

# MEASURING AND CLEANING SYSTEMS FOR METAL STRIPS



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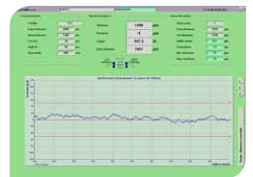
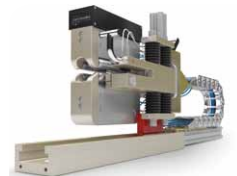
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## Profile and history of the company



UVB TECHNIK s.r.o. has been specialising in the development, manufacturing, installation, training as well as servicing of **measuring and cleaning systems** for metal strip and flat wires **in cold rolling mills and processing lines for 30 years.**

Accurate measuring and cleaning systems are nowadays absolutely necessary to follow continuous and efficient production process, prevent operational issues as well as improve product quality and control. High quality of products with minimum spare parts and long-term relationship with clients are crucial for the company to strengthen its position worldwide.

- 1991 Establishment of the company UVB TECHNIK in Ostrava, Czech Republic
- 1991 Development of metal **Strip thickness gauge**
- 1993 Patent for continuous metal strip thickness gauge
- 1994 Continuous strip thickness gauge with accuracy of 1 micron
- 1998 Limited liability company UVB TECHNIK s.r.o.
- 1999 First equipment exported abroad – to Spain
- 2000 Whole company production moved to Hlučín
- 2001 Exponential growth of export activities worldwide
- 2002 Invention of **Wiping equipment**
- 2003 Invention of **Strip profile gauge**
- 2005 New generation of **Scanner for positioning** of coking plant machines
- 2007 New production hall in Hlučín
- 2016 Development of **Shapemeter for flatness measurement**
- 2018 New R&D centre and production hall equipped with CNC machines
- 2020 New generation of **Laser strip thickness gauge**
- 2021 Invention of **Degreasing equipment**



# MTP / Continuous strip thickness gauge

Gauge for continuous contact measuring of metal strip thickness



## Functional principle

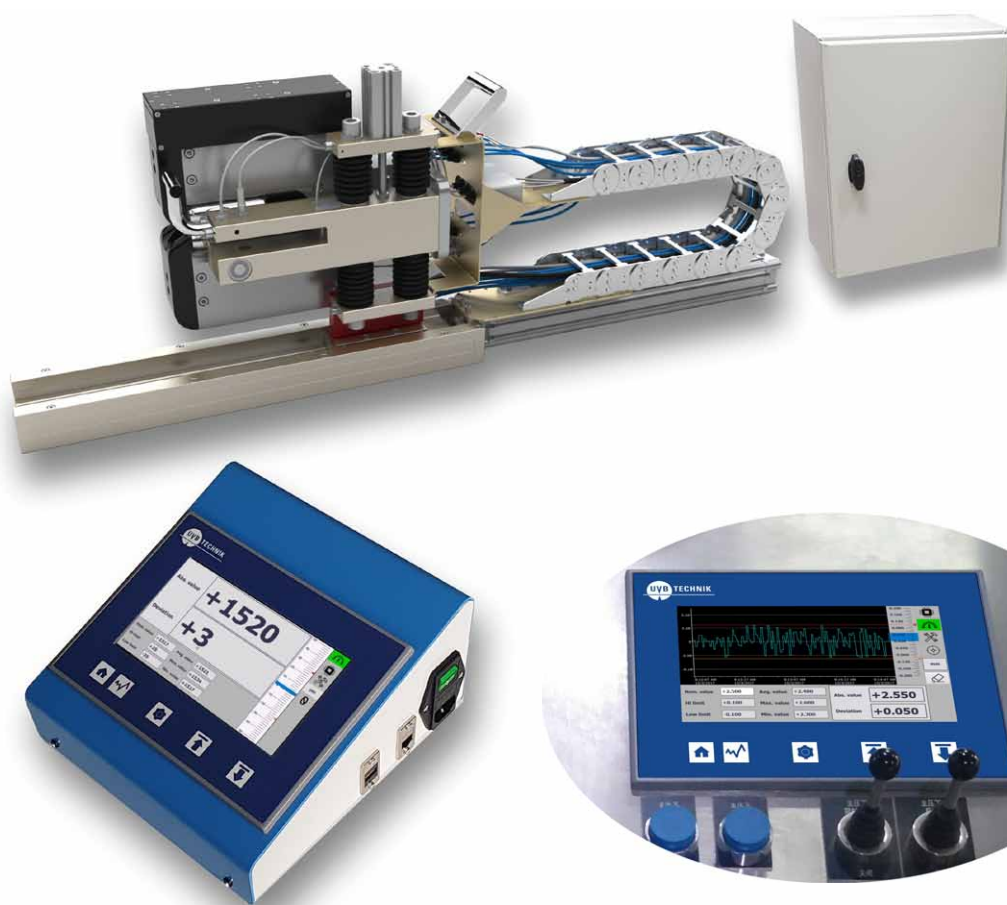
Contact thickness gauge is designed for measuring by means of two opposite sensors with flat sintered diamond contacts in a C-frame floating head to provide accurate measurement regardless material composition or oiled/dirty surface.

## Process of measuring

The measurement proceeds when the thickness gauge is lead manually or automatically onto the strip. Then the measured data are displayed on the HMI touch panel display or SPC PP-Visual with outputs for Automatic Gauge Control (AGC) system.

