i-Opener TD - Toe Sleeve

The i-Opener™ CEM TD (time delay) is a remotely actuated toe sleeve that is used to establish one or multiple circulation paths from the completion to the reservoir. The i-Opener CEM TD is used as a time and cost saving alternative to conventional toe perforating methods, and in applications requiring multiple pressure cycles and full casing pressure testing. In multistage frac applications, the i-Opener TD can be used to hydraulically frac the first stage and/or establish injectivity allowing frac balls or plugs to be pumped to the lower completion. The time delay mechanics in the i-Opener TD can be tailored to fit each application to allow for short or long opening delays in a wide range of pressures and temperatures. This capability allows for an unlimited number of high pressure cycles, in heavy fluids, to be performed without operating the i-Opener. After the required high-pressure operations are completed the i-Opener TD can be opened at lower pressure, even in lighter fluids where required.

The unique features of the i-Opener TD allows for multiple hydraulic pressure events in the well to set liner hangers, and to pressure test the liner and/or upper completion without risking premature opening of the toe.

The i-Opener CEM TD is designed to allow validation testing according to ISO 14998, V0 rating, making it suitable for wells where the lower completion is required to be part of the well barrier.

Features and benefits

- Customizable time delay with the ability to have multiple time delay windows
- Infinite number of pressure cycles within each time delay window
- Fully compatible with cemented or open hole completions
- Predictable flow area for establishing circulation
- Sleeve designed to be Barrier Qualified according to ISO 14998, V0 validation grade
- Decouples casing pressure test from flow initiation operation
- Can be run as part of a variety of multistage fracturing systems
- A sliding sleeve exposes all flow ports to the formation at once
- Large flow area flow ports for increased pumping efficiency and the ability to perform a toe stage frac
- Saves time and cost versus conventional toe perforating techniques

Applications

- Cemented and open hole completions
- Wells requiring casing integrity tests to maximum pressure
- Wells requiring multiple high pressure events for pressure test or functioning tools
- Wells in which flow initiation pressure cannot exceed test pressure

i-Opener CEM TD Specification

i-Opener CEM	**Casing size** in. (mm)	**Casing weight**[1] lb/ft (kg/m)	**OD** in. (mm)	**ID** in. (mm)	**Length** in. (m)	**Operating temp.** °F (°C)	**Absolute load/unload pressure per cycle**[3] psi (kPa)	**Burst pressure** psi (kPa)
450	4.5 (114.3)	21.5 (32.00)	5.72 (145.3)	2.76 (70.1)	63.0 (1.6)	275 (135)	15,000 (103,420)	10,000 (69,000)
500	5.0 (127.0)	23.2 (34.53)	6.00 (152.4)	2.76 (70.1)	63.0 (1.6)	275 (135)	15,000 (103,420)	10,000 (69,000)

[1] Additional weights available upon request [2] Additional settings available [3] Absolute pressure [4] Additional sizes available on request