

Dräger-Tube Application Note for Lithium Ion Battery Fires

Gases detected prior to thermal runaway

Warning signs of a fire include hissing or white gas coming from lithium-ion batteries.

Typical gases released during the early stages of a li-ion cell degrading:

Carbon dioxide, carbon monoxide, hydrogen and light weight hydrocarbons, e.g. methane, ethane, ethylene

CO is considered the main component for early fire detection.

Gases related to thermal runaway:

Depending on the specific cell types, the primary gases evolved include:

CO, CO₂, HF, H₂, CH₄, NO/NO₂, SO₂, HCl, HCN, NH₃ and HCHO

Dräger-Tube Solutions for Inorganic Gases - Start with a Simultaneous set, then an individual tube for HF:



Simultaneous Test Set I*

Set includes only the 5-tubes detector. Tube pump, manifold and hose (optional) are required additionally. Set I has tubes for: HCl, HCN, CO, NH₃ and Nitrous gases 10 strokes, approximately 50 to 60 seconds

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Tube	1st Mark	2nd Mark
HCl	2 ppm	10 ppm
HCN	-	9.5 ppm
CO	30 ppm	150 ppm
NH ₃	30 ppm	150 ppm
Nitrous gas (calib on NO ₂)	-	2.5 ppm NO ₂

*The tubes in the set are calibrated using the above gases.

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If the HCl tube is positive, i.e. yellow color, use the HF tube to confirm specifically HF.



Individual tube: Hydrogen Fluoride 1.5/b
Package of ten individual tubes for HF
1.5 to 15 ppm
20 strokes, approximately 2 minutes
CH30301

Accessories



Simultaneous set extension hose
1 meter, with 5-tube manifold and
tube opener
6400561



Dräger accuro tube pump
6400000



Extension hose
3 meter for individual tubes
6400077