

# M-clean™ Dryer Fabric Cleaning System

## Overview

### Applications

To eliminate dryer fabric stickies and their detrimental effects on paper making operations, the M-clean dryer fabric cleaning system combines cleaning against a roll, active vacuum removal of debris, and proprietary configuration of shower nozzles customized to the application resulting in rapid return on investment.

### Features

- ▶ Cleans against the roll
- ▶ Active vacuum system
- ▶ First-pass, one-pass cleaning

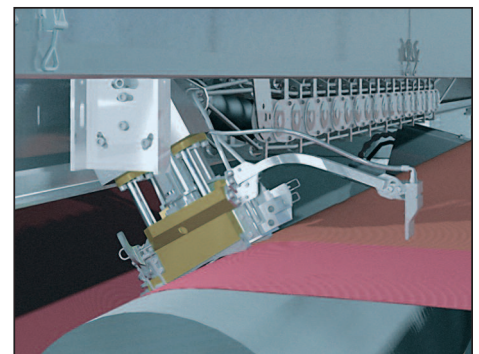
### Benefits

- ▶ Dryer section performance and energy optimization
- ▶ Reduced production costs
- ▶ Increased production
- ▶ Improved quality



## Value overview

- ▶ Dryer section and energy efficiency optimization
  - Removal of stickies increases heat transfer
  - Fabric void volume remains open for moisture evaporation
  - Intermittent cleaning consumes less water and energy
- ▶ Reduced production costs
  - Removes fiber picking which allows for reduced basis weight
  - Eliminates chemical cleaning and the expense of chemicals
  - Increased dryer fabric life reducing overall clothing costs
- ▶ Increased production
  - Eliminates sheet flutter for increased speeds and production
  - Removes sheet breaks for less lost time and more production
  - Improves CD profiles reducing cull and product downgrade
- ▶ Improved quality
  - Eliminates fiber picking and loose fiber carry in the sheet that can disrupt converting operations
  - Removal of fiber picking enhances sheet strength
  - Removal of stickies eliminates induced marks, holes, and edge cracks
  - Improved CD profiles enhances converting for fewer rejects, downgrades, and rebates



## Reliability

- ▶ Troubleshooting diagnostics
- ▶ Remote monitoring of diagnostics for production maintenance alerts
- ▶ Comprehensive preventative maintenance program
- ▶ North American based technical service team
- ▶ Local spare parts supply

# M-CLEAN DRYER FABRIC CLEANING SYSTEM

**Cleaning against a roll** was first proven over 20 years ago to offer superior cleaning in the Kadant R&D lab, and since then, on hundreds of paper machines. It ensures all of the energy from the customized nozzle arrangement is involved in breaking the stickies to fabric bonding without inducing fabric ridging and guiding issues associated with cleaning in a draw.

An **active vacuum system** for debris removal is a confirmed method to fully remove debris from the process and ensure it is not reintroduced to cause sheet contamination and breaks. The M-clean dryer fabric cleaning system first introduced this concept to the industry. An active vacuum system is critical for achieving optimal dryer fabric cleaning.

**First-pass, one-pass cleaning.** The M-clean dryer fabric cleaning system cleans so effectively and efficiently it typically needs to be utilized only once per eight hour shift, while other cleaners remain in use continuously.

Every North American installation of the M-clean dryer fabric cleaning system has resulted in production and quality benefits, justifying the project cost and resulting in return of investment (ROI). Below are examples of satisfied customers.

## **Elimination of dryer section sheet flutter**

The M-clean dryer fabric cleaning system enabled a corrugated medium and linerboard machine located in the Southeast U.S. to increase speed 300 feet per minute by removing production-limiting sheet flutter caused by stickies plugging the fabric and preventing air flow. Additionally, the machine eliminated the previously required weekly chemical cleaning of the dryer fabrics resulting in increased up time, increased production, and decreased chemical costs and safety hazards.

## **Removals of dryer section sheet breaks**

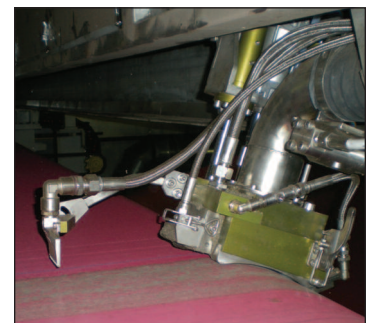
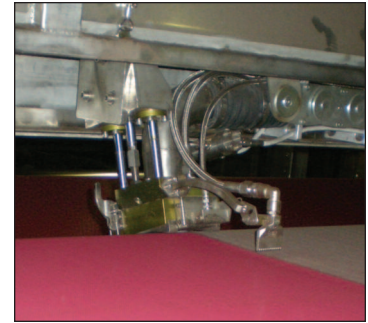
Prior to installing the M-clean dryer fabric cleaning system a recycled medium and linerboard paper machine endured up to 10 sheet breaks per day with most occurring in the early dryer section. Immediately after installation of the M-clean dryer fabric cleaning system, the dryer section sheet breaks were eliminated. After the first week of operation, the machine consistently produced up to 25 more tons per day yielding over \$1M in additional revenue.

## **Elimination of CD moisture and basis weight variation**

Another recycled corrugated medium and linerboard machine installed a M-clean dryer fabric cleaning system and experienced operational improvements resulting in rapid ROI. The many benefits included establishing new production records, increasing profitability, a 13% reduction in CD moisture variation, 40% reduction in basis weight variation, and 1,000 feet per minute increase in light-weight medium production.

## **Key success factors**

- ▶ Proof of concept demonstration of optimized nozzle configuration and water pressure in the Kadant R&D facility
- ▶ Comprehensive installation and project commissioning by Kadant consisting of project management, installation technicians, controls technician, hands-on crew training, after start-up troubleshooting, and unit optimization
- ▶ PLC based diagnostics for troubleshooting, preventative maintenance requirements, and identifying potential issues
- ▶ Remote monitoring of PLC diagnostics for one year to ensure the unit remains in proper working order with necessary preventative maintenance



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