Dewatering with SolidCoat Technology

SolidCoat Technology

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Introduction to SolidCoat Technology

General

• SolidCoat technology facilitates the redesigning of traditional dewatering elements bearing in mind:
  – Effective dewatering
  – Energy savings
  – Gentle fabric contact
  – High-quality end product

• SolidCoat dewatering elements employed in current paper machine solutions include:
  – VacuShoe, VacuBalance, BelShoe
  – Redesigned loaded blade elements
  – Slotted suction box covers
  – Perforated Uhle box covers

• In pulp drying, SolidCoat technology is used on filtrate box covers in the DryWay concept.

Introduction to SolidCoat Technology

General

• Consists of covers, foils and blades.
• Stainless steel bodywork
• Seamless and polished hard coating
• Wide range of coating materials for different process environments
• Worn elements can be recoated
SolidCoat Ceramics

Ceramic Layer
- Proprietary plasma applied oxides for dense coating

Engineered Ceramic

Metallic Bond Layer
Fourth generation HVAF applied ~100% dense corrosion resistant metal. Improves bonding of ceramic to vacuum element, prevents corrosion for optimum cover life.

Stainless Steel Body
Quality designed and engineered for proven life

Metallic Bond Layer

Vacuum Element

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Metallic Bond Layer

- Fourth generation bond coat technology provides a 100% dense corrosion resistant metal.
- Improves bonding of ceramic to vacuum element, prevents corrosion for optimum cover life.
Metallic Bond Layer

- Acts as transitional bond layer between ceramic and vacuum element body
- Extremely dense base coating. Less than 0.1% void volume
- Acts as corrosion resistant barrier

Ceramic Layer

Design

- Engineered surface properties to maximize wear resistance and surface cleanliness
- Optimum wear resistance (1200 - 1300 HV₃)

*Ceramic powders and sealing compounds are proprietary materials developed by Valmet*
Ceramic Sealing Technology
Red Sealer Penetration Test

- Cures to a hydrophilic surface to produce optimum cleanliness
- Capillary penetration into ceramic all the way to the bond coat.
- Prevents corrosive environment from reaching the vacuum element body

SolidCoat Technology
Benefits

- Papermaking process
  - Effective dewatering
  - No seams or joints, one continuous component.
- Reliable operation
  - Coating materials designed for gentle fabric contact
  - Thermal shock / impact resistant
- Total lifecycle costs
  - Savings through better dewatering, lower friction and lower vacuum.
  - SolidCoat elements can be recoated multiple times in the course of their lifecycle
Applications and Results

Slotted Suction Box Cover
Low vacuum usage, high dryness
Slotted Suction Box Cover
High sheet dry content at low vacuum levels

- High drainage capacity at low vacuum
  - Large open area thanks to narrow strip construction
  - Stable vacuum over the whole cover area
  - Generates less wire bending than a conventional slotted cover
  - Geometry of the narrow strips minimizes sheet rewetting after the suction box

SolidCoat covers - high sheet dry content at low vacuum levels

- Valmet slotted cover application
  - Increased sheet dry content at same vacuum levels
  - Energy savings while maintaining existing sheet dry content
  - Angled strips for lower flow resistance
New SolidLoad Loadable Blade Element

SolidCoat Applications
SolidLoad loadable blade

Process benefits
- No piano key effect
- No stripes in sheet
- Narrow blade – uniform wear
- More effective dewatering pulse
New Perforated Uhle box cover

New Perforated Uhle Box Cover
Cost-saving felt conditioning solution

- Cost savings and benefits through
  - Increased dewatering
  - Runnability
  - Better profiles
  - Lower friction – lower press drive load
  - Longer felt lifetime – longer felt change interval
  - Possibility to use seamed felts
  - Reduced vacuum consumption through vacuum system modification
New Perforated Uhle box Cover
Cost-saving felt conditioning solution

- Dewatering capacity is based on long dwell time in the suction area
- Increases felt dewatering at a lower vacuum level than a conventional slotted cover
- Decreases friction between the cover and the felt
  - Felt well supported over the entire suction area
  - No slots for the felt to "dive" into anymore
  - Gives a longer felt lifetime
- Quick and easy assembly to existing Uhle boxes

Effect of Perforated Cover
Case: Water rimming around pick-up roll before / after

Before installation
After installation of perforated cover
SolidCoat Applications

VacuShoe in ValFormer concept

- Custom-designed curved lead-in cover at the start of the forming section
- Increased production capacity and speed
- Ingoing geometry provides versatile tools for easy operation
- High dewatering capacity
- Improved formation
- Better two-sidedness control
- Wide basis weight range

Lower consistency and thicker web than with conventional hybrid former
SolidCoat Applications
BelShoe in BelBaie V concept

- A BelShoe placed at the jet landing area acts like a vacuum forming roll
  - High drainage capacity
  - Improved formation thanks to gentle initial dewatering and loadable blades

SolidCoat Applications
VacuBalance

Vacuum-assisted forming board with angled slots and drillings
SolidCoat Applications

VacuBalance

- Minimized pulsation
- Minimized stock jump
- Very high dewatering capacity
- Very wide operating window
- Excellent for layering

- Tendency for stock jump
- Heavy pulsation
- Limited dewatering capacity
- Fixed operation window
- Not suitable for layering

THANK YOU