毒性情報源	機関	アドレス(2007年10月現在)	備考
NIOSH労働健康ガイドライン	米国国立労働安全衛生研究所(NIOSH)	http://www.cdc.gov/niosh/81-123.html	物理化学的特性・健康影響等の要約文書
OPPT化学物質ファクトシート	米国環境保護庁(EPA)	http://www.epa.gov/chemfact/	各種毒性情報・物性
NPIC農薬ファクトシート	国立農薬情報センター(NPIC)	http://npic.orst.edu/npicfact.htm	農薬の毒性(急性影響主体)
農薬情報プロファイル	オレゴン州立大学他(EXTOXNET)	http://extoxnet.orst.edu/ghindex.html	農薬毒性情報サイトEXTOXNET
		http://extoxnet.orst.edu/pips/ghindex.html	農薬の物性、毒性影響、環境影響
化学剤	米国疾病予防管理センター(CDC)	http://www.bt.cdc.gov/chemical/	緊急事態リンク一覧
		http://www.bt.cdc.gov/agent/agentlistchem.asp	ATSDR 各種文書・NIOSHファクトシートへ
労働化学物質データベース	米国労働安全衛生庁(OSHA)	http://www.osha.gov/web/dep/chemicaldata/#target	物性、暴露指針等
ACGIH TLV	米国産業衛生専門家会議(ACGIH)	http://www.acgih.org/home.htm	毒性影響の有料小冊子
検索データベース類			
化学物質総合情報提供システム	経済産業省	http://www.safe.nite.go.jp/japan/db.html	化学物質総合検索システム等
化学物質の安全性に関するデータベース	経済産業省	http://www.meti.go.jp/policy/chemical_management/06DB/index.htm	化学物質管理関連データベースのリンク集
3省共同化学物質データベース	厚生労働省、経済産業省、環境省	http://www.safe.nite.go.jp/tmdb/Top.do;jsessionid=B0CEE1545ED48920C23EE589AF94D983	分解性・濃縮性、人健康影響、生態影響の試験データ
IPCS INCHEM	国際化学物質安全性計画(IPCS)	http://www.inchem.org/	IPCS作成評価文書検索サイト
IPCS INTOX	国際化学物質安全性計画(IPCS)	http://www.intox.org/databank/index.htm	中毒情報や医療処置ガイドライン
JECFA評価検索	FAO/WHO合同食品添加物専門家会議	http://jecfa.ilsi.org/search.cfm	JECFAによる評価の検索データベース
NTP試験情報	米国国家毒性計画(NTP)	http://ntp.niehs.nih.gov:8080/index.html?col=010stat	NTP実施各種試験の検索データベース
		http://ntp-apps.niehs.nih.gov/ntp_tox/index.cfm	NTPデータベース検索ホームページ
TOXNET	米国国立医学図書館(NLM)	http://toxnet.nlm.nih.gov/	毒性有害物質に関する総合データベース

毒性情報源	機関	アドレス(2007年10月現在)	備考
TOXSEEK	米国国立医学図書館(NLM)	http://toxseek.nlm.nih.gov/toxseek/ui8/searchfr.jsp?selectedcategory=Allcat	TOXNETその他を含む複合検索エンジン
PubMed	米国国立医学図書館(NLM)	http://www.ncbi.nlm.nih.gov/sites/entrez	文献検索エンジン
GESTIS	ドイツ労働安全研究所(BGIA)	http://www.hvbg.de/e/bia/gestis/stoffdb/index.html	有害化学物質データベース
CSST WHMIS	カナダ労働安全衛生委員会(CSST)	http://www.reptox.csst.qc.ca/ToEnglishUsers.htm	有害性物質情報システム
		http://www.reptox.csst.qc.ca/Documents/SIMDUT/ListeAng/Htm/ListeAng.htm	リスト
リンク集			
個々の化学物質の情報検索	国立医薬品食品衛生研究所	http://www.nihs.go.jp/hse/link/webguide.html	化学物質情報検索リンク集
NLM Database	米国国立医学図書館(NLM)	http://www.sis.nlm.nih.gov/sisfactsheets.html	各種データベースへの入り口
NLM Fact Sheets	米国国立医学図書館(NLM)	http://www.nlm.nih.gov/pubs/factsheets/factsheets.html	ファクトシート・データベースのリスト集
		http://www.nlm.nih.gov/pubs/factsheets/factsubj.html	
NIOSH Databases	米国国立労働安全衛生研究所(NIOSH)	http://www.cdc.gov/niosh/database.html	NIOSH関連へのリンク集
一般検索・文献検索			
Yahoo Japan	ヤフー	http://www.yahoo.co.jp/	一般検索
Google Japan	グーグル	http://www.google.com/intl/ja/	一般検索
CiNii	国立情報学研究所(NII)	http://ci.nii.ac.jp/	文献検索
JDream	科学技術振興機構(JST)	http://pr.jst.go.jp/	文献検索
J-STAGE	科学技術振興機構(JST)	http://www.jstage.jst.go.jp/browse/-char/ja	文献検索
WordWideScience	米国エネルギー省・英国図書館	http://worldwidescience.org/index.html	文献検索
HighWire Press	スタンフォード大学	http://highwire.stanford.edu/	文献検索

