



# Novec™

Brand

## 3M™ Novec™ 4710 Insulating Gas

### Introduction

3M™ Novec™ 4710 Insulating Gas is a sustainable alternative to sulfur hexafluoride (SF<sub>6</sub>) for electrical equipment insulation and arc quenching applications. It offers excellent dielectric properties, a wide range of operating temperatures and significant reductions in environmental impacts compared to SF<sub>6</sub>. Novec 4710 gas is non-flammable and has a wide safety margin for workers when used as designed for intended applications. This SF<sub>6</sub> alternative also has important environmental properties such as low global warming potential (GWP) when mixed with inert gases and zero ozone depletion potential (ODP). Novec 4710 gas in pure form has a relative dielectric strength two times greater than SF<sub>6</sub> at a given pressure.

### Product Description

Not for specification purposes. All values @ 77°F unless otherwise specified

#### Composition of 3M™ Novec™ 4710 Insulating Gas

Chemical Formula	(CF <sub>3</sub> ) <sub>2</sub> CFCN
2,3,3,3-tetrafluoro-2-(trifluoromethyl)-propanenitrile	99.3 mole %, minimum

### Typical Physical Properties

Not for specification purposes. All values @ 77°F unless otherwise specified

#### 3M™ Novec™ 4710 Insulating Gas

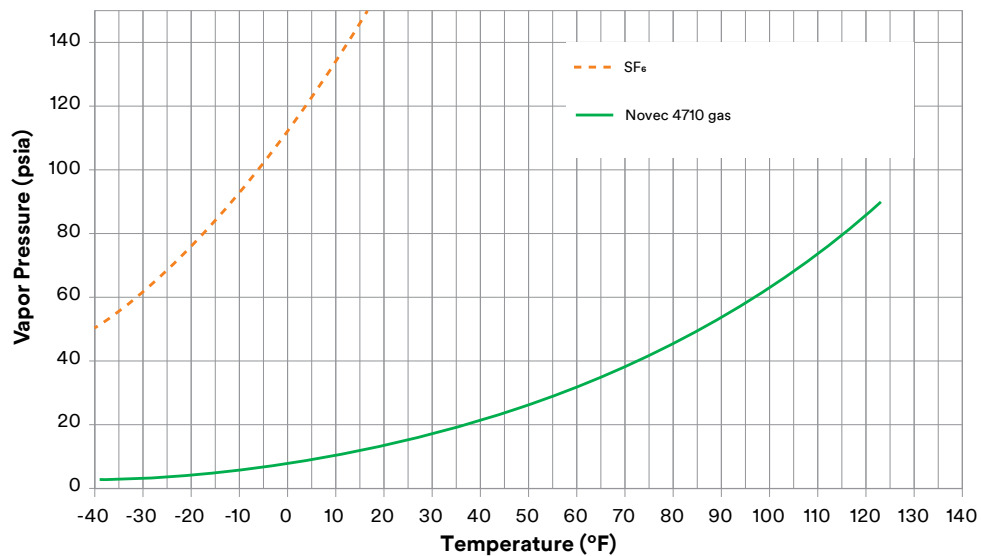
Molecular Weight (g/mol)	195
Flash Point (°F)	Non-flammable
Boiling Point (°F)	23.5
Freezing Point (°F)	-180
Critical Temperature (°F)	235
Critical Pressure (psia)	363
Gas Density at 14.5 psia (lb/ft <sup>3</sup> )	0.49
Vapor Pressure (psia)	36.5
Dielectric Strength at 14.5 psia, disk electrodes, 0.1 in gap (kV)	27.5

## Key Features and Benefits

- Excellent dielectric properties for medium and high voltage applications
- Wide range of operating temperatures and environments
- When used in a gas mixture, the greenhouse gas (GHG) impact can be reduced by up to 99% compared with SF<sub>6</sub>
- Non-flammable
- Non-ozone depleting
- Wide safety margin for workers when used as designed for intended applications
- Compatible with a wide range of equipment components

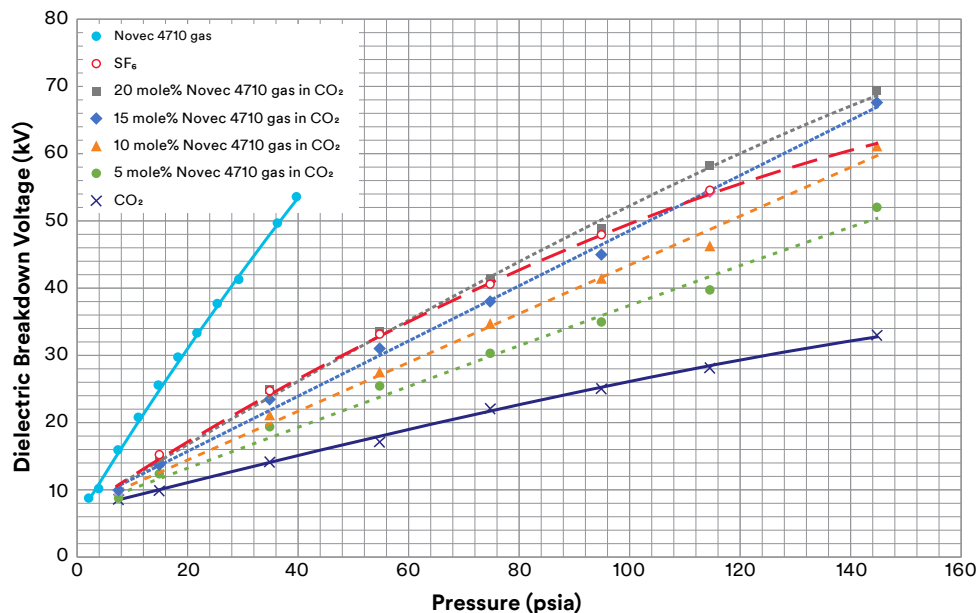
## Vapor Pressure of Novec 4710 Insulating Gas compared to SF<sub>6</sub>

