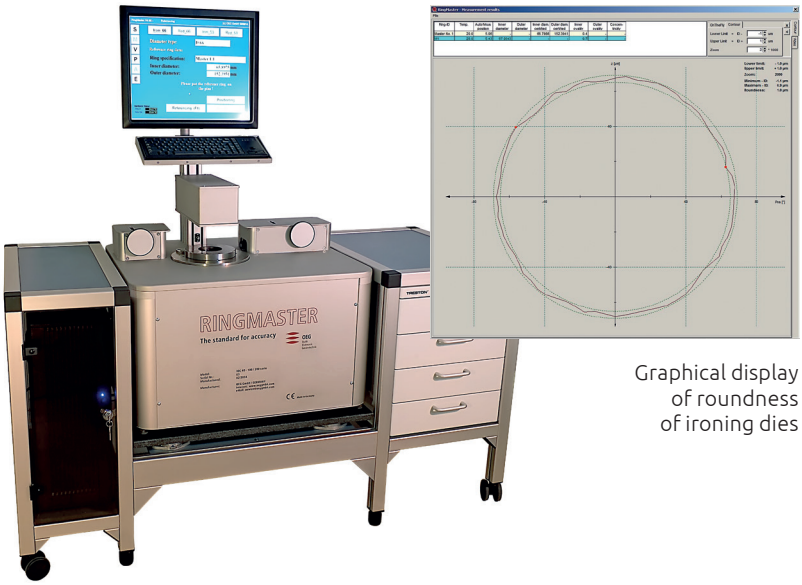
Equipment and proven technology for

Precision Tooling Measurement in beverage can industry

OEG GmbH · Phone +49 335 5213894 · Wildbahn 8 i · 15236 Frankfurt (Oder) · Germany ·www.oeggmbh.com · info@oeggmbh.com

Worldwide success by outstanding performance



Graphical display of roundness of ironing dies

OEG GmbH provides high accurate optical measuring equipment for complete metrology of almost all tools for the beverage can manufacturing like ironing rings, punches, necking dies and knock outs.

Parameters to be measured are inside and outside diameter, inside and outside roundness, concentricity, outside profile and transition parameters and inside profile of rings.

Additionally we offer special software to create tolerance model data for outside punch profiles and inside ring profiles, which enables the operator to compare the measured data with the CAD data according drawing.

All instruments were special developed for the beverage can industry and meet in particular their needs for tool measurement.

RINGMASTER

It's a measuring technology!

RINGMASTER is the master tool for measurement of all kind of ironing rings and necking dies, used in beverage can manufacture.

The high number of installations on all continents shows the general acceptance of the measuring instrument in the beverage can industry.

RINGMASTER is not only a measuring gauge, it's a measuring technology.

RINGMASTER is characterized by an optical, contactless measurement with very high accuracy.

It measures diameter and ovality at the same time in a single measuring operation.

Since his introduction in 1999 the equipment was steadily improved and adapted to the changing demands in the can industry.

RINGMASTER measuring functions according type				
Measuring function	ID 40-100/200 vario	ID 40-100/200 automatic	IOC 40-100/200 vario	IOC 40-100/200 automatic
Inside diameter (ID)	✓	✓	✓	✓
Roundness of ID	✓	✓	✓	✓
Outside diameter (OD)			✓	✓
Roundness of OD			✓	✓
Concentricity			✓	✓
Necking die option*	✓	✓	✓	✓

* only with additional calibration masters and mechanical adapters, possibly not suited for all existing ring types

OEG GmbH · Phone +49 335 5213894 · Wildbahn 8 i · 15236 Frankfurt (Oder) · Germany ·www.oeggmbh.com · info@oeggmbh.com

Ringmaster

General Data

Generally, there are 2 types of **RINGMASTER**:

1. ID-type for measurement of inside diameter and roundness
2. IOC type for measurement of inside and outside diameter and roundness and measurement of concentricity

Both are available either with manually adjustment of the measuring system to different inside ring diameters or with automatic, motorized and software controlled adjustment.

Measuring technology

For use of **RINGMASTER**, calibration rings are necessary.

Calibration rings shall be available for each ring type to be measured, for instance ironing and redraw rings.

OEG will supply proposals for the optimum number and types of calibration rings according customer needs.

In connection with special **RINGMASTER** soft- and hardware we provide a measuring technology, which guarantees easiest handling and highest measuring accuracy.