毒性情報源	機関	アドレス(2007年10月現在)	備考
Google Scholar	グーグル	http://scholar.google.com/	一般科学情報検索
発がん性・変異原性・生殖毒性物質(CMR)特化情報			
UK COC	英国発がん性諮問委員会	http://www.advisorybodies.doh.gov.uk/coc/statements.htm	発がん性
CCRIS	米国国立医学図書館(NLM)	http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CCRIS	発がん性・変異原性
UK COM	英国変異原性諮問委員会	http://www.advisorybodies.doh.gov.uk/com/statements.htm#o	変異原性
GENETOX	米国国立医学図書館(NLM)	http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?GENETOX	変異原性
NTP CERHR	NTPヒト生殖リスク評価センター	http://cerhr.niehs.nih.gov/reports/index.html	生殖毒性・変異原性
VCCEP	米国環境保護庁(EPA)	http://www.tera.org/peer/VCCEP/VCCEPpilotchemicals.html	子供を含む生殖能力への影響評価
		http://www.epa.gov/oppt/vccep/	
DART	米国国立医学図書館(NLM)	http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?DARTETIC	生殖発生毒性
Chemically Induced Birth Defects	Marcel Dekker, Inc.	http://www.dekker.com/sdek/home	生殖発生毒性物質 有料書籍
Catalog of Teratogenic Agents	Johns Hopkins Univ. Press	http://www.press.jhu.edu/books/title_pages/3452.html	催奇形性物質 有料書籍
MAKリスト	ドイツ学術振興会(DFG)MAK委員会	http://www.dfg.de/en/dfg_profile/structure/statutory_bodies/senate/senate_commissions_and_committees/investigation_health_hazards/in	各種分類 有料書籍
	Wiley	http://as.wiley.com/WileyCDA/WileyTitle/productCd-3527315993.html	出版社
IARCモノグラフ	国際がん研究機関(IARC)	http://monographs.iarc.fr/ENG/Monographs/allmonos90.php	既出
NTP発がん性レポート	米国国家毒性計画(NTP)	http://ntp.niehs.nih.gov/ntp/roc/toc11.html	既出
NTP試験報告書	米国国家毒性計画(NTP)	http://ntp.niehs.nih.gov/ntpweb/index.cfm?objectid=7DA86165-BDB5-82F8-F7E4FB36737253D5	既出
プロポジション65	米国カリフォルニア州	http://www.oehha.ca.gov/prop65/hazard_ident/hazard_id.html	既出
プロポジション65化学物質リスト	米国カリフォルニア州	http://www.oehha.ca.gov/prop65/prop65_list/files/P65single042007.pd	既出

毒性情報源	機関	アドレス（2007年10月現在）	備考
HCN	オランダ健康審議会（HCN）	http://www.gr.nl/index.php	既出
国内食品関連物質情報			
健康食品の安全性・有効性情報	国立健康栄養研究所	http://hfnet.nih.go.jp/	健康食品
食品添加物、残留農薬、容器包装の安全性情報	日本食品化学研究振興財団	http://www.ffcr.or.jp/	食品健康影響評価
		http://www.ffcr.or.jp/zaidan/FFCRHOME.nsf/pages/info.cao	既出
食品安全総合情報システム	内閣府食品安全委員会	http://www.fsc.go.jp/index.html	各種の安全性関連情報
		http://www.ifsis.fsc.go.jp/fsilv1/do/FSILogon	
厚生労働省食品安全情報	厚生労働省	http://www.mhlw.go.jp/topics/bukyoku/iyaku/syoku-anzen/index.html	食品添加物
農林水産省 消費・安全	農林水産省	http://www.maff.go.jp/j/syouan/index.html	有害化学物質・農薬・肥料・飼料・動物用医
		http://www.maff.go.jp/syohi_anzen/kobetsu.html	
		http://www.maff.go.jp/j/syouan/soumu/mat-index.html	
食品の安全性に関する情報	国立医薬品食品衛生研究所	http://www.nihs.go.jp/hse/food-info/index.html	食品添加物、残留農薬、汚染化学物質等
国内医薬品関連物質情報			
医薬品・医療機器等	厚生労働省	http://www.mhlw.go.jp/bunya/iyakuhin/index.html	医薬品、医薬部外品、食品添加物、残留農薬、動物用医薬品等
医薬品申請資料概要等	医薬品医療機器総合機構	http://www.info.pmda.go.jp/info/syounin_index.html	医薬品申請資料概要・審査報告書
国内農薬関連物質情報			
農薬抄録及び評価書	農林水産省消費技術安全センター	http://www.acis.famic.go.jp/syouroku/index.htm	既出
農薬安全性情報	農薬工業会	http://www.jcpa.or.jp/nouan/index.html	既出
国内労働衛生関連物質情報			

毒性情報源	機関	アドレス（2007年10月現在）	備考
産衛学会許容濃度勧告および提案理由	日本産業衛生学会	http://joh.med.uoeh-u.ac.jp/oel/index.html	既出
		http://joh.med.uoeh-u.ac.jp/	既出

