



# **KCI Chemical Engineering Products**

## **KCI Mac-Pac**

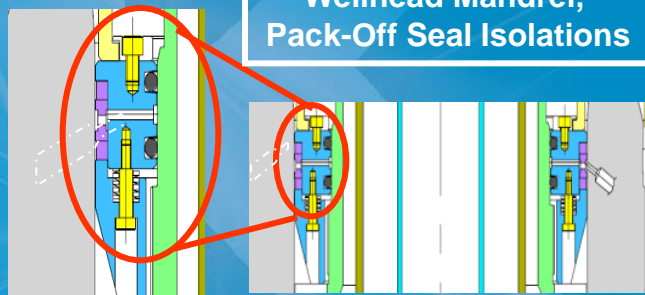
### **Product and Application Review**

### **Gate Valve, Stem Packing and other Isolations**

# KCI Mac-Pac Isolation Sealant & High Temperature Lubricant

Deployed as a high viscous fluid as an alternative to plastic packing products.  
Example: Energising existing 'Y' or 'P' Wellhead Seal Pack-Offs and Casing Mandrel Type Hanger seal structures.

Wellhead Mandrel,  
Pack-Off Seal Isolations

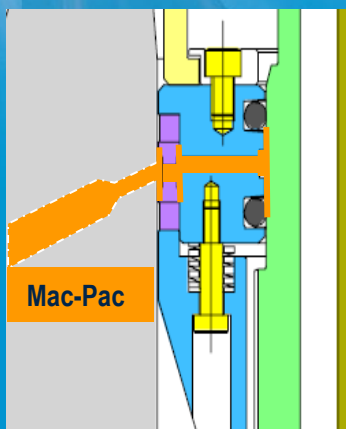


Short or Long Term Isolation  
Temperatures:  $-50^{\circ}$  to  $250^{\circ}$  C  
Ideal for:  
Gate Valves, Ball Valves, and Xmas  
Tree Valves.

Seat and Gate Sealing  
Areas & Stem Packing



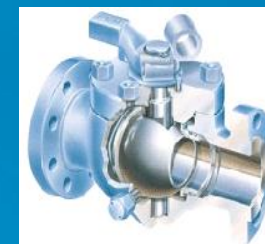
Gas Leak isolation



Wellhead Mandrel Seal Isolations



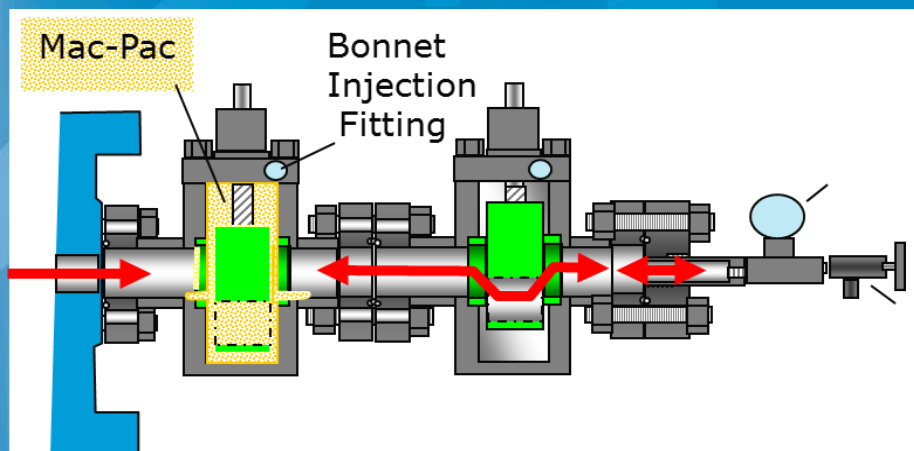
CV 8" #600 Ball Valve



*Ideal for: ball valve seal, stem packing,  
pipeline ESD systems, etc.*

# KCI Mac-Pac Isolation Sealant & High Temperature Lubricant

Deployed as a high viscous fluid as an alternative to plastic packing products.  
**Example:** Energising existing 'Y' or 'P' seals, Wellhead Seal Pack-Offs and Casing Mandrel Type Hanger seal structures.



