

1

EnduraClean – a functional surface for paper machine components



Sjaak Nelkert

Service
sjaak.nelkert@voith.com

Surfaces of many components in paper machines are, nowadays, engineered to meet specific requirements to improve their functionality and performance. Covers and coatings are frequently applied on OEM components and offered to the industry as service products.

EnduraClean is a new surface coating system (cover) tailored to provide a unique combination of anti-adhesion and wear resistance. It has been specifically developed for any paper machine roll or drying cylinder suffering from excessive build-up of foreign particles (debris) and/or from build-up of deposits.

Lead-in dryers and any rolls or drying cylinders following coaters and size presses are prime candidates for this coating system. The surface characteristics of the coating significantly reduces the sticking tendency and also allows doctoring to easily remove any accumulation of foreign particle build-up.

The EnduraClean surface coating system is being applied on-site, in the machine and during a scheduled machine shut-

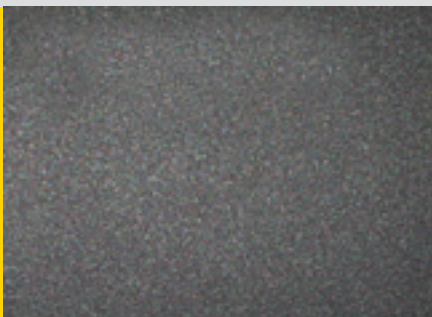
down. Multiple rolls or dryers can be coated simultaneously to minimize the total processing time.

On Site Grinding

Prior to the application of the EnduraClean coating system and depending on the condition of the roll or dryer, it might be necessary to re-condition the surface of the component by grinding. Rolls or drying cylinders which have been doctored heavily to remove deposits, are often grooved or damaged.

The Cylinder Service Group operates various types of grinders to re-condition drying cylinders in the machine. For safety reasons, all grinding machines are remotely controlled, incorporate dust

2



extraction systems and will restore the required cylinder shape and surface, fast and efficiently.

Dryer to dryer diameter tolerances (group tolerances) for cylinders running in drive trains, are always maintained.

EnduraClean Coating System

The on-site coating system consists of:

- Sand blasted bond surface
- Thermal sprayed, corrosion and wear resistant base coating
- Thermal sprayed adhesion layer
- Sintered Teflon® surface layer.

Sand Blasting

Prior to applying the thermal sprayed coatings, the surface must be properly prepared. Sand blasting has a dual function; it cleans the surface from contaminants and it increases the specific surface area, which assures bonding of the thermal sprayed coating system.

Thermal Spraying

A High Velocity Oxygen Fuel (HVOF) spray system is used to apply an ultra-dense base coat. This coat is thin, dense and consists of extreme hard carbides in a tough binder, with an overall coating hardness of HV 1,000 (approximately 70 HRc). A very thin “adhesion” layer of the same material is applied on top of this base layer. This adhesion layer functions as wear resistant matrix for the Teflon® compound.

Sintered Teflon

The top layer, and the actual functional surface consists of a sintered Teflon® type compound. This compound is impregnated into the wear resistant thermal sprayed surface. Sintering on-site is done using infrared propane heaters in a controlled heating and cooling sequence.

EnduraClean Characteristics

Non-Stick properties of PTFE (polytetrafluoroethylene) and other derivatives are well known. For years, Teflon® sleeves have been used to provide a non-stick

Fig. 1: Sintering of Teflon coating.

Fig. 2: EnduraClean surface.

Fig. 3: Grinder.

Fig. 4: HVOF Spraying.

Fig. 5: Schematic coating system.

surface to dryer cans. Disadvantages of the sleeves are the inability to doctor these surfaces and the high risk towards accidental damage.

Ultra-hard carbide, ceramic and metal based thermal sprayed coatings are widely used to provide extreme wear and corrosion resistant surfaces on press rolls, calender rolls, Yankee dryers, winder rolls, and doctor blades.

EnduraClean combines the wear/corrosion resistant and non-stick properties in one unique coating system. It will protect the surface, prevents sticking and thus improves the performance of the dryer or roll for years to come.

The EnduraClean coating system has found wide acceptance in paper machines, as numerous dryers and rolls have been coated on site since its introduction. This service product is offered, world-wide, through the Voith Cylinder Service Group.