表5　有害性情報リストアップ例

物質名(和名) 物質ABCD
物質名(英名) Substance ABCD
CASNo.: XXXX-XX-X

No	有害性の種類	生物種	試験方法	毒性内容 (毒性値・症状等)	出典	P*	元文献名	報告年	備考	採否
1	急性毒性(経口)	rat	oral	LD50: 100 mg/kg	RTECS(2004)	2	Archiv fuer Toxikologie. 22,115	1966		○
2		rat	oral	LD50: 219 - 457 mg/kg	CERIハザードデータ集(1999)	1	RTECS(1996), BUA Report 2(1985), IARC 65(1996)	-		
3		rat	oral	LD50: 100 mg/kg	HSDB(2003)	2	Sax's Dangerous Properties, p. 337	1996		
4		mouse	oral	LD50: 59 mg/kg	RTECS(2004)	2	Pesticide Manual. 9,452 (1991)	1991		
5		ヒト (adult)	The mean lethal dose of technical ABCD may be about 400 mg/kg when ingested by man		PIM257(2001)	1	Cinical Toxicology of Commercial Products	1984	technical grade	
6	急性毒性(経皮)	rat	skin	LD50: 900 mg/kg	RTECS(2004)	2	Wirksubstanzen der Pflanzenschutz	1971 1976		○
7		rat	skin	LD50: 0.9 mg/kg	HSDB(2003)	2	Sax's Dangerous Properties, p. 337	1996		×
8		rat	dermal	LD50: 900 mg/kg	PIM257(2001)	1	Sax's Dangerous Properties, 2000.	2000		
9	急性毒性(吸入)	rat	inhalation	LC50: 690 mg/m3/4H	RTECS(2004)	2	Gigiena i Sanitariya, see HYSAAV. 56(2),80 (1991)	1991		
10		rat	inhalation	LC50: 690 mg/m3	PIM257(2001)	1	The Regulated Chemicals List	2000		
11	皮膚腐食性/刺激性	?	Skin irritation results from extensive contact. Dermatitis and urticaria may occur		PIM257(2001)	1	CHRIS	1994	長期暴露?	△
12		rabbit	0.5 ml of a 10 % solution of ABCD was applied to the shaved skin of six rabbits for 24 hours covered by semi-occlusive dressing. Only mild erythema (score 1/0-4) was noted in both, intact and abraded skin of 4/6 rabbits. Erythema were not observed at 48 hour- and at 72 hour-reading.		SIDS(2001)	1	Hoechst AG, Report No. 493/75, 1975/oct./01.	1975	According to Fed. Reg. 1973, ABCD was evaluated as no irritant	○
13		ヒト	発赤		ICSC(J)(1998)	1				○
14	眼に対する損傷性/眼刺激性	ヒト	Vapors may irritate eyes, nose, throat.		HSDB(2003)	2	Farm Chemicals Handbook	1992		
15		ヒト	発赤		ICSC(J)(1998)	1				○
16		ヒト	Irritates the eyes		SITTIG(4th, 2002)	1				
17	呼吸器感作性/皮膚感作性	モルモット	経皮	弱い抗原性	CERIハザードデータ集	1	BUA Report 2 (1985)	1985		○
18		ラット	吸入 0.001ppm, 5 months	弱い感作性	CERIハザードデータ集	1	BUA Report 2 (1985)	1985		○
19	生殖細胞変異原性(in vivo)	mice	dominant lethal mutations	induced dominant lethal mutations in mice.	PIM257(2001)	1	IARC Monographs	1984	technical grade	
20		mice	chrom ab in bone marrow cells	were not found	PIM257(2001)	1	IARC Monographs	1984	technical grade	
21	生殖細胞変異原性(in vitro)	細菌	Ames test (TA98 or TA100)	negative	DFGOT vol.5 (1993)	1	Japanese MHW, 1974	1974	isomers	
22	発がん性	ヒト	人で発がん性を示す可能性がある。		ICSC(J)(1998)	1				○
23		mouse	oral. tremors, dyspnea, salivation, convulsions, diarrhea, and death. TD: 12600 mg/kg/30W continuous (Liver - Tumors)		RTECS(2004)	2	J of Cancer Res and Clinical Onco. 99,143 (1981)	1981		
24		rat, Wistar	FED ON DIETS CONTAINING 10, 50 OR 800 MG/KG DIET. NO INCR IN TUMOR INCIDENCE WAS REPORTED.		HSDB(2003)	2	IARC Monographs, V20	1979	Technical grade	△
25		mouse, male, DD	FED DIET. HEPATOMAS WERE FOUNDCONTROLS.		HSDB(2003)	2	IARC Monographs, V20	1979	Technical grade	
26	生殖毒性	ヒト	動物試験では人の生殖に毒性影響を及ぼす可能性があることが示されている。		ICSC(J)(1998)	1				