## Advantages

- **Accuracy <math>< 0.5 \mu\text{m}</math> or 1  $\mu\text{m}</math>$**  according to the model of the thickness gauge
- **Easy control of value 0.000** on the display after the gauge is out of the line
- **Simple design** for easy maintenance, service, calibration
- **Floating head** follows the pass line and strip waves for precise measurement
- **No mechanical readjustment** to nominal thickness
- **Stable measurement - no need of automatic zeroing** that would hide an error of the gauge
- **Crack-resistant** measuring contacts made of sintered diamond – **5-year guarantee**
- **No mark** also on sensitive materials thanks to **flat shape of measuring contacts**
- **Soft thrust** of the contacts can be adjusted by air regulator
- The automatic version is equipped with a **safety system** including sensors to enable fast pull out of the line in cases of any accident, for example strip breakage
- **High resistance** to heavy industry – **no electronic or fragile parts** inside measuring sensors
- **One push button calibration** with standard block once a year
- **Temperature dependence  $\leq 2 \mu\text{m}$  by 250 °C** due to material compensation and internal sensor and diamond tip cooling - **no head heating**



Freestanding touch panel box

or

Touch panel mounted to present operator panel

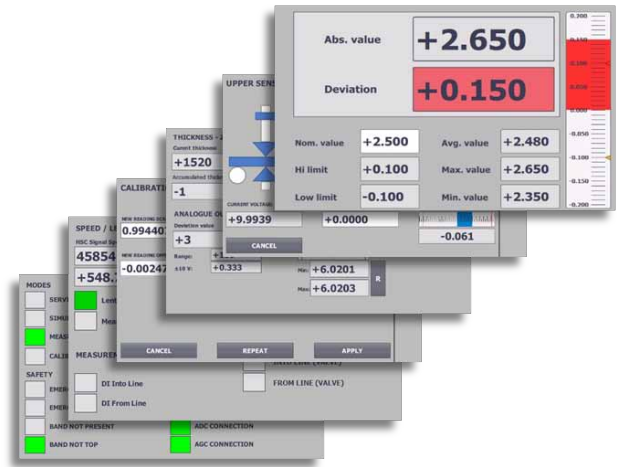
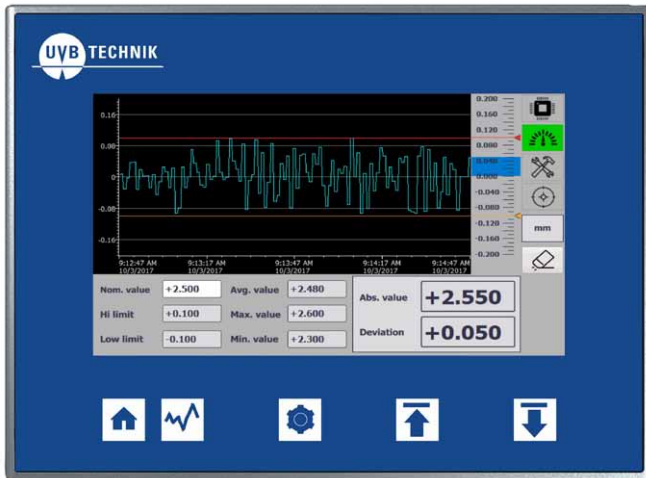
## Technical data

Parameter	MTP	MTP-AF
Type	Automatic or manual	Automatic
Resolution	0.001 mm (0.0001")	0.0001 mm (0.00001")
Measuring range	0.005 - 9 mm, max.20 mm 0.0002" - 0.35", max. 0.8"	0.005 - 2 mm 0.0002" - 0.08"
Accuracy	$\leq 1 \mu\text{m}$ ; $\leq 2 \mu\text{m}$ (> 2 mm) $\leq 0.00004$ "; $\leq 0.00008$ " (>0.08")	$\leq 0.5 \mu\text{m}$ $\leq 0.00002$ "
Measuring depth	$\leq 130 \text{ mm}$ ; $\leq 210 \text{ mm}$ ; $\leq 310 \text{ mm}$ $\leq 5.1$ "; $\leq 8.3$ "; $\leq 12.2$ "	
Max. strip speed	900 m/min (3000 ft/min)	
Max. strip temperature	250 °C (482 °F)	
Outputs for AGC	$\pm 20 \text{ mA}$ ( $\pm 10 \text{ V}$ , 0-20 mA, 4-20 mA)	
Data output / Set up	Profinet (Profibus or on request)	

## Optional accessories

- Industrial PC with SPC PP-VISUAL system

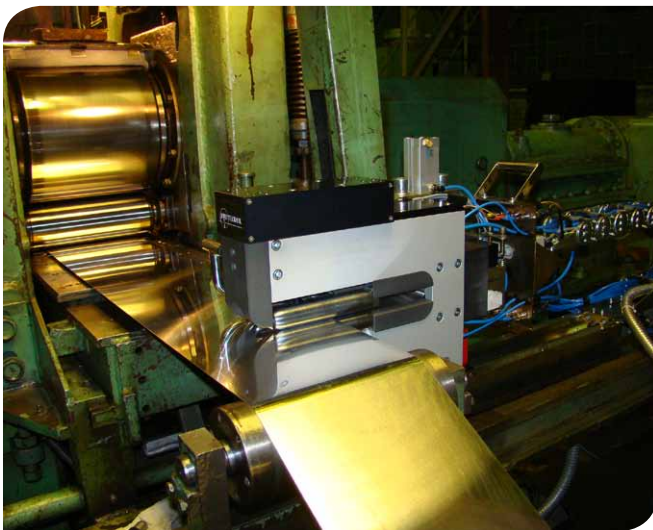
## HMI touch panel display



## HMI touch panel display

- Digital display of absolute thickness and deviation with bar graph
- Trend graph of last 2 minutes
- Setting the nominal value and limits or choosing from last preset values
- Simple calibration and service menu with diagnostics
- Selectable resolution 1  $\mu\text{m}$  – 0.1  $\mu\text{m}$  – 0.01 mil

- Remote control of the measuring head guidance IN/OUT of the strip
- Clear status information for the maintenance
- Automatic setting transfer to/from SPC system or superior PLC
- Remote support via the Internet using an industrial gateway or shared PC



MZSS, Russia, gold 9999, silver 9999, reversing rolling mill



Tenneco, Italy, bimetal, rolling mill - Single line gauge + scanning head





C.D. Waelzholz (werk Wickede), Germany, bimetal, cold rolling mill - Contact thickness gauge used for on-line calibration of X-ray gauge



