresol - Material biologic: urină - Momentul recoltării: sfârșit de schimb
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Serbia - Occupational Exposure Limits	
Local name	толуен
OEL TWA	192 mg/m³
	50 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	ЕУ** – напомена да се ради о хемијским материјама за које су утврђене индикативне граничне вредности изложености према Директиви 2006/15/ЕЗ (друга листа); К – напомена да хемијска материја може штетно деловати на кожу
Regulatory reference	ПРАВИЛНИК о превентивним мерама за безбедан и здрав рад при излагању хемијским материјама („Службени гласник РС”, бр. 106/09, 117/17 и 107/21)
Slovakia - Occupational Exposure Limits	
Local name	Toluén
NPHV (OEL TWA)	192 mg/m³
	50 ppm
NPHV (OEL STEL)	384 mg/m³
	100 ppm
Remark	K – znamená, že faktor môže byť ľahko absorbovaný kožou

toluene (108-88-3)	
Regulatory reference	Nariadenie vlády č. 355/2006 Z. z. (122/2024 Z. z.)
Slovakia - Biological limit values	
Local name	Toluén
BLV	600 µg/l Zisťovaný faktor: Toluén - Vyšetrovaný materiál: krv - Čas odberu vzorky: b) koniec expozície alebo pracovnej zmeny 1.5 mg/l Zisťovaný faktor: O-krezol - Vyšetrovaný materiál: moč - Čas odberu vzorky: c) pri dlhodobej expozícii; po viacerých pracovných zmenách, b) koniec expozície alebo pracovnej zmeny 2401 mg/l Zisťovaný faktor: Kyselina hipurová - Vyšetrovaný materiál: moč - Čas odberu vzorky: b) koniec expozície alebo pracovnej zmeny 1600 mg/g creatinine Zisťovaný faktor: Kyselina hipurová - Vyšetrovaný materiál: moč - Čas odberu vzorky: b) koniec expozície alebo pracovnej zmeny
Regulatory reference	Nariadenie vlády č. 355/2006 Z. z. (122/2024 Z. z.)
Slovenia - Occupational Exposure Limits	
Local name	toluen
OEL TWA	192 mg/m³
	50 ppm
OEL STEL	384 mg/m³
	100 ppm
Remark	K (Lastnost lažjega prehajanja snovi v organizem skozi kožo), Y (Snovi, pri katerih ni nevarnosti za zarodek ob upoštevanju mejnih vrednosti in bat vrednosti), BAT (Biološka mejna vrednost), EU
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Slovenia - Biological limit values	
Local name	toluen
BLV	600 µg/l Parameter: toluen - Biološki vzorec: kri - Čas vzorčenja: takoj po izpostavljenosti ob koncu delovne izmene 1.5 mg/l Parameter: o-krezol (po hidrolizi) - Biološki vzorec: urin - Čas vzorčenja: ob koncu delovne izmene, pri dolgotrajni izpostavljenosti: ob koncu delovne izmene po več zaporednih delavnikih 75 µg/l Parameter: toluen - Biološki vzorec: urin - Čas vzorčenja: takoj po izpostavljenosti ob koncu delovne izmene
Regulatory reference	Uradni list RS, št. 29/24 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Spain - Occupational Exposure Limits	
Local name	Tolueno
VLA-ED (OEL TWA)	192 mg/m³
	50 ppm
VLA-EC (OEL STEL)	384 mg/m³
	100 ppm

toluene (108-88-3)	
Remark	Vía dérmica (Indica que, en las exposiciones a esta sustancia, la aportación por la vía cutánea puede resultar significativa para el contenido corporal total si no se adoptan medidas para prevenir la absorción. En estas situaciones, es aconsejable la utilización del control biológico para poder cuantificar la cantidad global absorbida del contaminante), VLB® (Agente químico que tiene Valor Límite Biológico), VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo), r (Esta sustancia tiene establecidas restricciones a la fabricación, la comercialización o el uso en los términos especificados en el “Reglamento (CE) nº 1907/2006 sobre Registro, Evaluación, Autorización y Restricción de sustancias y preparados químicos” (REACH) de 18 de diciembre de 2006 (DOUE L 369 de 30 de diciembre de 2006). Las restricciones de una sustancia pueden aplicarse a todos los usos o sólo a usos concretos. El anexo XVII del Reglamento REACH contiene la lista de todas las sustancias restringidas y especifica los usos que se han restringido).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Spain - Biological limit values	
Local name	Tolueno
BLV	0.6 mg/l Parámetro: o-Cresol - Medio: Orina - Momento de muestreo: Final de la jornada laboral - Notas: F (Fondo. El indicador está generalmente presente en cantidades detectables en personas no expuestas laboraboralmente. Estos niveles de fondo están considerados en el valor VLB) 0.05 mg/l Parámetro: Tolueno - Medio: Sangre - Momento de muestreo: Principio de la última jornada de la semana laboral 0.08 mg/l Parámetro: Tolueno - Medio: Orina - Momento de muestreo: Final de la jornada laboral
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Toluen
NGV (OEL TWA)	192 mg/m³
	50 ppm
KGV (OEL STEL)	384 mg/m³
	100 ppm
Remark	B (Ämnet kan orsaka hörselskada. Exponering för ämnet nära det befintliga yrkeshygieniska gränsvärdet och vid samtidig exponering för buller nära insatsvärdet 80 dB kan orsaka hörselskada); H (Ämnet kan lätt upptas genom huden. Det föreskrivna gränsvärdet bedöms ge tillräckligt skydd endast under förutsättning att huden är skyddad mot exponering för ämnet ifråga)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Toluene
WEL TWA (OEL TWA)	191 mg/m³
	50 ppm
WEL STEL (OEL STEL)	384 mg/m³
	100 ppm
Remark	Sk (Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE

toluene (108-88-3)	
Iceland - Occupational Exposure Limits	
Local name	Tólúen (fenýlmetan, metýlbensen)
OEL TWA	94 mg/m³
	25 ppm
OEL STEL	188 mg/m³
	50 ppm
Remark	H (efnið getur auðveldlega borist inn í líkamann gegnum húð)
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Toluen
Grenseverdi (OEL TWA)	94 mg/m³
	25 ppm
Remark	H: Kjemikalier som kan tas opp gjennom huden; E: EU har en veiledende grenseverdi og/eller anmerkning for stoffet.
Regulatory reference	FOR-2024-04-05-581
North Macedonia - Occupational Exposure Limits	
Local name	Толуен
OEL TWA	192 mg/m³
	50 ppm
KTV	2
Short time value [mg/m³]	384 mg/m³
Short time value [ppm]	100 ppm
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанци во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусо време. Изложеноста на краткотрајни вредности може да трае најмногу 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m3 или во ml/m3(ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност; (К) својство на полесно пренесување на супстанците во организмот преку кожата; (BAT) биолошка гранична вредност – праг на биолошка гранична вредност, што значи предупредување на опасна хемиска супстанца и нејзини метаболити во ткивата, телесните течности или издишувањето на воздухот, без оглед на тоа, дали опасната хемиска супстанца е внесена во организмот со вдишување, голтање или преку кожата; (EU) European Union – гранична вредност, определена на ниво на Европската унија
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанци („Службен весник на Република Македонија” бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	Toluène / Toluol
MAK (OEL TWA)	190 mg/m³