VR-Plug Removed



Gate removed with Mac-Pac

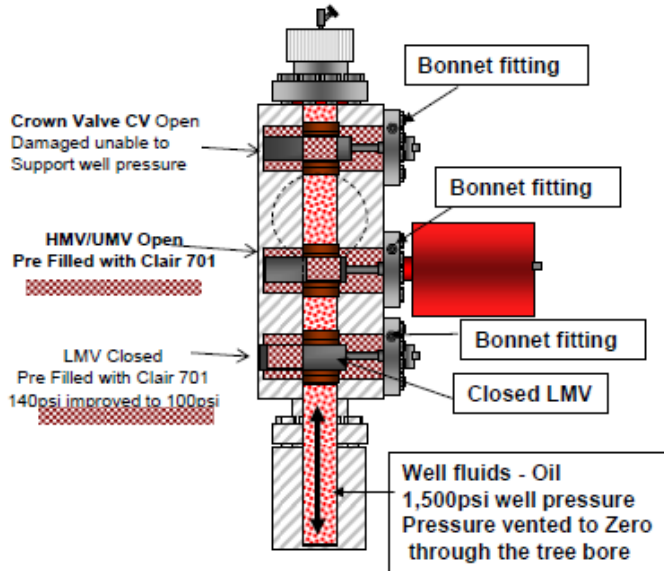


Valve Body Cavity with Mac-Pac

# KCI Mac-Pac Isolation Sealant & High Temperature Lubricant



Tree overview and position of valve prior to the isolation



Down Hole Safety Valve Closed  
1500psi below the closed Valve

Typical Tree Valve Arrangement

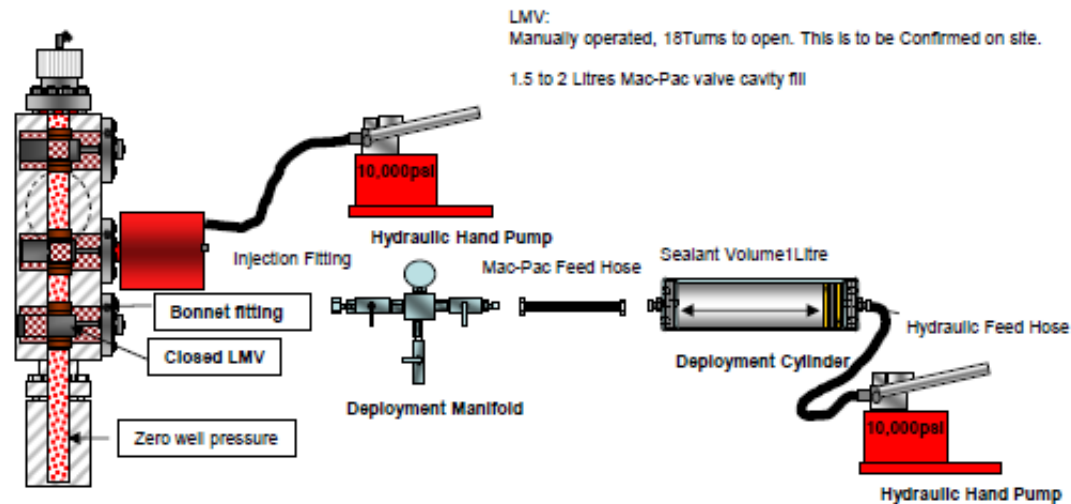
The Mac-Pac is deployed when standard greasing operation fail to provide an isolation within the Tree.

The Mac-Pac is injected into the valve cavity as the valve is opened, this displaces the grease into the tree bore.

Both LMV and UMV can be deployed with Mac-Pac to provide two independent barriers.

This is to provide isolation and testing upstream and to establish wireline and associated well access equipment.