Enersys, UK, lead, reversing rolling mill

## MTP references

- MacSteel Coil Processing (Pty) Ltd., South Africa
- SOTYL S.A., Argentina
- MAHLE Metal Leve S/A, Brasil
- Coining, Inc., USA
- NELCO, Texas, USA
- Chinalco Luoyang Copper Co. Ltd., China
- Jinangsu Yanhan Material Technology, China
- Shanghai Rolling Technologies Co., Ltd., China
- SMS Siemag Technology (Beijing) Co., Ltd., China
- Wenzhou Hongfeng Clading Metal Co., Ltd., China
- Wenzhou Hongyuan Copper Industry Co., Ltd., China
- Gupta Metal Sheets (P) Ltd., India
- IUP Jindal Metals & Alloys Ltd., India
- Jindal Stainless Ltd., India
- KSPG Automotive India Pvt. Ltd., India
- Laser Shaving Pvt. Ltd., India
- Nippon Cross Rolling, Japan
- Osaka Heat Treatment Co., Ltd., Japan
- Tokuriki Honten Co. Ltd., Japan
- WOORI GEC, South Korea
- ArcelorMittal F-M a.s. (GO Steel a.s.), Czech Republic
- BILSTEIN CEE a.s. (BILSTEIN GROUP), Czech Republic
- Copper Povrly Industries, a.s., Czech Republic
- C.D. Wälzholz GmbH (Wickeder Westfalenstahl GmbH), Germany
- Federal-Mogul Powertrain Italy srl (TENNECO), Italy
- FEDERAL-MOGUL BIMET S.A., (TENNECO), Poland
- Walcownia Metali Nieżelaznych "ŁABĘDY" S.A., Poland
- ZM SILESIA SA, Poland
- S.C. GALFINBAND S.A., Romania
- ELECTROSTAL Metallurgical Plant, JSC, Russia
- MZSS JSC, Russia
- U.S. STEEL Smederovo, Serbia
- Amera Slovakia Kremnica, s.r.o. (Mint Kremnica), Slovak Republic
- MAHLE Engine Components Slovakia s.r.o., Slovak Republic
- ALTUNA METAL WORKS, S.L., Spain
- Compañía Valenciana de Aluminio Baux, Spain
- JMA Alejandro Altuna, S.L.U., Spain
- Aurubis Netherlands B.V., The Netherlands
- NedZink BV, The Netherlands
- ŞENSAC Yassı Metal San. Koll. Şti., Turkey
- Enersys Ltd, United Kingdom
- EnviroWales Ltd (James Town Industries), United Kingdom
- And others on request



CIA Valenciana de Aluminio Baux, Spain, aluminium, dividing line



JSC „AZOTSM“, Ukraine, copper and alloys, rolling mill KVARTO

# MIA / Continuous foil thickness gauge

Gauge for continuous contact measuring of metal foil thickness



## Functional principle

MIA gauge measures thickness using flat sintered diamond contacts in a C-frame floating head to provide accurate measurement regardless material composition or oiled/dirty surface.

## Process of measuring

The measurement proceeds when the foil thickness gauge is lead manually or automatically onto the strip. Then the measured data are displayed on the HMI touch panel display or SPC PP-Visual with outputs for Automatic Gauge Control (AGC) system.

## Advantages

- **Accuracy < 0.5 µm**
- **Easy control of value 0.0000** on the display after the gauge is out of the line
- **Compact design** – pass line from 105 mm
- **Easy maintenance, service, calibration**
- **Floating head** follows the pass line and strip waves for precise measurement
- **No mechanical readjustment** to nominal thickness
- **Stable measurement – no need of automatic zeroing** that would hide an error of the gauge
- **Crack-resistant** measuring contacts made of sintered diamond – **5-year guarantee**
- **No mark** also on sensitive materials thanks to **flat shape of measuring contacts**
- **Soft thrust** of the contacts can be adjusted by air regulator
- **High resistant measuring sensor** – no electronic or fragile parts inside
- **One push button calibration** with standard block once a year





Coining Inc., USA, silver, 2 Hi mill

## Technical data

Parameter	MIA
Type	Automatic or manual
Resolution	0.0001 mm (0.00001")
Measuring range	0.001 - 4 mm (0.00004" - 0.16")
Accuracy	≤ 0.5 μm; ≤ 1 μm (> 2 mm) ≤ 0.00002"; ≤ 0.00004" (>0.08")
Measuring depth	≤ 100 mm (4")
Max. strip speed	600 m/min (2000 ft/min)
Max. strip temperature	250°C (482°F)
Outputs for AGC	± 20 mA (± 10 V, 0-20 mA, 4-20 mA)
Data output / Set up	Profinet (Profibus or on request)

### HMI touch panel display

- Digital display of absolute thickness and deviation with bar graph
- Trend graph of last 2 minutes
- Setting the nominal value and limits or choosing from last preset values
- Simple calibration and service menu with diagnostics
- Selectable resolution 1 μm – 0.1 μm – 0.01 mil
- Remote control of the measuring head guidance IN/OUT of the strip
- Clear status information for the maintenance
- Automatic setting transfer to/from SPC system or superior PLC
- Remote support via the Internet using an industrial gateway or shared PC

### Optional accessories

- Industrial PC with SPC PP-VISUAL system

### MIA references

- Coining Inc., USA
- Furukawa Electric Co. Ltd., Japan
- Tokuriki Honten Co. Ltd., Japan

# LMT / Laser strip thickness gauge

Gauge for continuous non-contact measuring of strip thickness



## Functional principle

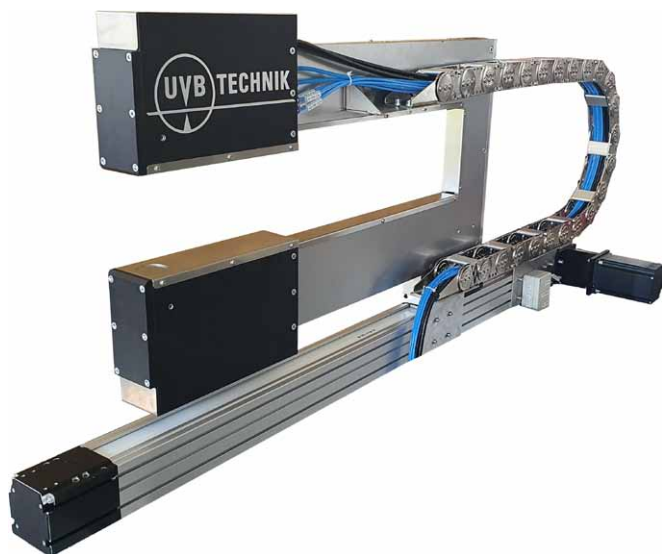
Non-contact measuring using four-point laser distance sensors of a new generation without influence on the reflectivity of the surface and with minimum dependence of accuracy on tilted/wavy strip.

