



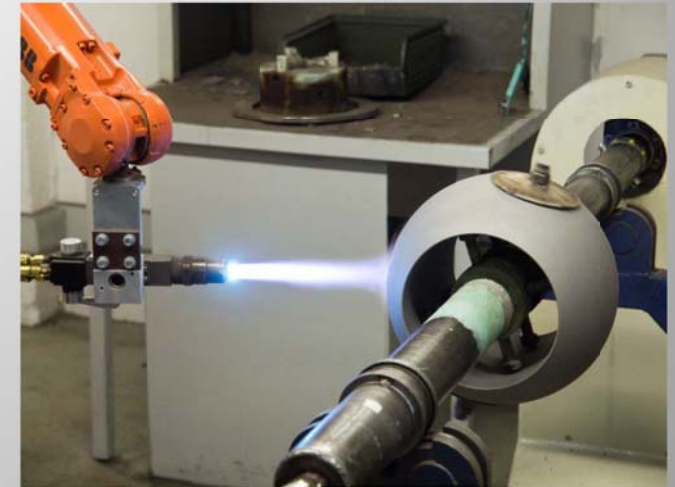
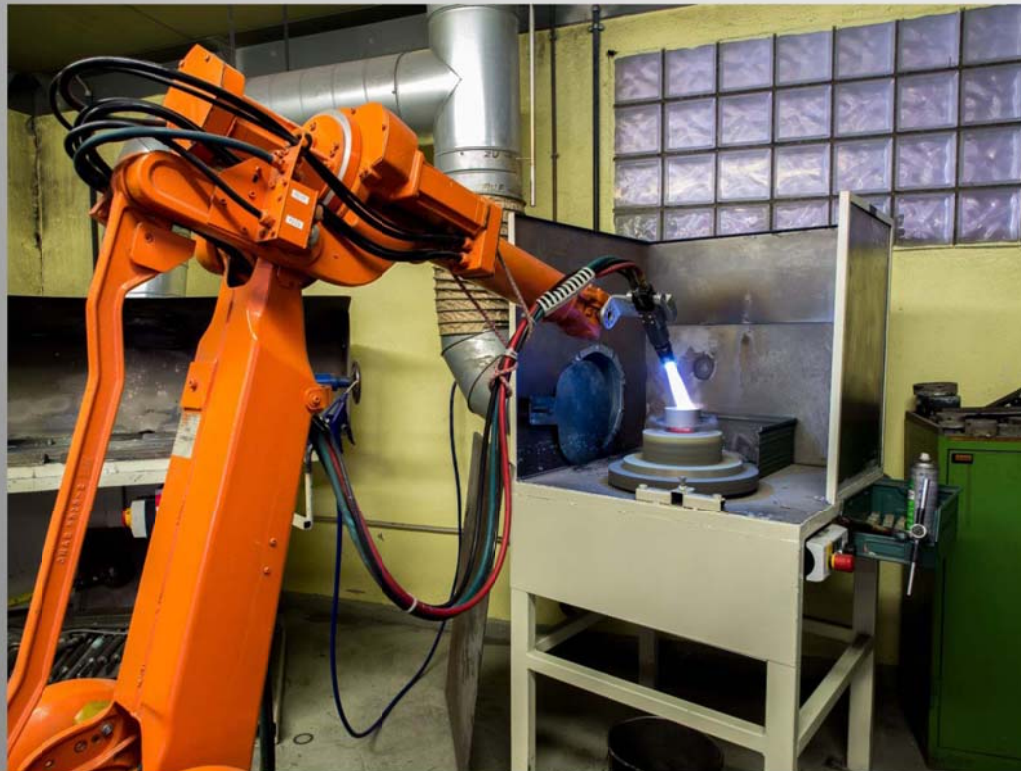
Topic

- Production of Metal Hardfacings
- Perrin Standard Hardfacing
 - Thermal Procédeure
 - Mechanical Procédeure
- Hardfacing Materials
- Hardfacing Materials – Choosing Criteria
- Other Surface Coatings





Production of Metal Hardfacings





Perrin Standard Hardfacings

Thermal hardfacings

e.g. Perrit 01 (Ni based), Perrit 03 (Co based)

2-steps process

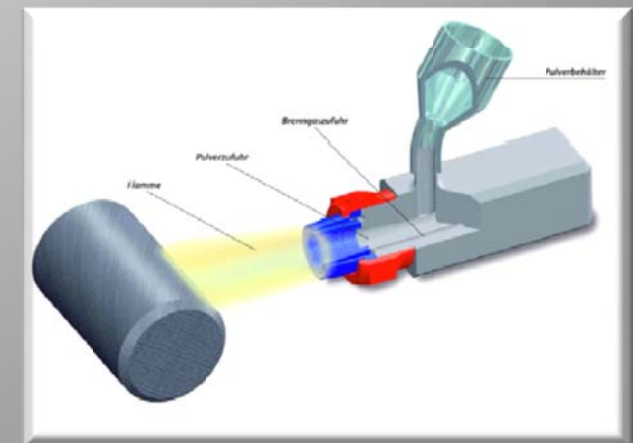
- a) Superimposing of hard facing material by Spray welding
- b) Fusing at 2000°F (~1010°C)

Coating thickness after final machining: 0,5 mm,

Hardness up to 56 HRC (Rockwell)

The liability of the injection layer on the base material is considerably increased by the thermal process.

The spray layer being gas-and liquid-tight.