toluene (108-88-3)	
	50 ppm
KZGW (OEL STEL)	760 mg/m³
	200 ppm
Notation	R, R2, SS_C, O^B, B / H, R2, SS_C, O^L, B
Remark	INRS, HSE, NIOSH, DFG
Regulatory reference	www.suva.ch, 01.01.2025
Switzerland - BAT	
Local name	Toluène / Toluol
BAT	2 g/g creatinine (1.26 mmol/mmol cr.; Paramètre biologique: Acide hippurique; Substrat d'examen: Urine; Moment du prélèvement: Fin de l'exposition, de la période de travail. Exposition de longue durée: après plusieurs périodes de travail; Remarques: Paramètre non spécifique. Influence de l'environnement.) / (1.26 mmol/mmol cr.; Biologischer Parameter: Hippursäure; Untersuchungsmaterial: Urin; Probennahmezeitpunkt: Expositionsende, bzw. Schichtende. Bei Langzeitexposition: nach mehreren vorangegangenen Schichten; Bemerkungen: Nicht spezifischer Parameter. Umwelteinflüsse.) 0.5 mg/l (4.62 µmol/l; Paramètre biologique: o-Crésol; Substrat d'examen: Urine; Moment du prélèvement: Fin de l'exposition, de la période de travail. Exposition de longue durée: après plusieurs périodes de travail; Remarques: Interprétation quantitative difficile.) / (4.62 µmol/l; Biologischer Parameter: o-Kresol; Untersuchungsmaterial: Urin; Probennahmezeitpunkt: Expositionsende, bzw. Schichtende. Bei Langzeitexposition: nach mehreren vorangegangenen Schichten; Bemerkungen: Quantitative Interpretation schwierig.) 600 µg/l (6.48 µmol/l; Paramètre biologique: Toluène; Substrat d'examen: Sang complet; Moment du prélèvement: Fin de l'exposition, de la période de travail.) / (6.48 µmol/l; Biologischer Parameter: Toluol; Untersuchungsmaterial: Vollblut; Probennahmezeitpunkt: Expositionsende, bzw. Schichtende.) 75 µg/l (Paramètre biologique: Toluène; Substrat d'examen: Urine; Moment du prélèvement: Fin de l'exposition, de la période de travail.) / (Biologischer Parameter: Toluol; Untersuchungsmaterial: Urin; Probennahmezeitpunkt: Expositionsende, bzw. Schichtende.)
Regulatory reference	Ordonnance 832.30 (OPA), article 50 al. 3, www.suva.ch/valeurs-limites / Verordnung 832.30 (VUV), Art. 50 Abs. 3, www.suva.ch/grenzwerte
USA - ACGIH - Occupational Exposure Limits	
Local name	Toluene
ACGIH OEL TWA	20 ppm
Remark (ACGIH)	TLV® Basis: CNS, visual & hearing impair; female repro system eff; pregnancy loss. Notations: OTO; A4 (Not classifiable as a Human Carcinogen); BEI
Regulatory reference	ACGIH 2024
USA - ACGIH - Biological Exposure Indices	
Local name	Toluene
BEI	0.3 mg/g creatinine Parameter: o-Cresol (with hydrolysis) - Medium: urine - Sampling time: End of shift - Notations: B 0.03 mg/l Parameter: Toluene - Medium: urine - Sampling time: End of shift 0.02 mg/l Parameter: Toluene - Medium: blood - Sampling time: Prior to last shift of workweek
Regulatory reference	ACGIH 2024

n-hexane (110-54-3)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	n-Hexane
IOEL TWA	72 mg/m³
	20 ppm
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
Albania - Occupational Exposure Limits	
Local name	n-Hekzan
OEL TWA	72 mg/m³
	20 ppm
Regulatory reference	VENDIM Nr. 522, datë 6.8.2014 PËR MIRATIMIN E RREGULLORES “PËR MBROJTJEN E SIGURISË DHE SHËNDETIT TË PUNËMARRËSVE NGA RISQET E LIDHURA ME AGJENTËT KIMIKË NË PUNË”
Austria - Occupational Exposure Limits	
Local name	n-Hexan
MAK (OEL TWA)	72 mg/m³
	20 ppm
MAK (OEL STEL)	288 mg/m³ (4x 15(Miw) min)
	80 ppm (4x 15(Miw) min)
Remark	Fortpflanzungsgefährdend: f
Regulatory reference	BGBl. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	n-Hexane # n-Hexaan
OEL TWA	72 mg/m³
	20 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	n-Хексан
OEL TWA	72 mg/m³
	20 ppm
Remark	• (Химични агенти, за които са определени гранични стойности във въздуха на работната среда за Европейската общност)
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
Local name	n-Heksan
GVI (OEL TWA)	72 mg/m³
	20 ppm
Remark	Direktiva: 2006/15/EZ. Napomena: Koža (razvrstana kao tvar koja nadražuje kožu (H315))

n-hexane (110-54-3)	
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Croatia - Biological limit values	
Local name	n-Heksan
BLV	1.74 µmol/l Karakteristični pokazatelj: n-heksan - Biološki uzorak: krv - Vrijeme uzorkovanja: za vrijeme izloženosti 150 µg/l Karakteristični pokazatelj: n-heksan - Biološki uzorak: krv - Vrijeme uzorkovanja: za vrijeme izloženosti 1.66 µmol/l Karakteristični pokazatelj: n-heksan - Biološki uzorak: krajnje izdahnuti zrak - Vrijeme uzorkovanja: za vrijeme izloženosti 40 ppm Karakteristični pokazatelj: n-heksan - Biološki uzorak: krajnje izdahnuti zrak - Vrijeme uzorkovanja: za vrijeme izloženosti 0.22 mmol/mol Creatinine Karakteristični pokazatelj: 2-heksanol - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene - Napomena: interferencija istodobne izloženosti metil etil-ketonu 0.2 mg/g creatinine Karakteristični pokazatelj: 2-heksanol - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene - Napomena: interferencija istodobne izloženosti metil etil-ketonu 5.25 mmol/mol Creatinine Karakteristični pokazatelj: 2,5-heksandion - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene - Napomena: interferencija istodobne izloženosti metil etil-ketonu 5.3 mg/g creatinine Karakteristični pokazatelj: 2,5-heksandion - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene - Napomena: interferencija istodobne izloženosti metil etil-ketonu
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 91/2018)
Cyprus - Occupational Exposure Limits	
Local name	n-εξάνιο
OEL TWA	72 mg/m³
	20 ppm
Regulatory reference	Κανονισμοί του 2007 (Κ.Δ.Π. 295/2007)
Czech Republic - Occupational Exposure Limits	
Local name	n-Hexan
PEL (OEL TWA)	70 mg/m³
	19.5 ppm
NPK-P (OEL C)	200 mg/m³
	55.8 ppm
Remark	I - dráždí sliznice (oči, dýchací cesty) resp. kůži, D - při expozici se významně uplatňuje pronikání faktoru kůží, P - u látky nelze vyloučit závažné pozdní účinky (s větou H372, H373).
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	n-Hexan
OEL TWA	72 mg/m³
	20 ppm
Remark	E (betyder, at stoffet har en EU-grænseværdi)

n-hexane (110-54-3)	
Regulatory reference	BEK nr 1619 af 19/12/2024
Estonia - Occupational Exposure Limits	
Local name	n-heksaan
OEL TWA	72 mg/m³
	20 ppm
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	n-Heksaani
HTP (OEL TWA)	72 mg/m³
	20 ppm
Remark	Iho
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	n-Hexane
VME (OEL TWA)	72 mg/m³
	20 ppm
Remark	Valeurs règlementaires contraignantes. Toxique pour la reproduction de catégorie 2
Regulatory reference	Article R4412-149 du Code du travail (réf.: INRS ED 6443, 2022; Outil65; Décret n° 2019-1487; Décret n° 2020-1546; Décret n° 2021-434; Décret n° 2021-1849)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	n-Hexan
AGW (OEL TWA)	180 mg/m³
	50 ppm
Peak exposure limitation factor	8(II)
Remark	DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission); EU - Europäische Union (Von der EU wurde ein Luftgrenzwert festgelegt: Abweichungen bei Wert und Spitzenbegrenzung sind möglich); Y - Ein Risiko der Fruchtschädigung braucht bei Einhaltung des Arbeitsplatzgrenzwertes und des biologischen Grenzwertes (BGW) nicht befürchtet zu werden
Regulatory reference	TRGS900
Germany - Biological limit values (TRGS 903)	
Local name	Hexan (n-Hexan)
Biological limit value	5 mg/l Parameter: 2,5-Hexandion plus 4,5-Dihydroxy-2-hexanon (nach Hydrolyse) - Untersuchungsmaterial: U = Urin - Probenahmezeitpunkt: b) Expositionsende, bzw. Schichtende - Festlegung/Begründung: 05/2013 DFG
Regulatory reference	TRGS 903
Gibraltar - Occupational Exposure Limits	
Local name	n-Hexane
OEL TWA	72 mg/m³
	20 ppm

