



DEFENSE

THROUGH BULKHEAD INITIATORS (TBI)

Pyroalliance designs and manufactures a series of Through-Bulkhead Initiators (TBIs) for defense applications. TBIs are designed to convert a detonating input into an ignition function, typically to ignite the propellant of a Solid Rocket Motor. Tightness is guaranteed between upstream and downstream side of bulkhead, preventing any loss of pressure.

TBIs are a key component of the propulsion function reliability and safety.

Combined with other products from Pyroalliance, TBIs are part of pyro-chains for Solid Rocket Motors.

More generally, Pyroalliance delivers complete pyrotechnic chains adapted to its customers' needs. They are designed and manufactured under Pyroalliance design authority.

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Operating mode

When the upstream detonating transfer line is activated, the detonating signal is transmitted via the TBI from the donor detonating charge to the receptor detonating charge through a tight metallic barrier. The signal is then converted into combustion mode by the TBI ignition mix, to trigger the downstream igniter train. TBIs operate through a shock wave stemming from the detonating line.

TBIs belong to a pyrotechnic chain which ensures transition from a detonating signal stemming from a detonating transfer line or directly from a Safe & Arm Device (SAD) system into the deflagration of an ignition load, across a tight barrier.

Benefits

TBIs provide:

- An ignition function with detonating input
- Structural barrier preventing loss of pressure of downstream elements
- Mass savings through the reduced quantity of embedded electrical power
- Absence of primary explosives (making one single Safe & Arm Device at the beginning of the pyrotechnic chain sufficient)
- Reduced dispersion of ignition times
- High level of safety (EMC and lightning immunity)
- Architecture without any moving parts

Applications

- Ignition of single pulse solid propellant motors

Typical performances and features

Operating time	< 5ms
Output energy	Range of 2300-2700J
Ignition mode	Detonating line / SAD
Size	Height : 46mm Length : 17.5mm Width : 15.5mm
Weight	< 50g
Reliability	0.9999 @90% CL
Leak rate	Less than 10 ⁻⁵ ccs/sec under 1 bar after functioning
Operating temperature	Adapted to typical airborne military climatic environment
Life Time	Adapted to the mission and life profile

Classification

- UN Number: UN0368
- Explosive Class: 1.4S in storage & delivery configuration
- Not subject to any ITAR constraint

For more information

Contact us: customer-info@pyroalliance.com

Les Mureaux Plant - Headquarters
139, Route de Verneuil - BP 2052
78132 Les Mureaux cedex – France
Tel. +33 (0)1 34 92 44 44
www.pyroalliance.com

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