

# Requirements for Clean Extinguishing Agent

## Scope

This document specifies the minimum requirements for an environmentally sustainable, total flooding, clean extinguishing agent for use in fixed fire-fighting systems. A clean extinguishing agent shall meet the following minimum requirements:

### 1. Material Requirements

The clean extinguishing agent shall be electrically nonconductive and of sufficient purity to prevent deposition of residue after discharge from a gaseous fire-extinguishing system (ISO 14520).

1.1. Product Purity	99.0 weight % minimum (by GC method)
1.2. Nonvolatile Residue	0.05 g/100 ml agent (by gravimetric method)
1.3. Dielectric Strength	> 2.0 relative to dry N <sub>2</sub> at 1 atm (by dielectric breakdown method)

### 2. Performance Requirements

The clean extinguishing agent shall have *Component Recognition* per either LPCB 1230, VdS 2344, CNPP or UL 2166 Halocarbon Clean Agent Extinguishing System Units and *Certificate Type Approval* per IMO MSC/Circ. 848 on Revised Guidelines for the Approval of Fixed Gas Fire-Extinguishing Systems. The agent shall have minimum extinguishing concentrations for class A and Class B fuels using the methods detailed in ISO 14520 (Standard covering Gaseous Fire-extinguishing Systems) and UL 2166.

### 3. Environmental Requirements

The clean extinguishing agent shall have approval under the US EPA Significant New Alternatives Policy (SNAP) as an alternative to halon. In an effort to address environmental impact associated with stratospheric ozone depletion and climate change due to global warming (Kyoto Protocol), the agent shall conform to the following environmental properties.

3.1. Atmospheric Lifetime	< 20 days
3.2. Ozone-Depletion Potential	0
3.3. Global Warming Potential	≤ 50

### 4. Safety Requirements

The clean extinguishing agent shall have toxicological properties that provide a safety margin > 50% when compared to the system design concentration.

$(\text{NOAEL} - \text{Design Concentration}) / \text{Design concentration} \times 100 = > 50\%$  Safety margin

The clean extinguishing agent shall have approval for use in normally occupied areas.

### 5. Standard Requirements:

- 5.1. The clean extinguishing agent shall be included in the ISO 14520 and NFPA 2001.
- 5.2. The clean extinguishing agent shall have a 20-year protection, valid globally, against regulatory bans or restrictions in use on the global warming potential, ozone depletion and atmospheric lifetime of the agent
- 5.3. The entity offering the certified and approved system using genuine clean extinguishing agent shall be able to demonstrate his relation to the genuine agent manufacturer (2 letters)