

# Thru Tubing Inflatable Permanent Cement Retainer

Product Family H34020 & H34021

## Applications

- Permanent abandonments
- Permanent lower zonal isolation
- Remedial cementing/squeezing

## Features and benefits

- Inflatable packing element allows large expansion ratios so the tool can be set below the production tubing
- Set on either coiled tubing, electric wireline or slickline allowing the well to be worked over “live” and reduce operational costs
- Does not require a rig on location, reducing operating costs
- Built in retrievable spotting valve allows cement to be spotted to the retainer – wellbore fluids are not pumped into formation
- Positive seal flapper valves prevent flow from either direction when spotting valve is retrieved – remove hydrostatic from squeeze

The **Thru-Tubing Permanent Cement Retainer (TTCR)** allows for permanent isolation and cementation of a lower zone without the necessity of pulling the production tubing. The Cement Retainer seals with a high expansion inflatable element that can pass through the production jewelry and seal in the casing / liner below.

The Cement Retainer is set with hydraulic pressure, and can be deployed on coiled tubing and threaded pipe. The inflatable element can be set in most IDs including blank pipe, perforations, slotted liners, sand screens and open hole.

The tool is run with the retrievable spotting valve (product family H34021), which provides for a means of spotting the cement to the retainer after an injection test negating the requirement to pump unwanted fluids into the formation. The hydraulic lock mechanism on the spotting valve carries the load of the cement retainer while running in the hole preventing the shear screws in the spotting valve from being preloaded.

The retainer incorporates two opposing flapper valves. The bottom flapper valve is held open by the ball seat and is free to close against pressure from below once the seat has been sheared. The top flapper closes against pressure from above when the spotting valve is disconnected from the retainer. Once closed, the flapper valves prevent any fluid movement across the set retainer.



| Size – Tool OD (in.)  | 1.69                        | 2.13            | 2.50           | 3.00           | 3.38           | 4.25          | 5.38            | 5.75          |
|---|-----------------------------|-----------------|----------------|----------------|----------------|---------------|-----------------|---------------|
| Chassis OD (in.) (mm)                                       | 1.69<br>(43)                | 2.13 (54)       |                |                |                |               |                 |               |
| Inflatable Element Length (in.) (ft)                        | 48.00<br>(4.00)             | 66.13 (5.51)    |                |                |                |               |                 |               |
| Tool Length – cement retainer (in.) (ft)                    | 93.70<br>(7.81)             | 102.50 (8.54)   |                |                |                |               |                 |               |
| Tool Length – cement retainer and spotting valve (in.) (ft) | 140.45<br>(11.70)           | 159.41 (13.28)  |                |                |                |               |                 |               |
| Tensile Rating (lb) (kg)                                    | 21,000<br>(9,545)           | 37,000 (16,818) |                |                |                |               |                 |               |
| Setting Ball Size (in.)                                     | 0.375                       | 0.500           |                |                |                |               |                 |               |
| Fish Neck Size and Style (in.)                              | 1.50 GS<br>Internal         | 2.0 GS Internal |                |                |                |               |                 |               |
| *Maximum Pressure Rating (psi) (bar)                        | 5,500<br>(379)              | 6,000<br>(414)  | 6,500<br>(448) | 8,000<br>(552) | 8,500 (586)    |               |                 |               |
| Maximum Temperature Rating (°F) (°C)                        | 300 (149)                   |                 |                |                |                |               |                 |               |
| Maximum Expansion ID (in.) (mm)                             | 4.892<br>(124)              | 6.765<br>(172)  | 8.681<br>(221) |                | 9.760<br>(248) |               | 12.415<br>(315) |               |
| Maximum Restriction to pass through (in.) (mm)              | 1.75<br>(44)                | 2.19<br>(56)    | 2.56<br>(65)   | 3.06<br>(78)   | 3.44<br>(87)   | 4.31<br>(109) | 5.44<br>(138)   | 5.81<br>(148) |
| Service   | Standard & H <sub>2</sub> S |                 |                |                |                |               |                 |               |

\*This pressure is rated at minimal expansion. Pressure ratings decrease as element expansion increases.

**Hole size element is to be set in (in./mm)**

| Element<br>(in./mm) | OD | 2.375         | 2.875         | 3.500         | 4.000         | 4.500          | 5.000          | 5.500          | 6.625          | 7.000          | 7.625          | 8.625          | 9.625          | 10.750         | 11.750          | 13.375          |
|---------------------|----|---------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|
|                     | ID | 1.995<br>(51) | 2.441<br>(62) | 2.992<br>(76) | 3.548<br>(90) | 3.958<br>(101) | 4.276<br>(109) | 4.892<br>(124) | 5.921<br>(150) | 6.094<br>(155) | 6.765<br>(172) | 7.511<br>(191) | 8.681<br>(221) | 9.760<br>(248) | 10.772<br>(271) | 12.415<br>(315) |