## Process of measuring

The measurement proceeds when the thickness gauge is lead automatically onto the strip by linear module with the option of zig zag scanning. Then the measured data are displayed on the HMI touch panel display or SPC PP-Visual with outputs for Automatic Gauge Control (AGC) system.

## Advantages

- **New generation 4-point laser sensor**
- **No electronic components** in the sensor head, just lenses => eliminates electrical noise influence and optical axis deviation
- **Optical-axis alignment function** - accurate measurement of even the wavy strip
- **Automatic calibration** using built-in standard
- **Air blow of laser sensors** to resist pollution during measurement
- **Automatic cover** of the laser sensors when the measurement is switched off



PWO Czech Republic a.s., steel, aluminium alloys, stamping line

## Technical data

Parameter	LMT-350A-1	LMT-350A-2	LMT-350A-5
Resolution	0.0001 mm 0.00001"	0.0001 mm 0.00001"	0.0001 mm 0.00001"
Distance between sensors	30 mm (1.2")	60 mm (2.4")	140 mm (5.5")
Max. pass line variation during measurement	± 1.3 mm ± 0.05"	± 3.7 mm ± 0.15"	± 10 mm ± 0.4"
Accuracy	≤ 1 µm ≤ 0.04 mil	≤ 2 µm ≤ 0.08 mil	≤ 5 µm ≤ 0.2 mil
Measuring rate	up to 10 kHz		
Max. measurement depth from the strip edge	350 mm (500 mm, 750 mm, 1000 mm) 14" (20", 30", 40")		

## HMI touch panel display

- Digital display of absolute thickness and deviation with bar graph
- Trend graph of last 2 minutes
- Setting the nominal value and limits or choosing from last preset values
- Simple calibration and service menu with diagnostics
- Selectable resolution 1 µm – 0.1 µm – 0.01 mil
- Remote control of the measuring head guidance IN/OUT of the strip
- Clear status information for the maintenance
- Automatic setting transfer to/from SPC system or superior PLC
- Remote support via the Internet using an industrial gateway or shared PC

## Optional accessories

- Industrial PC with SPC PP-VISUAL system

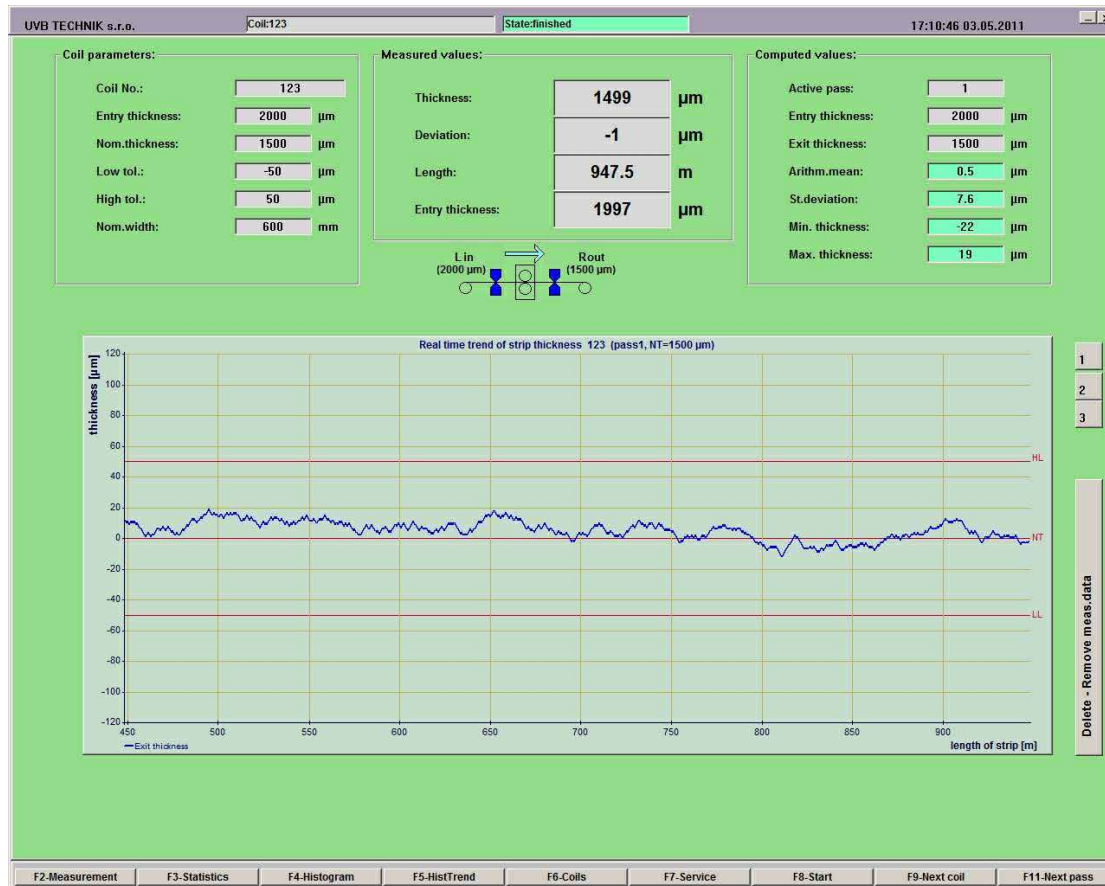
## LMT references

- PWO Czech Republic a.s., Czech Republic
- FEDERAL-MOGUL BIMET S.A. (TENNECO), Poland



# PP-VISUAL

Statistical Process Control of strip thickness and process values



## Functional principle

- PP-Visual system is designed for transfer of measured thickness by one or two gauges.
- The course, measured and statistical values are displayed on the screen in real time.

## Features

- Continuous visualisation and evaluation of statistical and measured values
- Printing reports in charts and graphic formats
- Archiving of measured data on the HDD
- Measuring the length if connected to pulse signal or speed data
- Access to computer network
- Option to add further technological values to be measured

## Basic components

- Software support with MS WINDOWS
- LCD monitor 19"
- Industrial chassis - PC on the basis of INTEL processor
- HDD of min. 2 TB
- Keyboard and mouse
- Communication interface (Ethernet network)

# MPP / Strip profile gauge (off-line)

Equipment for the laboratory measuring of thickness profile on a cut-out strip sample



## Functional principle

Strip profile gauge is based on contact measuring by means of two opposite digital sensors with diamond contacts to provide thickness measurement over the entire strip sample. The system generates statistical data for quality control, early prediction of the need for grinding rolls or cutting strip edges out of tolerances.

