MetalSkin® Cased-Hole Liner Expansion System

For 3 1/2- x 4 1/2-in., 4 1/4- x 5 1/2-in., 5 1/2- x 7-in., and 6- x 7 5/8-in. MetalSkin Cased-Hole Liners

Weatherford's *MetalSkin* expansion system is used to run and set *MetalSkin* cased-hole liners, providing permanent casing repair with minimal inside-diameter (ID) restriction. Built on the success of Weatherford's Homco® field-proven design, the expansion system consists of a slide valve, bumper jar, hydraulic hold-down sub, hydraulic setting tool, telescoping liner stop, debris sub, GS spear, and compliant expansion-cone assembly. No plugs or darts are required to activate the expansion process.

Before running in the wellbore, the expansion-cone assembly is preinstalled in the integral anchor joint of the *MetalSkin* liner. The mechanical slide valve located at the top of the running string opens while running in the hole, enabling the circulation of wellbore fluids to enter the running string. Serving as a robust mechanical-latch mechanism, the GS spear stabs into the preinstalled expansion-cone assembly, connecting the running string to the liner. The *MetalSkin* expandable liner system is lowered several feet below the predetermined setting depth to ensure setting location and to permit the upward string movement to close the slide valve.

When at depth, applied hydraulic pressure forces friction wickers on the hydraulic hold-down sub to anchor against the parent casing, isolating the expansion system from all tensile loads caused by the setting operation. During the initial anchoring sequence, pressure on the underside of the piston pulls the cone assembly into the bottom of the liner. The cone assembly is pulled further upwards into the liner, affixing the liner's carbide anchor to the parent casing. When anchored, expansion of the *MetalSkin* liner continues by bleeding off hydraulic pressure and mechanically pulling the cone assembly upward. After expanding the full liner length, the expansion system is pulled from the well and well operations can be continued without drill-out.

The expansion system features a debris sub to protect the cone assembly from downhole debris and a secondary release mechanism that is automatically activated by right-hand rotation to the tool.

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Applications

- Liners run with the *MetalSkin* Cased-Hole Liner System

Features, Advantages and Benefits

- The force transferred from the cylinders of the setting jack to the cone initiates a full 360° radial expansion, securely anchoring the expandable liner to the host casing.
- Multiple hydraulic cylinders enable force to be applied to the *MetalSkin* liner through the cone assembly, enabling high setting forces with low-volume pumping requirements.
- The hydraulic hold-down sub prevents tensional loading of the work string, enabling functional hydraulic pressure to be applied to anchor the liner.
- Cylinders have unrestricted pressure paths to minimize the chances of plugging, ensuring cone activation.
- The spring-loaded slide valve maintains equalization of fluids between the expansion system and the wellbore, enabling reliable activation of the hydraulic hold system.
- The bumper jar ensures reliable operation of the slide valve and hold-down sub in low-volume wells, ensuring optimal performance of the running tool.
- Casing thread connection suspends and isolates both the expansion cone and the GS receiving sub in place during run-in, preventing set-down weight from prematurely setting the liner.
- The telescoping liner stop holds the liner in place, preventing movement when the expansion cone is pulled into the liner's anchoring section during initial expansion.
- The debris sub isolates the cone assembly from debris, ensuring proper functionality to expand the liner.
- The GS spear serves as a robust mechanical-latch mechanism, connecting the expansion tools to the work string.
- The expansion system eliminates the need to drill out darts, plugs, and shoes, reducing rig time and saving overall operating costs.

Specifications

Contact an authorized Weatherford representative for further information.