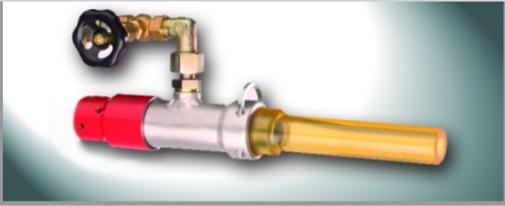


Turbo mixing spray nozzles



Crevice nozzle



Nozzle 25/ 32/ 40



Nozzle 50/ 65



Delivery tubes



Concreting head



Structure turbo mixing spray nozzle „ULTRA“

PAN-DA high-pressure pumps

Technical data

Type San 780

Water delivery rate	[l/h]	700
Water pressure	[bar]	90
Nozzle nominal width	[mm]	25/ 32
Electric motor	[kW]	2.2
Length / Width / Height	[mm]	600 x 360 x 440
Weight	[kg]	40



Type San 1.100

Water delivery rate	[l/h]	1,000
Water pressure	[bar]	90
Nozzle nominal width	[mm]	25/ 32/ 40
Electric motor	[kW]	5
Length / Width / Height	[mm]	600 x 360 x 440
Weight	[kg]	50



Type bn

Water delivery rate	[l/h]	1,200
Water pressure	[bar]	100
Nozzle nominal width	[mm]	32/ 40/ 50/ 65
Electric motor	[kW]	4
Length / Width / Height	[mm]	900 x 350 x 630
Weight	[kg]	130



Type pn

Water delivery rate	[l/h]	1,800
Water pressure	[bar]	100
Nozzle nominal width	[mm]	50/ 65
Electric motor	[kW]	7.5
Length / Width / Height	[mm]	900 x 350 x 630
Weight	[kg]	145



Type rh 25

Water delivery rate	[l/h]	2,900
Water pressure	[bar]	100
Nozzle nominal width	[mm]	50/ 65
Electric motor	[kW]	11
Length / Width / Height	[mm]	900 x 350 x 700
Gewicht	[kg]	165



Additive metering unit

Delivery rate	[l/h]	50 - 500
Operating pressure	[bar]	70
Nozzle nominal width	[mm]	32/ 40/ 50/ 65
Electric motor	[kW]	2.2
Length / Width / Height	[mm]	730 x 500 x 400
Weight	[kg]	90



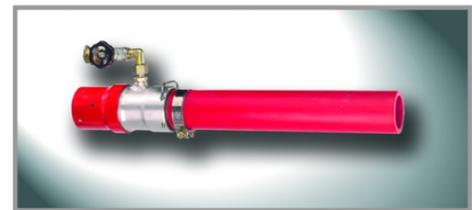
Subject to technical alterations | as of March 2006

PAN-DA high-pressure pumps Turbo mixing spray nozzles „ULTRA“

for shotcrete and
refractory compounds



- Turbo mixing of the highest standard
- Suitable for all dry-spray shotcreting systems
- Practically dust-free
- Little rebound



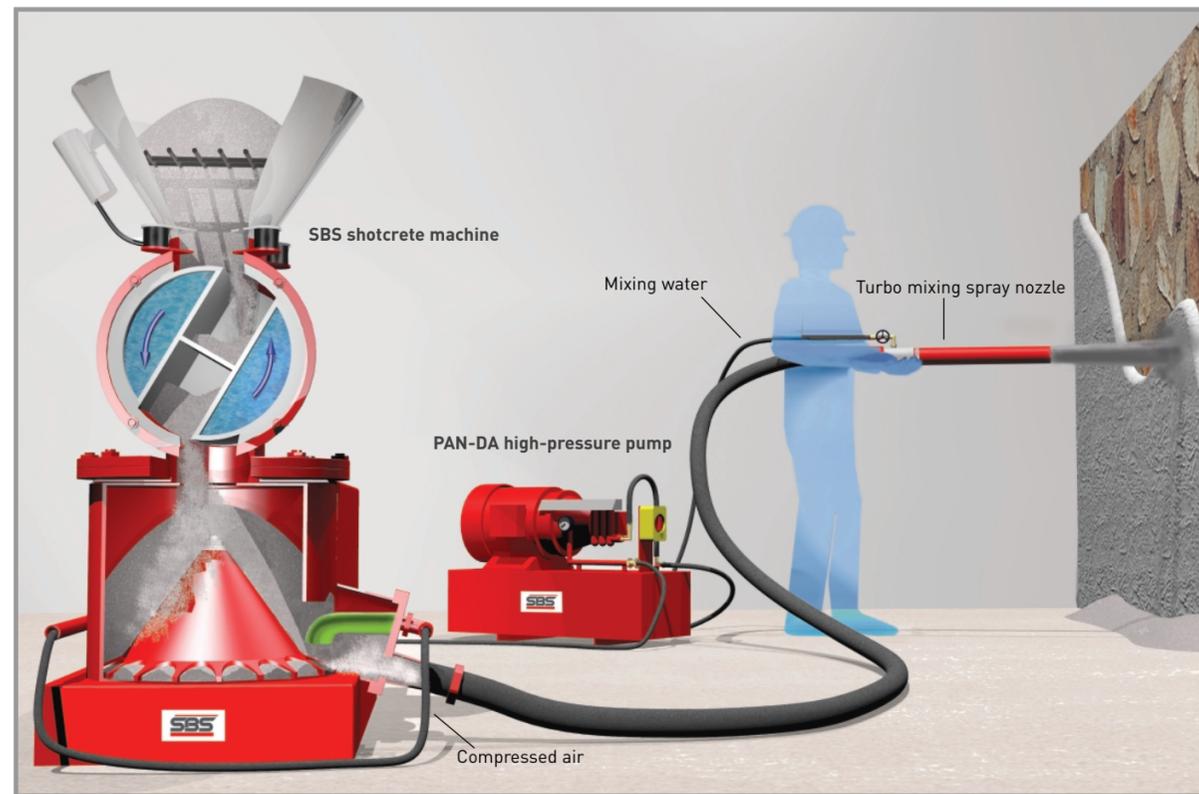
Initial situation

In dry-spray shotcreting, the material is transported pneumatically at high speed (approx. 40 m/s) through the conveying hose. In the mixing process, the nozzle has to mix dry shotcrete material and the mixing water into homogeneous fresh concrete in the fraction of a second, making it the critical point in the whole procedure. Any fluctuations or irregularities in the mixing process

