

High performance tool steel
and premium service

Relining

of extrusion containers

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1. Incoming inspection
2. Thermal shrinkage
3. Bore inspection
4. Heating system check
5. Further actions
6. Machine cylindrical bore
7. Shrink-in process
8. Final inspection, shipping





1. Incoming inspection

- Rough dimensions
- Any deviations from purchase order
- Mantle hardness (outside)
- State of heating system incl. cover rings
- Insulation value of heating system
- **Inspection protocol** 📄

2. Thermal shrinkage of inner liner and, if necessary, intermediate liner

- Controlled preheating of container in furnace
- Continuous flow of cooling water in liner
- Loosening of shrink fit by cooling effect
- Disassembly of liner by crane
- Rare in the case of regular relining: machining of the liner



8. Final inspection, shipping

- **Shrink protocol** 📄: Collect manufactured dimensions of mantle, intermediate and inner liner
- Future purchase orders of new liners based on shrink protocol
- Uniform use of container ensures liners remain interchangeable (allowance 10mm on final diameter)
- Safe transport with dump trucks

7. Shrink-in process

- Preheating container in furnace
- Insert the cold liner vertically into the preheated container
- Observe radial position during shrinking (for air cooling/ thermocouple bores)
- Cool down container to room temperature
- Finish machining of the bore
- Finish machining on stem and die side



3. Bore inspection

- Check intermediate liner and mantle for further usability
- Dimensional check: plastic deformation in the bore
- Hardness check in the bore
- **Dimensional- and hardness protocol** 📄
- In case of partial softening: additional air cooling?
- Strength < 1000MPa: new mantle or intermediate liner?

4. Check heating system, if necessary

- Remove cover rings
- Measure resistance of heating cartridge against body
- Measure current flow through cartridge
- Arrange for repairs by specialized company



6. Machine cylindrical bore

- Restore bore cylinder
- Ensure proper shrink fit over the container length
- Calculate shrink dimension

5. Further actions (examples)

- Low hardness level / radial expansion in the intermediate liner bore: container can no longer meet its support force requirement. Open bore, renew, thicker-walled inner liner?
- Weld repairs on critical elements (keyways, power supply pockets, air inlet holes).

Examples for additional premium services

Aluminium

Redressing of sealing surface on aluminium containers if there is sufficient allowance (e.g. 10mm).



▲ before



▲ after

Copper/Brass

Conical sealing faces, which are mainly used in copper/brass applications, can also be repaired.

This repair is usually carried out by welding on the cone followed by re-turning.



▲ before



▲ after

Cleaning of inner liner bore (e.g. copper oxide) by re-honing inner liner e.g. every 10,000 pushes.



Check keyways and guidance

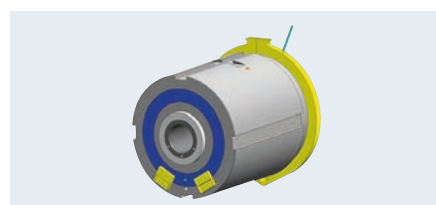
If necessary, keyways are welded on and reworked to ensure centric fixation of container.

Adequate weld repair must be carried out with subsequent stress-relieving treatment.



Modification to KCPC (Kind&Co Power Connector)

Cracks on power supply pockets for heating system can be avoided by design improvements.



Production processes

Melting

Forging

Heat treatment

Mechanical processing

Vacuum hardening

Surface treatment

Products

Hot-work tool steels

Cold-work tool steels

Die forging steels

Plastic mould steels

Industries

Die casting

Extrusion

Die forging

Pipe technology

Plastics technology

Hot-stamping

Special applications

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