




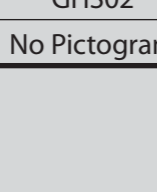

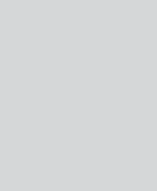


















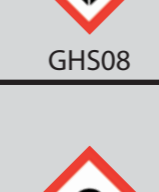
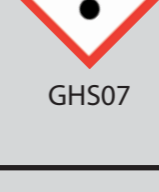





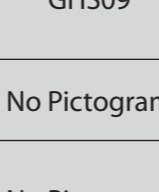

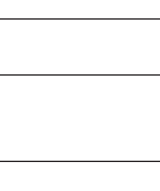


The Global Harmonised System (GHS) within the EU

The new classification and labelling system according to CLP regulation (EC) No 1272/2008

Hazard class	Category	Pictogram	Signal word	Code	Hazard statements	P-Codes
Explosives	Unstable Explosive		Danger	H200	Unstable Explosive	P201, P202, P281, P372, P373, P380, P401, P501
	Div 1.1		Danger	H201	Explosive; mass explosion hazard	P210, P230, P240, P250, P280, P370+P380, P372, P373, P401, P501
	Div 1.2		Danger	H202	Explosive; severe projection hazard	P210, P230, P240, P250, P280, P370+P380, P372, P373, P401, P501
	Div 1.3		Danger	H203	Explosive; fire, blast or projection hazard	P210, P230, P240, P250, P280, P370+P380, P372, P373, P401, P501
	Div 1.4		Warning	H204	Fire or projection hazard	P210, P240, P250, P280, P370+P380, P372, P373, P374, P401, P501
	Div 1.5		Danger	H205	May mass explode in fire	P210, P230, P240, P250, P280, P370+P380, P372, P373, P401, P501
	Div 1.6	No Pictogram				
Flammable gases	Category 1		Danger	H220	Extremely flammable gas	P210, P377, P381, P403
	Category 2	No Pictogram	Warning	H221	Flammable gas	P210, P377, P381, P403
Flammable aerosols	Category 1		Danger	H222	Extremely flammable aerosol	P210, P211, P251, P410+P412
	Category 2		Warning	H223	Flammable aerosol	P210, P211, P251, P410+P412
Flammable liquids	Category 1		Danger	H224	Extremely flammable liquid and vapour	P210, P233, P240, P241, P242, P243, P280, P303+P361+P533, P370+P378, P403+P235, P501
	Category 2		Danger	H225	Highly flammable liquid and vapour	
	Category 3		Warning	H226	Flammable liquid and vapour	
Flammable solids	Category 1		Danger	H228	Flammable solid	P210, P240, P241, P280, P370+P378
	Category 2		Warning	H228	Flammable solid	
Self-reactive substances and mixtures; and Organic peroxides	Type A		Danger	H240	Heating may cause an explosion	P210, P220, P234, P280, P370+ P378, P370+ P380+P375, P403+P235, P411, P420, P501
	Type B		Danger	H241	Heating may cause a fire or explosion	P210, P220, P234, P280, P370+P378, P370+ P380+P375, P403+P235, P411, P420, P501
	Type C, D		Danger	H242	Heating may cause a fire	P210, P220, P234, P280, P370+P378, P403+P235, P411, P420, P501
	Type E, F		Warning	H242	Heating may cause a fire	P210, P220, P234, P280, P370+P378, P403+P235, P411, P420, P501
	Type G	No Pictogram				
Pyrophoric liquids; Pyrophoric solids	Category 1		Danger	H250	Catches fire spontaneously if exposed to air	P210, P222, P280, P302+P334, P370+P378, P422
Self-heating substances and mixtures	Category 1		Danger	H251	Self-heating; may catch fire	
	Category 2		Warning	H252	Self-heating in large quantities; may catch fire	P235+P410, P280, P407, P413, P420
Substances And Mixtures Which, In Contact With Water, Emit Flammable Gases	Category 1			Danger	H260	In contact with water releases flammable gases which may ignite spontaneously
	Category 2	Danger		H261	In contact with water releases flammable gas	
	Category 3	Warning		H261	In contact with water releases flammable gas	P231+P232, P280, P370+P378, P402+P404, P501
Oxidising gases	Category 1		Danger	H270	May cause or intensify fire; oxidizer	P220, P244, P370+P376, P403
	Category 1			Danger	H271	May cause fire or explosion; strong oxidiser
Oxidising liquids; Oxidising solids	Category 2			Danger	H272	May intensify fire; oxidizer
	Category 3		Warning	H272	May intensify fire; oxidizer	P210, P220, P221, P280, P370+P378, P501
Gases under pressure	Compressed gas Liquefied gas Dissolved gas		Warning	H280	Contains gas under pressure; may explode if heated	P410+P403
	Refrigerated liquefied gas		Warning	H281	Contains refrigerated gas; may cause cryogenic burns or injury	P282, P336, P315, P403
Corrosive to Metals	Category 1		Warning	H290	May be corrosive to metals	P234, P390, P404
	Category 1, 2			Danger	H300	Fatal if swallowed
Category 3	Danger	H301		Toxic if swallowed	P264, P270, P301+P310, P321, P330, P405, P501	
Category 4	Warning	H302		Harmful if swallowed	P264, P270, P301+P312, P330, P501	
Aspiration hazard	Category 1		Danger	H304	May be fatal if swallowed and enters airways	P301+P310, P331, P405, P501
	Category 1, 2			Danger	H310	Fatal in contact with skin
Category 3	Danger	H311		Toxic in contact with skin	P280, P302+P352, P312, P322, P361, P363, P405, P501	
Category 4	Warning	H312		Harmful in contact with skin	P280, P302+P352, P312, P322, P363, P501	

