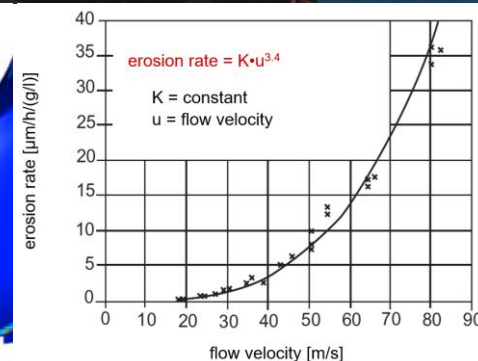
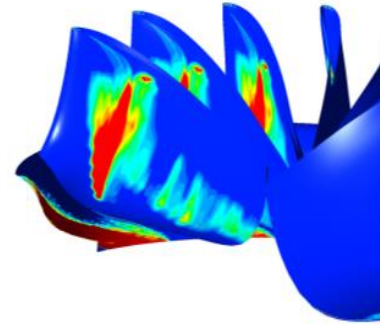
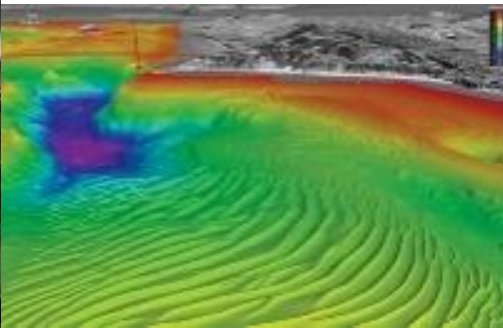
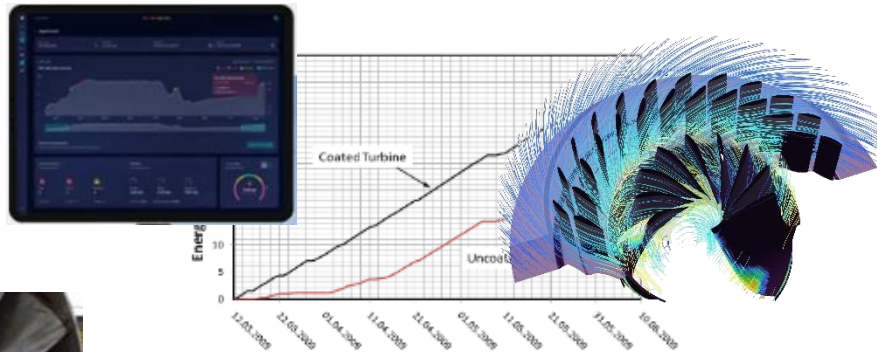
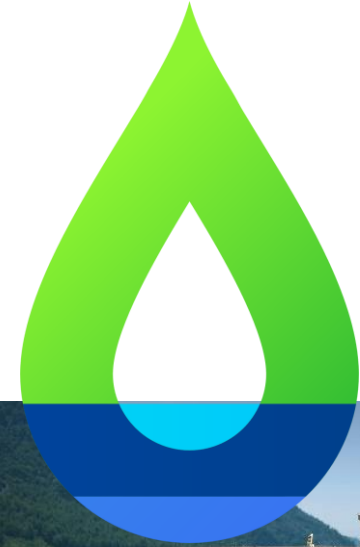


SedimentCareProgram

Coatings for hydraulic equipment



Boundary conditions:
experiment: model test
material: X5 CrNi 13/4
sediment concentr.: 3g/l

Source:
W. Keiser (1999)
from C. Ortmann
Entsander von Wasserkraftanlagen
2006



Content

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Portfolio of products

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Why does it matter?

Why do we need coatings?

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How does it work?

What is Softurb® LS?