27		mice, female	Diet. Mating with unterated males until the end of the gestation period. The fertility of female mice was not affected. Additional doses caused a slight delay in foetal development.	DFGOT vol.5 (1993)	1	J. clin. Nutr. 41, 599 (1972)	1972		○
28		mice	with evidence of immune system alteration in the offsprings.	PIM257(2001)	1	Immunopharmacol. Immunotoxicol. 12(2), 293-310	1990	isomers	
29	特定標的臓器（単回暴露）	ヒト	中枢神経系に影響を与えることがある。これらの影響は遅れて現われることがある。	ICSC(J)(1998)	1				○
30		mice, rats, rabbits	oral. tremors, dyspnea, salivation, convulsions, diarrhea, and death.	HSDB(2003)	2	Vet Human Toxicol 31 (2): 113-6 (1989)	1989	投与量不明	×
31		ヒト	Irritability and central nervous excitation: notably vomiting, restlessness, ataxia, convulsions. Subsequently, CNS depression leads to respiratory failure. Occasional dermatitis and urticaria may develop.	PIM257(2001)	1	Cinical Toxicology of Commercial Products, 5th ed.	1984		○
32	特定標的臓器（反復暴露）	rat, female	Repeated dermal application of ABCD (100 mg/kg/day) for 7, 15 and 30 days. produced pathomorphological changes in skin, liver, kidney and brain of female rats along with significant enzymatic alterations.	HSDB(2003)	2	Indian J Exp Biol 29 (2): 149-55 (1991)	1991		△
33		SD rats	A 21-day study was performed using two rats of each sex at diphacinone levels of 0 (control), 0.125, 0.25, 0.5, 1, 2 and 4 mg/kg diet. At 21 days, there was no effect on prothrombin time.	EHC175(1995)	1	Bull Environ Contam Toxicol, 27: 559-567.	1981		
34		ヒト	Headache, dizziness, drowsiness, irritability, muscle twitching, myoclonic jerks and convulsions, anorexia, fatigue and malaise	PIM257(2001)	1	Advances in Modern Environ Toxicol, volume	1990		○
35		ヒト	中枢神経系、骨髄、肝臓、性ホルモン、生殖系に影響を与えることがある。	ICSC(J)(1998)	1				
36	吸引性呼吸器有害性	情報なし							

P*:情報源優先順位
ここに記載の情報は架空のものであり、ある物質の具体的情報を記したものではない。

DRAFT

Comparison between EU and GHS Criteria

Human Health and Environment

The comparison is based on the GHS ST/SG/AC.10/30, 2003 as amended by ST/SG/AC.10/32/Add.3, 9 March 2005

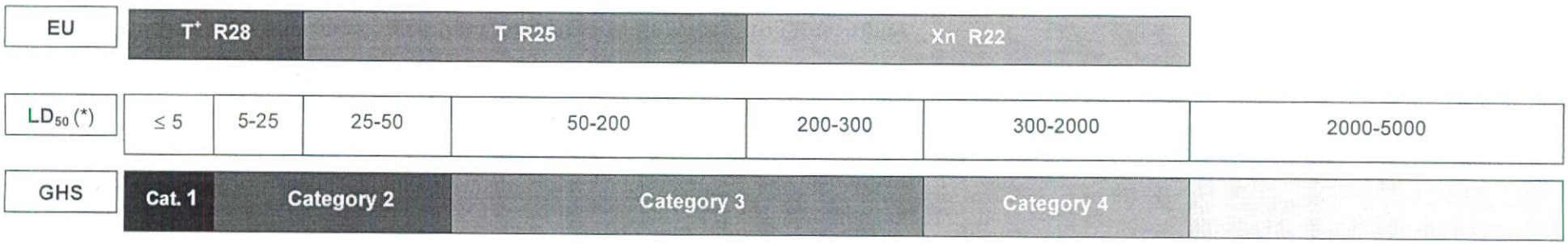
This comparison of the current EU classification system and the GHS is a draft working document of the Commission Services. It is intended to serve as a first introduction and general orientation about consistency and differences between the two classification systems. Its aim is to give a first indication of where classification provisions differ. In case of any inconsistency in this document with the text of the GHS or the current Community legislation in force, the original texts alone shall be decisive. It does not supersede in any way the classification rules as set out in Community legislation currently in force. This document does not bind the Commission in any way.

It does not include any opinion of the Commission Services on Optionality.

Version June 08, 2005
DG ENTR G1 REACH

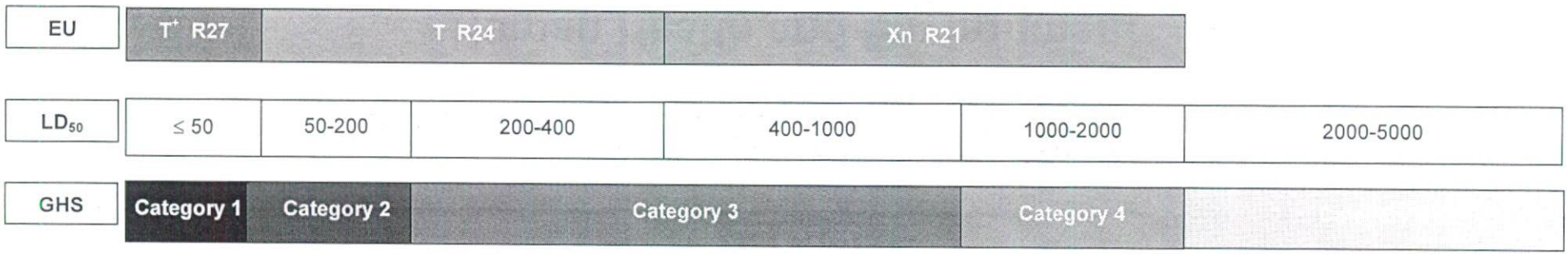
EU versus OECD Criteria for the Classification of Dangerous Substances and Mixtures