## Process of measuring

After inserting strip sample, sample data are written either manually or from database and fully automatic measurement starts.

## Advantages

- **Pneumatic grip** of the sample eliminates deflection of the strip sample
- Accuracy is **not influenced by composition nor surface** of the measured material
- **No mechanical readjustment** to nominal thickness
- **Simple calibration** once a year by standard gauge blocks

## HMI monitor & IPC

- Both graphic and numerical real-time display of the measured data
- Measured data can be read from a remote PC
- Printing reports in charts and graphic formats
- Archiving of measured data on the HDD - DBF and CSV files



## Technical data

Parameter	MPP
Thickness of the strip sample	0.03 - 5 mm (0.03 - 18 mm) 0.0001" - 0.2" (0.001" - 0.7")
Accuracy	$\leq 1 \mu\text{m}$ ; $\leq 3 \mu\text{m}$ (> 9 mm) $\leq 0.00004"$ ; $\leq 0.00012"$ (> 0.35")
Resolution	0.001 mm (0.0001")
Max. width of the strip sample	3000 mm (118")
Number of measured points	1 measurement per 1 mm (0.04")



AL INVEST, Czech Republic, aluminium

## MPP references

- ArcelorMittal, South Africa
- Duferco, South Africa
- JSW Steel Ltd., India
- thyssenkrupp Electrical Steel India Pvt Ltd.
- Böhler-Uddeholm Precision Strip GmbH. & Co KG, Austria
- Voestalpine Stahl GmbH, Austria
- Copper Povrly Industries, a.s., Czech Republic
- ArcelorMittal St. Chély d'Apcher, France
- ArcelorMittal, Romania
- ArcelorMittal Spain (Aceralia S.A.), Spain
- Compañía Valenciana de Aluminio Baux, Spain
- El Zinc - Asturiana de Laminados S.A., Spain
- Borcelik Celik Sanaci Ticares. A.S., Turkey



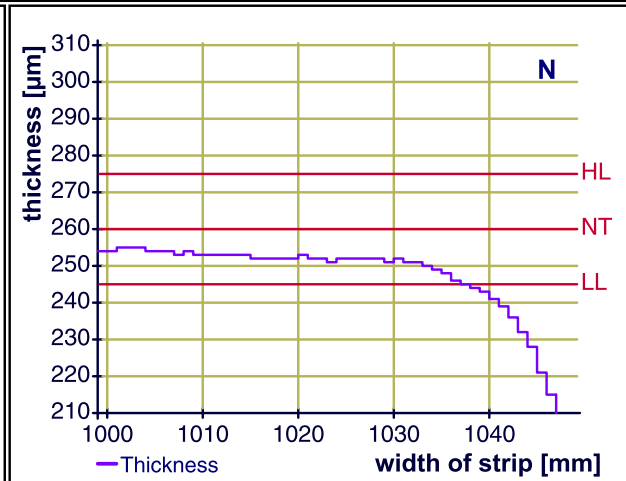
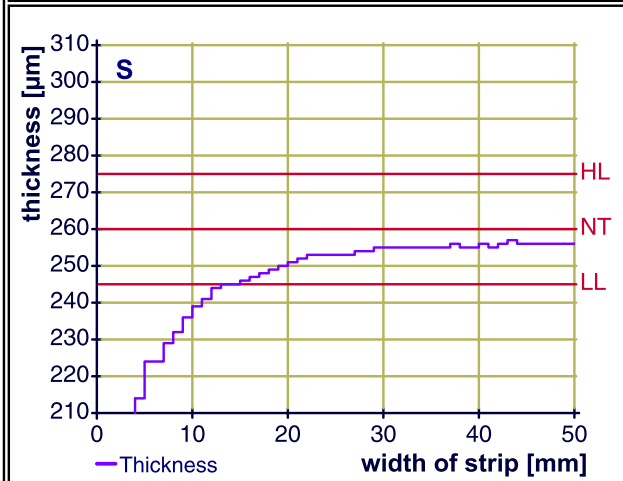
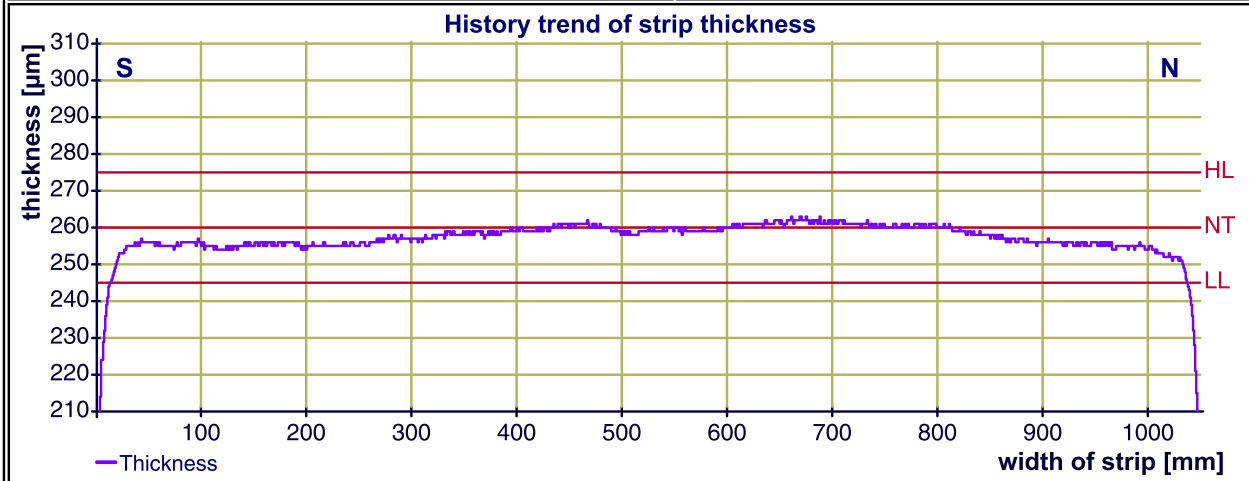
**Report on the measuring process of strip profile gauge**



UVB TECHNIK s.r.o.

