



## (NEW) Propylene Oxide Detonation Flame Arrester USCG Approved for Gases with an MESG of 0.28mm & greater.



**IS YOUR FACILITY SAFE? IS YOUR PROPYLENE OXIDE VAPOR CONTROL SYSTEM PROTECTED WITH A GROUP 'C' DETONATION FLAME ARRESTER, USCG APPROVED OR NOT? IF THE ANSWER IS YES, YOU MAY HAVE A PROBLEM!**

Paradox Intellectual Properties (Paradox IP), working with the USCG and End Users have developed a detonation flame arrester for use with **Propylene Oxide and similar "nuisance gases"**. This product is the only USCG Approved product like it in the world. It is tested and approved for gases having an MESG of 0.28mm and above. (0.28mm is hydrogen). This tremendous turnaround by the USCG was the result of the information provided to the Coast Guard which showed a potentially dangerous situations where Group "C" Detonation Arresters were mistakenly approved for Propylene Oxide installations. Propylene Oxide, which has an MESG



of 0.70 is classed by NEC as Group "B". Previously detonation flame arresters approved by the USCG for **Propylene Oxide** were mistakenly Group C, (gases having an MESG greater than 0.65mm). The problem being not all gases react the same when ignited within their prospective explosion limits, refusing to react in the same manner as similar gases that have been classified by using the MESG as the criteria.

**Propylene Oxide** is one of those gases in which NEC has recognized as a gas that does not follow the MESG classification criteria alone and recommends that a flame arrester used to prevent an explosion with this gas must be a **Group "B" (MESG of 0.28mm)**. Propylene Oxide is not the only gas that has this unique characteristic; 1,3 Butadiene with an MESG of 0.79mm also requires a Group "B" detonation arrester.

In light of this revelation which the USCG has recognized, the current and **"ONLY"** solution to date that is USCG Approved is the Paradox USCG Approved Model **C-2C-GCtH detonation flame arrester**. This newly approved detonation arrester is available with a Carbon Steel (CS), 304SS or 316SS Housing and/or 304SS, 316SS or Hastelloy element matrix.

- U.S. Coast Guard Approved  
2" (50mm), Concentric only.

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## ***Detonation Flame Arrestor***

*The Paradox IP is the leader in research and development of Detonation Flame Arrestors. We represent the best technology for value in flame arrestor protection with a proven track record of identifying problems and developing product/solutions by thoroughly testing in our state of the art laboratory.*

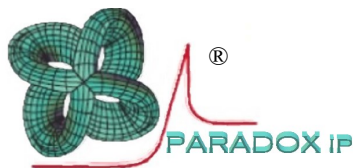
With 30 years of laboratory expertise, multiple patents of products manufactured by three un-related companies that encompass more than 50% of the total world wide arrester sales, there just isn't another company like Paradox.

Detonation flame arresters prevent flame propagation by absorbing heat and dissipating supersonic pressure waves, using multiple spiral wound crimped ribbon flame cells staged with turbulent creating screen sections.

These screen sections allow for much larger cells than that of competitive crimped ribbon arresters, allowing maximum flow with maximum protection. They provide protection against flame propagation in piping systems that are manifolded or have long run-up distances. Paradox's detonation flame arrester element technology dampens the high velocities and pressures associated with deflagrations and detonations while quenching the flame front and providing larger flame channels which requires less frequent maintenance due to clogging and greater ease in cleaning when service is required. This translates to less down time. Our element offers maximum flow to pressure drop characteristics enhancing the value of our product in any system.

Detonation Flame Arresters are typically used for extended pipe length or multiple pipe bend configurations to stop high pressures and flame velocities associated with detonations and overdriven detonations. In addition, it stops confined and unconfined, low and high pressure deflagrations. All Paradox units are bi-directional and are proven to stop an ignited flammable vapor mixture approaching from either direction traveling at subsonic or supersonic velocities.

Designed with flanged connections, this Arrestor provides the option of the removal of the flame cell (element) for easy cleaning and replacement without disconnection of the pipe connection flanges. Standard housing construction is carbon steel and stainless steel. The element is available in 304 S.S and 316 S.S. Special material and protective coatings are available on request.