n-hexane (110-54-3)	
Regulatory reference	Factories (Control of Chemical Agents at Work) Regulations 2003 (LN. 2018/181)
Greece - Occupational Exposure Limits	
Local name	Εξάνιο, n− (n− εξάνιο)
OEL TWA	72 mg/m³
	20 ppm
Regulatory reference	Π.Δ. 162/2007 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	n-HEXÁN
AK (OEL TWA)	72 mg/m³
	20 ppm
Remark	b (Bőrön át is felszívódik), i (ingerlő anyag, amely izgatja a bőrt, nyálkahártyát, szemet vagy mindhármat), BEM (biológiai expozíciós mutató); EU2 (2006/15/EK irányelvben közölt érték); T (Azok az anyagok, amelyek egészségkárosító hatása TARTÓS expozíciót követően jelentkezik)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Hungary - Biological Exposure Indices	
Local name	n-Hexán
BEI	2 mg/l Biológiai expozíciós (hatás) mutató: 2,5-hexán-dion (hidrolízis után) - Biológiai minta: vizeletben - Mintavétel ideje: m.v. (műszak végén) 18 µmol/l Biológiai expozíciós (hatás) mutató: 2,5-hexán-dion (hidrolízis után) - Biológiai minta: vizeletben - Mintavétel ideje: m.v. (műszak végén)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	n-Hexane
OEL TWA	72 mg/m³
	20 ppm
Remark	IOELV (Indicative Occupational Exposure Limit Values), Skin (Substances which have the capacity to penetrate intact skin when they come in contact with it and be absorbed into the body. A substantial contribution to the total body burden via dermal exposure is possible)
Regulatory reference	Chemical Agents Code of Practice 2024
Ireland - Biological limit values	
Local name	Hexane
BMGV	0.4 mg/l Parameter: 2,5-Hexanedion - Medium: urine - Sampling time: End of shift at end of workweek
Regulatory reference	Biological Monitoring Guidelines (HSA, 2011)
Italy - Occupational Exposure Limits	
Local name	n-Esano
OEL TWA	72 mg/m³

n-hexane (110-54-3)	
	20 ppm
Regulatory reference	Allegato XXXVIII del Decreto Legislativo 4 settembre 2024, n. 135
Latvia - Occupational Exposure Limits	
Local name	n-Heksāns
OEL TWA	72 mg/m³
	20 ppm
Remark	Ietekme uz dzirdi
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 191).
Lithuania - Occupational Exposure Limits	
Local name	n-heksanas
IPRV (OEL TWA)	72 mg/m³
	20 ppm
Remark	R (reprodukcijai toksiškas poveikis)
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
Luxembourg - Occupational Exposure Limits	
Local name	n-Hexane
OEL TWA	72 mg/m³
	20 ppm
Regulatory reference	Mémorial A Nº 226 de 2021 concernant la protection de la sécurité et de la santé des salariés contre les risques liés à des agents chimiques sur le lieu de travail
Malta - Occupational Exposure Limits	
Local name	n-Hexane
OEL TWA	72 mg/m³
	20 ppm
Regulatory reference	S.L. 424.24 - Chemical Agents at Work Regulations (L.N. 356 of 2021) # L.S. 424.24 - Regolamenti dwar Aġenti Kimiċi fuq il-Post tax-Xogħol (A.L. 356 tal-2021)
Netherlands - Occupational Exposure Limits	
Local name	n-Hexaan
TGG-8u (OEL TWA)	72 mg/m³
	20 ppm
TGG-15min (OEL STEL)	144 mg/m³
	40 ppm
Regulatory reference	Arbeidsomstandighedenregeling 2024
Portugal - Indicative Occupational Exposure Limit (IOEL)	
Local name	n-Hexano
IOEL TWA	72 mg/m³
	20 ppm
Regulatory reference	Decreto-Lei n.º 1/2021 de 6 de janeiro

n-hexane (110-54-3)	
Portugal - Occupational Exposure Limits	
Local name	n-Hexano
OEL TWA	50 ppm
Remark	P (Toxicidade percutânea); IBE (Índice biológico de exposição)
Regulatory reference	Norma Portuguesa NP 1796:2014
Portugal - Biological Exposure Indices	
Local name	n-Hexano
BEI	0.4 mg/l Parâmetro: 2,5-Hexanodiona - Meio: urina - Momento da amostragem: Fim do turno no fim da semana de trabalho - Notaçao: Sem hidrólise
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	n-Hexan
OEL TWA	72 mg/m³
	20 ppm
Remark	R2 - susceptibil de a dăuna fertilității
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Romania - Biological limit values	
Local name	N-hexan
BLV	5 mg/g creatinine Indicatorul biologic: 2,5 hexandionă - Material biologic: urină - Momentul recoltării: sfârșit de schimb
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Serbia - Occupational Exposure Limits	
Local name	н-хексан
OEL TWA	72 mg/m³
	20 ppm
Remark	ЕУ** – напомена да се ради о хемијским материјама за које су утврђене индикативне граничне вредности изложености према Директиви 2006/15/ЕЗ (друга листа)
Regulatory reference	ПРАВИЛНИК о превентивним мерама за безбедан и здрав рад при излагању хемијским материјама („Службени гласник РС”, бр. 106/09, 117/17 и 107/21)
Slovakia - Occupational Exposure Limits	
Local name	n-Hexán
NPHV (OEL TWA)	72 mg/m³
	20 ppm
NPHV (OEL STEL)	140 mg/m³
	40 ppm
Regulatory reference	Nariadenie vlády č. 355/2006 Z. z. (122/2024 Z. z.)
Slovakia - Biological limit values	
Local name	n-Hexán

n-hexane (110-54-3)	
BLV	5 mg/l Zisťovaný faktor: 2,5-Hexándion a 4,5-dihydroxy-2-hexanón - Vyšetrovaný materiál: moč - Čas odberu vzorky: b) koniec expozície alebo pracovnej zmeny
Regulatory reference	Nariadenie vlády č. 355/2006 Z. z. (122/2024 Z. z.)
Slovenia - Occupational Exposure Limits	
Local name	n-heksan
OEL TWA	72 mg/m³
	20 ppm
OEL STEL	576 mg/m³
	160 ppm
Remark	Y (Snovi, pri katerih ni nevarnosti za zarodek ob upoštevanju mejnih vrednosti in bat vrednosti), BAT (Biološka mejna vrednost), EU
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Slovenia - Biological limit values	
Local name	n-heksan
BLV	5 mg/l Parameter: 2,5-heksandion in 4,5-dihidroksi-2-heksanon (po hidrolizi) - Biološki vzorec: urin - Čas vzorčenja: ob koncu delovne izmene
Regulatory reference	Uradni list RS, št. 29/24 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Spain - Occupational Exposure Limits	
Local name	n-Hexano
VLA-ED (OEL TWA)	72 mg/m³
	20 ppm
Remark	VLB® (Agente químico que tiene Valor Límite Biológico), VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Spain - Biological limit values	
Local name	n-Hexano
BLV	0.2 mg/l Parámetro: 2,5-Hexanodiona - Medio: Orina - Momento de muestreo: Final de la semana laboral - Notas: Sin hidrólisis
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	n-Hexan
NGV (OEL TWA)	72 mg/m³
	20 ppm
KGV (OEL STEL)	180 mg/m³
	50 ppm
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	n-Hexane

n-hexane (110-54-3)	
WEL TWA (OEL TWA)	72 mg/m³
	20 ppm
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	n-Hexan
OEL TWA	72 mg/m³
	20 ppm
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	n-heksan
Grenseverdi (OEL TWA)	72 mg/m³
	20 ppm
Remark	R: Kjemikalier som skal betraktes som reproduksjonstoksiske; E: EU har en veiledende grenseverdi og/eller anmerkning for stoffet.
Regulatory reference	FOR-2024-04-05-581
North Macedonia - Occupational Exposure Limits	
Local name	n-хексан
OEL TWA	72 mg/m³
	20 ppm
Remark	(*) дополнување на граничната вредност заради донесената Директива на Комисијата 2006/15ES од 7 февруари 2006 за создавање на втора листа на индикативни гранични вредности за професионална изложеност според директивата 98/24/EC и за измените на директивата 91/322/EEC и директивата 2000/39/ EC (Сл. весник бр. 38 од ден 9.2.2006, стр. 36); (BAT) биолошка гранична вредност – праг на биолошка гранична вредност, што значи предупредување на опасна хемиска супстанца и нејзини метаболити во ткивата, телесните течности или издишувањето на воздухот, без оглед на тоа, дали опасната хемиска супстанца е внесена во организмот со вдишување, голтање или преку кожата; (EU) European Union – гранична вредност, определена на ниво на Европската унија
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанци („Службен весник на Република Македонија” бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	n-Hexane / n-Hexan
MAK (OEL TWA)	180 mg/m³
	50 ppm
KZGW (OEL STEL)	1440 mg/m³
	400 ppm
Notation	R, R2, SS_C, B / H, R2, SS_C, B
Remark	NIOSH
Regulatory reference	www.suva.ch, 01.01.2025