Typical Mac-Pac deployment equipment



# KCI Mac-Pac Isolation Sealant & High Temperature Lubricant

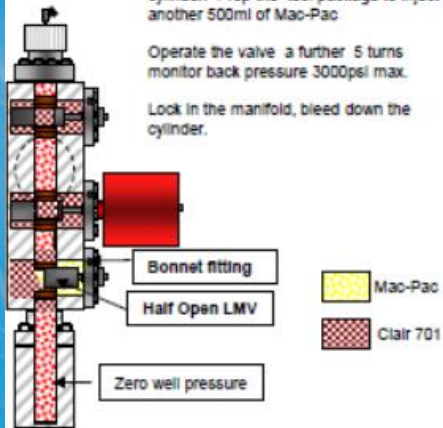


Operate the valve 4 turns  
Inject 500ml of Mac-Pac, monitor back  
pressure 3000psi max.

Lock in the manifold, bleed down the  
cylinder. Prep the tool package to inject  
another 500ml of Mac-Pac

Operate the valve a further 5 turns  
monitor back pressure 3000psi max.

Lock in the manifold, bleed down the  
cylinder.



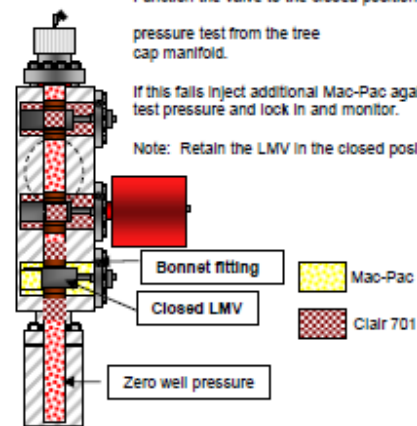
Operate the valve a further 5 turns  
Inject 500ml of Mac-Pac, monitor back  
pressure 3000psi max. Lock in  
between  
1500psi and 3000psi at the manifold

Function the valve to the closed position

pressure test from the tree  
cap manifold.

If this fails inject additional Mac-Pac against  
test pressure and lock in and monitor.

Note: Retain the LMV in the closed position

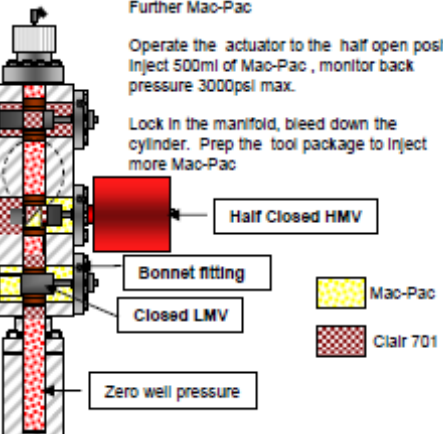


Independent control of the UMV to ¼ closed  
Inject 500ml of Mac-Pac monitor back  
pressure 3000psi max.

Lock in the manifold, bleed down the  
cylinder. Prep the tool package to inject  
Further Mac-Pac

Operate the actuator to the half open position  
Inject 500ml of Mac-Pac, monitor back  
pressure 3000psi max.

Lock in the manifold, bleed down the  
cylinder. Prep the tool package to inject  
more Mac-Pac