## Features and Benefits

- **USCG Approved**
- ***All Paradox Detonation Flame Arrestors*** are designed for stable, over-driven & unstable detonations as well as deflagrations.
- ***Removable Element*** design allows for easy replacement.
- **Outstanding corrosion** and chemical resistance.
- ***Instrument/drain ports*** are optional and available



## Paradox's Large Crimp Opening Provide:

- Maximum flow
- Less Pressure Drop
- Easy Cleaning
- Less Clogging
- Less Maintenance
- Bi-directional Design
- Available in ANSI, DIN and JIS flanges.

## Available Materials

## Approved Gas Groups

### Housing

### Cell

### Gas Group

Carbon Steel

304 SS

IIA (D)

304 SS

316 SS

IIB3 (C)

316L SS

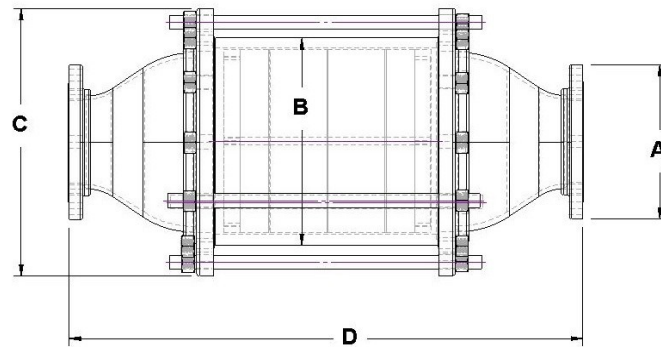
Hastelloy

IIC (B)

Hastelloy



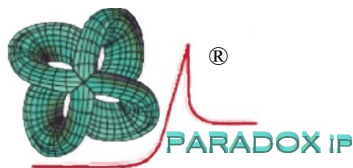
## Series C-Detonation Flame arrester Specifications



USCG  
Approved



Model	A 150# AN- SICConn. Size in. (mm)	B Housing Size In. (mm)	C Outside Di- ameter In. (mm)	D Overall Length In. (mm)	Initial Pressure Rating Group D (-2 psia for Group C)	Approx. Weight lb.
C-2C-GCtH	2"	8.625"	11"	28.25" +/- .125"	22.7 psia (1.54 bar)	242



**Model C-2C-GCtH**  
**Detonation Flame Arrester for Gases with an MESG of 0.28mm & above.**  
**Specification Data Sheet**

Flame Arrester Type	In-line Bi- Directional Flame Arrester
Gasket Type for Propylene Oxide service	B16.20 Teadit Style 942 Campro gasket 316L / ePTFE-
Recommended installation /use	Vertically or Horizontally anywhere in a Piping systems.
Design/Test Standard/Test Gas	USCG 33 cfr/ Hydrogen
Connection sizes	2" Pipe sizes only
Type of connection	Flanged connection.
Flange ratings	Available in ASME 150# Raised Faced Flange
Housing Materials	Standard Model; Carbon Steel, also available in 304, 316L & most other Austenitic metal or has-telloy.
Element Type/Material	The element is crimped metal ribbon made from 304 Stainless Steel and is also available in 316L or hastelloy.
Maximum Initial pressure (Psia.)	22.7
Operating temperature range	-17°C to +60°C
Hydrostatic Test Pressure	350 Psig.
Gas Group Application Rating	NEC Group B( IEC Group IIC)



**Figure 1. Flame Arrestor Available Constructions and Model Numbering System**

The flame arrester below describes an 18", 150# RF concentric detonation arrester with a carbon steel housing and 304ss element matrix and includes 3/4" NPT drains, pressure and temp taps.

C	18	C	D	-	C	S	R	-	D	P	T	3/4
<b>Flame Arrestor Type</b>	<b>Connection Size</b>	<b>C= Concentric E= Eccentric</b>	<b>NEC Gas Group</b>		<b>Housing Material</b>	<b>Element Material</b>	<b>Connection Type</b>		<b>Options</b>			
A = FA	0.5" through 48in.		D		C = Carbon steel	S = 304 SST	F = Flat face flange		D = Drain Tap & Plug			
B = HPFA			C		S = 304 SST	S1 = 316 SST	R = Raised face flange		P = Pressure Tap			
C = DFA			B		S1 = 316 SST	H = Hastelloy®			T = Temperature Probe Tap			
D = H2 DFA					H = Hastelloy®				1/2, 3/4, 1 = NPT tap size			
									Or			
									1/2F, 3/4F, 1F, etc; =			
									150# ANSI Flange size.			