1. Acute Toxicity - Oral



Remarks: (*) : Alternative EU criteria when using the "Fixed Dose" procedure:
T+ R28 : oral, rat 5 mg/kg : < 100 % survival - T R25 : oral, rat 5 mg/kg : 100 % survival but evident toxicity
Xn R22 : oral, rat 50 mg/kg : 100 % survival but evident toxicity - 500 mg/kg : < 100 % survival

2. Acute Toxicity - Dermal



3. Acute Toxicity - Inhalation

3.1 Aerosols & Particulates / Dusts and mists

EU Aerosols & particulates	T^+ R26		T R23		Xn R20	
LC_{50}	≤ 0.05	0.05-0.25	0.25-0.5	0.5-1	1-5	?
GHS Dust&Mist	Category 1		Category 2	Category 3	Category 4	

3.2 Gases & Vapours

EU	T+ R26		T R23	Xn R20	
LC_{50} (Vapours) mg/l/4hr	≤ 0.5	0.5-2	2-10	10-20	?
GHS	Category 1		Category 2	Category 3	Category 4	Category 5
LC_{50}* (gases) (ppm V)	≤ 100	100-500	500-2500	2500-5000	?	

*This criteria for gases are not defined in the current EU system and have only been defined in the frame of GHS.

4. Aspiration Hazards

EU	**Xn R65** (May cause lung damage if swallowed)

Criteria

Liquid substances and preparations presenting an aspiration hazard because of their low viscosity :

(a) For substances and preparations containing aliphatic, alicyclic and aromatic hydrocarbons in a total concentration equal to or greater than 10% and having either

- a flow time of less than 30 sec. in a 3 mm ISO cup according to ISO 2431 (April 1996/July 1999 edition) relating to "Paints and varnishes – Determination of flow time by use of flow cups",
- a kinematic viscosity measured by a calibrated glass capillary viscometer in accordance with ISO 3104/3105 of less than 7×10^{-6} m^2/sec at 40° C (ISO 3104, 1994 edition, relating to "Petroleum products – Transparent and opaque liquids – Determination of kinematic viscosity and calculation of dynamic viscosity" ; ISO 3105, 1994 edition, relating to "Glass capillary kinematic viscometers – Specifications and operating instructions"), or
- a kinematic viscosity derived from measurements of rotational viscometry in accordance with ISO 3219 of less than 7×10^{-6} m^2/sec at 40° C (ISO 3219, 1993 edition, relating to "Plastics – Polymers/resins in the liquid state or as emulsions or dispersions – Determination of viscosity using a rotational viscometer with defined shear rate").

Note that substances and preparations meeting these criteria need not be classified if they have a mean surface tension greater that 33mN/m at 25° C as measured by the du Nouy tensiometer or by the test methods shown in Annex V Part A.5.

(b) For substances and preparations, based on practical experience in humans.

GHS	**Category 1**	**Category 2**
Criteria	**Chemicals known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.** A substance is classified in Category 1: (a) Based on reliable and good quality human evidence; or (b) If it is a hydrocarbon and has a kinematic viscosity of 20.5mm^2/s or less, measured at 40° C. Note: Examples of substances included in Category 1 are certainly hydrocarbons, turpentine and pine oil	**Chemicals which cause concern owing to the presumption that they cause human aspiration toxicity hazard** On the basis of existing animal studies and expert judgment that takes into account surface tension, water solubility, boiling point, and volatility, substances of 14 mm2/s or less, measured at 40°C. Note: Taking this into account, some authorities would consider the following to be included in this Category: n-primary alcohols with a composition of at least 3 carbon atoms but not more that 13; isobutyl alcohol, and ketones with a composition of no more than 13 carbon atoms.

5. Skin Corrosion

EU	**C R35**	**C R34**	
	Corrosion = full thickness destruction of skin tissue on at least 1 animal during the *test for skin irritation* cited in Annex V or during an equivalent method or if the results are based on the results of a validated in vitro test or if the results can be predicted: for example from strong alkali or acid reactions indicated by a pH of $\leq$ 2 or $\geq$ 11,5		
Exposure	≤ 3 min	> 3 min - ≤ 1 hour	> 1 hour - ≤ 4 hours
GHS	**Category1**		
	Category 1A (Obs. ≤ 1 hour)	**Category 1B** (Observation period ≤ 14 days)	**Category 1C** (Observation period ≤ 14 days)
	Corrosion = destruction of skin tissue, namely visible necrosis through the epidermis and into the dermis in at least 1 of 3 tested animals after exposure up to 4 hours. Corrosive reactions are typified by ulcers, bleeding, bloody scabs and, by the end of observation at 14 days, by discoloration due to blanching of the skin, complete areas of alopecia and scars.		