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Portfolio of products



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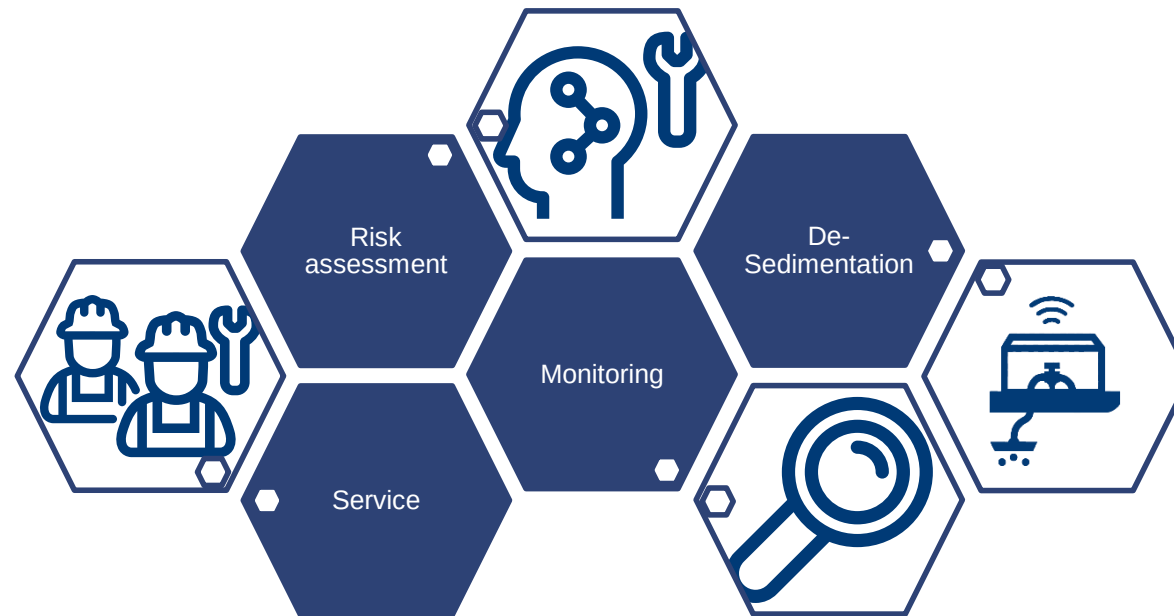
Voith products for sediment topics

