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Topic

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

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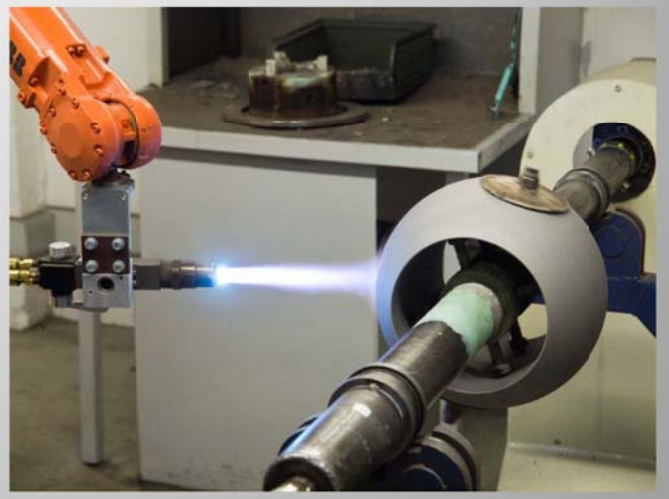
Production of Metal Hardfacings



Perrin Standard Hardfacings

Thermal hardfacings

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

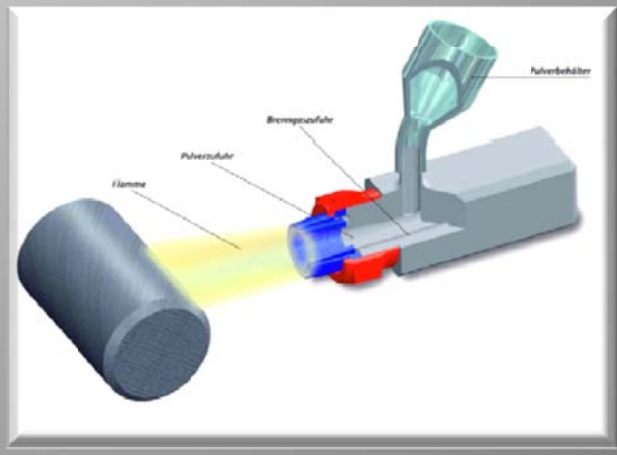
2-steps process

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

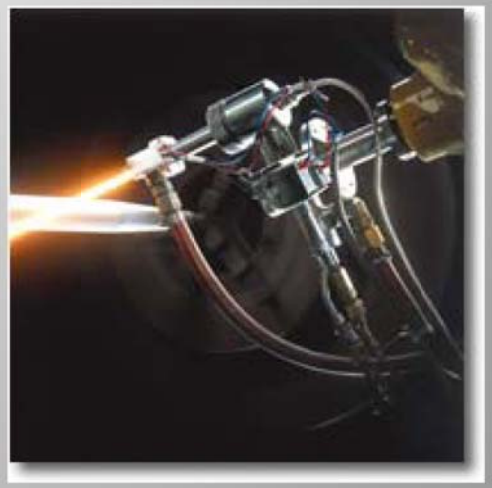
Mechanical hardfacings e.g. Perrit 20 (Tungsten Carbide)

1-step process

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

Coating thickness after final machining: 0,2 mm,

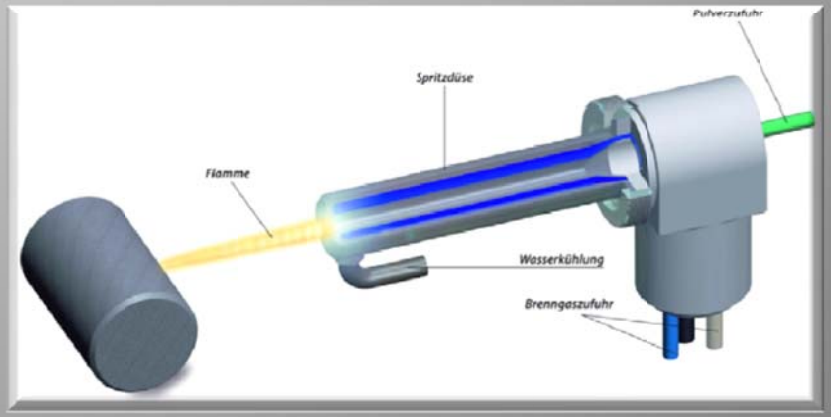
Hardness 1100 – 1350 HV (Vickers) > 70 HRC



Adhesion is done mechanically by "dig" (verkrallen)

Low temperature stress.

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



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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

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

- *turning of coated surface*
- *final lapping with ball (bigger sizes)*

Perrit 01 coated seat ring DN 2" after machining

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Hardfacing Materials

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

Perrin-Name	Chemical / Trade Name	Kind of Hard facing	Temperatures	Hardness [HRC] / [HV]	Final Thickness
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:	Perrit 20
	e.g. Solid Medium at ambient temperature	
	Reason: Cheaper than Thermal Hard facings	
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 H2S 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”)

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Other Surface Coatings

Chrome-Plating

Up welding

Nickel-Plating

Hardening (Kolsterising)

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Questions are welcome

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