To: Correspondence group on Dust Explosion Hazard

26th October 2015

GAFTA Position Paper on Dust Explosion Hazard

Gafta is the international organisation representing the trade in agricultural commodities, established in 1878. The purpose of this paper is to restate Gafta's position regarding the debate taking place in the UNECE Sub-Committee of Experts on the Globally Harmonized System (GHS) on the Classification and Labelling of Chemicals and also the Correspondence Group.

We are aware that work continues on a step by step approach regarding the question of "Dust Explosion Hazard to consider introducing a new hazard class in the GHS, or alternatively, to set specific guidance for the communication of hazards following a harmonized approach.

As we have previously stated, Gafta does not support the introduction of a new hazard class within the GHS as the GHS clearly states that, in order to create a new class, the substance or mixture of substances to be classified must have an intrinsic hazardous property for its classification.

Section 1.3.2.2.1 of the GHS reads:
"The GHS uses the term "hazard classification" to indicate that only the intrinsic hazardous properties of substances or mixtures are considered."

Also, Section 1.1.3.1.1. of the GHS reads:
"The goal of the GHS is to identify the intrinsic hazards found in substances and mixtures and to convey hazard information about these hazards..."

Gafta does not agree that all dusts or mixtures of dusts with air are intrinsically hazardous substances, nor intrinsically explosive. Thus, it becomes necessary to clearly distinguish between those dusts whose explosive property is inherent in the substance – intrinsic property - and those dusts which come from substances or solids which are not intrinsically explosive. If we consider those dusts from substances which are not intrinsically explosive - but may be combustible - or the mixtures of these with air to pose an explosion hazard, a combination of other factors must be present, such as particle size, a necessary minimum concentration of the particles in air (low flammable limit), the existence of a minimum energy source of ignition and the condition of confinement, all of which must be simultaneously present to generate an explosion. Therefore, the release of a combustible dust from a condition of confinement (e.g., a building) means that it has escaped confinement and thus no longer presents a dust explosion hazard. An example of this type of dust is the dust from agricultural products. Gafta does not consider these types of products, including when presented in dust form, as presenting an intrinsic hazardous property. Consequently, we do not agree that these types of products could potentially be included in a possible classification in the GHS.

In Annex 1, we provided a flowchart containing the conditions which must be present for a dust explosion hazard to exist. However, we do not believe this quality is an intrinsic property of all combustible dusts or mixtures of dusts with air.

On the other hand, when speaking about "Dust Explosion Hazard", it appears that the hazard being referenced is that of a physical hazard due to a possible explosion. However, the concept of dust or mixture of dust with air does not necessarily meet the GHS definition of an explosive substance:

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"An explosive substance (or mixture) is a solid or liquid substance (or mixture of substances) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic substances are included even when they do not evolve gases."

1 GHS, Chapter 2.1 Explosives, Section 2.1.1.1, p 43. The same definition is in Chapter 1.2 Definitions and Abbreviations, p 12.

According to this definition, for a substance to be explosive, the substance or mixture of substances must have the capacity in itself to generate such an explosion. It is our opinion, the condition of being a dust or a mixture of dust and air together is not enough to generate an explosion. In some dusts, sufficient condition will be granted by the very nature of the origin of the substance; and, in other dusts, coming from non-intrinsically explosive substances, the explosion will only occur given the combination of other conditions, as already mentioned.

Consequently, we cannot support the proposal to create a new class of hazard in the GHS for those dusts or mixtures of dust with air coming from substances which are not intrinsically explosive, as specified in the GHS classification criterion and furthermore, do not meet the definition of "explosive substance."

Gafta does not support the creation of a new hazard class in the GHS for those dusts or mixtures of dust with air from substances which are not intrinsically explosive. Potential dust explosion hazards associated with grain may exist during the grain handling process, during loading or unloading, when it is moved in an elevator in a confined space. Agricultural commodities do not pose a risk during normal transportation. Any possible vibrations during transport have never created sufficient movement of grain to raise dust or create an explosive atmosphere. Any related risk is being successfully addressed in domestic and international regulation. These standards are designed to mitigate the safety and environmental risk of agricultural commodities.

Grain is not classified as a dangerous good in international transport regulations. The International Maritime Organisation has established grain as "non-hazardous". The grain requirements are included in the International Code of the Safe Carriage of Grain in Bulk, 1991. These regulatory requirements are backed up by robust industry education and training programmes. Grain handlers have an excellent safety record built upon decades of successful commitment to reducing safety risks and complying with relevant regulations.

Gafta does not support the introduction of any system to categorize dusts present in bulk agricultural commodities as inherently dangerous but could support assessing the need to incorporate new and further hazard communication or clarification elements to those already existing, in order to make sure that the dust explosion hazard takes into account the conditions illustrated in Annex 1.

