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# List of R-phrases

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**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 <sup>[1]</sup>, 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
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- 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

### **R-phrases no longer in use**

- R13: Extremely flammable liquefied gas.
- R47: May cause birth defects.

### **External links**

- [Chemical Risk & Safety Phrases in 23 European Languages](#) <sup>[2]</sup>

### **References**

[1] <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32001L0059:EN:HTML>

[2] <http://schoolscout24.de/cgi-bin/rsp/rspinput.cgi>

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# Article Sources and Contributors

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