VOITH

Transparent portfolio

Step by step

System Integration



SedimentCareProgram

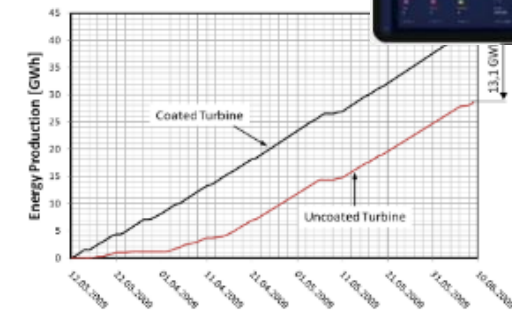
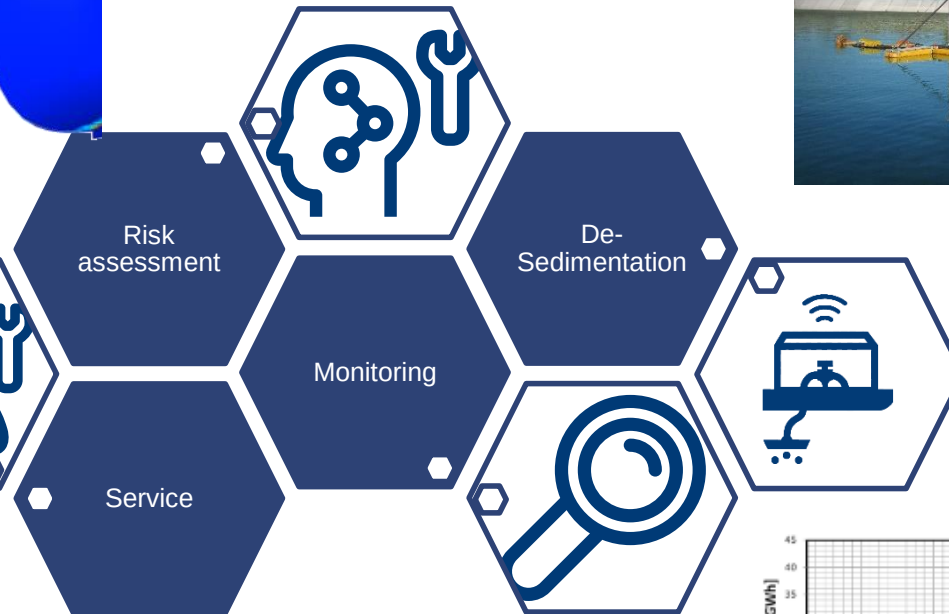
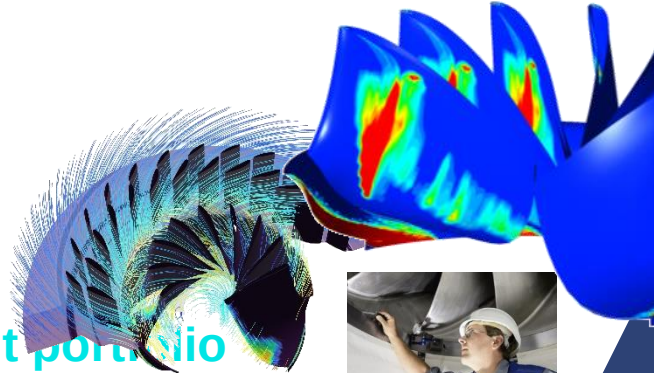
Voith products for sediment topics

VOITH

Transparent portfolio

Step by step

System



2

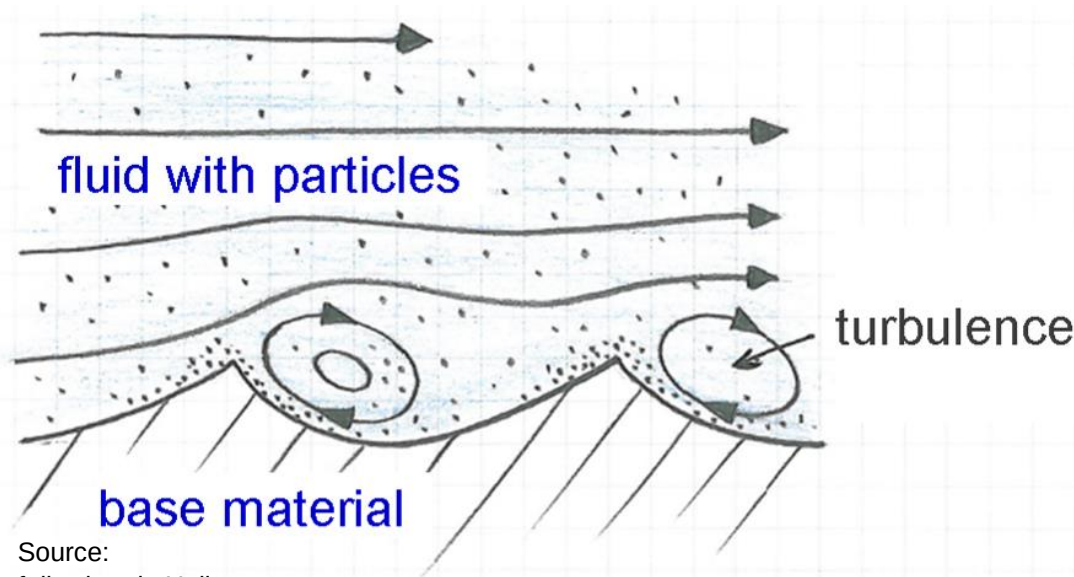
Why does it matter?

