

**R-phrases** (short for **Risk Phrases**) are defined in Annex III of [European Union Directive 67/548/EEC](#): *Nature of special risks attributed to dangerous substances and preparations*. The list was consolidated and republished in [Directive 2001/59/EC](#), where translations into other EU languages may be found.

These risk phrases are used internationally, not just in Europe, and there is an ongoing effort towards complete international harmonization. (*Note: missing R-number combinations indicate phrases that were deleted or replaced by another phrase.*)

## **Risk phrases**

- R1: Explosive when dry
- R2: Risk of explosion by shock, friction, fire or other sources of ignition
- R3: Extreme risk of explosion by shock, friction, fire or other sources of ignition
- R4: Forms very sensitive explosive metallic compounds
- R5: Heating may cause an explosion
- R6: Explosive with or without contact with air
- R7: May cause fire
- R8: Contact with combustible material may cause fire
- R9: Explosive when mixed with combustible material
- R10: Flammable
- R11: Highly flammable
- R12: Extremely flammable
- R14: Reacts violently with water
- R15: Contact with water liberates extremely flammable gases
- R16: Explosive when mixed with oxidising substances
- R17: Spontaneously flammable in air
- R18: In use, may form flammable/explosive vapour-air mixture
- R19: May form explosive peroxides
- R20: Harmful by inhalation
- R21: Harmful in contact with skin
- R22: Harmful if swallowed
- R23: Toxic by inhalation
- R24: Toxic in contact with skin
- R25: Toxic if swallowed
- R26: Very toxic by inhalation
- R27: Very toxic in contact with skin
- R28: Very toxic if swallowed
- R29: Contact with water liberates toxic gas.
- R30: Can become highly flammable in use
- R31: Contact with acids liberates toxic gas
- R32: Contact with acids liberates very toxic gas
- R33: Danger of cumulative effects
- R34: Causes burns
- R35: Causes severe burns
- R36: Irritating to eyes

- R37: Irritating to respiratory system
- R38: Irritating to skin
- R39: Danger of very serious irreversible effects
- R40: Limited evidence of a carcinogenic effect
- R41: Risk of serious damage to eyes
- R42: May cause sensitisation by inhalation
- R43: May cause sensitisation by skin contact
- R44: Risk of explosion if heated under confinement
- R45: May cause cancer
- R46: May cause heritable genetic damage
- R48: Danger of serious damage to health by prolonged exposure
- R49: May cause cancer by inhalation
- R50: Very toxic to aquatic organisms
- R51: Toxic to aquatic organisms
- R52: Harmful to aquatic organisms
- R53: May cause long-term adverse effects in the aquatic environment
- R54: Toxic to flora
- R55: Toxic to fauna
- R56: Toxic to soil organisms
- R57: Toxic to bees
- R58: May cause long-term adverse effects in the environment
- R59: Dangerous for the ozone layer
- R60: May impair fertility
- R61: May cause harm to the unborn child
- R62: Possible risk of impaired fertility
- R63: Possible risk of harm to the unborn child
- R64: May cause harm to breast-fed babies
- R65: Harmful: may cause lung damage if swallowed
- R66: Repeated exposure may cause skin dryness or cracking
- R67: Vapours may cause drowsiness and dizziness
- R68: Possible risk of irreversible effects

## **Combinations**

- R14/15: Reacts violently with water, liberating extremely flammable gases
- R15/29: Contact with water liberates toxic, extremely flammable gases
- R20/21: Harmful by inhalation and in contact with skin
- R20/22: Harmful by inhalation and if swallowed
- R20/21/22: Harmful by inhalation, in contact with skin and if swallowed
- R21/22: Harmful in contact with skin and if swallowed
- R23/24: Toxic by inhalation and in contact with skin
- R23/25: Toxic by inhalation and if swallowed
- R23/24/25: Toxic by inhalation, in contact with skin and if swallowed
- R24/25: Toxic in contact with skin and if swallowed
- R26/27: Very toxic by inhalation and in contact with skin
- R26/28: Very toxic by inhalation and if swallowed
- R26/27/28: Very toxic by inhalation, in contact with skin and if swallowed