6. Skin Irritation

EU	Xi R38

Criteria	
	- Significant inflammation of the skin which persists for at least 24 hours after an exposure period of up to 4 hours determined on the rabbit according to the cutaneous irritation test method cited in Annex V to Dir. 67/548/EEC (Publication: SBN 92-828-0076-8) Inflammation of the skin is significant if : (a) the mean value of the scores for either erythema and eschar formation or oedema formation, calculated over all the animals tested, is 2 or more; or (b) in the case where the Annex V test has been completed using three animals, either erythema and eschar formation or oedema formation equivalent to a mean value of 2 or more calculated for each animal separately has been observed in two or more animals. In both cases all scores at each of the reading times (24, 48 and 72 hr) for an effect should be used in calculating respective mean values. Inflammation of the skin is also significant if it persists in at least two animals at the end of the observation time, Particular effects e.g. hyperplasia, scaling, discoloration, fissures, scabs and alopecia should be taken into account. Relevant data may also be available from non-acute animal studies (see comments on R48, section 2.d). These are considered significant if the effects seen are comparable to those described above. - Substances and preparations which cause significant inflammation of the skin, based on practical observations in humans on immediate, prolonged or repeated contact. - Organic peroxides, except where evidence to the contrary is available.

GHS	Category 2 (Irritant)	Category 3 (Mild Irritant)
Criteria	(1) Mean value of ≤ 2.3 -<4.0 for erythema/eschar or for oedema in at least 2 of 3 test animals from gradings at 24, 48 and 72 hours after path removal, or if reactions are delayed, from grades on 3 consecutive days after the onset of dermal reactions, or (2) Inflammation that persists to the end of the observation period normally 14 days in at least 2 animals, particularly taking into account alopecia, hyperplasia, and scaling, or (3) In some cases where there is pronounced variability of response among animals, with very definite positive effects related to chemical exposure in a single animal but less than the criteria above	Mean value of ≥ 1.5 - < 2.3 for erythema/eschar or for oedema from gradings in at least 2 of 3 tested animals from grades at 24, 48 and 72 hours or, if reactions are delayed, from grades on 3 consecutive days after the onset of skin reactions (when not included in the irritant Category 2)

7. Eye Irritation

EU	Xi R41	Xi R36
Criteria	Substances/preparations when applies to the eye of an animal cause *severe* ocular lesions within 72 hours after exposure which persist for at least 24 hours. Occular lesions are severe if the means of the scores of the eye irritation test in Annex V have any of the values: - cornea opacity equal to or greater than 3 - iris lesion greater than 1.5. The same shall be the case where the test has been completed using three animals if these lesions, on two or more animals, have any of the values : - cornea opacity equal to or greater than 3, - iris lesion equal to 2. In both cases all scores at each of the reading times (24, 48 and 72 hours) for an effect should be used in caculating the respective mean values. Ocular lesions are also severe when they are still present at the end of the observation time. Ocular lesions are also severe if the substance or preparation causes irreversible colouration of the eyes - Substances and preparations which cause severe ocular lesions based on practical experience in humans. Note : When a substance or preparation is classified as corrosive and assigned R34 or R35, the risk of severe damage to eyes is considered implicit and R41 is not included in the label.	Xi R36: Substances/preparations when applies to the eye of an animal, cause *significant* ocular lesions within 72 hours after exposure which persist for at least 24 hours. Ocular lesions are significant if the mean score of the eye irritation test cited in Annex V have any of the following values : - cornea opacity equal to or greater than 2 but less than 3, - iris lesion equal to or greater that 1 but not greater than 1.5, - redness of the conjunctivae equal to or greater than 2.5, - oedema of the conjunctiva (chemosis) equal to or greater than 2, or, in the case where the Annex V test has been completed using three animals if the lesions, on two or more animals, are equivalent to any of the above values except that for iris lesion the value should be equal to or greater than 1 but less than 2 and for redness of the conjunctivae the value should be equal to or greater than 2.5. In both cases all scores at each of the reading times (24, 48 and 72 hours) for an effect should be used in calculating the respective mean values. - Substances or preparations which cause significant ocular lesions, based on practical experience in humans. - Organic peroxides except where evidence to the contrary is available.

Correlation	Irreversible effects	Reversible effects	
GHS	**Category 1** (irreversible effects on the eye)	**Category 2 A** (irritating to eyes)	**Category 2B** (mildly irritating to eyes)
Description	At least in 1 animal effects on the cornea, iris or conjunctiva not expected to, or have not fully reversed within an observation period of 21 days and/or at least in 2 of 3 test animals a positive response of: corneal opacity ≥ 3 and/or iritis > 1.5 calculated on the mean scores following grading at 24, 48 and 72 hours after installation of the test material.	At least in 2 of 3 tested animals a positive response of: corneal opacity ≥ 1 and/or iritis ≥ 1 and/or conjunctival redness ≥ 2, and/or conjunctival oedema (chemosis) ≥ 2 calculated as the mean scores following grading at 24, 48 and 72 hours after installation of the test material, and which fully reverses within an observation period of 21 days.	When the effects listed in Category 2 A fully reverse within 7 days of observation

8. Respiratory Sensitisation

EU	**Xn R42**
Criteria	Human evidence that the substance/preparation can induce specific respiratory hypersensitive - normally seen as asthma, rhinitis and alveolitis - or where there are positive results from appropriate animal tests, or in case the substance is an isocyanate unless there is evidence that the specific isocyanate does not cause respiratory hypersensitivity.
GHS	**Category 1**
Criteria	- If there is evidence in humans that the substance can induce specific respiratory hypersensitivity and/or - if there are positive results from an appropriate animal test.

