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

Self Reacting Chemicals — October 2017

How does OSHA's Hazard Communication Standard (HCS) define Self Reacting Chemicals?

Self-reactive chemicals are thermally unstable liquid or solid substances liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes substances classified as explosives, organic peroxides, oxidizing liquids or oxidizing solids.

How does HCS classify Self Reacting Chemicals?

A self-reactive chemicals are considered for classification in this class unless:

(a) It is classified as an explosive;
(b) It is classified as an oxidizing liquid or an oxidizing solid, except that a mixture of oxidizing substances which contains 5% or more of combustible organic substances shall be classified as a self-reactive substance;
(c) It is classified as an organic peroxide;
(d) Its heat of decomposition is less than 300 J/g; or
(e) Its self-accelerating decomposition temperature (SADT) is greater than 75 °C (167 °F) for a 50 kg (110 lb) package.

Self-reactive Chemicals are classified in one of the seven types with Type A being the most hazardous and Type G being the least hazardous:

Table 1: Classification Criteria

Type	Description
Type A	Any self-reactive chemicals which can detonate or deflagrate rapidly, as packaged
Type B	Any self-reactive substance or mixture possessing explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package
Type C	Any self-reactive chemicals possessing explosive properties when the substance as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion
Type D	Any self-reactive chemicals which in laboratory testing either detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or does not detonate or deflagrate at all and shows a medium effect when heated under confinement
Type E	Any self-reactive chemicals which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement
Type F	Any self-reactive chemicals 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
Type G	Any self-reactive chemicals 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) to 75 °C (167 °F) for a 50 kg (110 lb) package), and, for liquid mixtures, a diluent having a boiling point greater than or equal to 150 °C (302 °F) is used for desensitization. Note: If the mixture is not thermally stable or a diluent having a boiling point less than 150 °C (302 °F) is used for desensitization, the mixture shall be defined as self-reactive substance TYPE F.

Table 2 shows some of the label elements for self-reactive chemicals. The precautionary statements are not included due to space limitations of this fact sheet. See §1910.1200 for complete classification and labelling information.

Table 2: Hazard Communication Label Elements for self-reactive chemicals

Type	Type A	Type B	Type C and Type D	Type E and Type F	Type G
Pictogram					There are no label elements allocated to this type
Signal Word	Danger	Danger	Danger	Warning	
Hazard Statement	Heating may cause an explosion	Heating may cause a fire or explosion	Heating may cause a fire	Heating may cause a fire	

Important considerations in classifying a substance as a self-reactive chemicals:

The properties of self-reactive chemicals are determined in accordance with test series A to H as described in Part II of the UN ST/SG/AC.10 (UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Rev. 4). Self-accelerating decomposition temperature (SADT) shall be determined in accordance with the UN ST/SG/AC.10, Part II, section 28 (UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Rev. 4.).

The classification procedures for self-reactive chemicals need not be applied if:

(a) There are no substance groups present in the molecule associated with explosive or self-reactive properties; examples of such groups are given in Tables A6.1 and A6.2 in the Appendix 6 of the UN ST/SG/AC.10 UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Rev. 4.); or

(b) For a single organic substance or a homogeneous mixture of organic substances, the estimated SADT is greater than 75 °C (167 °F) or the exothermic decomposition energy is less than 300 J/g.

The onset temperature and decomposition energy may be estimated using a suitable calorimetric technique (See 20.3.3.3 in Part II of the UN ST/SG/AC.10 (UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Rev. 4.)

How is this classification applied to mixtures?

Mixtures are classified based on available data on the finished product (mixture as a whole).

To learn more…

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