Why do we need coatings?



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Abrasion mechanism



Source:
following de Haller
Handbuch der Werkstoffprüfung
Siebel E. (1939)

Influencing parameters:

- particle (concentration, hardness, size, shape)
- resistance of material against abrasion
- flow velocity of fluid
- local turbulences / impact angle

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Root cause Sediment

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Project 1



Project 2



Project 3



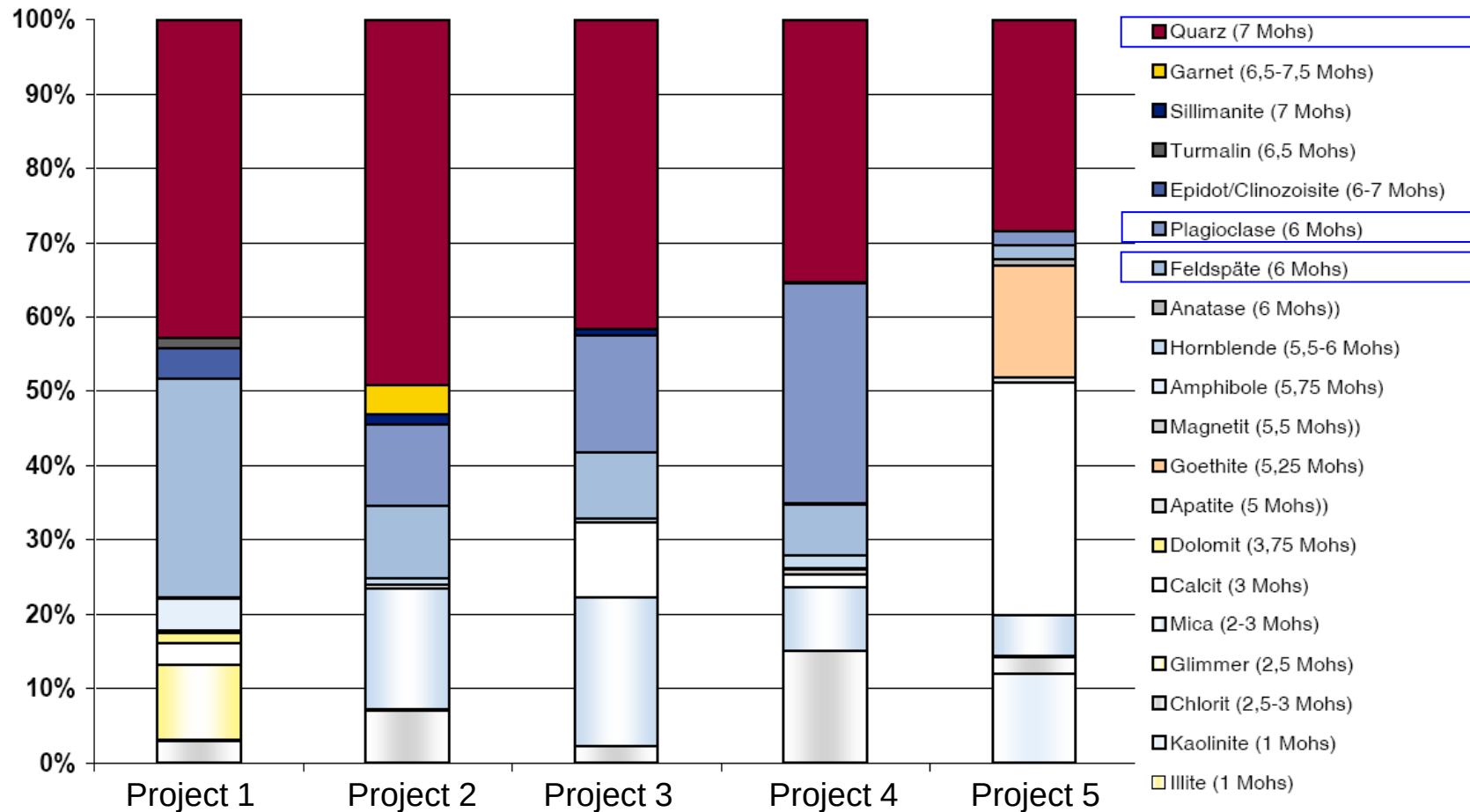
Project 4



Project 5

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Root cause Sediment



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Protective coating – effected areas

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3

How does it work?