Hazard class	Category	Pictogram	Signal word	Code	Hazard statements	P-Codes
Skin corrosion/irritation	Category 1A, B, C		Danger	H314	Causes severe skin burns and eye damage	P260, P264, P280, P301+P330+ P331, P303+P361+P533, P363, P304+P340, P310, P321, P305+ P351+P338, P405, P501
	Category 2		Warning	H315	Causes skin irritation	P264, P280, P302+P352, P321, P332+P313, P362
Sensitisation, Skin	Category 1		Warning	H317	May cause an allergic skin reaction	P261, P272, P280, P302+P352, P333+P313, P321, P363, P501
	Category 1		Danger	H318	Causes serious eye damage	P280, P305+P351+P338, P310
Serious eye damage/eye irritation	Category 2			Warning	H319	Causes serious eye irritation
	Acute toxicity, inhalation	Category 1, 2		Danger	H330	Fatal if inhaled
Category 3		Danger		H331	Toxic if inhaled	P261, P271, P304+P340, P311, P321, P403+P233, P405, P501
Category 4		Warning		H332	Harmful if inhaled	P261, P271, P304+P340, P312
Sensitisation, respiratory	Category 1		Danger	H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled	P261, P285, P304+P341, P342+P311, P501
	Category 3			Warning	H335	May cause respiratory irritation
Specific target organ toxicity, single exposure; Respiratory tract irritation	Category 3			Warning	H336	May cause drowsiness or dizziness
	Category 3		Warning	H336	May cause drowsiness or dizziness	
Germ cell mutagenicity	Category 1A, 1B		Danger	H340	May cause genetic defects	P201, P202, P281, P308+P313, P405, P501
	Category 2		Warning	H341	Suspected of causing genetic defects	
Carcinogenicity	Category 1A, 1B		Danger	H350	May cause cancer	P201, P202, P281, P308+P313, P405, P501
	Category 2		Warning	H351	Suspected of causing cancer	
Reproductive toxicity	Category 1A, 1B		Danger	H360	May damage fertility or the unborn child	P201, P202, P281, P308+P313, P405, P501
	Category 2		Warning	H361	Suspected of damaging fertility or the unborn child	
Reproductive toxicity, effects on or via lactation	Additional category	No Pictogram		H362	May cause harm to breast-fed children	P201, P260, P263, P264, P270, P308+P313
Specific target organ toxicity, single exposure	Category 1		Danger	H370	Causes damage to organs	P260, P264, P270, P307+P311, P321, P405, P501
	Category 2		Warning	H371	May cause damage to organs	P260, P264, P270, P309+P311, P405, P501
Specific target organ toxicity, repeated exposure	Category 1		Danger	H372	Causes damage to organs through prolonged or repeated exposure	P260, P264, P270, P314, P501
	Category 2		Warning	H373	Causes damage to organs through prolonged or repeated exposure	P260, P314, P501
Hazardous to the aquatic environment, acute hazard	Category 1		Warning	H400	Very toxic to aquatic life	P273, P391, P501
	Category 1			Warning	H410	Very toxic to aquatic life with long lasting effects
Category 2	Warning	H411		Toxic to aquatic life with long lasting effects		
Category 3	No Pictogram	H412		Harmful to aquatic life with long lasting effects		
Hazardous to the aquatic environment, long-term hazard	Category 3			H413	May cause long lasting harmful effects to aquatic life	P273, P501
	Category 4		No Pictogram		H413	May cause long lasting harmful effects to aquatic life

