

AIR BEARING SHAPEMETER

ON-LINE FLATNESS MEASUREMENT FOR THE ROLLING INDUSTRY

The Air Bearing ShapeMeter, by Primetals Technologies is designed to provide accurate shape measurement of rolled steel or aluminum sheet and foil material.

The increasing demand for high quality rolled products, places a growing requirement for exceptional product flatness. Flatness errors lead to non-uniform tension distribution across the material width, resulting in waviness and buckles in the finished product.

The Air Bearing ShapeMeter (ABSM) roll is designed to provide accurate online flatness measurement of sheet and foil materials.

ABSM is specifically tailored to suit any cold and foil mill including the heavy-duty applications.

MAIN DESIGN FEATURES

- Roll diameters available to suit various applications
- Rotor widths available from 25 mm-120 mm for specific resolution requirements
- Low inertia and negligible friction eliminates the need for an external drive
- Bearing exhaust air prevents ingress of contaminants
- Continuous signal output provides a fast response to minimize control delays
- Quickly detachable signal umbilical cord
- Small installation envelope

PROVEN
TECHNOLOGY
**OVER 975
REFERENCES**

CONSTRUCTION

The ABSM comprises of a series of hardened, precision ground rotors, supported by an air film bearing from a stationary stainless steel arbor. The system is connected by a detachable pneumatic umbilical cord and the electronics are mounted remotely from the roll, for easy access.

SPECIFICATION

Roll O/D	147 mm, 164 mm or 200 mm
No of rotors	To suit application
Rotor width	25 mm to 120 mm
Strip width	Up to 2.3 m
Strip thickness range	2 x 0.005 mm to 5 mm
Roll speed	> 3,000 m/min
Signal response time	< 30 ms
Signal resolution	0.11 N
Signal output	Profibus / Profinet
Operating temperature	Up to 200°C

OPERATING PRINCIPLE

An array of jets supply each rotor with air from a common group chamber in the center of the arbor. The differential pressure measured between the top and bottom of each air bearing is proportional to the load applied to the rotor. Hence the tension is calculated at each rotor position across the width of the strip, providing the flatness value of the rolled strip.

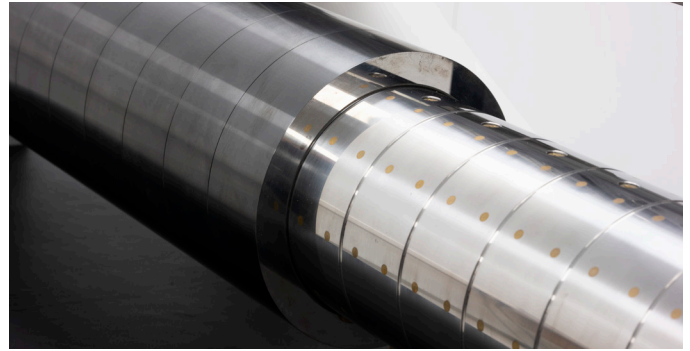
Each differential pressure output is measured by means of a high integrity pneumatic transducer, which is remotely located in the transducer housing, attached to the end of the ShapeMeter arbor via an armored signal umbilical. Each rotor has a separate measuring channel, where the rotor is the only moving part and all the other parts are stationary, including the measurement and signal transfer elements.

The signal output provides continuous readings that are independent of the mill speed, allowing a fast signal response and high accuracy, even at low rolling speeds.

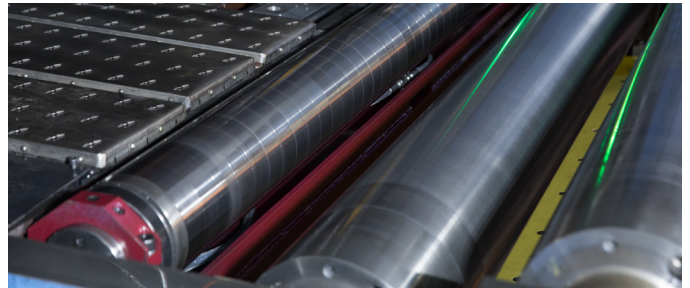
OPTIONAL FEATURES

- Multi-position retraction mechanism for accurate vertical positioning and differing wrap angles to suit strip thickness
- Automatic trend alignment option maintains the roll perfectly perpendicular to strip resulting in optimum signal integrity

Various rotor coating choices including chromium, flash chrome and Plasma-Enhanced Chemical Vapor Deposition (PECVD) providing a surface, three times harder than the traditional hard chrome options



Rotors on the stainless-steel arbor featuring jet holes - during assembly



ABSM installed in an aluminum foil mill

MAIN BENEFITS

- Highly accurate on-line measurement from 25 mm width zones upwards, for improved product quality
- Compact design and low inertia, requiring no helper drive
- Excellent zonal definition and continuous measurement
- Automatic alignment, multiple wrap angle and retraction features
- Small installation envelope
- Simple maintenance and in-mill calibration
- Onsite service and process support
- Proven reliability over the last 50 years

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