Order	: Sample-1	Nominal width	: 1050 mm
Nominal thickness	: 260 µm	Material ID1	:
Low tolerance	: -15 µm	Material ID2	:
High tolerance	: 15 µm	Material ID3	:

Distance from edge mm	Thickness / Max deviation (263 µm)						Profile parameters	
	Operating side S			Backside N				
	t[µm]	d[µm]	%	t[µm]	d[µm]	%		
5	224	39	17.41	228	35	15.35	Width of strip	: 1049 mm
6	224	39	17.41	232	31	13.36	Centre thickness	: 259 µm
10	239	24	10.04	243	20	8.23	Crown 40	: 4.5 µm
15	246	17	6.91	249	14	5.62	Wedge 40	: -3.0 µm
20	251	12	4.78	251	12	4.78	Slope 140/40	: 1.5 µm
25	253	10	3.95	252	11	4.37	DIN Edge drop (6/Centre) S	: 13.51 %
30	255	8	3.14	252	11	4.37	N	: 10.42 %
35	255	8	3.14	253	10	3.95	Difference (6/25) S	: 29 µm
40	256	7	2.73	253	10	3.95	N	: 20 µm
50	256	7	2.73	254	9	3.54	Difference (30/Centre) S	: 4 µm
75	255	8	3.14	255	8	3.14	N	: 7 µm
100	255	8	3.14	256	7	2.73	Arithmetic mean	: 256.91 µm
140	255	8	3.14	256	7	2.73	Outside limits	: 0.02 %
300	257	6	2.33	261	2	0.77	Max. thickness (661 mm)	: 263 µm
							Min. thickness (1 mm)	: 179 µm
							High spot	: 0 µm



Measurement date: 03:12:2013 15:51:24, Measured on MPP-1500 by uvb

# STM / Shapemeter for strip flatness measurement

Sectional strip tension meter



## Functional principle

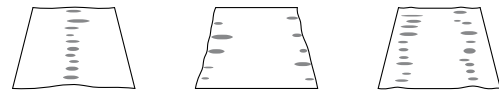
Shapemeter is designed as a sectional strip tension meter for evaluating metal strip flatness in cold rolling mills and tension levelling lines.

## Process of measuring

The principle of flatness evaluation is based on measuring pressure forces of a metal strip to the multiple independent zones. A visual unit displays measured flatness in I-Units and tension in Newtons across the strip in real time on an HMI monitor in the form of a column and flat graphical mapping and provides data output for Automatic Flatness Control.

## Defects occurring during the rolling process

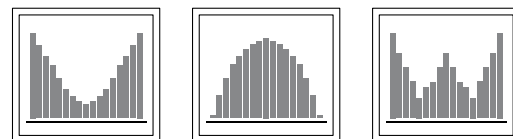
Strip flatness



Rolling gap

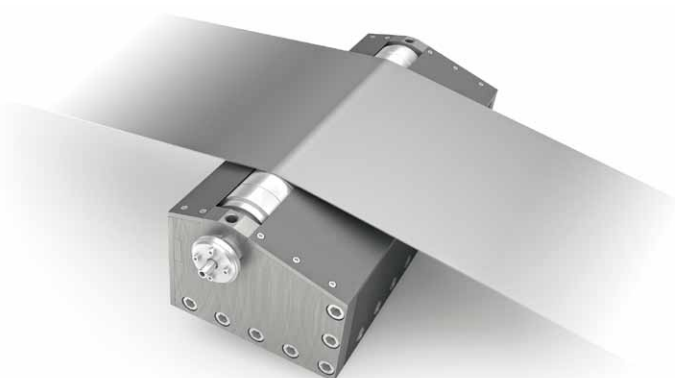


Monitor



## Advantages

- **Applicable also for sensitive materials** thanks to small bending angle/downforce
- **Simple design** for maintenance, service and calibration
- **Measuring flatness and tensile forces from zero speed** of the strip
- **Measuring total tension** without additional load cells
- **Simple calibration** on site using standard calibration weight
- **High hardness** of outer measuring rings 60 - 65 HRC
- **Special coatings** of the rings for application with sensitive materials
- **Easy adjustment of segment height** - no need of grinding the rings when wearing
- Small inertia of the outer rings allows measuring foils and high acceleration of the strip - **no need of additional motor**
- **No need of full turn** of measuring roll to have data from all segments



### HMI monitor & IPC

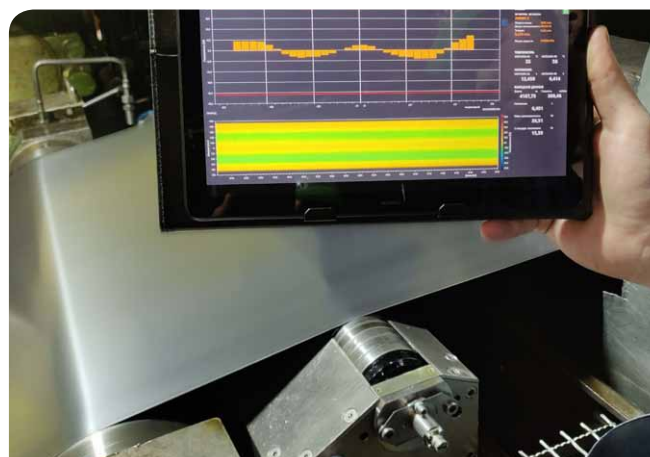
- Real-time display of flatness across the strip width and length in the form of bar graph and real trend
- Strip tension distribution display in Newtons
- Total tension force
- Clear status information for the maintenance
- Printing reports in charts and graphic formats
- Archiving of measured data on the HDD
- Access to computer network

### Technical data

Parameter	STM
Accuracy	< 0.15 %, usually 0.5-2 I-units
Strip temperature	Max. 250 °C (482 °F)
Width of each measuring zone	33.5 mm / 42 mm (1.32" / 1.65")
Diameter of measuring rings	100 - 210 mm (3.94" - 8.27")
Hardness of outer measuring rings	up to 60 - 65 HRC (based on application)
Max. speed of the strip	2 000 m/min (6600 ft/min)
Recommended bending angle	5° - 10°
Response time	50 ms
Data output	Profinet (Profibus or on request)
Analogue outputs for AFC	± 20 mA (± 10 V, 0-20 mA, 4-20 mA)
Display units	N, I-Units
Surface of measuring ring	Steel, PEEK material or other based on application