Perrin Standard Hardfacings

Mechanical hardfacings e.g. Perrit 20 (Tungsten Carbide)

1-step process

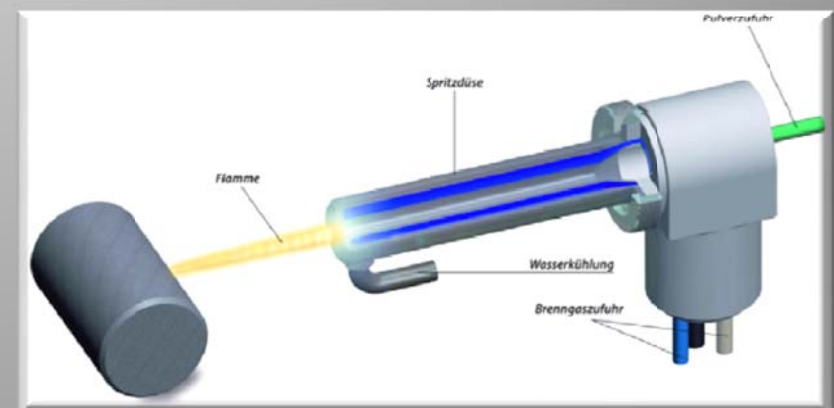
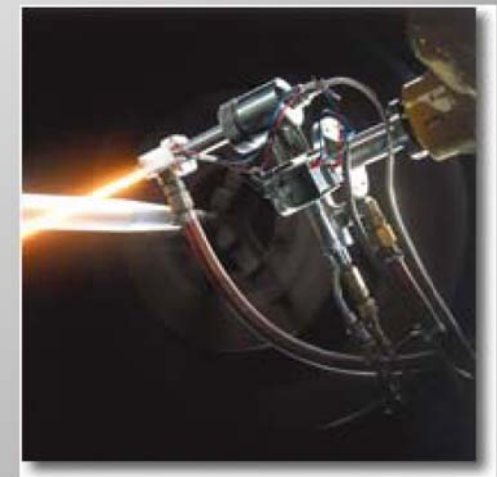
Superimposing of hard facing material by high velocity Spray Welding (at supersonic speed)

Coating thickness after final machining: 0,2 mm,
Hardness 1100 - 1350 HV (Vickers) > 70 HRC

Adhesion is done mechanically by "dig" (verkrallen)

Low temperature stress.

This coating is also used for inner flow passages of the ball valves.





Hardfacing of Ball

Steps of production:

- *pre machining SS ball (free of tension)*
- *coating*
 - *spray welding*
 - *heat treatment at app. 2000°F*
in a vacuum-furnace
- *turning of inside diameter*
- *turning of outside diameter*
- *milling of slit*
- *grinding of outside diameter*
- *final lapping with seats (bigger sizes)*
- *final controlling*



*pre machined ball
DN 2" after coating
with Perrit 01*



*Perrit 01 coated
ball DN 2" after
lapping*



Hardfacing of Seats

Steps of production:

- *pre machining SS seat (free of tension)*
- *coating*
 - *spray welding*
 - *heat treatment at app. 2000°F*
in a vacuum-furnace
- *turning of coated surface*
- *final lapping with ball (bigger sizes)*



*pre machined seat
ring DN 2" after
coating with Perrit 01*



*Perrit 01 coated seat
ring DN 2" after
machining*



Hardfacing Materials

Extract of Perrin Hardfacing Materials („Perrit....“)

<i>Perrin-Name</i>	<i>Chemical / Trade Name</i>	<i>Kind of Hard facing</i>	<i>Temperatures</i>	<i>Hardness [HRC] / [HV]</i>	<i>Final Thickness</i>
Perrit 01	73% Ni, 16% Cr / Colmonoy 6	Thermal (sintered)	1382°F / 750°C	56 HRC	0,5 mm
Perrit 03	45,7% CO, 19% Cr / Stellite SF20	Thermal (sintered)	1110°F / 600°C	56 HRC	0,5 mm
Perrit 20	88% WC + 12% CO WCCO 88-12	Mechanical (high velocity spray welding)	1000°F / 500°C	1100 HV	0,2 mm
Perrit 25	Co 28Mo 8Cr 2 Si Diamalloy 3002 NS	Mechanical (high velocity spray welding)	1400°F / 760°C	1100 HV	0,2 mm



Hardfacing Materials - Choosing Criteria

- | | |
|---|---------------------------------------|
| 1. Perrin Standard:
Without any special requirements, Temp. << 500°C:
e.g. Solid Medium at ambient temperature
Reason: Cheaper than Thermal Hard facings | Perrit 20 |
| 2. High Temperature differences or Silicon application (Dow Corning): | Perrit 01 |
| 3. Oxygen or clean gases | Perrit 20 (Ball)
Perrit 01 (Seats) |
| 4. High content of H ₂ S in the medium | Perrit 03 |
| 5. Temperatures > 500°C | Perrit 01 / 03 / Perrit 25 |
| 6. High content of salts | Perrit 24 |

Hardfacing of valve bore with Perrit 20 (Be careful – only possible for bigger sizes >6")



Other Surface Coatings

Chrome-Plating



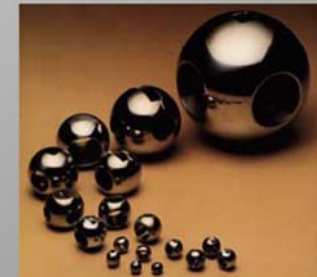
Up welding



Nickel-Plating



Hardening (Kolsterising)



PERRIN links Nidderau with the world



*Questions
are
welcome*

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