Clean Agent
Fire Suppression Alternatives

Comparison
Novec1230
FM-200
Which System Is The Best?
Fire Suppression Agent Comparison

Inert: Inergen IG541, IG55

Synthetic: HFC125, Novec1230, HFC227ea
Although these figures represent the agent itself, it does not take into account the GWP of the manufacturing of the cylinders.

<table>
<thead>
<tr>
<th></th>
<th>OZONE DEPLETION FACTOR</th>
<th>GLOBAL WARMING POTENTIAL</th>
<th>ATMOSPHERIC LIFETIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO₂</td>
<td>0</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Inergen</td>
<td>0</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>IG-55</td>
<td>0</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Novec1230</td>
<td>0</td>
<td>1</td>
<td>0.014 years (5 days)</td>
</tr>
<tr>
<td>FM-200</td>
<td>0</td>
<td>3500</td>
<td>33 years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>CO₂</th>
<th>Inert Gases</th>
<th>Novec1230</th>
<th>HFC227</th>
</tr>
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<tbody>
<tr>
<td>Ozone Depletion Factor</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Global Warming Potential</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3500</td>
</tr>
<tr>
<td>Atmospheric Lifetime</td>
<td>0</td>
<td>0</td>
<td>0.014</td>
<td>33</td>
</tr>
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</table>
* not effective on ...
  • class A deep seated fires
  • chemicals containing their own supply of oxygen (cellulose nitrate)
  • chemicals capable of auto-thermal decomposition

Extinguishing Capability

A, B, C (E)
How? - OXYGEN Reduction
12% - 14%
Inergen/IG55

A, B, C (E)
How? - HEAT Removal
FM200 (7.9% - 8.5%)
Novec123 (5.3% - 5.6%)

A, B, C (E)
DANGEROUS/Toxic
How? - OXYGEN Reduction
CO2 – 50-%

NOT Suitable for occupied spaces

Suitable for occupied spaces
### Human Safety

<table>
<thead>
<tr>
<th></th>
<th>Design Concentration</th>
<th>NOAEL</th>
<th>LOAEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novec1230</td>
<td>4.2% - 5.9%</td>
<td>10%</td>
<td>&gt;10%</td>
</tr>
<tr>
<td>FM-200®</td>
<td>6.4% - 9.0%</td>
<td>9%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Inergen®</td>
<td>34.2% - 41.2%</td>
<td>43%</td>
<td>52%</td>
</tr>
<tr>
<td>IG-55</td>
<td>40.3% - 47.5%</td>
<td>43%</td>
<td>52%</td>
</tr>
<tr>
<td>CO₂</td>
<td>35% - 65%</td>
<td>5%</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

- **NOAEL** - No observable adverse effect level
- **LOAEL** - lowest-observed-adverse-effect-level
Fire Suppression Decision Factors
Pipe length and complexity of the pipe run

- **FM-200®**
- **Novec™ 1230**
- **CO₂**
- **Inergen® and IG55**

The length of the bar does not give absolute ratios, it is a general indication only. The width of the bar refers to the possible complexity of the pipe run (indication only).
Working Pressures

The installer must ensure the correct pressure rating for pipes and fittings according to the flow calculation result.

* Pipe pressure downstream the pressure reducing unit.
** The final peak pressure in the pipe will result from the hydraulic flow calculation.
Comparison for a 200 m³ class A hazard

FM-200®: 7.9% = 0.63 kg/m³
126 kg - 1 x 147 ltr.

Novec™1230: 5.3% = 0.78 kg/m³
156 kg - 1 x 180 ltr.

Inergen®: 39.9% = 0.51 m³/m³
102 m³ - 5 x 80 ltr. (300 bar)

CO₂: 50% = 1.30 kg/m³
260 kg - 6 x 50 kg

IG55/Inergen®: 39.9% = 0.51 m³/m³
102 m³ - 7 x 80 ltr. (200 bar)
102 m³ - 5 x 80 ltr. (300 bar)
FM200 and Novec1230 demand less space and less pipe work. Inert Gas cylinders can often be more complicated with larger foot prints and more pipe work.
Q: So what is The Best Fire Suppression Agent?

A: Generally, there is no Best system! Many factors finally lead to the decision for a certain system.
Decision Factors

- Which fire class?
- Which system approval is required?
- Single hazard or multiple hazards
- Available space for Cylinders

Total Flooding

- Special requirements from insurance
- Health and safety

What type of application

Local application