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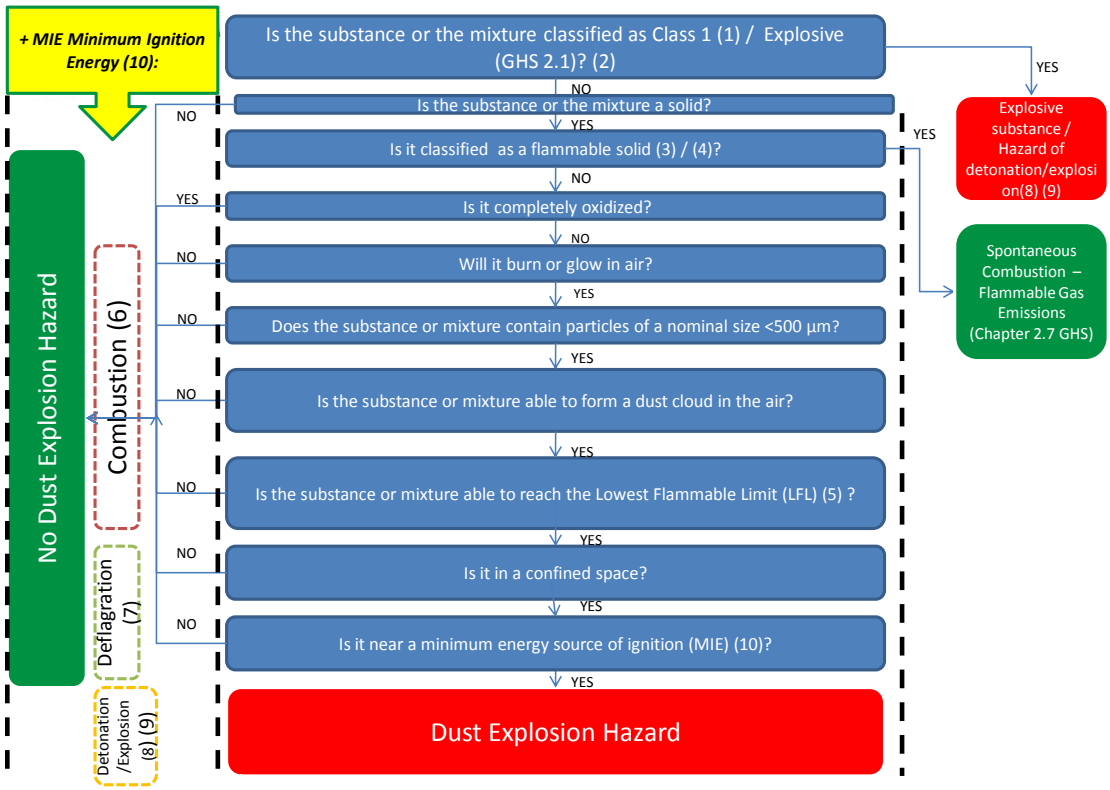
Annex I – Flowchart to identify dust explosion hazards



(1) **Class 1** comprises explosive substances (a substance which is not itself an explosive but which can form an explosive atmosphere of gas, vapour or dust is not included in Class 1), except those that are too dangerous to transport or those where the predominant hazard is appropriate to another class. [Recommendations on the Transport of Dangerous Goods: Model Regulations (18th Revised Edition), section 2.1.1.1. point (a)]

(2) **Definition of Explosive substance in GHS:** An explosive substance (or mixture) is a solid or liquid substance (or mixture of substances) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause to the surroundings. Pyrotechnic substances are included even when they do not evolve gases."[1] [GHS, Section 2.1.1.1]

(3) **Class 4 - Flammable solids:** Solids which under conditions encountered in transport, are readily combustible or may cause or contribute to fire though friction; self-reactive substances which are liable to undergo a strongly exothermic reaction; solid desensitized which may explode if not diluted sufficiently. [Recommendations on the Transport of Dangerous Goods: Model Regulations (18th Revised Edition), section 2.4.1.1. point (a)]

(4) **Definition of Flammable Solid in GHS:** A flammable solid is a solid which is readily combustible, or may cause or contribute to fire through friction. [GHS, Section 2.7.1]

(5) **Lower Flammable Limit (LFL):** The lowest concentration of a combustible substance in a gaseous oxidizer that will propagate a flame, under defined test conditions. [NFPA 68,2013]

(6) **Combustion:** A chemical process of oxidation that occurs at a rate fast enough to produce heat and usually light in the form of either a glow or flame. [NFPA 69, 2013]

(7) **Deflagration:** Propagation of a combustion zone at a velocity that is less than the speed of sound in the unreacted medium. [NFPA 68,2013]

(8) **Detonation:** Propagation of a combustion zone at a velocity greater than the speed of sound in the unreacted medium. [NFPA 68,2013]

(9) **Explosion:** The bursting or rupturing of an enclosure or a container due to the development of internal pressure from a deflagration. [NFPA 68,2013]

(10) **Minimum Ignition Energy (MIE):** The minimum amount of energy released at a point in a combustible mixture that causes flame propagation away from the point, under specified test conditions. [NFPA 68,2013]