n-hexane (110-54-3)	
Switzerland - BAT	
Local name	n-Hexane / n-Hexan
BAT	5 mg/l (Paramètre biologique: 2,5-Hexanedione + 4,5-Dihydroxy-2-hexanone; Substrat d'examen: Urine; Moment du prélèvement: Fin de l'exposition, de la période de travail.) / (Biologischer Parameter: 2,5-Hexandion plus 4,5-Dihydroxy-2-hexanon; Untersuchungsmaterial: Urin; Probennahmezeitpunkt: Expositionsende, bzw. Schichtende.)
Remark	Paramètre non spécifique. / Nicht spezifischer Parameter.
Regulatory reference	Ordonnance 832.30 (OPA), article 50 al. 3, www.suva.ch/valeurs-limites / Verordnung 832.30 (VUV), Art. 50 Abs. 3, www.suva.ch/grenzwerte
USA - ACGIH - Occupational Exposure Limits	
Local name	n-Hexane
ACGIH OEL TWA	50 ppm
Remark (ACGIH)	TLV® Basis: CNS impair; peripheral neuropathy; eye irr. Notations: Skin; BEI
Regulatory reference	ACGIH 2024
USA - ACGIH - Biological Exposure Indices	
Local name	n-Hexane
BEI	0.5 mg/l Parameter: 2,5-Hexanedione (without hydrolysis) - Medium: urine - Sampling time: End of shift
Regulatory reference	ACGIH 2024

cyclohexane (110-82-7)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Cyclohexane
IOEL TWA	700 mg/m³
	200 ppm
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
Albania - Occupational Exposure Limits	
Local name	Ciklohekzan
OEL TWA	700 mg/m³
	200 ppm
Regulatory reference	VENDIM Nr. 522, datë 6.8.2014 PËR MIRATIMIN E RREGULLORES "PËR MBROJTJEN E SIGURISË DHE SHËNDETIT TË PUNËMARRËSVE NGA RISQET E LIDHURA ME AGJENTËT KIMIKË NË PUNË"
Austria - Occupational Exposure Limits	
Local name	Cyclohexan
MAK (OEL TWA)	700 mg/m³
	200 ppm
MAK (OEL STEL)	2800 mg/m³ (4x 15(Miw) min)
	800 ppm (4x 15(Miw) min)
Regulatory reference	BGBl. II Nr. 156/2021

cyclohexane (110-82-7)	
Belgium - Occupational Exposure Limits	
Local name	Cyclohexane # Cyclohexaan
OEL TWA	350 mg/m³
	100 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	Циклохексан
OEL TWA	700 mg/m³
	200 ppm
Remark	• (Химични агенти, за които са определени гранични стойности във въздуха на работната среда за Европейската общност)
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
Local name	Cikloheksan
GVI (OEL TWA)	700 mg/m³
	200 ppm
Remark	Direktiva: 2006/15/EZ. Napomena: Koža (razvrstana kao tvar koja nadražuje kožu (H315))
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 148/2023)
Croatia - Biological limit values	
Local name	Cikloheksan
BLV	150 mg/g creatinine Karakteristični pokazatelj: 1,2-cikloheksandiol - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene (kod kronične izloženosti nakon nekolito uzastopnih smjena) 146 mmol/mol Creatinine Karakteristični pokazatelj: 1,2-cikloheksandiol - Biološki uzorak: mokraća - Vrijeme uzorkovanja: na kraju radne smjene (kod kronične izloženosti nakon nekolito uzastopnih smjena) 4.49 µmol/l Karakteristični pokazatelj: cikloheksanol - Biološki uzorak: krv - Vrijeme uzorkovanja: za vrijeme izloženosti 450 µg/l Karakteristični pokazatelj: cikloheksanol - Biološki uzorak: krv - Vrijeme uzorkovanja: za vrijeme izloženosti 3.61 mmol/mol Creatinine Karakteristični pokazatelj: cikloheksanol - Biološki uzorak: mokraća - Vrijeme uzorkovanja: za vrijeme druge polovice radne smjene 3.2 mg/g creatinine Karakteristični pokazatelj: cikloheksanol - Biološki uzorak: mokraća - Vrijeme uzorkovanja: za vrijeme druge polovice radne smjene
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 91/2018)
Cyprus - Occupational Exposure Limits	
Local name	Κυκλοεξάνιο
OEL TWA	7000 mg/m³
	200 ppm
Regulatory reference	Κανονισμοί του 2007 (Κ.Δ.Π. 295/2007)

cyclohexane (110-82-7)	
Czech Republic - Occupational Exposure Limits	
Local name	Cyklohexan
PEL (OEL TWA)	700 mg/m³
	200 ppm
NPK-P (OEL C)	2000 mg/m³
	572 ppm
Remark	I - dráždí sliznice (oči, dýchací cesty) resp. kůži.
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Cyclohexan
OEL TWA	172 mg/m³
	50 ppm
Remark	E (betyder, at stoffet har en EU-grænseværdi)
Regulatory reference	BEK nr 1619 af 19/12/2024
Estonia - Occupational Exposure Limits	
Local name	Tsükloheksaan
OEL TWA	700 mg/m³
	200 ppm
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	Sykloheksaani
HTP (OEL TWA)	350 mg/m³
	100 ppm
HTP (OEL STEL)	875 mg/m³
	250 ppm
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	Cyclohexane
VME (OEL TWA)	700 mg/m³
	200 ppm
VLE (OEL C/STEL)	1300 mg/m³
	375 ppm
Remark	Valeurs règlementaires contraignantes. La VLEP CT n'est pas réglementaire et provient d'une circulaire du ministère chargé du travail
Regulatory reference	Article R4412-149 du Code du travail et circulaire du Ministère du travail (réf.: INRS ED 6443, 2022; Outil65; Décret n° 2019-1487; Décret n° 2020-1546; Décret n° 2021-434; Décret n° 2021-1849)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Cyclohexan

cyclohexane (110-82-7)	
AGW (OEL TWA)	700 mg/m³
	200 ppm
Peak exposure limitation factor	4(II)
Remark	DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission); EU - Europäische Union (Von der EU wurde ein Luftgrenzwert festgelegt: Abweichungen bei Wert und Spitzenbegrenzung sind möglich)
Regulatory reference	TRGS900
Germany - Biological limit values (TRGS 903)	
Local name	Cyclohexan
Biological limit value	150 mg/g creatinine Parameter: 1,2-Cyclohexandiol (nach Hydrolyse) - Untersuchungsmaterial: U = Urin - Probenahmezeitpunkt: c) am Schichtende, bei Langzeitexposition nach mehreren vorangegangenen Schichten - Festlegung/Begründung: 05/2024 DFG
Regulatory reference	TRGS 903
Gibraltar - Occupational Exposure Limits	
Local name	Cyclohexane
OEL TWA	700 mg/m³
	200 ppm
Regulatory reference	Factories (Control of Chemical Agents at Work) Regulations 2003 (LN. 2018/181)
Greece - Occupational Exposure Limits	
Local name	Κυκλοεξάνιο
OEL TWA	700 mg/m³
	200 ppm
Regulatory reference	Π.Δ. 162/2007 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	CIKLOHEXÁN
AK (OEL TWA)	700 mg/m³
	200 ppm
Remark	EU2 (2006/15/EK irányelvben közölt érték); N (Irritáló anyagok, egyszerű fojtógázok, csekély egészségkárosító hatással bíró anyagok)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Cyclohexane
OEL TWA	700 mg/m³
	200 ppm
Remark	IOELV (Indicative Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Italy - Occupational Exposure Limits	
Local name	Cicloesano