What is Softurb[®] LS?



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Protective coating – Softurb® LS

- Softurb® LS is a soft coating used to increase surface resistance of hydraulic equipment against abrasion or damage induced by sediments during power generation
- Softurb® LS is the successor product of Softurb® 80



Uncoated and damaged runner



Runner with Softurb® - coating

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Protective coating – Softurb® LS

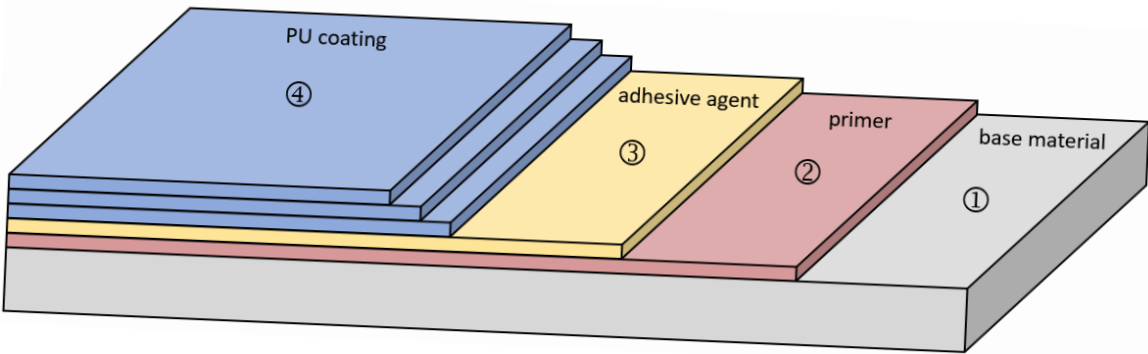


- Very good abrasion protection
 - Application without heavy machinery
 - Improved adhesion to avoid peeling effects
 - Repairable - simple and fast
 - Application for higher flow velocities
- Minimize susceptibility to failure

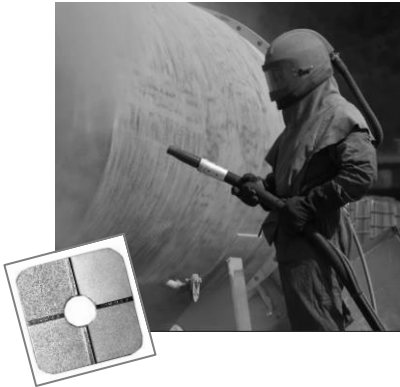
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Protective coating – Softurb® LS

Multilayer structure for optimized adhesion and performance:



Application of standards for surface preparation comparable to paintings & varnishes:



Changes	Softurb® 80	Softurb® LS
Standardized application process	👎	👍
Adjusted to applicable environmental regulations	👎	👍
Performance lead compared to market competition	👎	👍

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Protective coating – Softurb® LS

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Protective coating – Softurb® LS