9. Skin Sensitisation

EU	**Xi R43**
Criteria	If practical experience shows that the substance/preparation may be capable of inducing sensitisation by skin contact in a *substantial number* of persons, or where there are positive results from an appropriate animal test
GHS	**Category 1**
Criteria	- If there is evidence in humans that the substance can induce sensitization by skin contact in a substantial number of persons or - if there are positive results from an appropriate animal test.

10. Mutagenic Substances

EU	Category 1 T R46	Category 2 T R46	Category 3 Xn R68
Criteria	**Substances *known* to be mutagenic to man.** Sufficient evidence to establish a causal association between human exposure to a substance and heritable genetic damage.	**Substances which *should be regarded* as if they are mutagenic to man.** There is sufficient evidence to provide a strong presumption that human exposure to the substance may result in the development of heritable genetic damage, generally on the basis of : - appropriate animal studies, - other relevant information.	**Substances which *cause concern* for man owing to possible mutagenic effects.** Substances which cause concern for man owing to possible mutagenic effects. There is evidence from appropriate mutagenicity studies, but this is insufficient to place the substance in Category 2.

GHS	Category 1		Category 2
	Category 1A	Category 1B	
Criteria	**Chemicals *known* to induce heritable mutations in germ cells of humans.** Positive evidence from human epidemiological studies.	**Chemicals which should be *regarded* as if they induce heritable mutations in germ cells of humans.** - Positive result(s) from *in vivo* heritable germ cell mutagenicity tests in mammals; or - Positive result(s) from *in vivo* somatic cell mutagenicity tests in mammals, in combination with some evidence that the substance has potential to cause mutations to germ cells. This supporting evidence may, for example, be derived from mutagenicity/genotoxicity tests in germ cells *in vivo*, or by demonstrating the ability of the substance or its metabolite(s) to interact with the genetic material of germ cells; or - Positive results from tests showing mutagenic effects in the germ cells of humans, without demonstration of transmission to progeny; for example, an increase in the frequency of aneuploidy in sperm cells of exposed people.	**Chemicals which *cause concern* for man owing to the possibility that they may induce heritable mutations in germ cells of humans** Positive evidence obtained from experiments in mammals and/or in some cases from *in vitro* experiments, obtained from: - Somatic cell mutagenicity tests *in vivo*, in mammals; or - Other *in vivo* somatic cell genotoxicity tests which are supported by positive results from *in vitro* mutagenicity assays. **Note** : - Chemicals which are positive in *in vitro* mammalian mutagenicity assays, and which also show chemical structure activity relationship to known germ cell mutagens, should be considered for classification as Category 2 mutagens.

11. Carcinogenic Substances

EU	Category 1 T R45 & T R49	Category 2 T R45 & T R49	Category 3 Xn R40
Criteria	**Substances *known* to be carcinogenic to man.** Sufficient evidence to establish a causal association between human exposure to a substance and the development of cancer.	**Substances *which should be regarded* as if they are carcinogenic to man.** There is sufficient evidence to provide a strong presumption that human exposure to a substance may result in the development of cancer, generally on the basis of: - appropriate long-term animal studies, - other relevant information.	**Substances which *cause concern* for man owing to possible carcinogenic effects.** Substances which cause concern for man owing to possible carcinogenic effects but in respect of which the available information is not adequate for making a satisfactory assessment. There is some evidence from appropriate animal studies, but this is insufficient to place the substance in Category 2.

GHS	Category 1		Category 2
	Category 1A	Category 1B	
Criteria	**Chemicals *known* to have carcinogenic potential for humans.; the placing of a chemical is largely based on human evidence**	**Chemicals *presumed* to have carcinogenic potential for humans; the placing of a chemical is largely based on animal evidence** Based on strength of evidence together with additional considerations, such evidence may be derived from human studies that establish a causal relationship between human exposure to a chemical and the development of cancer (known human carcinogen). Alternatively, evidence may be derived from animal experiments for which there is sufficient evidence to demonstrate animal carcinogenicity (presumed human carcinogen). In addition, on a case by case basis, scientific judgement may warrant a decision of presumed human carcinogenicity derived from studies showing limited evidence of carcinogenicity in humans together with limited evidence of carcinogenicity in experimental animals	**Suspected human carcinogens** The placing of a chemical in Category 2 is done on the basis of evidence obtained from human and/or animal studies, but which is not sufficiently convincing to place the chemical in Category 1. Based on strength of evidence together with additional considerations, such evidence may be from either limited evidence of carcinogenicity in human studies or from limited evidence of carcinogenicity in animal studies.