cyclohexane (110-82-7)	
OEL TWA	350 mg/m³
	100 ppm
Regulatory reference	Allegato XXXVIII del Decreto Legislativo 4 settembre 2024, n. 135
Latvia - Occupational Exposure Limits	
Local name	Cikloheksāns
OEL TWA	80 mg/m³
	23 ppm
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 191).
Lithuania - Occupational Exposure Limits	
Local name	Cikloheksanas
IPRV (OEL TWA)	700 mg/m³
	200 ppm
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
Luxembourg - Occupational Exposure Limits	
Local name	Cyclohexane
OEL TWA	700 mg/m³
	200 ppm
Regulatory reference	Mémorial A Nº 226 de 2021 concernant la protection de la sécurité et de la santé des salariés contre les risques liés à des agents chimiques sur le lieu de travail
Malta - Occupational Exposure Limits	
Local name	Cyclohexane
OEL TWA	700 mg/m³
	200 ppm
Regulatory reference	S.L. 424.24 - Chemical Agents at Work Regulations (L.N. 356 of 2021) # L.S. 424.24 - Regolamenti dwar Aġenti Kimiċi fuq il-Post tax-Xogħol (A.L. 356 tal-2021)
Netherlands - Occupational Exposure Limits	
Local name	Cyclohexaan
TGG-8u (OEL TWA)	700 mg/m³
	200 ppm
TGG-15min (OEL STEL)	1400 mg/m³
	400 ppm
Regulatory reference	Arbeidsomstandighedenregeling 2024
Poland - Occupational Exposure Limits	
Local name	Cykloheksan
NDS (OEL TWA)	300 mg/m³
NDSCh (OEL STEL)	1000 mg/m³
Remark	Skóra (Oznakowanie substancji notacją „skóra” oznacza, że wchłanianie substancji przez skórę może być tak samo istotne jak przy narażeniu drogą oddechową).

cyclohexane (110-82-7)	
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Indicative Occupational Exposure Limit (IOEL)	
Local name	Ciclo-hexano
IOEL TWA	700 mg/m³
	200 ppm
Regulatory reference	Decreto-Lei n.º 1/2021 de 6 de janeiro
Portugal - Occupational Exposure Limits	
Local name	Ciclo-hexano
OEL TWA	100 ppm
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Ciclohexan
OEL TWA	700 mg/m³
	200 ppm
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 179/2024)
Serbia - Occupational Exposure Limits	
Local name	циклохексан
OEL TWA	700 mg/m³
	200 ppm
Remark	ЕУ** – напомена да се ради о хемијским материјама за које су утврђене индикативне граничне вредности изложености према Директиви 2006/15/ЕЗ (друга листа)
Regulatory reference	ПРАВИЛНИК о превентивним мерама за безбедан и здрав рад при излагању хемијским материјама („Службени гласник РС”, бр. 106/09, 117/17 и 107/21)
Slovakia - Occupational Exposure Limits	
Local name	Cyklohexán
NPHV (OEL TWA)	700 mg/m³
	200 ppm
Regulatory reference	Nariadenie vlády č. 355/2006 Z. z. (122/2024 Z. z.)
Slovenia - Occupational Exposure Limits	
Local name	cikloheksan
OEL TWA	700 mg/m³
	200 ppm
OEL STEL	2800 mg/m³
	800 ppm
Remark	BAT (Biološka mejna vrednost), EU
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Slovenia - Biological limit values	
Local name	cikloheksan

cyclohexane (110-82-7)	
BLV	150 mg/g creatinine Parameter: 1,2-cikloheksandiol (po hidrolizi) - Biološki vzorec: urin - Čas vzorčenja: ob koncu delovne izmene, pri dolgotrajni izpostavljenosti: ob koncu delovne izmene po več zaporednih delavnikih
Regulatory reference	Uradni list RS, št. 29/24 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Spain - Occupational Exposure Limits	
Local name	Ciclohexano
VLA-ED (OEL TWA)	700 mg/m³
	200 ppm
Remark	VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo), r (Esta sustancia tiene establecidas restricciones a la fabricación, la comercialización o el uso en los términos especificados en el “Reglamento (CE) nº 1907/2006 sobre Registro, Evaluación, Autorización y Restricción de sustancias y preparados químicos” (REACH) de 18 de diciembre de 2006 (DOUE L 369 de 30 de diciembre de 2006). Las restricciones de una sustancia pueden aplicarse a todos los usos o sólo a usos concretos. El anexo XVII del Reglamento REACH contiene la lista de todas las sustancias restringidas y especifica los usos que se han restringido).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Sweden - Occupational Exposure Limits	
Local name	Cyklohexan
NGV (OEL TWA)	700 mg/m³
	200 ppm
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Cyclohexane
WEL TWA (OEL TWA)	350 mg/m³
	100 ppm
WEL STEL (OEL STEL)	1050 mg/m³
	300 ppm
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Sýklóhexan
OEL TWA	175 mg/m³
	50 ppm
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
North Macedonia - Occupational Exposure Limits	
Local name	циклохексан
OEL TWA	700 mg/m³
	200 ppm

cyclohexane (110-82-7)	
Remark	(BAT) биолошка гранична вредност – праг на биолошка гранична вредност, што значи предупредување на опасна хемиска супстанца и нејзини метаболити во ткивата, телесните течности или издишувањето на воздухот, без оглед на тоа, дали опасната хемиска супстанца е внесена во организмот со вдишување, голтање или преку кожата; (EU) European Union – гранична вредност, определена на ниво на Европската унија
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанци („Службен весник на Република Македонија" бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	Cyclohexane / Cyclohexan
MAK (OEL TWA)	700 mg/m³
	200 ppm
KZGW (OEL STEL)	2800 mg/m³
	800 ppm
Notation	B / B
Remark	NIOSH
Regulatory reference	www.suva.ch, 01.01.2025
Switzerland - BAT	
Local name	Cyclohexane / Cyclohexan
BAT	150 mg/g creatinine (146 µmol/mmol cr.; Paramètre biologique: 1,2-Cyclohexanediol total; Substrat d'examen: Urine; Moment du prélèvement: Fin de l'exposition, de la période de travail. Exposition de longue durée: après plusieurs périodes de travail.) / (146 µmol/mmol cr.; Biologischer Parameter: Gesamt-1,2-Cyclohexandiol; Untersuchungsmaterial: Urin; Probennahmezeitpunkt: Expositionsende, bzw. Schichtende. Bei Langzeitexposition: nach mehreren vorangegangenen Schichten.)
Regulatory reference	Ordonnance 832.30 (OPA), article 50 al. 3, www.suva.ch/valeurs-limites / Verordnung 832.30 (VUV), Art. 50 Abs. 3, www.suva.ch/grenzwerte
USA - ACGIH - Occupational Exposure Limits	
Local name	Cyclohexane
ACGIH OEL TWA	100 ppm
Remark (ACGIH)	TLV® Basis: CNS impair
Regulatory reference	ACGIH 2024
USA - ACGIH - Biological Exposure Indices	
Local name	Cyclohexane
BEI	50 mg/g creatinine Parameter: 1,2-Cyclohexanediol - Medium: urine - Sampling time: End of shift, end of workweek - Notations: Ns
Regulatory reference	ACGIH 2024
2,2-dimethylbutane (75-83-2)	
Austria - Occupational Exposure Limits	
Local name	Hexan (alle Isomeren außer n-Hexan und Methylcyclopentan): 2,2-Dimethylbutan
MAK (OEL TWA)	715 mg/m³
	200 ppm

2,2-dimethylbutane (75-83-2)	
MAK (OEL STEL)	2860 mg/m³ (4x 15(Miw) min)
	800 ppm (4x 15(Miw) min)
Regulatory reference	BGBl. II Nr. 156/2021
Czech Republic - Occupational Exposure Limits	
Local name	Hexan isomery: 2,2-Dimethylbutan
PEL (OEL TWA)	1000 mg/m³
	279 ppm
NPK-P (OEL C)	2000 mg/m³
	558 ppm
Remark	I - dráždí sliznice (oči, dýchací cesty) resp. kůži.
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Finland - Occupational Exposure Limits	
Local name	2,2-Dimetyylibutaani
HTP (OEL TWA)	1800 mg/m³
	500 ppm
HTP (OEL STEL)	2300 mg/m³
	630 ppm
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	2,2-Dimethylbutan
AGW (OEL TWA)	1800 mg/m³
	500 ppm
Peak exposure limitation factor	2(II)
Remark	DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission)
Regulatory reference	TRGS900
Poland - Occupational Exposure Limits	
Local name	Heksanu izomery acykliczne nasycone, z wyjątkiem heksanu: 2,2-dimetylobutan
NDS (OEL TWA)	400 mg/m³
NDSCh (OEL STEL)	1200 mg/m³
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Slovenia - Occupational Exposure Limits	
Local name	2,2-dimetilbutan
OEL TWA	1800 mg/m³
	500 ppm
OEL STEL	3600 mg/m³
	1000 ppm