can lead to high rebound and dust generation, resulting in high disposal costs and decreasing production rates. Considerable quality loss in the concrete can make extensive reworking necessary!

Solution

The SBS PAN-DA high-pressure system makes clever use of the high speed of the material flow to effectively deal with this critical point.

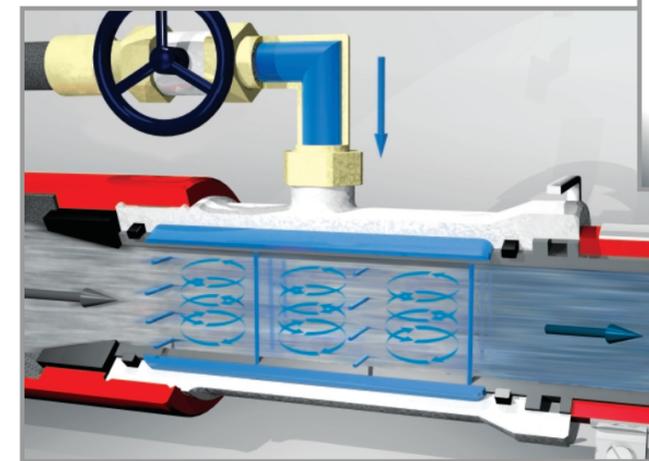


SBS-system

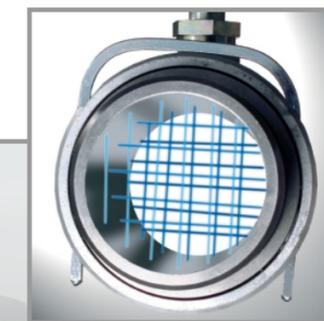
Function

The mixing water provided by a PAN-DA high-pressure pump is conveyed through a high-pressure pipe to the nozzle at pressures of up to 100 bar. The mixing cylinder is equipped with a special mixing pipe with a precisely calculated number of drilled micro holes arranged in succession on altogether 4 levels. Forcing the mixing water through the holes, results in a small meshed water grid flowing at high speed. The flow of material now meets the water grid at right angles. At

the moment of impact, the two flows arriving at almost the same speed generate considerable turbulence with optimum mixing of the dry shotcreting material and the water.



SBS turbo mixing spray nozzle



Water grid in turbo section

Conclusion

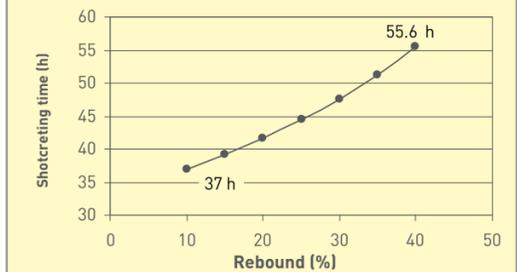
Many shotcrete building sites are completed with losses due to sub-standard shotcreting equipment. Some of the risks include high rebound with resulting losses in production rate, high disposal costs and previously not calculated additional material requirements, to name but a few. Time and again, building sites have to be closed because the dust emission levels are too high, together with expensive reworking as a result of inadequate end strengths in the shotcrete. These risks can be minimised by using our

top quality SBS PAN-DA high-pressure system. Low rebound, practically no dust emission and high shotcrete quality make the PAN-DA system a most profitable, indispensable partner.

Improved output, material savings and long-life cycle reduce site costs considerably, resulting in excellent value for money. Investment in a PAN-DA high-pressure system thus pays off in next-to-no time.

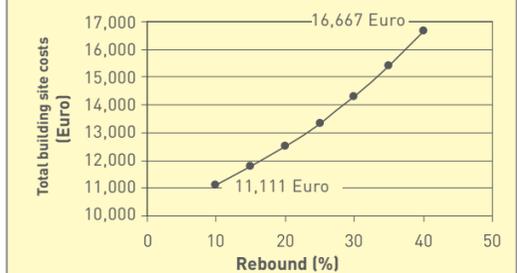
Profitability analysis

Diagram to show shotcreting time and rebound for 100 m³ hardened concrete*



* Shotcreting machine conveying capacity: 3 m³/h (hardened concrete)

Relationship of total building site costs* to rebound for 100 m³ hardened concrete



* Calculation basis: 100 Euro/m³ (hardened concrete)

Model calculation (hard compacted concrete)

In a refurbishment project, 100 m³ shotcrete are to be installed on a wall. The upper tables only consider the development of the total building site costs together with the absolute shotcreting time. No consideration is given to the costs for possible rebound disposal or to personnel costs.

The following formula can be used to calculate the building site quantities:

$$V_{\text{total}} = \frac{V_{\text{wall}} \cdot 100\%}{(100\% - x\% \text{ rebound})}$$

For x = 15% rebound, a total of 117.6 m³ shotcrete mixture would have to be provided to produce 100 m³ shotcrete.