Not for specification purposes. All values @ 77°F unless otherwise specified



## Dielectric Breakdown Voltage: Mixtures of Novec 4710 Gas in CO<sub>2</sub> (Uniform field using parallel disk electrodes with 0.1 inch gap)

Not for specification purposes. All values @ 77°F unless otherwise specified



## Typical Applications

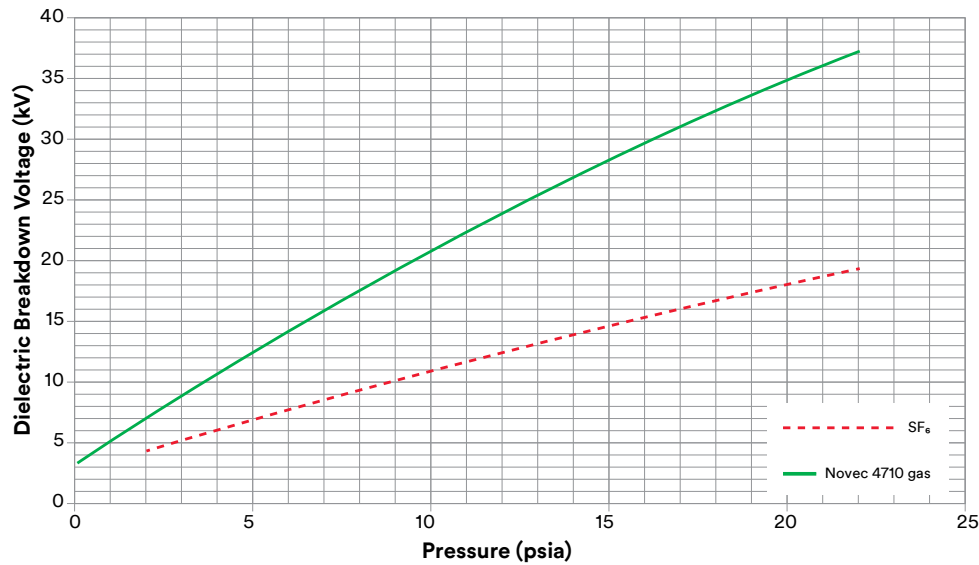
- Versatile insulating gas for medium and high voltage applications including gas insulated lines, gas insulated switchgear and circuit breakers
- Mix with inert gases for electric power industry applications
- Wide range of applications

## Safety and Handling

Before using this product, please read the current Safety Data Sheet (available at [3M.com/SDS](http://3M.com/SDS) or through your 3M sales or technical service representative) and the precautionary statement on the product package and labels. Follow all applicable precautions and directions.

### Dielectric Breakdown Voltage of Novec 4710 Gas Compared to SF<sub>6</sub> (Uniform field using parallel disk electrodes with 0.1 inch gap)

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## Environmental Properties

	3M™ Novec™ 4710 Insulating Gas	SF <sub>6</sub>
Atmospheric Lifetime (years)	30	3,200
Global Warming Potential (100-yr ITH, IPCC 2013 method)	2,100	23,500
Ozone Depletion Potential (CFC-11 = 1)	0	0

## Materials Compatibility

In practice, Novec 4710 gas differs somewhat in materials compared to SF<sub>6</sub>. While the product is compatible with most common metals, it can be affected by some of the components found in lubricating greases and the elastomers used in gaskets and o-rings.

Many materials have been found to be compatible with the product. However, material compatibility is best evaluated using the specific materials of construction being considered for contact with the Novec 4710 gas. 3M research scientists are available to assist with material compatibility evaluations. Contact your local 3M sales representative for additional information.

## Regulatory Status

Novec 4710 gas is a single constituent product and has been REACH registered (Annex VII) in Europe and TSCI registered in Taiwan. It is currently under TSCA research and development status in the United States (pre-manufacture notice (PMN) in progress). It has been approved for low volumes in Korea. Registration and notification are in progress in other regions and countries. Contact your local 3M sales representative for additional information.

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### The 3M™ Novec™ Brand Family

The Novec brand is the hallmark for a variety of proprietary 3M products. Although each has its own unique formula and performance properties, all Novec products are designed in common to address the need for smart, safe and sustainable solutions in industry-specific applications. These include precision and electronics cleaning, heat transfer, fire protection, protective coatings, immersion cooling, advanced insulation media replacement solutions and several specialty chemical applications.

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3M™ Novec™ Engineered Fluids • 3M™ Novec™ Aerosol Cleaners • 3M™ Novec™ 1230 Fire Protection Fluid • 3M™ Novec™ Electronic Grade Coatings • 3M™ Novec™ Electronic Surfactants • 3M™ Novec™ Insulating Gases

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**Safety Data Sheet:** Consult Safety Data Sheet before use.

**Regulatory:** For regulatory information about this product, contact your 3M representative.

**Technical Information:** The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

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