2,2-dimethylbutane (75-83-2)	
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Sweden - Occupational Exposure Limits	
Local name	2,2-Dimetylbutan
NGV (OEL TWA)	700 mg/m³
	200 ppm
KGV (OEL STEL)	1100 mg/m³
	300 ppm
Remark	V (Vägledande korttidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
North Macedonia - Occupational Exposure Limits	
Local name	2,2-диметилбутан
OEL TWA	720 mg/m³
	200 ppm
KTV	4
Short time value [mg/m³]	2880 mg/m³
Short time value [ppm]	800 ppm
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанци во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусо време. Изложеноста на краткотрајни вредности може да трае најмногу 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m3 или во ml/m3(ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанци („Службен весник на Република Македонија” бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	2,2-Diméthylbutane / 2,2-Dimethylbutan
MAK (OEL TWA)	1800 mg/m³
	500 ppm
KZGW (OEL STEL)	3600 mg/m³
	1000 ppm
Remark	NIOSH
Regulatory reference	www.suva.ch, 01.01.2025
2,3-dimethylbutane (79-29-8)	
Austria - Occupational Exposure Limits	
Local name	Hexan (alle Isomeren außer n-Hexan und Methylcyclopentan): 2,3-Dimethylbutan
MAK (OEL TWA)	715 mg/m³
	200 ppm

2,3-dimethylbutane (79-29-8)	
MAK (OEL STEL)	2860 mg/m³ (4x 15(Miw) min)
	800 ppm (4x 15(Miw) min)
Regulatory reference	BGBl. II Nr. 156/2021
Czech Republic - Occupational Exposure Limits	
Local name	Hexan isomery: 2,3-Dimethylbutan
PEL (OEL TWA)	1000 mg/m³
	279 ppm
NPK-P (OEL C)	2000 mg/m³
	558 ppm
Remark	I - dráždí sliznice (oči, dýchací cesty) resp. kůži.
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Finland - Occupational Exposure Limits	
Local name	2,3-Dimetyylibutaani
HTP (OEL TWA)	1800 mg/m³
	500 ppm
HTP (OEL STEL)	2300 mg/m³
	630 ppm
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	2,3-Dimethylbutan
AGW (OEL TWA)	1800 mg/m³
	500 ppm
Peak exposure limitation factor	2(II)
Remark	DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission)
Regulatory reference	TRGS900
Poland - Occupational Exposure Limits	
Local name	Heksanu izomery acykliczne nasycone, z wyjątkiem heksanu: 2,3-dimetylobutan
NDS (OEL TWA)	400 mg/m³
NDSCh (OEL STEL)	1200 mg/m³
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Slovenia - Occupational Exposure Limits	
Local name	2,3-dimetilbutan
OEL TWA	1800 mg/m³
	500 ppm
OEL STEL	3600 mg/m³
	1000 ppm

2,3-dimethylbutane (79-29-8)	
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Sweden - Occupational Exposure Limits	
Local name	2,3-Dimetylbutan
NGV (OEL TWA)	700 mg/m³
	200 ppm
KGV (OEL STEL)	1100 mg/m³
	300 ppm
Remark	V (Vägledande korttidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
North Macedonia - Occupational Exposure Limits	
Local name	2,3-диметилбутан
OEL TWA	720 mg/m³
	200 ppm
KTV	4
Short time value [mg/m³]	2880 mg/m³
Short time value [ppm]	800 ppm
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанци во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусо време. Изложеноста на краткотрајни вредности може да трае најмногу 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m3 или во ml/m3(ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанци („Службен весник на Република Македонија” бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	2,3-Diméthylbutane / 2,3-Dimethylbutan
MAK (OEL TWA)	1800 mg/m³
	500 ppm
KZGW (OEL STEL)	3600 mg/m³
	1000 ppm
Remark	NIOSH
Regulatory reference	www.suva.ch, 01.01.2025
3-methylpentane (96-14-0)	
Austria - Occupational Exposure Limits	
Local name	Hexan (alle Isomeren außer n-Hexan und Methylcyclopentan): 3-Methylpentan
MAK (OEL TWA)	715 mg/m³
	200 ppm

3-methylpentane (96-14-0)	
MAK (OEL STEL)	2860 mg/m³ (4x 15(Miw) min)
	800 ppm (4x 15(Miw) min)
Regulatory reference	BGBl. II Nr. 156/2021
Czech Republic - Occupational Exposure Limits	
Local name	Hexan isomery: 3-Methylpentan
PEL (OEL TWA)	1000 mg/m³
	279 ppm
NPK-P (OEL C)	2000 mg/m³
	558 ppm
Remark	I - dráždí sliznice (oči, dýchací cesty) resp. kůži.
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Finland - Occupational Exposure Limits	
Local name	3-Metyylipentaani
HTP (OEL TWA)	1800 mg/m³
	500 ppm
HTP (OEL STEL)	2300 mg/m³
	630 ppm
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	3-Methylpentan
AGW (OEL TWA)	1800 mg/m³
	500 ppm
Peak exposure limitation factor	2(II)
Remark	DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission)
Regulatory reference	TRGS900
Poland - Occupational Exposure Limits	
Local name	Heksanu izomery acykliczne nasycone, z wyjątkiem heksanu: 3-metylopentan
NDS (OEL TWA)	400 mg/m³
NDSCh (OEL STEL)	1200 mg/m³
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Slovenia - Occupational Exposure Limits	
Local name	3-metilpentan
OEL TWA	1800 mg/m³
	500 ppm
OEL STEL	3600 mg/m³
	1000 ppm

3-methylpentane (96-14-0)	
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Sweden - Occupational Exposure Limits	
Local name	3-Metylpentan
NGV (OEL TWA)	700 mg/m³
	200 ppm
KGV (OEL STEL)	1100 mg/m³
	300 ppm
Remark	V (Vägledande korttidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
North Macedonia - Occupational Exposure Limits	
Local name	3-метилпентан
OEL TWA	720 mg/m³
	200 ppm
KTV	4
Short time value [mg/m³]	2880 mg/m³
Short time value [ppm]	800 ppm
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанци во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусо време. Изложеноста на краткотрајни вредности може да трае најмногу 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m3 или во ml/m3(ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанци („Службен весник на Република Македонија” бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	3-Méthylpentane / 3-Methylpentan
MAK (OEL TWA)	1800 mg/m³
	500 ppm
KZGW (OEL STEL)	3600 mg/m³
	1000 ppm
Remark	NIOSH
Regulatory reference	www.suva.ch, 01.01.2025
2-methylpentane (107-83-5)	
Austria - Occupational Exposure Limits	
Local name	Hexan (alle Isomeren außer n-Hexan und Methylcyclopentan): 2-Methylpentan
MAK (OEL TWA)	715 mg/m³
	200 ppm

2-methylpentane (107-83-5)	
MAK (OEL STEL)	2860 mg/m³ (4x 15(Miw) min)
	800 ppm (4x 15(Miw) min)
Regulatory reference	BGBl. II Nr. 156/2021
Czech Republic - Occupational Exposure Limits	
Local name	Hexan isomery: 2-Methylpentan
PEL (OEL TWA)	1000 mg/m³
	279 ppm
NPK-P (OEL C)	2000 mg/m³
	558 ppm
Remark	I - dráždí sliznice (oči, dýchací cesty) resp. kůži.
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 330/2023 Sb.)
Finland - Occupational Exposure Limits	
Local name	2-Metyylipentaani
HTP (OEL TWA)	1800 mg/m³
	500 ppm
HTP (OEL STEL)	2300 mg/m³
	630 ppm
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	2-Methylpentan
AGW (OEL TWA)	1800 mg/m³
	500 ppm
Peak exposure limitation factor	2(II)
Remark	DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission)
Regulatory reference	TRGS900
Poland - Occupational Exposure Limits	
Local name	Heksanu izomery acykliczne nasycone, z wyjątkiem heksanu: 2-metylopentan
NDS (OEL TWA)	400 mg/m³
NDSCh (OEL STEL)	1200 mg/m³
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Slovenia - Occupational Exposure Limits	
Local name	2-metilpentan
OEL TWA	1800 mg/m³
	500 ppm
OEL STEL	3600 mg/m³
	1000 ppm

