

Transport, Corrosivity & Harmonizing International Standards

Presented by

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9:50 AM – 10:30 AM

Harmonization With UN Model Regulations

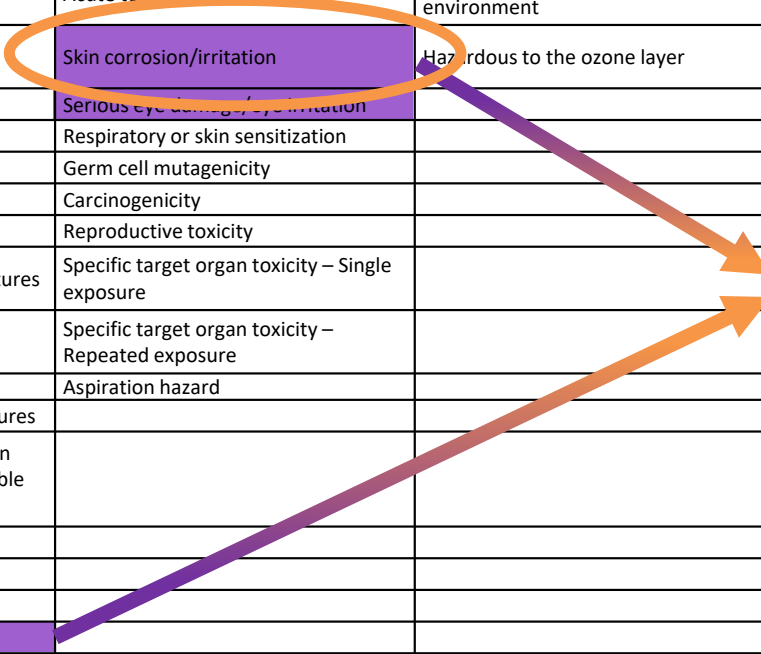
- Every two years, the dangerous goods transport regulations must change to harmonize with the UN Model Regulations (Orange Book).
- The current version (not necessarily the latest version) is the 20th Revised Edition which was developed during the 2015 – 2016 biennium.
- Various implementation dates but generally applicable from January 1, 2019.

Harmonization With UN Model Regulations

- This presentation focuses on changes made to the transport classification of corrosive materials.

GHS and TDG Hazard Classes

GHS Hazard Classes (Rev. 7) (Named, not numbered)			TDG Hazard Classes (20 th Rev. Ed.) (Numbered <i>and</i> Named)
Physical Hazards (GHS Part 2)	Health Hazards (GHS Part 3)	Environmental Hazards (GHS Part 4)	(Model Regulations Part 2)
17 Classes	10 Classes	2 Classes	9 Classes (plus divisions)
Explosives	Acute toxicity	Hazardous to the aquatic environment	Class 1 (six divisions)
Flammable gases (including chemically unstable gases)	Skin corrosion/irritation	Hazardous to the ozone layer	Class 2 (three divisions)
Aerosols	Serious eye damage/eye irritation		Class 3 (no divisions)
Oxidizing gases	Respiratory or skin sensitization		Class 4 (three divisions)
Gases under pressure	Germ cell mutagenicity		Class 5 (two divisions)
Flammable liquids	Carcinogenicity		Class 6 (two divisions)
Flammable solids	Reproductive toxicity		Class 7 (no divisions)
Self-reactive substances and mixtures	Specific target organ toxicity – Single exposure		Class 8 (no divisions)
Pyrophoric liquids	Specific target organ toxicity – Repeated exposure		Class 9 (no divisions)
Pyrophoric solids	Aspiration hazard		
Self-heating substances and mixtures			
Substances and mixtures which, in contact with water, emit flammable gases			
Oxidizing liquids			
Oxidizing solids			
Organic peroxides			
Corrosive to metals			
Desensitized Explosives			



	GHS	TDG
Nature/Type of Danger (Hazard Class)	Skin Corrosion/Irritation	Class 8
Severity/Degree of Danger	Hazard Category 1	Class 8
	Sub-category 1A	PG I
	Sub-category 1B	PG II
	Sub-category 1C	PG III
	Hazard Category 2	Not Regulated
	Hazard Category 3	Not Regulated

				TDG
				Class 8
Packing Group	Exposure Time	Observation Period	Effect	
I	≤ 3 min	≤ 60 min	Full thickness destruction of intact skin.	Class 8
II	> 3 min, ≤ 1 hour	≤ 14 days	Full thickness destruction of intact skin.	PG I
III	> 1 hour, ≤ 4 hours	≤ days	Full thickness destruction of intact skin.	PG II
III	-	-	Corrosion rate on steel or aluminum > 6.25 mm / year @ 55 °C.	PG III
				Not Regulated
				Not Regulated

Harmonization With UN Model Regulations

- This presentation focuses on changes made to the transport classification of corrosive materials.
- Changes were made to the classification of skin corrosion:
 1. Updated the OECD guidelines to the 2015 version.
 2. Revised the definition of “corrosive to skin”.
 3. Introduced additional methods for classifying mixtures to allow classification without testing.