**Maximum applied differential pressure (psi/bar)**

**Maximum temperature (°F/°C)**

|                 |     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |
|-----------------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| 1.69<br>(42.9)  | psi | 5,500 | 5,500 | 4,600 | 3,200 | 2,600 | 2,200 | 1,700 |       |       |       |       |       |       |       |       |  |
|                 | bar | (379) | (379) | (317) | (221) | (179) | (152) | (117) |       |       |       |       |       |       |       |       |  |
|                 | °F  | 300   | 300   | 300   | 300   | 300   | 250   | 250   |       |       |       |       |       |       |       |       |  |
|                 | °C  | (149) | (149) | (149) | (149) | (149) | (121) | (121) |       |       |       |       |       |       |       |       |  |
| 2.13<br>(54.1)  | psi |       | 6,000 | 6,000 | 5,500 | 4,300 | 3,600 | 2,600 | 1,600 | 1,500 | 1,000 |       |       |       |       |       |  |
|                 | bar |       | (414) | (414) | (379) | (297) | (248) | (179) | (110) | (103) | (69)  |       |       |       |       |       |  |
|                 | °F  |       | 300   | 300   | 300   | 300   | 300   | 300   | 280   | 280   | 280   |       |       |       |       |       |  |
|                 | °C  |       | (149) | (149) | (149) | (149) | (149) | (149) | (138) | (138) | (138) |       |       |       |       |       |  |
| 2.50<br>(63.5)  | psi |       |       | 6,500 | 6,500 | 6,300 | 5,500 | 4,200 | 2,500 | 2,300 | 1,800 | 1,550 | 1,300 |       |       |       |  |
|                 | bar |       |       | (448) | (448) | (434) | (379) | (290) | (172) | (159) | (124) | (107) | (90)  |       |       |       |  |
|                 | °F  |       |       | 300   | 300   | 300   | 300   | 300   | 300   | 280   | 280   | 260   | 260   |       |       |       |  |
|                 | °C  |       |       | (149) | (149) | (149) | (149) | (149) | (149) | (138) | (138) | (127) | (127) |       |       |       |  |
| 3.00<br>(76.2)  | psi |       |       |       | 8,000 | 8,000 | 8,000 | 8,000 | 4,900 | 4,550 | 3,400 | 2,500 | 1,600 |       |       |       |  |
|                 | bar |       |       |       | (552) | (552) | (552) | (552) | (338) | (314) | (234) | (172) | (110) |       |       |       |  |
|                 | °F  |       |       |       | 300   | 300   | 300   | 300   | 300   | 300   | 280   | 260   | 240   |       |       |       |  |
|                 | °C  |       |       |       | (149) | (149) | (149) | (149) | (149) | (149) | (138) | (127) | (149) |       |       |       |  |
| 3.38<br>(85.9)  | psi |       |       |       | 8,500 | 8,500 | 8,500 | 8,500 | 6,500 | 6,200 | 4,900 | 3,700 | 2,450 | 1,700 |       |       |  |
|                 | bar |       |       |       | (586) | (586) | (586) | (586) | (448) | (428) | (338) | (255) | (169) | (117) |       |       |  |
|                 | °F  |       |       |       | 300   | 300   | 300   | 300   | 300   | 300   | 300   | 280   | 280   | 275   |       |       |  |
|                 | °C  |       |       |       | (149) | (149) | (149) | (149) | (149) | (149) | (149) | (138) | (138) | (135) |       |       |  |
| 4.25<br>(108.0) | psi |       |       |       |       |       |       | 8,500 | 8,500 | 8,500 | 6,550 | 4,900 | 3,300 | 2,350 |       |       |  |
|                 | bar |       |       |       |       |       |       | (586) | (586) | (586) | (452) | (338) | (228) | (162) |       |       |  |
|                 | °F  |       |       |       |       |       |       | 300   | 300   | 300   | 300   | 280   | 280   | 280   |       |       |  |
|                 | °C  |       |       |       |       |       |       | (149) | (149) | (149) | (149) | (138) | (138) | (138) |       |       |  |
| 5.38<br>(136.7) | psi |       |       |       |       |       |       |       | 8,500 | 8,500 | 8,500 | 8,100 | 5,950 | 4,700 | 3,800 | 2,800 |  |
|                 | bar |       |       |       |       |       |       |       | (586) | (586) | (586) | (559) | (410) | (324) | (262) | (197) |  |
|                 | °F  |       |       |       |       |       |       |       | 300   | 300   | 300   | 300   | 300   | 280   | 280   | 280   |  |
|                 | °C  |       |       |       |       |       |       |       | (149) | (149) | (149) | (149) | (149) | (138) | (138) | (138) |  |
| 5.75<br>(146.1) | psi |       |       |       |       |       |       |       | 8,500 | 8,500 | 8,500 | 8,500 | 6,850 | 5,350 | 4,350 | 3,200 |  |
|                 | bar |       |       |       |       |       |       |       | (586) | (586) | (586) | (586) | (472) | (369) | (300) | (221) |  |
|                 | °F  |       |       |       |       |       |       |       | 300   | 300   | 300   | 300   | 300   | 280   | 280   | 260   |  |
|                 | °C  |       |       |       |       |       |       |       | (149) | (149) | (149) | (149) | (149) | (138) | (138) | (127) |  |

Reduce pressure ratings by 20% for H2S service elements. Standard service elements use high strength alloys but are susceptible to stress corrosion cracking (SCC) in H2S and other highly corrosive environments. H2S service elements use nickel alloy materials that meet the requirements of NACE MR0175. For element ratings in different IDs in different IDs from above, contact your local BHGE representative.