2-methylpentane (107-83-5)	
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Sweden - Occupational Exposure Limits	
Local name	2-Metylpentan
NGV (OEL TWA)	700 mg/m³
	200 ppm
KGV (OEL STEL)	1100 mg/m³
	300 ppm
Remark	V (Vägledande korttidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
North Macedonia - Occupational Exposure Limits	
Local name	2-метилпентан
OEL TWA	720 mg/m³
	200 ppm
KTV	4
Short time value [mg/m³]	2880 mg/m³
Short time value [ppm]	800 ppm
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанци во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусо време. Изложеноста на краткотрајни вредности може да трае најмногу 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m3 или во ml/m3(ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанци („Службен весник на Република Македонија” бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	2-Méthylpentane / 2-Methylpentan
MAK (OEL TWA)	1800 mg/m³
	500 ppm
KZGW (OEL STEL)	3600 mg/m³
	1000 ppm
Remark	NIOSH
Regulatory reference	www.suva.ch, 01.01.2025

8.1.2. Recommended monitoring procedures

No additional information available

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

WE: 924-168-8	
DNEL/DMEL (Workers)	
Long-term - systemic effects, dermal	21 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	145 mg/m³
DNEL/DMEL (General population)	
Long-term - systemic effects,oral	8 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	27 mg/m³
Long-term - systemic effects, dermal	9 mg/kg bodyweight/day
WE: 921-577-3	
DNEL/DMEL (Workers)	
Long-term - systemic effects, dermal	432 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	3000 mg/m³
DNEL/DMEL (General population)	
Long-term - systemic effects,oral	214 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	643 mg/m³
Long-term - systemic effects, dermal	214 mg/kg bodyweight/day

8.1.5. Control banding

No additional information available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Appropriate engineering controls:
Ensure good ventilation of the work station. Provide local exhaust or general room ventilation. Use spark-/explosionproof appliances and lighting system. Ground equipment electrically.

8.2.2. Personal protection equipment

Personal protective equipment symbol(s):

8.2.2.1. Eye and face protection

Eye protection:
Wear security glasses which protect from splashes

8.2.2.2. Skin protection

Skin and body protection:
Antistatic clothing. Wear impervious rubber safety shoes. Long sleeved protective clothing

Hand protection:
Protective gloves against chemicals (EN 374). Breakthrough time : refer to the recommendations of the supplier. Neoprene or nitrile rubber gloves

Material	Permeation	Thickness (mm)
Nitrile rubber (NBR)		0,34
Neoprene rubber (HNBR)	2 (> 30 minutes)	0,75
Neoprene rubber (HNBR)	6 (> 480 minutes)	1,35

8.2.2.3. Respiratory protection

Respiratory protection:
Wear suitable respiratory equipment in case of insufficient ventilation

8.2.2.4. Thermal hazards

Thermal hazard protection:
Use insulated gloves, impervious apron, long sleeves and other protective clothing when handling this material hot.

8.2.3. Environmental exposure controls

Environmental exposure controls:
Avoid release to the environment. Do not exceed the occupational exposure limits (OEL).

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Colour	:	Colourless.
Odour	:	characteristic.
Odour threshold	:	Not available
Melting point	:	< -60 °C
Freezing point	:	Not available
Boiling point	:	30 – 90 °C
Flammability	:	Highly flammable liquid and vapour.
Lower explosion limit	:	Not available
Upper explosion limit	:	Not available
Flash point	:	- 35 °C
Auto-ignition temperature	:	> 200 °C
Decomposition temperature	:	Not available
pH	:	W tym przypadku nie dotyczy
Viscosity, kinematic	:	≈ 0.31 mm²/s
Solubility	:	No data.
Partition coefficient n-octanol/water (Log Kow)	:	Not available
Vapour pressure	:	n- pentane 45–79 kPa 20 °C; isopentane 74–79 kPa 20°C
Vapour pressure at 50°C	:	Not available
Density	:	0.64 – 0.67 g/cm³ Type: 'density' Temp.: 15 °C
Relative density	:	Not available
Relative vapour density at 20°C	:	Not available
Particle characteristics	:	Not applicable

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No data.

10.4. Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Carbon oxides (CO, CO2).

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity (oral) : Not classified
Acute toxicity (dermal) : Not classified
Acute toxicity (inhalation) : Not classified

WE: 924-168-8	
LD50 oral rat	> 5840 mg/kg
LD50 dermal rat	2800 – 3100 mg/kg bodyweight Animal: rat
LC50 Inhalation - Rat	> 25.2 mg/l air Animal: rat

WE: 921-577-3	
LD50 oral rat	> 2000 mg/kg masy ciała Animal: rat, Guideline: OECD Guideline 401 (Acute Oral Toxicity), Guideline: EU Method B.1 (Acute Toxicity (Oral))
LC50 Inhalation - Rat	> 25,3 mg/l air Animal: rat, Guideline: OECD Guideline 403 (Acute Inhalation Toxicity)

Skin corrosion/irritation : Causes skin irritation.
Serious eye damage/irritation : Not classified
Respiratory or skin sensitisation : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified
Reproductive toxicity : Suspected of damaging fertility.
STOT-single exposure : May cause drowsiness or dizziness.
STOT-repeated exposure : Causes damage to organs through prolonged or repeated exposure.

WE: 924-168-8	
LOAEC (inhalation, rat, vapour, 90 days)	16.479 mg/l air Animal: rat, Animal sex: male, Guideline: OECD Guideline 413 (Subchronic Inhalation Toxicity: 90-Day Study)

WE: 921-577-3	
NOAEC (inhalation, rat, vapour, 90 days)	30 mg/l air Animal: rat, Guideline: OECD Guideline 413 (Subchronic Inhalation Toxicity: 90-Day Study), Guideline: other:, Guideline: EPA OTS 798.2450 (90-Day Inhalation Toxicity), Guideline: other:, Guideline: other:

Aspiration hazard : May be fatal if swallowed and enters airways.

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Adverse health effects caused by endocrine disrupting properties : The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

11.2.2. Other information

No additional information available

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Toxic to aquatic life with long lasting effects.

Hazardous to the aquatic environment, short–term (acute) : Not classified

Hazardous to the aquatic environment, long–term (chronic) : Toxic to aquatic life with long lasting effects.

WE: 924-168-8	
LOEC (chronic)	0.32 mg/l Test organisms (species): Daphnia magna Duration: '21 d'
NOEC (chronic)	0.17 mg/l Test organisms (species): Daphnia magna Duration: '21 d'

12.2. Persistence and degradability

ORLEsol C-56	
Persistence and degradability	Stable in use and storage conditions as recommended in item 7.

12.3. Bioaccumulative potential

ORLEsol C-56	
Bioaccumulative potential	Not applicable in this case.

12.4. Mobility in soil

ORLEsol C-56	
Additional information	Not applicable in this case.

12.5. Results of PBT and vPvB assessment

ORLEsol C-56
This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

Component	
Substance(s) not meeting the PBT criteria of REACH regulation, in accordance with Annex XIII	WE:924-168-8 WE:921-577-3
Substance(s) not meeting the vPvB criteria of REACH regulation, in accordance with Annex XIII	WE:924-168-8 WE:921-577-3

12.6. Endocrine disrupting properties

Adverse effects on the environment caused by endocrine disrupting properties : The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

12.7. Other adverse effects

Other information	Conform to current legislation, regulations and orders

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional waste regulation : Act of 14 December 2012 on waste (J. o L. 2013, item 322 as amended; consolidated text J. o L. 2020, item 797). Act of 13 June 2013 on the management of packaging and packaging waste (J. o L. 2013, item 888 as amended; consolidated text J. o L. 2020, item 1114). Decree of the Minister of Environment of 14 December 2014 on the catalogue of waste (J. o L. 2014, item 1923).

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions. Reprocess or burn in an approved incinerator.

Sewage disposal recommendations : Do not empty into drains. Do not allow to enter into surface water or drains. Disposal must be done according to official regulations.

