



Hazard Communication Information Sheet reflecting the US OSHA Implementation of the *Globally Harmonized System of Classification and Labelling of Chemicals (GHS)*

Produced by the SCHC-OSHA Alliance
GHS/HazCom Information Sheet Workgroup

Organic Peroxides

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How does OSHA's Hazard Communication Standard (HCS 2012) define organic peroxides?

Organic Peroxides means a liquid or solid organic chemical which contains the bivalent -O-O- structure and as such is considered a derivative of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. The term organic peroxide includes organic peroxide mixtures containing at least one organic peroxide. Organic peroxides are thermally unstable chemicals, which may undergo exothermic self-accelerating decomposition.

In addition, they may have one or more of the following properties:

- be liable to explosive decomposition,
- burn rapidly,
- be sensitive to impact or friction,
- react dangerously with other substances.

An organic peroxide is regarded as possessing explosive properties when in laboratory testing the formulation is liable to detonate, to deflagrate rapidly or to show a violent effect when heated under confinement.







How does HCS 2012 classify organic peroxides?

Table 1 presents the classification criteria for Organic Peroxides. Note that for this hazard, a letter is used to designate each hazard category, as opposed to numbers. See 29 CFR 1910.1200 for complete information.

Table 1: HCS Organic Peroxides Classification Criteria

Category	Type A	Type B	Type C
Criteria	Any organic peroxide which, as packaged, can detonate or deflagrate rapidly	Any organic peroxide possessing explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package	Any organic peroxide possessing explosive properties when the chemical as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion
Category	Type D	Type E	Type F
Criteria	Any organic peroxide which in laboratory testing: (i) detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or (ii)	Any organic peroxide which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement	Any organic peroxide which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power.
Category	Type G		
Criteria	Any organic peroxide which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any explosive power, provided that it is thermally stable (self-accelerating decomposition temperature is 60°C (140°F) or higher for a 50 kg (110 lb) package), and, for liquid mixtures, a diluent having a boiling point of not less than 150°C (302°F) is used for desensitization. If the organic peroxide is not thermally stable or a diluent having a boiling point less than 150 °C (302 °F) is used for desensitization, the chemical is classified as Type F.		

Table 2: HCS Label Elements for Organic Peroxides

Category	Type A	Type B	Type C
Pictogram			
Signal Word	Danger	Danger	Danger
Hazard Statements	Heating may cause a fire or explosion	Heating may cause a fire or explosion	Heating may cause a fire
Category	Type D	Type E	Type F
Pictogram			
Signal Word	Danger	Warning	Warning
Hazard Statements	Heating may cause a fire	Heating may cause a fire	Heating may cause a fire
Category	Type G		
Pictogram	No Symbol		
Signal Word	No Signal Word		
Hazard Statements	No Hazard Statement		

Additional classification considerations

For purposes of classification, the properties of organic peroxides are determined in accordance with test series A to H as described in Part II of the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Revision 4; Self-accelerating decomposition temperature (SADT) is determined in accordance with the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Revision 4 , Part II, section 28.

Classification of mixtures

Mixtures of organic peroxides may be classified as the same type of organic peroxide as that of the most dangerous ingredient. However, as two stable ingredients can form a thermally less stable mixture, the SADT of the mixture is determined.

To learn more...

- OSHA: Hazard Communication: <https://www.osha.gov/dsg/hazcom/index.html>
HCS 2012.
- SCHC site: <http://www.schc.org/osha-alliance>

The information contained in this sheet is believed to accurately represent current OSHA HCS requirements. However, SCHC cannot guarantee the accuracy or completeness of this information. Users are responsible for determining the suitability and appropriateness of these materials for any particular application.

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