

## Dryer Bars

### Applications

Turbulator bars are axial bars held against the inside surface of a dryer and are used to generate turbulence in the rimming layer of condensate. Turbulator bars can increase drying capacity and improve drying uniformity in dryers with stationary or rotating syphons.

### Features

- ▶ Stainless steel tube bars
- ▶ No coil or barrel springs
- ▶ No wave, star, or Belleville washers
- ▶ Bar height engineered for optimum condensate depth
- ▶ No machining or special tools required
- ▶ Radial stiffness of bars increased 19%
- ▶ Circumferential stiffness increased 21%

### Benefits

- ▶ High heat transfer
- ▶ Light weight hollow bars for easy handling
- ▶ Fast installation
- ▶ Stainless steel prevents bar "thinning"



### Kadant Johnson introduces the first revolutionary change in dryer bar design in the past 20 years.

Turbulator Tube Bars are stainless steel axial bars, installed on the inside of dryers and used to induce turbulence in the condensate layer, to improve the uniformity and rate of heat transfer (drying rate) of the dryers. The increased heat transfer rate is also much more uniform in the cross-machine direction than any other internal dryer configuration. These features can be used in dryers with rimming condensate to:

- ▶ Increase the drying rate of paper machines that are already running at their steam pressure limits
- ▶ Improve the moisture profile on machines that have poor heat transfer uniformity
- ▶ Increase the rate of response to changes in steam pressure
- ▶ Improve machine runnability, reduce edge cockles, cracks, and sheet picking
- ▶ Reduce time required to thread the tail and widen the sheet

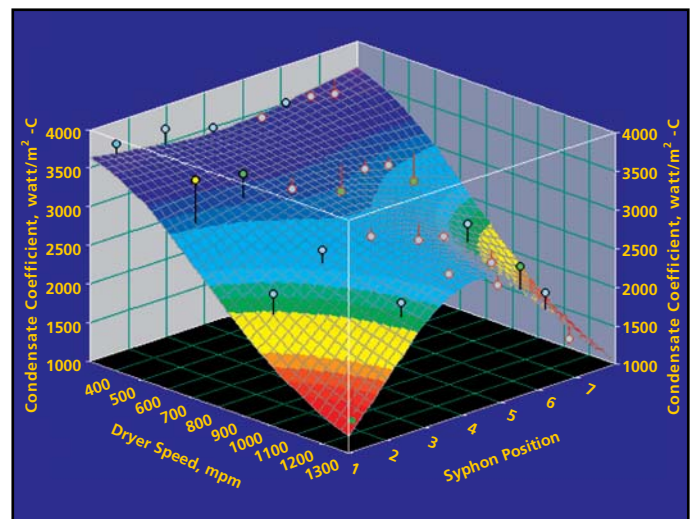
### Optimizing Heat Transfer

When operating with the right configuration of bars and the corresponding optimum condensate depth, dryer bars can not only achieve a high rate of heat transfer, but also achieve a high degree of drying uniformity. Kadant Johnson Research conducted exhaustive testing to determine the optimum design for the new Turbulator Tube Bars. The dryer heat transfer depends on a number of factors, such as speed, condensing load, steam pressure, syphon location, and syphon clearance. As shown in the figure, a high rate of heat transfer

can be maintained, even at high dryer speeds, if the syphon clearance is set at an optimum setting.

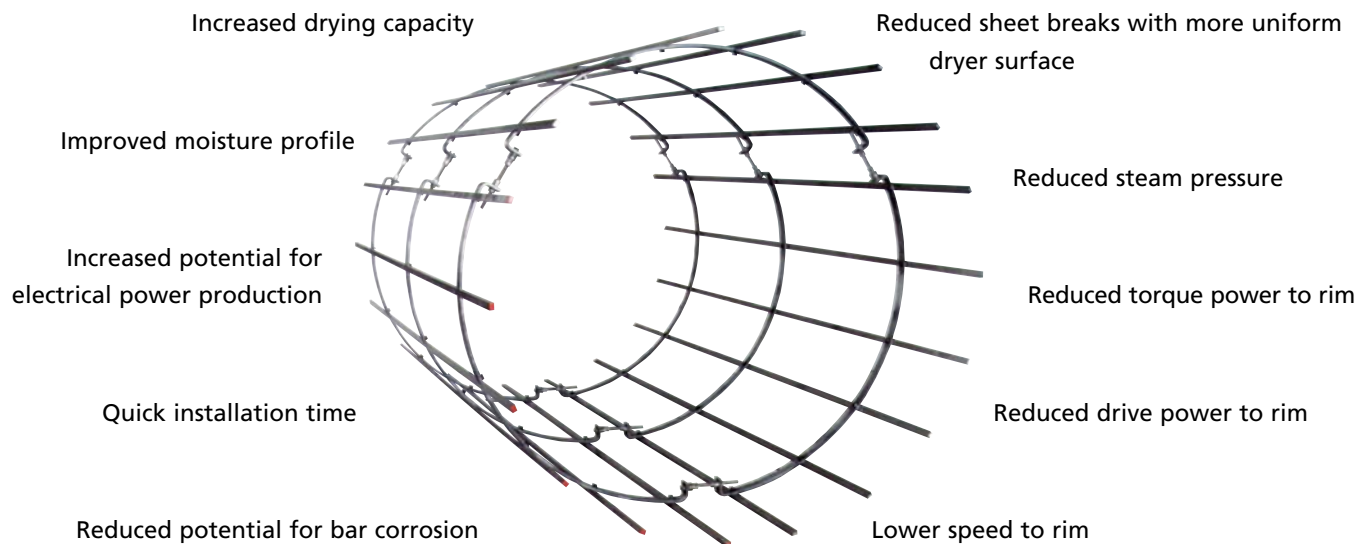
In general, the highest heat transfer performance, and the least loss in heat transfer, occurs when the syphon clearance is set near the optimum values.

A region exists for a range of syphon clearances for which the condensate coefficient is highest over the entire speed range. Operating at the optimum syphon clearance not only maximizes the capacity to transfer heat at a given speed, it also minimizes the loss of heat transfer with increasing speed.



# TURBULATOR TUBE BARS

## What can you expect from Kadant Johnson Turbulator Tube Bars?



Bar Configuration	Application
Standard, full-width	Cover the main portion of the shell for maximum heat transfer and uniformity.
Edge Control™ bars	Short segments placed between the stationary syphon and the dryer head for fine adjustment of the dryer edge temperature profile.
Groove Control™ bars	Short segments placed in the syphon groove when the syphon is positioned outside the groove.
De-Tuned™ bars	Cover the main portion of the shell for <i>minimum heat transfer</i> and maximum uniformity.

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