# Energy Savings due to Optimised Doctor Blade Systems

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PaCon is a young company from Upper Bavaria which specialises in the measurement of line loads in doctor / blade scraper systems in the paper, board and tissue industry.

In order to clean cylinders in e.g. paper, board or tissue machines, or rotating rolls in printing presses, knife like blades are pressed onto the rotating surface of the cylinders. The angle of attack is between 10 to 30 degrees, where the angle is measured between the blade and the tangent to the surface of the cylinder at the point of contact. Depending on the surface of the roll and its speed of rotation, the blades are made of materials such as metal, plastic or reinforced polymer composites. The line load, which is measured in force per unit of length, usually falls into the range of 80 to 400 Newton per Meter. Originally, the load was a combination of the weight of the doctor blade, the weight of the doctor blade holder as well as the supporting beam structure. In modern systems the line load is no longer caused by weight, instead it is caused by an expanding pneumatic pressure hose in the blade holder.

Doctor systems are in use in many places in paper, board or tissue machines. Their main purpose is to keep rolls clean and to help prevent the paper from wrapping around the rolls, which would cause damage to the machine and stop production. In order to perform their function, the blades scrape along the surface of the rotating cylinder which also creates heat and causes abrasion. In addition to the attrition of the scraper blade itself, this talk is going to present results from simulations and measurements to show how much energy is necessary to overcome the braking effect of doctor systems. The usual methods to determine the line load on the blade tip are based on calculations or diagrams and not on real measurements. Based on the measurement of more than 100 different rolls, PaCon Ltd & Co. KG has found that in more than 90% of the cases the line load was incorrect or even off the expected value by up to 300%. Without an actual measurement, no accurate statement can be made about the real line load that acts between a roll and blade, and therefore about the braking effect and energy losses present in the doctor system.

Results from collaboration with paper mills will show the surprisingly great potential for energy savings that are possible with an optimally configured doctor blade system, when compared to the actual situation most often found in industry.