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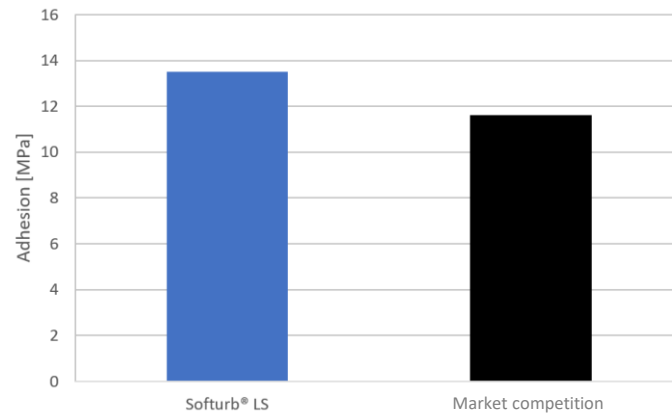
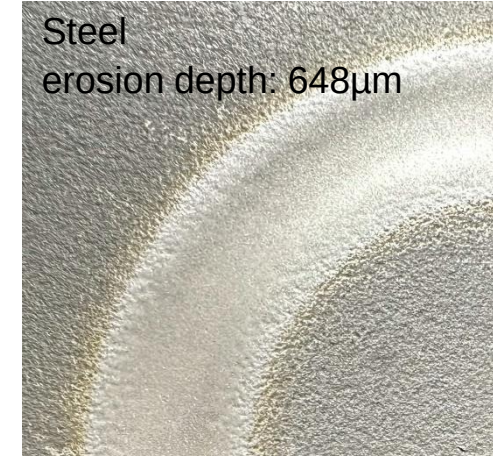
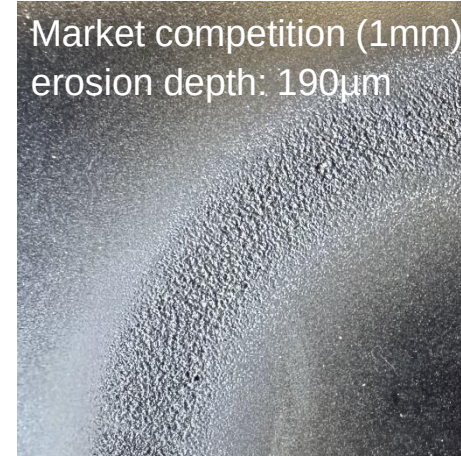
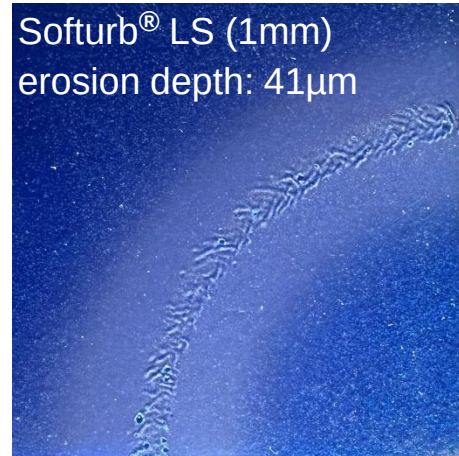
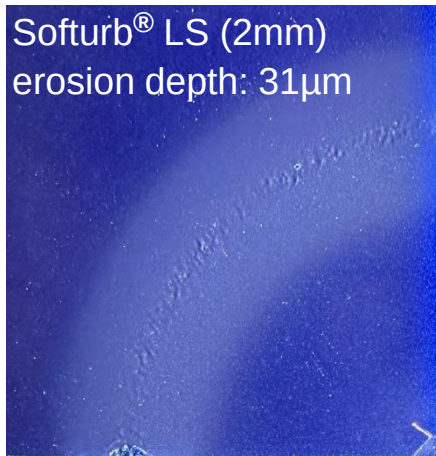
Test setup:

- distance of injector: 2cm
- sediment: garnet (Speedblast 0,1 - 0,3mm; Mohs 7; ESSKA)
- amount of sediment: 50kg
- test duration: 30min
- impingement angle: 90°
- radius: 30mm
- water pressure: 100bar

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Protective coating – Softurb® LS

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- improved adhesion to avoid peeling effects
 - failure within the coating allows simple repair
 - application for higher flow velocities
- Minimize susceptibility to failure

**Superior abrasion resistance
compared to uncoated components
or competition products**

Thank You!

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