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## CLASS E – CORROSIVE MATERIAL

**65. A product, material or substance shall be included in Class E - Corrosive Material listed in Schedule II to the Act if**

- (a) it corrodes SAE 1020 steel or 7075-T6 non-clad aluminum surfaces at a rate exceeding 6.25 millimetres per year at a test temperature of 55°C when tested in accordance with *Test Method, Laboratory Corrosion Testing of Metals for the Process Industries*, NACE Standard TM-01-69 (1976 Revision);**
- (b) it is corrosive to skin when tested in accordance with OECD Test Guideline No. 404, "Acute Dermal Irritation/Corrosion", dated May 12, 1981;**
- (c) it is included in Class 8 in Part III of the *Transportation of Dangerous Goods Regulations*;**
- (d) it is a gas included in Division 4 of Class 2 in Part III of the *Transportation of Dangerous Goods Regulations*;**
- (e) there is evidence that it causes visible necrosis of human skin tissue; or**
- (f) it is an untested mixture containing a product, material or substance that meets the criteria referred to in paragraph (b) or (e) and is present at a concentration of at least one per cent.**


### INTERPRETATION / DISCUSSION of SECTION 65

The criteria in this section address the corrosive properties of a product, material or substance on biological tissue (human and laboratory animal) as well as on metal. The WHMIS criteria also includes "goods" in Class 8 and 2.4 of the *TDG Regulations*.

**Concrete and concrete mixtures:** Unhardened concrete has been shown to pose a significant hazard to workers in terms of its corrosive properties. The sale/importation of concrete mixtures is not exempt from *HPA/CPR* requirements; {ref.: PIS No.21}.

**Corrosion versus irritation - classification?:** Refer to the interpretation / discussion corresponding to section 60 of the *CPR*.

**pH as a criterion for inclusion in Class E:** OECD Test Guideline No. 404 states that: "Strongly acidic or alkaline substances, for example, with a demonstrated pH of 2 or less or 11.5 or greater, need not be tested for primary dermal irritation, owing to their predictable corrosive properties". This infers that such substances may be viewed as corrosive based simply on a pH test and need not be subject to the full test in accordance with the guidelines. Therefore, (to avoid discrepancies in classifying controlled products)

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it is recommended that a product, material or substance with a demonstrated pH of 2 or less or 11.5 or greater be considered to be included in Class E, unless test data in accordance with OECD Guideline 404, **or**, as per subparagraph 33(3)(b)(v) of the *CPR*, any other test or method that is carried out in accordance with generally accepted standards of good scientific practice demonstrates this is not to be the case; {ref.: PIS No.60}. It is anticipated that the *CPR* will be amended to explicitly state that a material within this pH range is included in WHMIS Class E unless there is evidence which demonstrates that the material is not corrosive.

**Use of *in vitro* methods:** The U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) permits the use of a U.S. Department of Transport-approved *in vitro* method for evaluating skin corrosivity for compliance of OSHA's Hazard Communication Standard. As reflected in the "Harmonized Integrated Hazard Classification System for Human Health and Environmental Effects of Chemical Substances - Harmonized System for the Classification of Chemicals which cause Skin Irritation/Corrosion" (OECD, November 1998), when considering results from *in vitro* methods, a hierarchal approach has been agreed upon internationally. When considering results from *in vitro* methods, (such as, for example, "CORROSITEX<sup>®</sup>"), as agreed to for the Globally Harmonized System, a positive result constitutes criteria for inclusion in WHMIS Class E; negative or inconclusive results cannot be considered the sole basis for classification and further testing may be required; {ref.: PIS No. 60}.

**Paragraph 65(a):**

The NACE standard referenced in this paragraph does not specify the concentration of the solution to be used when determining whether or not a solid meets this criterion. In order to have a common baseline, should a supplier wish to use the NACE method for solids, it is recommended that a saturated solution be used, i.e., not a solution based on the recommended usage.

Regarding the duration of this test, many corrosion resistant materials form a protective layer. Short duration tests on such materials would indicate a high corrosion rate which may be very misleading. Short duration tests can also give misleading results on alloys that form passive films such as some stainless steels. For such materials, a more prolonged test may be required to permit the breakdown of the passive layer. Tests run for a longer period may provide a more accurate indication of the corrosivity of a substance than tests run for shorter periods.

**Paragraph 65(b):**

The referenced OECD guideline specifies pH ranges. See above for information regarding "pH as a criterion for inclusion in Class E".

**Paragraph 65(c):**

As with the Canadian *TDGR*, the U.S. Department of Transport's (DOT) regulations are based on the United Nations Recommendations on the Transport of Dangerous Goods. Following DOT's authorization of the use of CORROSITEX to determine classification and packing groups for Class 8 hazards, the seventh session of the U.N. Subcommittee of Experts on the Transport of Dangerous Goods voted to delete the word "animal" in paragraph 8.3 of the U.N. recommendations, thereby permitting *in vitro* tests to be used internationally.



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**Paragraph 65(d):**

Refer to the interpretation / discussion corresponding to subsection 43(4) for information regarding amendments to the *TDGR* which affected the TDG classification of substances originally included in TDG 2.4 when the *CPR* came into effect.

**Paragraph 65 (f):**

Where a mixture has not been tested as a whole to determine its health hazards, for the purposes of classification under this section of the *CPR*, the mixture is assumed to present the same hazards as any component meeting the criteria in paragraphs (b) or (e) if that component comprises 1.0% or greater of the untested mixture.