Additional EU Hazard Class

Explosive when dry	EUH001
Explosive with or without contact with air	EUH006
Reacts violently with water	EUH014
In use may form flammable/explosive vapour-air mixture	EUH018
May form explosive peroxides	EUH019
Contact with water liberates toxic gas	EUH029
Contact with acids liberates toxic gas	EUH031
Contact with acids liberates very toxic gas	EUH032
Risk of explosion if heated under confinement	EUH044
Hazardous to the ozone layer	EUH059
Repeated exposure may cause skin dryness or cracking	EUH066
Toxic by eye contact	EUH070
Corrosive to the respiratory tract	EUH071

For more information, please visit the online Safety Center: sigma-aldrich.com/safety-center.html

The Global Harmonised System (GHS) within the EU

The new classification and labelling system according to CLP regulation (EC) No 1272/2008

H-CODES

GHS hazard notes codification system is discussed more in the UN Expert Committee; therefore, changes may be necessary.

PHYSICAL HAZARDS

H200	Unstable Explosive
H201	Explosive; mass explosion hazard
H202	Explosive; severe projection hazard
H203	Explosive; fire, blast or projection hazard
H204	Fire or projection hazard
H205	May mass explode in fire
H220	Extremely flammable gas
H221	Flammable gas
H222	Extremely flammable aerosol
H223	Flammable aerosol
H224	Extremely flammable liquid and vapour
H225	Highly flammable liquid and vapour
H226	Flammable liquid and vapour
H228	Flammable solid
H240	Heating may cause an explosion
H241	Heating may cause a fire or explosion
H242	Heating may cause a fire
H250	Catches fire spontaneously if exposed to air
H251	Self-heating; may catch fire
H252	Self-heating in large quantities; may catch fire
H260	In contact with water releases flammable gases which may ignite spontaneously
H261	In contact with water releases flammable gas
H270	May cause or intensify fire; oxidizer
H271	May cause fire or explosion; strong oxidizer
H272	May intensify fire; oxidizer
H280	Contains gas under pressure; may explode if heated
H281	Contains refrigerated gas; may cause cryogenic burns or injury
H290	May be corrosive to metals