Harmonization With UN Model Regulations

- The result of these changes is that transport regs are now more closely aligned with GHS criteria for skin corrosion.
- However, the TDG classification of skin corrosion is still not fully aligned with the GHS.
- Why not?

The TDG Tiered Approach to Classification

Tier 1:

If test data for the mixture are available, use them.

Tier 2:

If test data for the mixture are not available, get them.

Some of the Characteristics of the Transport Sector's Approach to Classification

- Classification is based on test results.
 - No distinction is generally made between the classification of a substance and the classification of a mixture.
 - There is a “list” but test results override it.
- A Packing Group (hazard category/sub-category) assignment is required, and must be accurate.
 - Indicates the degree of danger and therefore determines the level of safety regulation that must be applied.
 - Must not overstate or understate the degree of danger.

Some of the Characteristics of the Transport Sector's Approach to Classification

- Consequently, the transport sector has been reluctant to embrace the non-test classification methods of the GHS.
- To see non-test classification methods incorporated into TDG classification is a big step.

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Revision to the definition of skin corrosion:

Packing Group	Exposure Time	Observation Period	Effect	Effect
I	≤ 3 min	≤ 60 min	Full thickness destruction of intact skin.	Irreversible damage of intact skin.
II	> 3 min, ≤ 1 hour	≤ 14 days	Full thickness destruction of intact skin.	Irreversible damage of intact skin.
III	> 1 hour, ≤ 4 hours	≤ days	Full thickness destruction of intact skin.	Irreversible damage of intact skin.

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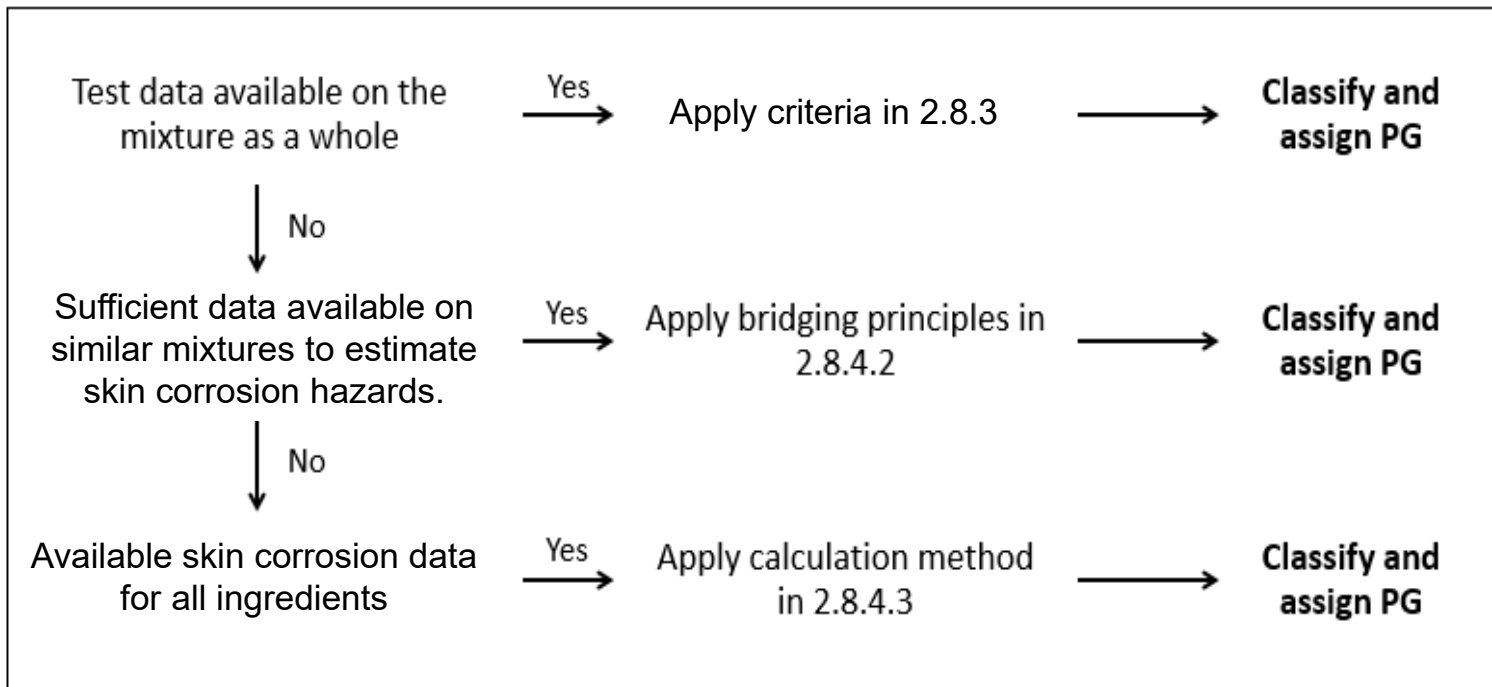
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New Methods for Classifying Corrosive Mixtures

- No further changes to the classification of substances.
- Introduction of a tiered approach for classification of mixtures.

