

# Espey WD500 for sealing a chill roll in a water quench

The Brückner Group stands for technological competence and ultimate quality for machinery and lines for the production and processing of plastic films. Brückner Maschinenbau GmbH & Co. KG, a part of the group, is the world market leader in the field of stretching and speciality film lines, providing latest technology in adoption of innovative and safe sealing technique of EagleBurgmann Espey.

## Process description

A plastic film stretch line is composed of an extruder for melting synthetic granules which are casted on a chill roll, a chill roll for cooling the melted granules (for the production of polypropylene normally arranged in a water quench), a film stretching line for longitudinal and transverse stretching to achieve defined film properties as shrinkage suitability or tear resistance and a haul-off with film wrapping.

## Problem and challenge

For the production of polypropylene the chill roll for cooling the melted granules is arranged in a water quench. Outside the quench the roll is supported in vertical bearings on both sides. The chill roll requires a sealing system for rotating movement at the wall duct of the water quench. In the sealing area the chill roll revolving with 0-15 min<sup>-1</sup> carries a wear protected sleeve with an outer diameter of 295 mm (11.61"). The water quench generates a maximum pressure in the seal area of 1.093 bar abs. (18.85 PSI). The water temperature differs from 25-50 °C (77-122 °F). The sealing system is subjected to variations with regard to temperature, pressure and number of revolutions and is allowed to have a maximum leakage of 2-4 ml / h only. Furthermore the sealing system has to withstand an axial expansion of the roll in consequence of temperature variations of 0.3-0.5 mm (0.01-0.02") and a radial play of max. 5 mm (0.2").



Plastic film stretching line

Photos by courtesy of Brückner Maschinenbau GmbH & Co. KG



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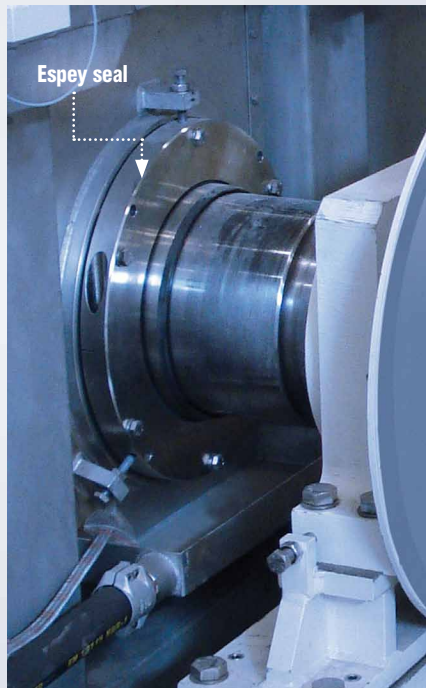
Plastic film stretching line

## EagleBurgmann Espey solution

To fulfil the application requirement of a maximum water leakage of 4 ml / h in consideration to a radial play of up to 5 mm (0.2") and operation ranges with regard to revolutions per minute, pressure and temperature Espey designed the carbon floating ring seal type Espey WD500 with two three-part overlapped mortised seal rings with tight joints made of resin impregnated carbon. The seal rings run directly on the shaft. The split seal housing and the short width of only 37 mm (1.46") guarantee an easy installation and removal for maintenance. Shaft and bearing removals are not required. In addition the seal allows a long-term operation time of minimum 2-3 years depending on operation hours and water quality from one to the other maintenance rate.

### Operating conditions

Application: plastic film stretch line  
 Seal type: Espey WD500  
 Medium: water  
 Operation temperature:  
 25 ... 50 °C (77 ... 122 °F)  
 Pressure abs.: max. 1.093 bar (18.85 PSI)  
 Revolutions: 0-15 min<sup>-1</sup>  
 Shaft diameter: 295 mm (11.61")  
 Radial play: max. 5 mm (0.2")  
 Axial play: 0.3-0.5 mm (0.01-0.02")  
 Barrier gas: not necessary



Chill roll wall duct with assembled Espey seal



Chill roll bearing and temperature control