FIMI Machinery, Italy, aluminium, tension leveling line



VIZ Steel (NLMK), Russia, silicon electrical steel, reversing CRM

### STM references

- Johnson Controls, Inc. Mexico, Mexico
- Johnson Controls Battery Co. Ltd., China
- F.I.M.I. Fabbrica Impianti Macchine Industriali S.p.A., Italy
- Johnson Controls Battery Group, Inc., USA
- Amara Raja Batteries Limited, India
- VIZ-STEEL LTD, Russia
- Steel Equipment Specialists, LLC, USA
- Jindal Stainless Ltd, India



# SZ / Wiping equipment

Equipment for wiping emulsions from the surface of metal strip



## Functional principle

Wiping Equipment is designed for removing liquids/emulsions/oils by means of two pairs of specially shaped abrasion resistant and flexible slats mounted in a floating frame to clean strip surface and prevent spilling emulsions/oils off the line.

## Process of wiping

The upper and lower wiping parts of the frame are pressed together by a couple of air cylinders – pressure to the strip can be continuously controlled. There is compressed air between wiping slats in order to increase efficiency of strip wiping.

## Applications

- Cold rolling mills
- Degreasing lines (between baths)
- Pickling lines (for strip drying without hot air)

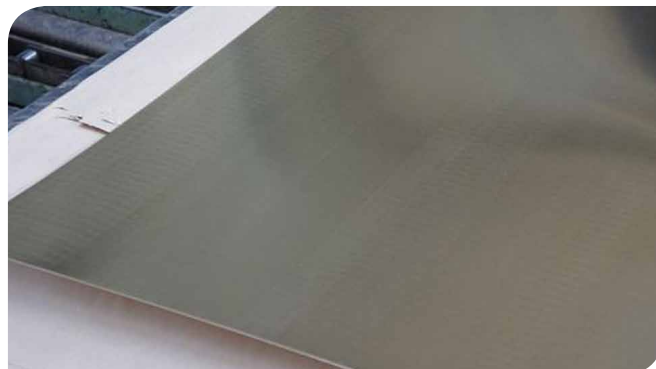
## Advantages

- **Quiet** operation
- **Compact** design

- No influence on strip tension – important for accurate strip **flatness measurement**
- Simple and **fast replacement** of exchangeable slat holders
- **Floating frame** follows the pass line and strip waves
- **Regulated soft pressure** of wiping slats to avoid any mark on the surface
- **Segmented slats holders** copy the strip shape/waviness across the width



Strip BEFORE wiping

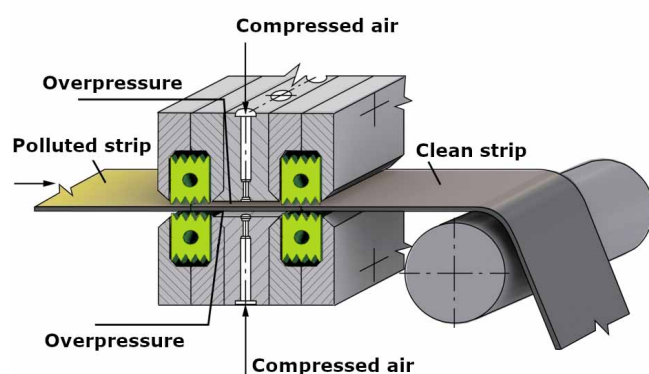


Strip AFTER wiping



## Technical data

Parameter	SZ
Max. strip width	3000 mm (118")
Strip speed	references up to 900 m/min (3000 ft/min)
Max. strip temperature	160 °C (320 °F)
Max. strip thickness	10 mm (0.4")



SUPERMAX, India, steel, reversing rolling mill

## SZ references

- Tower Aluminium Nig Plc., Nigeria
- Envases de Plata S.A., Argentina
- SOTYL S.A., Argentina
- Ashland Aluminum Co., Inc., USA
- The Northwest Machine Co. Ltd., China
- Ningbo Qiyi, China
- Xinyu Shanlong Strip Co., Ltd., China
- Agrawal Metal Works PVT. Ltd., India
- Gupta Metal Sheets (P) Ltd., India
- Jindal Stainless Ltd, India
- Sherman Steel Technologies, FZE, India
- Supermax Personal Care Pvt. Ltd., India
- thyssenkrupp Electrical Steel India Pvt Ltd.
- Tube Investments of India Ltd., India
- Osaka Heat Treatment Co., Ltd., Japan
- Wah Brass Mills (Pvt) Ltd., Pakistan
- NASTECH Ltd, South Korea
- Siam Poongsan Metal Co.Ltd., Thailand
- Sherman Steel Technologies, FZE, United Arab Emirates
- TI Group Automotive Systems - s.a./n.v., Belgium
- AL Invest Břidličná, a.s., Czech Republic
- KWW, a.s. (Bilstein Gruppe), Czech Republic
- ACIERS COSTE SAS, France
- Fives DMS, France
- Primetals Technologies France S.A.S., France
- Bandstahl Schulte & CO.GmbH, Germany
- KS Gleitlager GmbH, Germany
- MKM Mansfelder Kupfer und Messing GmbH, Germany
- Pfarr Stanztechnik GmbH, Germany
- Johnson Controls Power Solutions EMEA, VB Autobatterie GmbH & Co.KGaA, Germany
- MINO S.p.A., Italy
- ELECTROSTAL Metallurgical Plant, JSC, Russia
- ARANIA S.A., Spain
- Özer Metal Sanayi A.Ş., Turkey
- The Royal Mint, United Kingdom
- And others on request

# OZ / Degreasing equipment

Equipment for cleaning metal strip surface



## Functional principle

Degreasing equipment is designed to clean strip surface and to remove the rest of oils and emulsions off the metal strip on processing lines.

Degreasing equipment consists of 3 sections in a floating frame:

1. **Wetting section** with degreasing liquid sprayed through nozzles
2. **Brushing section** with two round brushes rotating against strip movement
3. **Wiping section** with two pairs of specially shaped abrasion resistant and flexible wiping slats. There is compressed air between wiping slats in order to increase efficiency of strip cleaning.