12. Substances Toxic for Reproduction

EU	**Category 1 T R60 & T R61**	**Category 2 T R60 & T R61**	**Category 3 Xn R62 & R63**
Criteria	**Substances *known* to impair fertility in humans or to cause development toxicity in humans. (Sufficient evidence from human exposure)**	**Substances which *should be regarded* as if they impair fertility to humans or cause development toxicity in humans.** - *Substances which should be regarded as if they impair fertility in humans.* There is sufficient evidence to provide a strong presumption that human exposure to the substance may result in impaired fertility on the basis of: - clear evidence in animal studies of impaired fertility in the absence of toxic effects, or, evidence of impaired fertility occurring at around the same dose levels as other toxic effects but which is not a secondary non-specific consequence of the other toxic effects. - other relevant information. - *Substances which should be regarded as if they cause development toxicity to humans* There is sufficient evidence to provide a strong presumption that human exposure to the substance may result developmental toxicity, generally on the basis of: - clear results in appropriate animal studies where effects have been observed in the absence of signs of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not a secondary non-specific consequence of the other toxic effects. - other relevant information.	**Substances which *cause concern* for human fertility or to possible developmental toxic effects** - *Substances which cause concern for human fertility* Generally on the basis of: - results in appropriate animal studies which provide sufficient evidence to cause a strong suspicion of impaired fertility in the absence of toxic effects, or evidence of impaired fertility occuring at around the same dose levels as other toxic effects, but which is not a secondary non-specific consequence o the other toxic effects, but where the evidence is insufficient to place the substance in Category 2. - other relevant information. - *Substances which cause concern for humans owing to possible developmental toxic effects* Generally on the basis of: - results in appropriate animal studies which provide sufficient evidence to cause a strong suspicion of developmental toxicity in the absence of signs of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not a secondary non-specific consequence of the other toxic effects, but where the evidence is insufficient to place the substance in Category 2, - other relevant information.

GHS	**Category 1**		**Category 2**
	Category 1A	**Category 1B**	
Criteria	***Chemicals known human reproductive toxicant*** The placing of the substance in this category is largely based on evidence from humans.	***Chemicals presumed human reproductive toxicant*** The placing of substances in this category is largely based on evidence from experimental animals. Data from animal studies should provide clear evidence of an adverse effect on sexual function and fertility or on development in the absence of other toxic effects, or if occurring together with other toxic effects the adverse effect on reproduction is considered not to be a secondary non-specific consequence of other toxic effects. However, when there is mechanistic information that raises doubt about the relevance of the effect for humans, classification in Category 2 may be more appropriate.	***Chemicals suspected human reproductive toxicant*** This category includes substances for which there is some evidence from humans or experimental animals, - possibly supplemented with other information – of an adverse effect on sexual function and fertility, or on development, in the absence of other toxic effects, or if occurring together with other toxic effects the adverse effect on reproduction is considered not to be a secondary non-specific consequence of the other toxic effects, and where the evidence is not sufficiently convincing to place the substance in Category 1. For instance, deficiencies in the study may make the quality of evidence less convincing, and in view of this Category 2 be the more appropriate classification.

Remarks : R40 = possible risk of irreversible effects
R45 = may cause cancer
R49 = may cause cancer by inhalation

R60 = may impair fertility
R61 = may cause harm to the unborn child
R62 = possible risk of impaired fertility
R63 = possible risk of harm to unborn child

13. Effect during Lactation

EU	**R64**
Criteria	Substances which are classified as toxic to reproduction and which also cause concern due to their effects on lactation should in addition be labelled with R64 . For the purpose of classification, toxic effects on offspring resulting only from exposure via the breast milk, or toxic effects resulting from direct exposure of children will not be regarded as "Toxic to reproduction", unless such effects result in impaired development of the offspring. Substances which are not classified as toxic to reproduction but which cause concern due to toxicity when transferred to the baby during the period of lactation should be labelled with R64. This R-phrase may also be appropriate for substances which affect the quality of the milk. R64 May cause harm to breastfed babies For substances and preparations which are absorbed by women and may interfere with lactation or which may be present (including metabolites) in breast milk in amounts sufficient to cause concern for the health of the breastfed child.
GHS	**Effects on or via lactation.**
Criteria	Effects on or via lactation are allocated to a separate single category. It is appreciated that for many substances there is no information on the potential to cause adverse effects on the offspring via lactation. However substances which are absorbed by women and have been shown to interfere with lactation, or which may be present (including metabolites) in breast milk in amounts sufficient to cause concern for the health of a breastfed child, should be classified to indicate this property hazardous to breastfed babies. This classification can be assigned on the basis of: (a) absorption, metabolism, distribution and excretion studies that would indicate the likelihood the substances would be present in potentially toxic levels in breast milk; and/or (b) results of one or two generation studies in animals which provide clear evidence of adverse effect in the offspring due to transfer in the milk or adverse effect on the quality of the milk; and/or (c) human evidence indicating a hazard to babies during the lactation period.