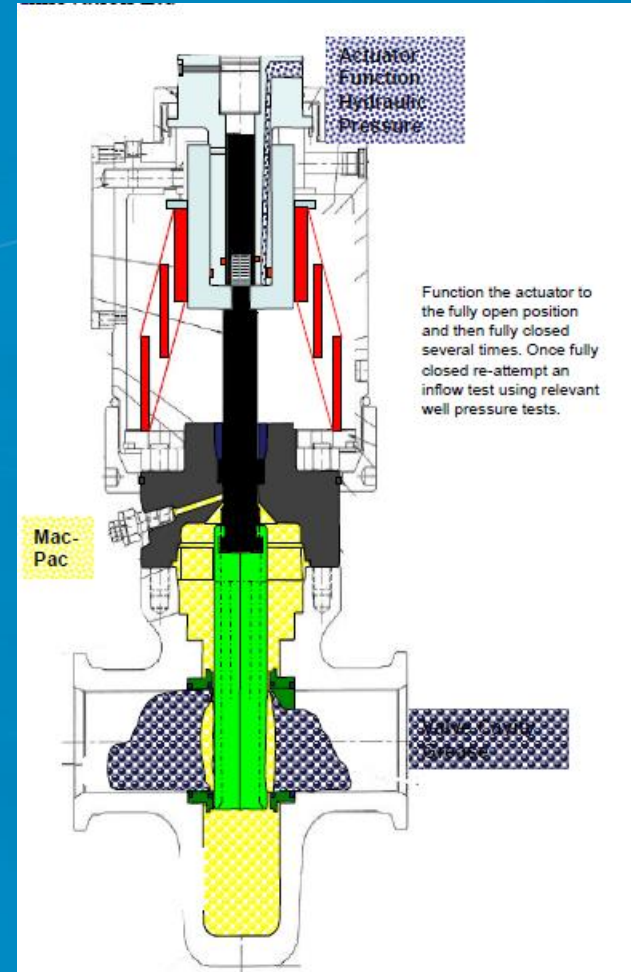
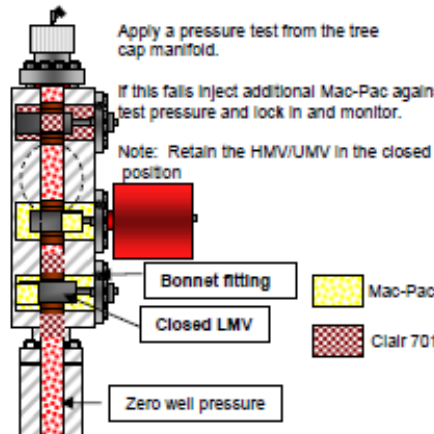
Close the valve / actuator take it off the  
back seat. Inject 500ml of Mac-Pac, monitor  
back pressure 3000psi max. Lock in  
Pressure between 1500psi and 3000psi at  
the manifold

Close the actuated valve under control

Apply a pressure test from the tree  
cap manifold.

If this fails inject additional Mac-Pac against  
test pressure and lock in and monitor.

Note: Retain the HMV/UMV in the closed  
position



Function the actuator to  
the fully open position  
and then fully closed  
several times. Once fully  
closed re-attempt an  
inflow test using relevant  
well pressure tests.

# KCI Mac-Pac Isolation Sealant & High Temperature Lubricant



Flange & Bleeder Plug



Bleeder Valve



Leak Path Present  
Top Clamp Assembly  
Valve Closed



Leak Path Present  
Bottom Clamp Assembly  
Valve Open



Clamp Assembly  
Installed Pressure Leak  
Deflected Downwards



Mac-Pac Cylinder Installed



Mac Pac Passing Through  
The Clamp Assembly

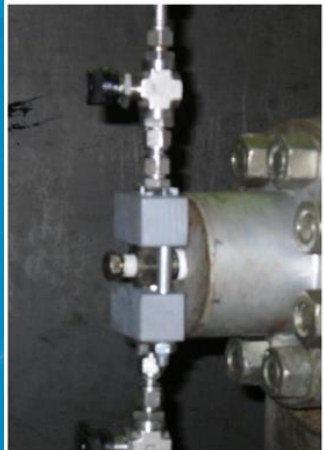


Bottom and Top  
Valves Closed

# KCI Mac-Pac Isolation Sealant & High Temperature Lubricant



500psi Locked In The Clamp  
Assembly Back Out  
The Bleeder Screw



The Bleeder Screw Fully  
Retracted



Mac-Seal Injection as a contingency  
after the deployment of the Mac-Pac



Mac-Seal Injection as a contingency  
after the deployment of the Mac-Pac



Bleeder removed