HEALTH HAZARDS

H300	Fatal if swallowed
H301	Toxic if swallowed
H302	Harmful if swallowed
H304	May be fatal if swallowed and enters airways
H310	Fatal in contact with skin
H311	Toxic in contact with skin
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H319	Causes serious eye irritation
H330	Fatal if inhaled
H331	Toxic if inhaled
H332	Harmful if inhaled
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness
H340	May cause genetic defects
H341	Suspected of causing genetic defects
H350	May cause cancer
H351	Suspected of causing cancer
H360	May damage fertility or the unborn child
H361	Suspected of damaging fertility or the unborn child
H362	May cause harm to breast-fed children
H370	Causes damage to organs
H371	May cause damage to organs
H372	Causes damage to organs through prolonged or repeated exposure
H373	May cause damage to organs through prolonged or repeated exposure

ENVIRONMENTAL HAZARDS

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
H412	Harmful to aquatic life with long lasting effects
H413	May cause long lasting harmful effects to aquatic life

COMBINATION OF H-CODES

H300 + H310	Fatal if swallowed or in contact with skin
H300 + H330	Fatal if swallowed or if inhaled
H310 + H330	Fatal in contact with skin or if inhaled
H300 + H310 + H330	Fatal if swallowed, in contact with skin or if inhaled
H301 + H311	Toxic if swallowed or in contact with skin
H301 + H311	Toxic if swallowed or if inhaled
H311 + H331	Toxic in contact with skin or if inhaled
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H302 + H312	Harmful if swallowed or in contact with skin
H302 + H312	Harmful if swallowed or if inhaled
H312 + H332	Harmful in contact with skin or if inhaled
H302 + H312 + H332	Harmful if swallowed, in contact with skin or if inhaled
H315 + H320	Causes skin and eye irritation

ADDITIONAL HAZARD STATEMENTS

EUH001	Explosive when dry
EUH006	Explosive with or without contact with air
EUH014	Reacts violently with water
EUH018	In use may form flammable/explosive vapour-air mixture
EUH019	May form explosive peroxides
EUH029	Contact with water liberates toxic gas
EUH031	Contact with acids liberates toxic gas
EUH032	Contact with acids liberates very toxic gas
EUH044	Risk of explosion if heated under confinement
EUH059	Hazardous to the ozone layer
EUH066	Repeated exposure may cause skin dryness or cracking
EUH070	Toxic by eye contact
EUH071	Corrosive to the respiratory tract

P-CODES

GENERAL

P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P103	Read label before use

PREVENTION

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
P211	Do not spray on an open flame or other ignition source.
P220	Keep/Store away from clothing/.../combustible materials.
P221	Take any precaution to avoid mixing with combustibles/...
P222	Do not allow contact with air.
P223	Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P230	Keep wetted with ...
P231	Handle under inert gas.
P232	Protect from moisture.
P233	Keep container tightly closed.
P234	Keep only in original container.
P235	Keep cool.
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.
P244	Keep reduction valves free from grease and oil.
P250	Do not subject to grinding/shock/.../friction.
P251	Pressurized container: Do not pierce or burn, even after use.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P262	Do not get in eyes, on skin, or on clothing.
P263	Avoid contact during pregnancy/while nursing.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P281	Use personal protective equipment as required.
P282	Wear cold insulating gloves/face shield/eye protection.
P283	Wear fire/flammable resistant/retardant clothing.
P284	Wear respiratory protection.
P285	In case of inadequate ventilation wear respiratory protection.
P231 + P232	Handle under inert gas. Protect from moisture.
P235 + P410	Keep cool. Protect from sunlight.