- R27/28: Very toxic in contact with skin and if swallowed
- R36/37: Irritating to eyes and respiratory system
- R36/38: Irritating to eyes and skin
- R36/37/38: Irritating to eyes, respiratory system and skin
- R37/38: Irritating to respiratory system and skin
- R39/23: Toxic: danger of very serious irreversible effects through inhalation
- R39/24: Toxic: danger of very serious irreversible effects in contact with skin
- R39/25: Toxic: danger of very serious irreversible effects if swallowed
- R39/23/24: Toxic: danger of very serious irreversible effects through inhalation and in contact with skin
- R39/23/25: Toxic: danger of very serious irreversible effects through inhalation and if swallowed
- R39/24/25: Toxic: danger of very serious irreversible effects in contact with skin and if swallowed
- R39/23/24/25: Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed
- R39/26: Very Toxic: danger of very serious irreversible effects through inhalation
- R39/27: Very Toxic: danger of very serious irreversible effects in contact with skin
- R39/28: Very Toxic: danger of very serious irreversible effects if swallowed
- R39/26/27: Very Toxic: danger of very serious irreversible effects through inhalation and in contact with skin
- R39/26/28: Very Toxic: danger of very serious irreversible effects through inhalation and if swallowed
- R39/27/28: Very Toxic: danger of very serious irreversible effects in contact with skin and if swallowed
- R39/26/27/28: Very Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed
- R42/43: May cause sensitization by inhalation and skin contact
- R48/20: Harmful: danger of serious damage to health by prolonged exposure through inhalation
- R48/21: Harmful: danger of serious damage to health by prolonged exposure in contact with skin
- R48/22: Harmful: danger of serious damage to health by prolonged exposure if swallowed
- R48/20/21: Harmful: danger of serious damage to health by prolonged exposure through inhalation and in contact with skin
- R48/20/22: Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed
- R48/21/22: Harmful: danger of serious damage to health by prolonged exposure in contact with skin and if swallowed
- R48/20/21/22: Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed
- R48/23: Toxic: danger of serious damage to health by prolonged exposure through inhalation

- R48/24: Toxic: danger of serious damage to health by prolonged exposure in contact with skin
  - R48/25: Toxic: danger of serious damage to health by prolonged exposure if swallowed
  - R48/23/24: Toxic: danger of serious damage to health by prolonged exposure through inhalation and in contact with skin
  - R48/23/25: Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed
  - R48/24/25: Toxic: danger of serious damage to health by prolonged exposure in contact with skin and if swallowed
  - R48/23/24/25: Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed
  - R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
  - R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
  - R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment
  - R68/20: Harmful: possible risk of irreversible effects through inhalation
  - R68/21: Harmful: possible risk of irreversible effects in contact with skin
  - R68/22: Harmful: possible risk of irreversible effects if swallowed
  - R68/20/21: Harmful: possible risk of irreversible effects through inhalation and in contact with skin
  - R68/20/22: Harmful: possible risk of irreversible effects through inhalation and if swallowed
  - R68/21/22: Harmful: possible risk of irreversible effects in contact with skin and if swallowed
  - R68/20/21/22: Harmful: possible risk of irreversible effects through inhalation, in contact with skin and if swallowed
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**S-phrases** are defined in Annex IV of [European Union Directive 67/548/EEC](#): *Safety advice concerning dangerous substances and preparations*. The list was consolidated and republished in [Directive 2001/59/EC](#), where translations into other EU languages may be found.

These safety phrases are used internationally and not just in Europe, and there is an ongoing effort towards complete international harmonization. (*Note: missing S-number combinations indicate phrases that were deleted or replaced by another phrase.*)

- (S1): Keep locked up
- (S2): Keep out of the reach of children
- S3: Keep in a cool place
- S4: Keep away from living quarters
- S5: Keep contents under ... (*appropriate liquid to be specified by the manufacturer*)
- S6: Keep under ... (*inert gas to be specified by the manufacturer*)
- S7: Keep container tightly closed
- S8: Keep container dry

