



# Resilient Tunnel Plug



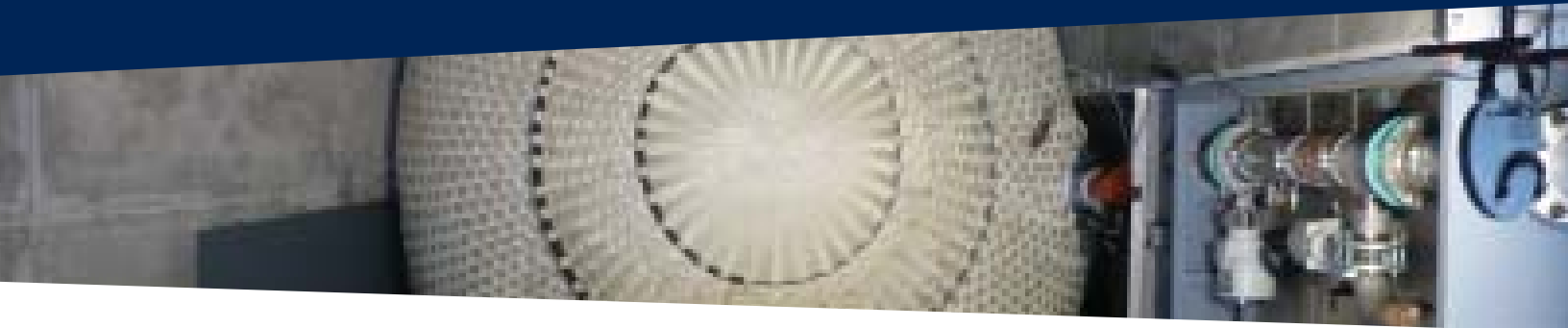
The Resilient Tunnel Plug (RTP) is a high-strength inflatable device that can be deployed rapidly to prevent fluid flow in a tunnel of any shape or size. It was developed by ILC Dover under a Department of Homeland Security Science & Technology Directorate program. The RTP was originally developed for security applications to protect underground subway systems from flooding caused by damage to an underwater transit tunnel. It can also be used for other applications, including the prevention of flooding from top-down water events, or to partition tunnels to prevent the movement of smoke, chemical/biological agents or people.



## FEATURES AND BENEFITS

- **Conforming inflatable structure** — Can adapt to any tunnel configuration
- **Compact stowage** — Can store in small spaces and at point of use for rapid response
- **Scalable design** — Can be sized to fit any tunnel
- **Robust materials and construction** — High reliability
- **Limited changes required to the infrastructure for installation** — Low installation cost
- **Less downtime of the system to install** — Low operational impact cost
- **Simple design with few moving parts** — Low maintenance cost, highly reliable

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## OPERATION

The RTP functions similarly to an automotive airbag system in that it resides in a small container and is pressurized to shape when an event occurs. Internal pressure exceeds the external water pressure threat to create the barrier, and the plug is held in place with friction. The RTP was designed to be a reusable fixed asset located at the point of use, but it can also be a transportable system if required.

## SYSTEM COMPONENTS

**Plug** — Three-layer flexible and damage-tolerant structure

- Outer-layer webbing and fabric made of Kevlar® or Vectran®
- Air-retention layer made of polyurethane-coated polyester

**Container** — Contoured stainless steel box that is mounted in the tunnel

**Pumps** — Fill the plug with air (or water)

**Control System** — Monitors the health of the system and controls pressure during/after deployment

Security applications when response time is critical

## CONFIGURATION OPTIONS

### Fixed asset at point of use

- Rapid response approach
- Mounted in tunnel
- Pressurization system is remote
- Can be automated or manually activated

### Transportable system

- Deploy to location when needed
- Mobile platform
- Pressurization system can be remote or local
- Manually positioned for deployment

## OUR SOLUTIONS ARE CUSTOM-DESIGNED TO MEET YOUR REQUIREMENTS



The RTP has been validated via test in a 16.5-ft.-diameter representative rail tunnel against a 30-ft. water head pressure challenge.



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