

InjectGARD™ Variable Orifice Safety Valve With HiFLO™ Lock



Protection for Completions with HiFLO™ Landing Nipples

Applications:

- Injection Operations
- Water / Gas (WAG) Applications
- CO₂ Storage - CCS
- Working Pressure up to 10,000 psi [690 bar]
- Subsurface controlled safety valve operation

Benefits:

- No Control Lines
- No Surface Equipment
- Surge protection
- Passive autonomous control
- Minimized pressure drop over injection range
- Eliminates field orifice size change-outs
- Unlimited setting depth
- 20-year design life
- Simple installation and recovery

Features:

- Variable Orifice design controlled by flow rate
- Cryogenic trim available
- Large variability of orifice response to flow
- Constant velocity profile regardless of flow rate
- Erosion resistant ceramic materials

Description

The InjectGARD™ Variable Orifice Safety Valve is an API-14A, V3 rated safety valve designed specifically for injection operations. It can be deployed within an InjectGATE™ tubing retrievable injection safety valve or within a dedicated HiFLO™ landing nipple at any depth. The InjectGARD™ is designed for injection of either fluid, gas, or both (WAG Applications) up to a working pressure of 10,000 psi [68,948 kPa]

The InjectGARD™ deployed with the Tejas HiFLO™ Lock (shown) will provide the greatest longevity and lowest injection differential pressure during operation. Alternative OEM Locks can also be used if required. The variable orifice safety valve incorporates a GARD™ Power-Seat that has a bubble tight seal that prevents potential formation damaging “surge” within the well when injection stops.

The unique variable orifice design proportionally opens in response to injection flow and maintains a constant pressure drop regardless of the injection flow rate. The InjectGARD™, eliminates the need for costly wireline orifice change-outs required for flapper-style safety valves when the injection rate changes over time. Also, the internal components are highly erosion resistant and have greater longevity than traditional flapper-style injection safety valves. The InjectGARD™ can also be trimmed to withstand cryogenic injection applications down to -248°F (-150°C).



InjectGARD™ Retrievable Safety Valve†				
Tubing Size in [mm]	Max. Outside Diameter in [mm]	Flow Area in ² [cm ²]	Max. Inj. Rate bbl/day	Pressure Rating psi [bar]
2.375 [60.32]	1.875 [47.63]	0.61 [3.93]	5,500	10,000 [690]
2.875 [73.02]	2.220 [56.39]	1.08 [6.97]	9,750	
3.500 [88.90]	2.785 [70.74]	1.96 [12.65]	17,500	
4.000 [101.60]	3.280 [83.31]	3.02 [19.48]	27,000	
4.500 [114.30]	3.630 [92.20]	3.80 [24.51]	34,500	
5.000 [127.00]	4.280 [108.71]	5.81 [37.48]	52,000	5,000 [345]
5.500 [139.70]	4.373 [111.07]	6.49 [41.87]	56,000	
	4.510 [114.55]		58,500	

† The engineering data provided illustrate the scope of this product offering and are not all inclusive. Additional sizes and functionality are available upon request.

InjectGARD™ with
HiFLO™ Lock