RESPONSE

P310	Immediately call a POISON CENTER or doctor/physician.
P311	Call a POISON CENTER or doctor/physician.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P313	Get medical advice/attention.
P314	Get medical advice/attention if you feel unwell.
P315	Get immediate medical advice/attention.
P320	Specific treatment is urgent (see ... on this label).
P321	Specific treatment (see ... on this label).
P322	Specific measures (see ... on this label).
P330	Rinse mouth.
P331	Do NOT induce vomiting.
P334	Immerse in cool water/wrap in wet bandages.
P335	Brush off loose particles from skin.
P336	Thaw frosted parts with lukewarm water. Do not rub affected area.
P338	Remove contact lenses, if present and easy to do. Continue rinsing.
P340	Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P341	If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
P342	If experiencing respiratory symptoms:
P350	Gently wash with plenty of soap and water.
P351	Rinse cautiously with water for several minutes.
P352	Wash with plenty of soap and water.
P353	Rinse skin with water/shower.
P360	Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.
P361	Remove/Take off immediately all contaminated clothing.
P362	Take off contaminated clothing and wash before reuse.
P363	Wash contaminated clothing before reuse.
P371	In case of major fire and large quantities:
P372	Explosion risk in case of fire.
P373	DO NOT fight fire when fire reaches explosives.
P374	Fight fire with normal precautions from a reasonable distance.
P376	Stop leak if safe to do so.

P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P378	Use ... for extinction.
P380	Evacuate area.
P381	Eliminate all ignition sources if safe to do so.
P390	Absorb spillage to prevent material damage.
P391	Collect spillage. Hazardous to the aquatic environment
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P301 + P312	IF SWALLOWED: call a POISON CENTER or doctor/physician IF you feel unwell.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P302 + P334	IF ON SKIN: Immerse in cool water/wrap in wet bandages.
P302 + P350	IF ON SKIN: Gently wash with plenty of soap and water.
P302 + P352	IF ON SKIN: wash with plenty of soap and water.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse SKIN with water/shower.
P304 + P312	IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.
P304 + P340	IF INHALED: Remove victim to fresh air and Keep at rest in a position comfortable for breathing.
P304 + P341	IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P306 + P360	IF ON CLOTHING: Rinse Immediately contaminated CLOTHING and SKIN with plenty of water before removing clothes.
P307 + P311	IF exposed: call a POISON CENTER or doctor/physician.
P308 + P313	IF exposed or concerned: Get medical advice/attention.
P309 + P311	IF exposed or if you feel unwell: call a POISON CENTER or doctor/physician.
P332 + P313	IF SKIN irritation occurs: Get medical advice/attention.
P333 + P313	IF SKIN irritation or rash occurs: Get medical advice/attention.
P335 + P334	Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.
P337 + P313	IF eye irritation persists: Get medical advice/attention.
P342 + P311	IF experiencing respiratory symptoms: call a POISON CENTER or doctor/physician.
P370 + P376	In case of fire: Stop leak if safe to do so.
P370 + P378	In case of fire: Use ... for extinction.
P370 + P380	In case of fire: Evacuate area.
P370 + P380 + P375	In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.
P371 + P380 + P375	In case of major fire and large quantities: evacuate area. Fight fire remotely due to the risk of explosion.

STORAGE

P401	Store...
P402	Store in a dry place.
P403	Store in a well-ventilated place.
P404	Store in a closed container.
P405	Store locked up.
P406	Store in corrosive resistant/... container with a resistant inner liner.
P407	Maintain air gap between stacks/pallets.
P410	Protect from sunlight.
P412	Do not expose to temperatures exceeding 50°C/ 122°F.
P413	Store bulk masses greater than ... kg/...lbs at temperatures not exceeding ... °C/...°F.
P420	Store away from other materials.
P422	Store contents under ...
P402 + P404	Store in a dry place. Store in a closed container.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P410 + P403	Protect from sunlight. Store in a well-ventilated place.
P410 + P412	Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F.
P411 + P235	Store at temperatures not exceeding ... °C/...°F. Keep cool.

DISPOSAL

P501	Dispose of contents/container to....
P502	Refer to manufacturer/supplier for information on recovery/recycling

PICTOGRAMS



GHS01
Exploding Bomb



GHS02
Flame



GHS03
Flame over Circle



GHS04
Gas Cylinder



GHS05
Corrosion



GHS06
Skull and Crossbones



GHS07
Exclamation Mark



GHS08
Health Hazard



GHS09
Environment

For more information, please visit the online Safety Center: sigma-aldrich.com/safety-center.html