

EquiFlow® OptiSteam™ Flow Control Device

MAXIMIZE PRODUCTION EFFICIENCY AND IMPROVE STEAM-OIL-RATIO IN SAGD WELLS

OVERVIEW

Halliburton's EquiFlow® OptiSteam™ flow control device (FCD) helps improve completion performance and efficiency in steam-assisted gravity drainage (SAGD) operations by balancing steam injection throughout the length of a completion.

The EquiFlow OptiSteam FCD consists of four components – a top sub, bottom sub, sleeve, and a center nipple with two sets of flow ports. Injected steam travels through the tubing and controlled ports, into the tubing-liner annulus, and finally through the liner into the formation.

The sleeve is an optional component which provides the operator ON/OFF ability. This allows flexibility to be run closed, circulate steam during warm-up, then shift open for injection. Also, if one zone becomes too hot, the device can be shifted closed. A common B-type shifting profile is used.

Halliburton's suite of flow control devices for SAGD wells offers solutions to maximize production efficiency and help operators improve steam-oil ratio (SOR). Together the EquiFlow® inflow control device (ICD) and autonomous ICD help optimize steam flow in SAGD production wells.

FEATURES

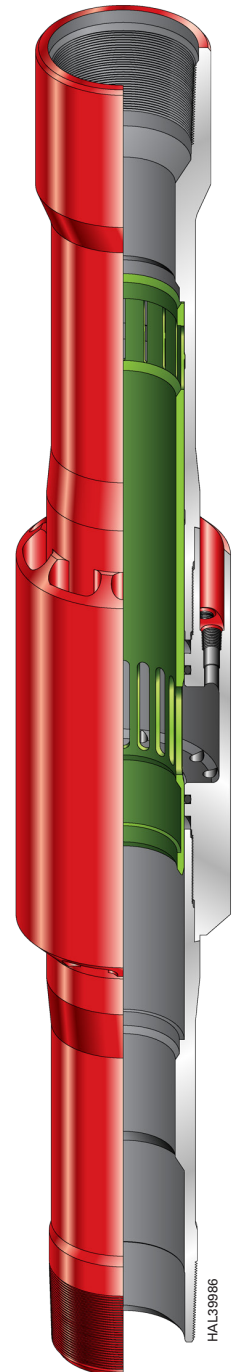
- » Externally adjustable
- » Diffuser ports control exiting steam velocities
- » Tested per ISO 14998
- » ON/OFF flow ability with sleeve

BENEFITS

- » Allows for last minute changes to flow setting
- » Final flow setting can be selected later in the project, after more information is collected on the well

EquiFlow® OptiSteam™ FCD Technology Specifications

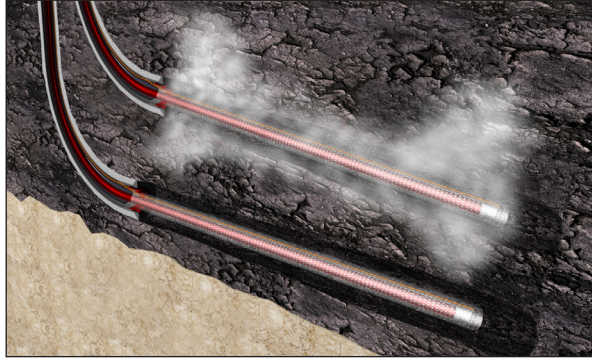
FCD OD in. (mm)	Minimum Bore ID in. (mm)	Quantity of Nozzles (10 mm ID)	Standard Metallurgy	Standard Temperature Rating
4.30-in. (109.2 mm)	1.87-in. (47.5 mm)	24		
4.80-in. (121.9 mm)	2.313-in. (58.8 mm)	28		
5.80-in. (147.3 mm)	2.813-in. (71.5 mm)	32	NACE 4140	520°F (271°C)
6.80-in. (172.7 mm)	3.81-in. (96.8 mm)	36		