- S9: Keep container in a well-ventilated place
- S10: Keep contents wet
- S11: Avoid contact with air
- S12: Do not keep the container sealed
- S13: Keep away from food, drink and animal foodstuffs
- S14: Keep away from ... (*incompatible materials to be indicated by the manufacturer*)
- S15: Keep away from heat
- S16: Keep away from sources of ignition - No smoking
- S17: Keep away from combustible material
- S18: Handle and open container with care
- S20: When using do not eat or drink
- S21: When using do not smoke
- S22: Do not breathe dust
- S23: Do not breathe gas/fumes/vapour/spray (*appropriate wording to be specified by the manufacturer*)
- S24: Avoid contact with skin
- S25: Avoid contact with eyes
- S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
- S27: Take off immediately all contaminated clothing
- S28: After contact with skin, wash immediately with plenty of ... (*to be specified by the manufacturer*)
- S29: Do not empty into drains
- S30: Never add water to this product
- S33: Take precautionary measures against static discharges
- S35: This material and its container must be disposed of in a safe way
- S36: Wear suitable protective clothing
- S37: Wear suitable gloves
- S38: In case of insufficient ventilation wear suitable respiratory equipment
- S39: Wear eye/face protection
- S40: To clean the floor and all objects contaminated by this material use ... (*to be specified by the manufacturer*)
- S41: In case of fire and/or explosion do not breathe fumes
- S42: During fumigation/spraying wear suitable respiratory equipment (*appropriate wording to be specified by the manufacturer*)
- S43: In case of fire use ... (*indicate in the space the precise type of fire-fighting equipment. If water increases the risk add - **Never use water***)
- S45: In case of accident or if you feel unwell seek medical advice immediately (show the label where possible)
- S46: If swallowed, seek medical advice immediately and show this container or label
- S47: Keep at temperature not exceeding ... °C (*to be specified by the manufacturer*)
- S48: Keep wet with ... (*appropriate material to be specified by the manufacturer*)

- S49: Keep only in the original container
- S50: Do not mix with ... (*to be specified by the manufacturer*)
- S51: Use only in well-ventilated areas
- S52: Not recommended for interior use on large surface areas
- S53: Avoid exposure - obtain special instructions before use
- S56: Dispose of this material and its container at hazardous or special waste collection point
- S57: Use appropriate containment to avoid environmental contamination
- S59: Refer to manufacturer/supplier for information on recovery/recycling
- S60: This material and its container must be disposed of as hazardous waste
- S61: Avoid release to the environment. Refer to special instructions/safety data sheet
- S62: If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label
- S63: In case of accident by inhalation: remove casualty to fresh air and keep at rest
- S64: If swallowed, rinse mouth with water (only if the person is conscious)

## Combinations

- (S1/2): Keep locked up and out of the reach of children
- S3/7: Keep container tightly closed in a cool place
- S3/7/9: Keep container tightly closed in a cool, well-ventilated place
- S3/9/14: Keep in a cool, well-ventilated place away from ... (*incompatible materials to be indicated by the manufacturer*)
- S3/9/14/49: Keep only in the original container in a cool, well-ventilated place away from ... (*incompatible materials to be indicated by the manufacturer*)
- S3/9/49: Keep only in the original container in a cool, well-ventilated place
- S3/14: Keep in a cool place away from ... (*incompatible materials to be indicated by the manufacturer*)
- S7/8: Keep container tightly closed and dry
- S7/9: Keep container tightly closed and in a well-ventilated place
- S7/47: Keep container tightly closed and at temperature not exceeding ... °C (*to be specified by the manufacturer*)
- S8/10: Keep container wet, but keep the contents dry
- S20/21: When using do not eat, drink or smoke
- S24/25: Avoid any inhalation, contact with skin and eyes. Wear suitable protective clothing and gloves
- S27/28: After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of ... (*to be specified by the manufacturer*)
- S29/35: Do not empty into drains; dispose of this material and its container in a safe way
- S29/56: Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point
- S36/37: Wear suitable protective clothing and gloves

- S36/37/39: Wear suitable protective clothing, gloves and eye/face protection
- S36/39: Wear suitable protective clothing and eye/face protection
- S37/39: Wear suitable gloves and eye/face protection
- S47/49: Keep only in the original container at temperature not exceeding ... °C (*to be specified by the manufacturer*)

Source: wikipedia, access 11.04.2011