



BLUE TOPAZ
TECHNOLOGY

SUPER-HARD COMPOSITE (SHC) GAS LIFT VALVE TRIM

Upgrade Gas Lift Valves to Mitigate Early Failure Due to Washed Trim

APPLICATION

Gas Lift Wells using 1" valves

BENEFITS

- Replaces current tungsten carbide trim with a superior composite material.
- Integrates with any manufacturer's gas lift valve as a direct swap with the current trim with no loss of performance.



- A wear resistance of 30x the conventional carbide trim.
- Prevents early valve failure due to trim wash-out, mitigating the need for early workover intervention.

Gas Lift Operators report that early trim failure due to exceeding API recommended flow rates are a major issue.

Gas Lift Valves are being increasingly deployed in unconventional oil wells to enable fluid lift.

With many options for deployment, a common cause of failure is the need to unload the wells at an optimal rate of 1 bbl/min.

When this limit is exceeded, rapid destructive erosion occurs to the trim, allowing gas to leak into the fluid flow and causing uncontrolled multi-point injection. This has a detrimental effect on production and the erosion gets rapidly worse with time, eventually causing the valves to fail open, leading to ineffective gas lift.

Blue Topaz Technology has developed a patent pending solution using super-hard diamond composite. This material has been engineered to perform in the harshest environment and to resist the erosive nature of the fluids passing through the valve.

SIMPLE CONVERSION

The trims are manufactured to fit gas lift valves from multiple manufacturers. The existing orifice is removed and the new two-part orifice with the SHC trim lining the typical erosion prone surface.

These are available with typical orifice sizes of 12/64, 14/64 and 16/64, with more sizes being developed on demand. **See Figure 1.**



Figure 1. The gas lift valve orifice with SHC insert installed in tungsten carbide carrier.

The second element of the valve, the stem, has been redesigned from a simple braised tungsten carbide ball to a carefully engineered plug seated in a stainless-steel carrier. The plug is suitable for multiple orifices, with one size fitting 12-14-16/64th valves. **See Figure 2.**



Figure 2. Gas lift valve stem & SHC plug to fit orifices.

SHC PROPERTIES

- Superior thermal stability, compared to PCD.
- Significantly reduced coefficient of thermal expansion (CTE) mismatch.
- Thermally stable up to 1400°C, which creates less risk of failures during application.
- Easy to process.
- Electrically conductive: EDM processability allows flexibility in cutting various geometries.
- Sizes larger than those of unsupported PCD: diameter - 35 mm, height - 35 mm.
- Does not require polishing of the bore to achieve the surface finish of the wire.
- Ability to be easily brazed or shrink-fitted into casing.
- Versatility: ferrous and non-ferrous wires.
- Wear resistance comparable to that of PCD and corrosion resistance slightly better than that of PCD.

FLEXIBLE DESIGN

The trim is currently available for select gas lift valves from a limited number of manufacturers. We are constantly adding manufacturers to our supply scope with a very fast turnaround. If your valve is not supported, get in touch and we can rapidly modify the trim to fit.

ONGOING R&D

Blue Topaz Technology is currently developing solutions for gas lift valve check valves, as well as other applications where tungsten carbide has a technical limit. For more information, or to discuss your potential project, please contact us: Sales@Bluetopaztech.com +1-281-907-8986