New TDG Tiered Approach for Classifying Mixtures

Figure 2.8.4.1: Step-wise approach to classify and assign packing group of corrosive mixtures



Bridging Principles

- Dilution
- Batching
- Concentration of mixtures of packing group I
- Interpolation within one packing group
- Substantially similar mixtures

Calculation Method

$$\frac{PGx1}{GCL} + \frac{PGx2}{SCL2} + \dots + \frac{PGxi}{SCLi} \geq 1$$

Where:

PG xi = concentration of substance 1, 2 . . . i in the mixture, assigned to packing group X (I, II or III)

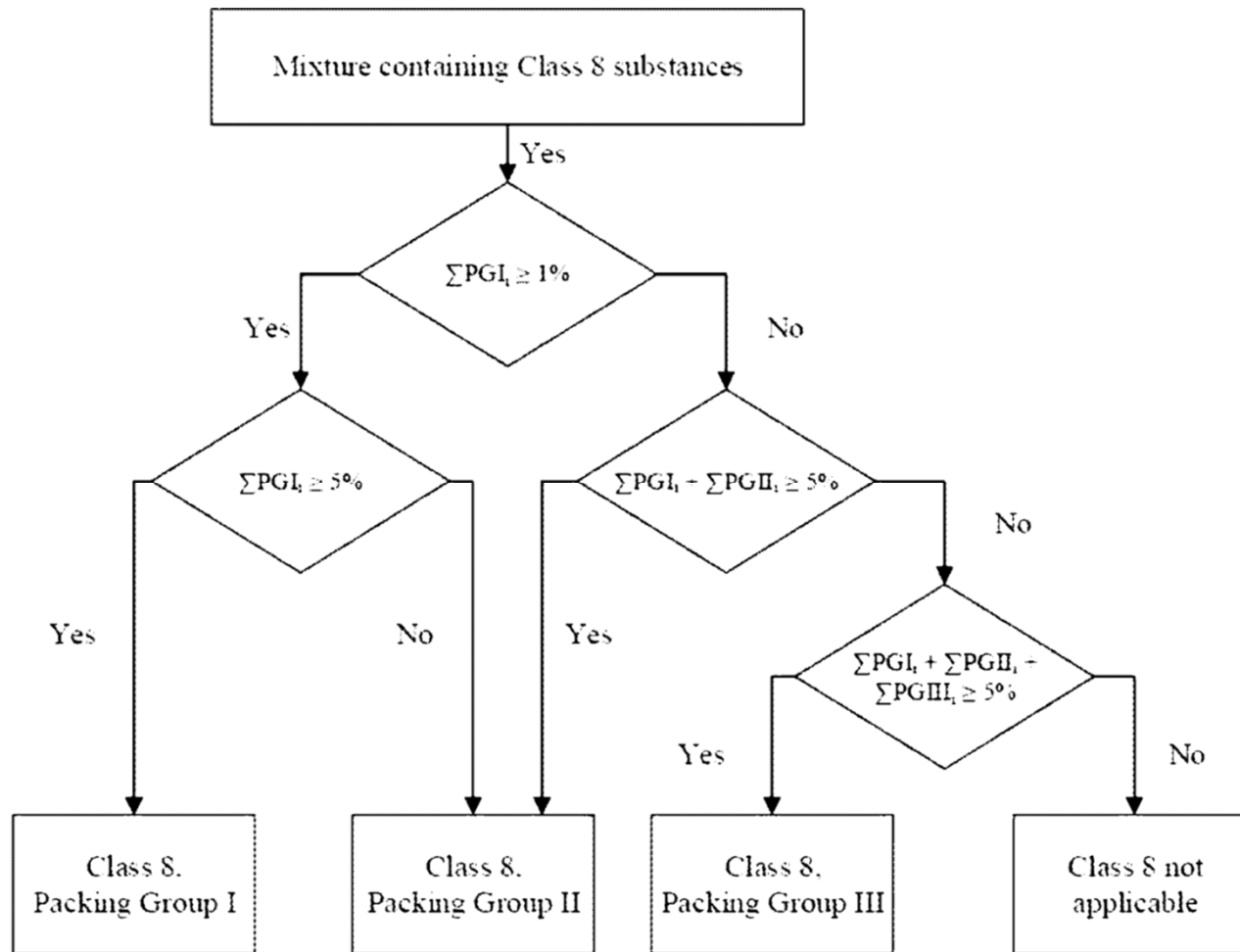
GCL = generic concentration limit

SCLi = specific concentration limit assigned to substance i

Refer to Figure 2.8.4.3 for Generic Concentration Limits (GCL).

Take full advantage of the examples provided in the note to 2.8.4.3.5.

Figure 2.8.4.3 Calculation method



Did Not Adopt

- pH
- Additivity
- Weight of Evidence