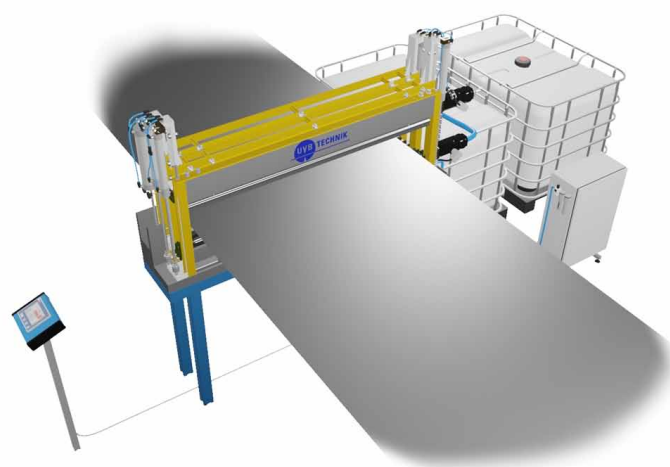
## Process of degreasing

Based on strip material, the programme (speed of brushes, flow volume of degreasing liquid) on touch panel display is chosen. Above mentioned parameters can be automatically modified according to the strip speed. After frame closing the degreasing process starts. Wiped oil and emulsions with the degreasing liquid are collected through a bath into a tank for waste sludge.

## Advantages

- **Quiet operation**
- **User-friendly control**
- **Compact design** for installation on current lines (only 290 mm needed)
- **Floating frame** follows the pass line and strip waves
- **Regulated soft pressure** of the brushes and wiping slats to avoid any mark on the surface
- **Segmented slat holders** copy the strip shape/waviness across the width
- **High efficiency** even compared with whole degreasing lines





## Technical data

Parameter	OZ
Max. strip width	3000 mm (118")
Max. strip speed	5 m/s (16 ft/s)*
Max. strip temperature	50 °C (122 °F)*
Max. strip thickness	10 mm (0.4")

\*higher on request



Asturiana de Laminados, S.A., Spain, TnZn, tension leveling line



Result BEFORE degreasing



Result AFTER degreasing

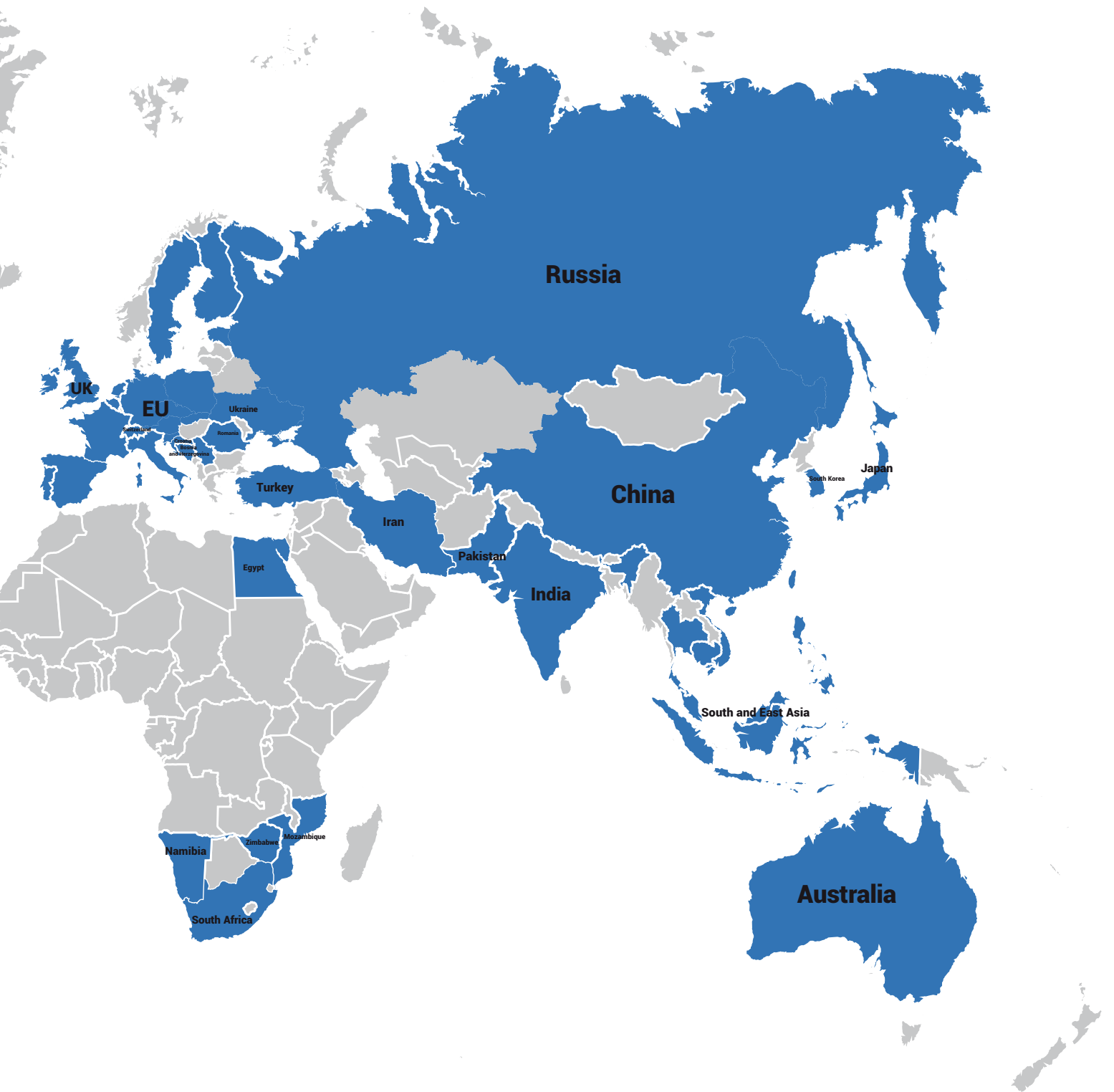
### OZ references

- Jindal Stainless Ltd , India
- Asturiana de Laminados, S.A., Spain



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