Product/Packaging disposal recommendations : Recycle or dispose of in compliance with current legislation. Only pass on empty containers/packaging for recycling. Use only registered transporters.

HP Code : HP3 - "Flammable:"
– flammable liquid waste: liquid waste having a flash point below 60 °C or waste gas oil, diesel and light heating oils having a flash point > 55 °C and ≤ 75 °C;
– flammable pyrophoric liquid and solid waste: solid or liquid waste which, even in small quantities, is liable to ignite within five minutes after coming into contact with air;
– flammable solid waste: solid waste which is readily combustible or may cause or contribute to fire through friction;
– flammable gaseous waste: gaseous waste which is flammable in air at 20 °C and a standard pressure of 101.3 kPa;
– water reactive waste: waste which, in contact with water, emits flammable gases in dangerous quantities;
– other flammable waste: flammable aerosols, flammable self-heating waste, flammable organic peroxides and flammable self-reactive waste.
HP5 - "Specific Target Organ Toxicity (STOT)/Aspiration Toxicity:" waste which can cause specific target organ toxicity either from a single or repeated exposure, or which cause acute toxic effects following aspiration.
HP4 - "Irritant – skin irritation and eye damage:" waste which on application can cause skin irritation or damage to the eye.
HP10 - "Toxic for reproduction:" waste which has adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in the offspring.
HP14 - "Ecotoxic:" waste which presents or may present immediate or delayed risks for one or more sectors of the environment

SECTION 14: Transport information

In accordance with ADR / IMDG / RID

ADR	IMDG	RID
14.1. UN number or ID number		
UN 1268	UN 1268	UN 1268

ADR	IMDG	RID
14.2. UN proper shipping name		
PETROLEUM PRODUCTS, N.O.S.	PETROLEUM DISTILLATES, N.O.S.	PETROLEUM DISTILLATES, N.O.S.
Transport document description		
UN 1268 PETROLEUM PRODUCTS, N.O.S., 3, I, (D/E), ENVIRONMENTALLY HAZARDOUS	UN 1268 PETROLEUM DISTILLATES, N.O.S., 3, I, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS	UN 1268 PETROLEUM DISTILLATES, N.O.S., 3, I, ENVIRONMENTALLY HAZARDOUS
14.3. Transport hazard class(es)		
3	3	3
		
14.4. Packing group		
I	I	I
14.5. Environmental hazards		
Dangerous for the environment: Yes	Dangerous for the environment: Yes Marine pollutant: Yes EmS-No. (Fire): F-E EmS-No. (Spillage): S-E	Dangerous for the environment: Yes
No supplementary information available		

14.6. Special precautions for user

Observe the special provisions specified in the regulations. Observe the precautionary measures specified in sections 7 and 8.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

REACH Annex XVII (Restriction List)

EU restriction list (REACH Annex XVII)

Reference code	Applicable on	Entry title or description
3(a)	ORLEsol C-56	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F
3(b)	ORLEsol C-56	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10
3(c)	ORLEsol C-56	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard class 4.1

EU restriction list (REACH Annex XVII)		
Reference code	**Applicable on**	**Entry title or description**
40.	ORLEsol C-56	Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 or not.
57.	cyclohexane	Cyclohexane

REACH Annex XIV (Authorisation List)

Contains no substance(s) listed on REACH Annex XIV (Authorisation List)

REACH Candidate List (SVHC)

Contains substance(s) listed on the REACH Candidate List in concentrations ≥ 0.1 % or SCL: n-hexane (EC 203-777-6, CAS 110-54-3)

PIC Regulation (Prior Informed Consent)

Contains no substance(s) listed on the PIC list (Regulation EU 649/2012 concerning the export and import of hazardous chemicals)

POP Regulation (Persistent Organic Pollutants)

Contains no substance(s) listed on the POP list (Regulation EU 2019/1021 on persistent organic pollutants)

Ozone Regulation (2024/590)

Contains no substance(s) listed on the Ozone Depletion list (Regulation EU 2024/590 on substances that deplete the ozone layer)

Council Regulation (EC) for the control of dual-use items

Contains no substance subject to the COUNCIL REGULATION (EC) for the control of dual-use items

VOC Directive (2004/42)

Organic solvent : Yes

Explosives Precursors Regulation (2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

Drug Precursors Regulation (273/2004)

Contains substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

15.1.2. National regulations

France

Occupational diseases	
Code	Description
RG 59	Occupational poisoning by hexane
RG 84	Conditions caused by liquid organic solvents for professional use: saturated or unsaturated aliphatic or cyclic liquid hydrocarbons and mixtures thereof; liquid halogenated hydrocarbons; nitrated derivatives of aliphatic hydrocarbons; alcohols; glycols, glycol ethers; ketones; aldehydes; aliphatic and cyclic ethers, including tetrahydrofuran; esters; dimethylformamide and dimethylacetamine; acetonitrile and propionitrile; pyridine; dimethylsulfone and dimethylsulfoxide

Germany

VOC ordinance (ChemVOCFarbV) :

Employment restrictions : Observe restrictions according Act on the Protection of Working Mothers (MuSchG). Observe restrictions according Act on the Protection of Young People in Employment (JArbSchG).

Water hazard class (WGK) : WGK 3, Highly hazardous to water (Classification according to AwSV, Annex 1).

Chemicals Prohibition Ordinance (ChemVerbotsV)	:	This product is subject to ChemVerbotsV Annex 2 Entry 2. The following requirement must be observed: Basic requirements for the implementation of the submission (according to § 8 paragraph 1, 3 and 4).
Major Accidents Ordinance (12. BImSchV)	:	Is not subject to the Major Accidents Ordinance (12. BImSchV)

Netherlands

ABM category	:	A(2) - toxic for aquatic organisms, may have longterm hazardous effects in aquatic environment
SZW-lijst van kankerverwekkende stoffen	:	None of the components are listed
SZW-lijst van mutagene stoffen	:	None of the components are listed
SZW-lijst van reprotoxische stoffen – Borstvoeding	:	None of the components are listed
SZW-lijst van reprotoxische stoffen – Vruchtbaarheid	:	n-hexane is listed
SZW-lijst van reprotoxische stoffen – Ontwikkeling	:	None of the components are listed

Denmark

Class for fire hazard	:	Class II-1
Store unit	:	5 liter
Classification remarks	:	R10 <H224;H304;H315;H336;H361;H373;H411>; Emergency management guidelines for the storage of flammable liquids must be followed
Danish National Regulations	:	Young people below the age of 18 years are not allowed to use the product Pregnant/breastfeeding women working with the product must not be in direct contact with the product

Poland

Polish National Regulations	:	according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878 Act of 25 February 2011 on chemical substances and their mixtures (J. o L. No. 63, item 322 as amended; consolidated text J. o L. 2019, item 1225). Act of 14 December 2012 on waste (J. o L. 2013, item 322 as amended; consolidated text J. o L. 2020, item 797). The announcement of Marshal of the Sejm of the Republic of Poland dated 19 October 2016 concerning the consolidated text announcement of the decree on the management of packaging and packaging waste (J. o L. 2016, item 1863 as amended). Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008 Regulation of the Minister of Family, Labour and Social Policy of 12 June 2018 on the highest permissible concentration and intensity of noxious agents for health at work environment (J. o L. item 1286 as amended). Decree of the Minister of Environment of 14 December 2014 on the catalogue of waste (J. o L. 2014, item 1923).

15.2. Chemical safety assessment

For this mixture a chemical safety assessment has not been carried out

SECTION 16: Other information

Indication of changes:
Sections: 2.1, 3.2, 11.1.

Full text of H- and EUH-statements:	
Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment – Chronic Hazard, Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment – Chronic Hazard, Category 2
Asp. Tox. 1	Aspiration hazard, Category 1
Flam. Liq. 1	Flammable liquids, Category 1
Flam. Liq. 2	Flammable liquids, Category 2

Full text of H- and EUH-statements:	
Repr. 2	Reproductive toxicity, Category 2
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT RE 1	Specific target organ toxicity – Repeated exposure, Category 1
STOT RE 2	Specific target organ toxicity – Repeated exposure, Category 2
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Narcosis
H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361	Suspected of damaging fertility or the unborn child.
H361f	Suspected of damaging fertility.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
EUH066	Repeated exposure may cause skin dryness or cracking.

The classification complies with : ATP 12

Safety Data Sheet (SDS), EU