APPLICATION

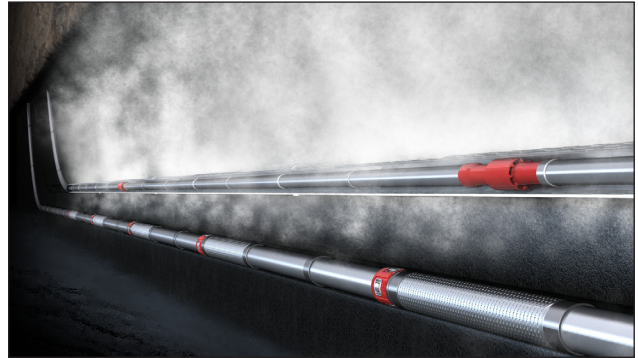
With SAGD injectors, steam must be balanced to account for varying payzone thickness, reservoir heterogeneity, and heel-toe tubing frictional effects. An optimized steam chamber allows for maximized bitumen recovery versus the traditional dual tubing injection method, which cannot properly balance the steam chamber and often develops a 'barbell' chamber instead. The EquiFlow® OptiSteam™ FCD provides the proper outflow balance.

Without flow control devices



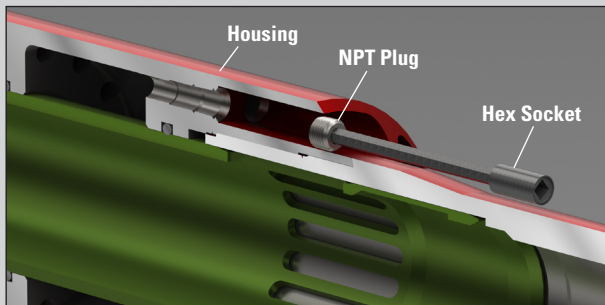
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With EquiFlow OptiSteam FCDs

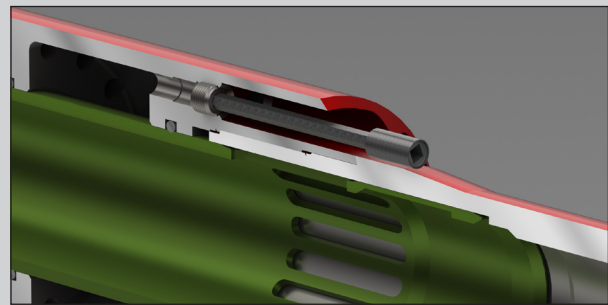


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Simple external adjustability by plugging off ports prior to running

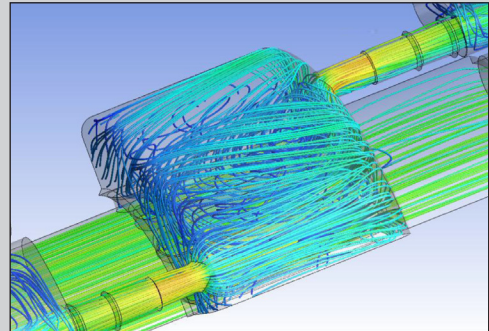
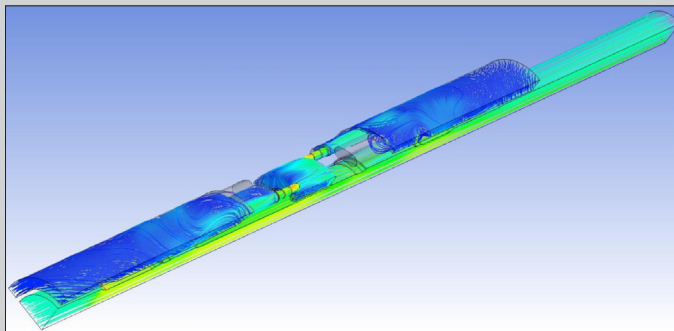


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Design has been validated through computational fluid dynamic (CFD) software



For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com

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