

FEATURE	CONVENTIONAL SINGLE-SEAL	ALTERNATIVE LOCKED DESIGN	SURETAP® PLUG
<b>SEAL CONFIGURATION</b>	Single O-ring.	Single seal O-ring.	<b>Dual compression seals, compliant to scored bore and self-energised by pipeline pressure.</b>
<b>VERIFICATION</b>	PBU on hot tap adaptor after disconnect and differential pressure load applied.	PBU on hot tap adaptor after disconnect and differential pressure load applied.	<b>Testable seal annulus from before differential pressure load applied.</b>
<b>IMCA COMPLIANT</b>	No.	No.	<b>Yes.</b>
<b>FAIL-SAFE DESIGN</b>	Externally deployed lock restraint. Relies on technician measurements of location and segment deployment.	Internally deployed lock restraint using hot tap. Fixed deployment distance. Mechanical restraint on restraint discs when disconnected.	<b>Lock restraint, testable verification of engagement prior to disconnection.</b>
<b>EXTERNAL PORTS</b>	Required.	Zero penetrations.	<b>Zero penetrations.</b>
<b>DEPLOYMENT CONTROL</b>	Operator controlled.	May be proprietary.	<b>Operator controlled.</b>
<b>FUTURE REMOVAL</b>	Standard.	May be proprietary.	<b>Dual seals offer a far higher chance of "leak-tight isolation" at re-entry. Options such as injecting sealant between the seals could also be considered.</b>
<b>DEPLOYMENT PROTECTION</b>	Check valve held open by deployment system and external pressure equalisation port.	Check valve held open by deployment system and external pressure equalisation port.	<b>Radial clearance prevents differential pressure. Allows to pass bore restrictions and prevents seal damage during deployment.</b>
<b>DEPLOYMENT SYSTEM</b>	Hot tap machine with mechanical disconnect. Personnel access to segment actuators required.	Hot tap machine with bespoke deployment tool which has restricted operation to OEM technicians.	<b>Preferred option is a simple hydraulic deployment system which will be available for sale and operated by clients. Alternative option to use hot tap machine with coiled hydraulic hoses.</b>
<b>INCORRECT LOCATION</b>	External segments could potentially miss the plug if deployed short. Application of differential pressure could be applied to unrestrained plug.	Fixed stop at base. Needs special fitting. Unable to set restraint if not in groove.	<b>Unable to set the restraint if not in correct location. Seal test verifies lock segments engaged in groove prior to generating differential pressure.</b>
<b>FLANGE MACHINING</b>	Deep groove for segments with tight tolerance. Multiple external holes for actuator segments. Often needs special thick flange.	Tight tolerance groove. Shallow groove so no need for special flange, step on bore for location will restrict cutter to valve bore clearance. (Cutter needs to pass the step).	<b>Shallow groove, wide tolerance as shear ring supported at bore. No additional special requirements.</b>