



Endura series – Hard coatings for Yankee and MG Cylinders

Hard coatings preserve Yankee and MG Cylinders and prolong their service life. Furthermore, coated cylinders can improve paper quality. To these ends Voith Paper Rolls has developed the Endura series of tailored dryer cylinder coatings to meet the rising demands of the paper industry.



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Voith Paper Rolls can offer a suitable coating system for every application:

EndurAll – the optimal surface coating for tissue creping cylinders

Endura MG – the optimal surface coating for MG cylinders

Prior to market launch all new Voith Paper Rolls coatings undergo extensive testing, particularly for wear resistance on a specially developed test facility. To ensure realistic test conditions, a doctor runs against the coating at a line force, which can be increased up to ten times the normal load. Corrosion resistance is tested

on a standardized facility enabling a wide variety of test conditions as near as possible to those on the paper machine in question. Local machining of the hard cylinder surface is also investigated and optimized, as well as its compatibility with the specific papermaking process in each case.

Voith Paper Rolls service specialists apply these coatings exclusively on site at the paper mill. To this purpose they take with them a grinding machine, sandblasting and coating equipment, weighing about 30 tons in total.

Fig. 1: Endura application process.

Fig. 2: Endura MG.

The overall application process – pre-grinding, sandblasting, coating and final grinding – takes 5 to 6 days for EndurAll coatings and 7 to 10 days for Endura MG coatings.

Optimal surface roughness is indispensable for consistently high tissue creping quality. EndurAll coatings are finished to an Ra value of 0.4 to 0.6 μm , which, combined with an ideal crowning curve and optimized organic cover material, ensures improved tissue quality. Another benefit is considerably extended doctor blade life, resulting in additional cost savings.

Tissue machine re-start can be supervised by an experienced Voith engineer, who, at the same time, optimally adjusts the production parameters to suit the new roll surface characteristics. Under optimal conditions the new surface coating will not require any re-grinding for several years, thanks to its extremely high wear resistance.

Likewise MG cylinders require optimal surface roughness to attain high paper gloss and smoothness. The normal cast surface quality can be ground down to minimal Ra values of 0.1-0.2 μm . With Endura MG coating Ra values of 0.05-0.15 μm can be reached, thus improving paper gloss and smoothness accordingly. This hard and smooth surface coating retains consistently high Ra values over its service life, which is extremely long.

These coatings not only increase the service life of creping and MG cylinders, but also can significantly improve paper machine runnability and product quality.

Coatings pay off for the user, because...

Creping and MG cylinders are extremely high stressed paper machine components – on the one hand high thermal strain through internal steam pressure and drier hoods, and on the other hand mechanical strain by press rolls and doctor abrasion. The cylinder surfaces, therefore, have to be reground whenever necessary, at the same time restoring the crowning and concentricity to a tolerance of 0.02 mm. The normal grinding intervals are 12 to 24 months for creping cylinders and 10 to 20 years for MG cylinders.

The cylinders are mainly used for drying paper or board and are heated from within by steam at a pressure of up to 10 bar. They are, therefore, subject to pressure vessel regulations, i.e. they have to be officially inspected at regular intervals like an automobile. Their safety is checked thereby, both visually and based on the admissible loading characteristics. The diagram, which indicates the Maximum Allowable Working Pressure (MAWP) is very important for the operational safety of the cylinder, because they directly indicate the maximum admissible steam

pressure according to wall thickness, as a function of external loading (such as line force applied by the press rolls). Since the cylinder wall thickness is reduced every time it is reground, the admissible steam pressure reduces accordingly.

Cylinder wall thickness reduction is not necessarily a drawback, however, because thinner cylinder walls make for better heat transfer and improve the cylinder's drying performance. Nevertheless, there are limits to drying performance improvement by thinner cylinder walls. Voith Paper Rolls can calculate the optimal drying performance, which is generally at a wall thickness of about 3 to 4 mm more than the minimal wall thickness at which the cylinder has to be decommissioned.

Yankee dryers are delivered with a grinding allowance of 12 to 15 mm, so that they last about 30 years. Instead of replacing them with a new cylinder, they can be resurfaced to make them last much longer. Voith Paper Rolls recommends this coating procedure as soon as the optimal drying performance has been reached. Furthermore, resurfacing of Yankee dryers is also recommended if their performance is negatively affected by excessive porosity of the cast shell.

...resurfacing saves investment costs by making Yankee dryers last much longer!

