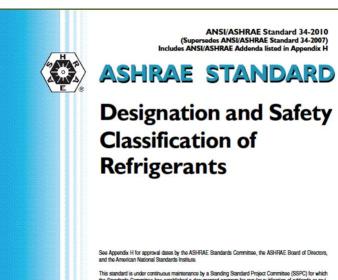
The major ASHRAE standards dealing with refrigerants are:

- 1. Standard 34, Designation and Safety Classification of Refrigerants
- 2. Standard 15, Safety Standard for Refrigeration Systems
- 3. Standard 147, Reducing the Release of Halogenated Refrigerants from Refrigerating and Air-Conditioning Equipment.

ASHRAE safety standards 15 and 34 covered the flammability and toxicity requirements. Standard 34 Overview by Tom Watson, P.E. President ASHRAE



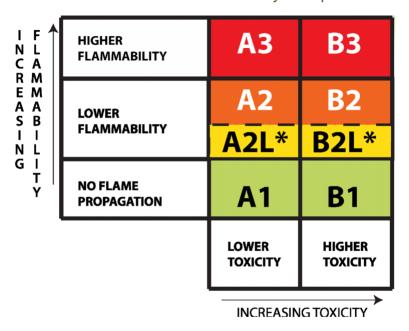
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*A2L and B2L are lower flammability refrigerant a maximum burning velocity of ≤ 10 cm/s (3.9 ir

➤ Toxicity Classification Based on

- chronic (long term) measure
 - Class A has PEL' > 400 PPM
 - Class B has PEL < 400 PPM
 - PEL = Permissible Exposure Limit

> Flammability Classification Based on

- ASTM E 681 with electrically activated match
- Class 1 no flame propagation
- Class 2 LFL > 0.10 kg/m³ and hc < 19 MJ/kg
- Class 2L Cl 2 w/ burning velocity < 10 cm / sec
- Class 3 LFL < 0.10 kg/m 3 or hc > 19 MJ/kg

➤ ASHRAE 34 defined Class 2L

- Years of work to differentiate Class 2L from Class 2/3
- Single criteria: Flame speed < 10 cm/s
- Refrigerants that fall into new category include:

R-32, R143a R-717 (Ammonia) R-1234yf

- Change in flammability rating does not alter toxicity rating
- Approved by Standards Committee in Feb 2010

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• "International Refrigerant Standards and their Influence on the Global HVAC Industry and Refrigerant

Replacement ": /www.unep.org/ozonaction/Portals/105/documents/virtualexpo/crh2013-WatsonTom "\$20(ASHRAE).pdf