RINGMASTER measuring accuracy				
Measuring function	ID 40-100/200 vario	ID 40-100/200 automatic	IOC 40-100/200 vario	IOC 40-100/200 automatic
Inside diameter (ID)	±1 µm ±0.039 mil			
Roundness of ID				
Outside diameter (OD)	n.a.		±2 µm ±0.079 mil	
Roundness of OD				
Concentricity				
Necking die option*	±3 µm ±0.118 mil			

n.a. = not applicable

RINGMASTER options and features according type				
Parameter	ID 40-100/200 vario	ID 40-100/200 automatic	IOC 40-100/200 vario	IOC 40-100/200 automatic
Minimum ID	40 mm / 1.575 inch			
Maximum ID	100 mm / 3.937 inch			
Minimum OD				
Maximum OD	200 mm / 7.874 inch			
Maximum land position*	35 mm / 1.378 inch			
Adjustment to other ID	manually, by operator	motorized, software controlled by operator	manually, by operator	motorized, software controlled by operator
Adjustment to other OD	n.a.		manually, by operator	
Temperature sensors	2			
Forced reference measurement	according temperature difference since last reference measurement or time interval			
Autofocus stage	stepper motor driven			
Rotary table				
Connectivity to TCS/ Data export capability	yes			
Remote maintenance capability				
Calibration ring data base				
Operator data base				
Operating systems	Win7 or higher			

* in relation to measuring table, increase on inquiry no problem ID
= Inside Diameter, OD = Outside Diameter

Punchmaster

The master tool for punch measurement

PUNCHMASTER was specially developed for the measurement of punches, used in beverage can industry.

PUNCHMASTER is characterized by contactless, optical measurement with submicron resolution. The main measuring functions run automatically and software controlled.

PUNCHMASTER features the following measuring and functions:

- Outside diameter at any z-position (height position)
- Outside roundness at any z-position (height position)
- Automatic step measurement
- Measurement of step position
- Measurement of outside profile
- Measurement of taper
- Calculation of transition radius and transition angle

PUNCHMASTER feature also the measurement of knock outs. Therefor special adapters and additional calibration masters are necessary.

Knock out measuring functions are:

- Outside diameter at any z-position (height position)
- Outside roundness at any z-position (height position)

Along with the **PUNCHMASTER** a software for creation of tolerance models for the punch profile according CAD drawing is provided.

This allows the evaluation of the measured punch profile and the comparison of the measured profile with the tolerance model according the drawing.

Punchmaster

Measuring software

The **PUNCHMASTER** software controls the acquisition of measuring data and the motorized, fully automatic measurement. It offers simple measuring functions like the automatic step measurement and more time consuming functions like the measurement of the complete outside punch profile or the step profile.

Beside the automatic measuring functions the software offers also interactive measurements.

Punchmaster – calibration masters

According the measuring principle, calibration masters are necessary. OEG has developed a special master, which can be used for all currently used can sizes.

PUNCHMASTER – technical parameters*	
Measuring accuracy for diameter/roundness**	±1 µm / ±0.039 mil
Measuring accuracy for outside profile/contour	
Minimum outside diameter	40 mm / 1.575 inch
Maximum outside diameter	100 mm / 3.937 inch
Maximum punch height	250 mm / 9.843 inch
Knock out option***	±2 µm / ±0.079 mil

* parameters can be adapted to special demands on inquiry
** roundness of calibration master <0.5 micron required
*** special adapters and additional calibration masters are necessary

OEG GmbH · Phone +49 335 5213894 · Wildbahn 8 i · 15236 Frankfurt (Oder) · Germany · www.oeggmbh.com · info@oeggmbh.com

Punchmaster

Software for creation of tolerance models

The **PUNCHMASTER** features the high accurate measurement of the punch profile.

For the operator it is very important to compare the measured profiles with the desired punch profile according drawing. For that reason OEG GmbH has developed a software module, which can create tolerance models, using the most important data from the drawings of the punch.

That affects the data for the transition radii and angles of the step and the complete punch profile.

The model has to be produced once for each punch type.

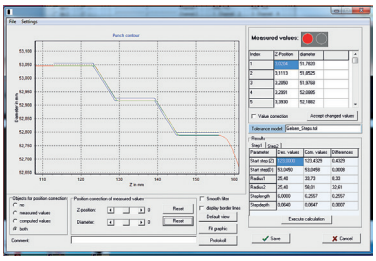
It is stored in the data base and can be loaded always, if measuring data for this punch type has to be evaluated.

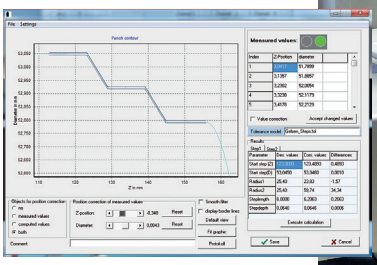
Punchmaster

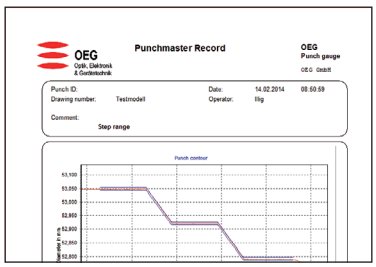
software for evaluation of measuring data and comparison with tolerance model

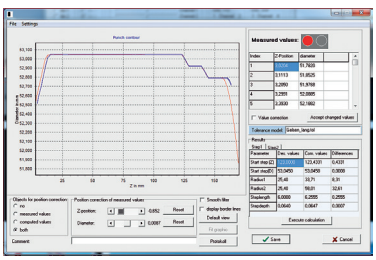
The **PUNCHMASTER** software does not only control the measuring functions and the movements. The software is also equipped with a tool for evaluation of the measured punch profile data. This tool allows the operator, to load the punch tolerance model (created with the according software) and the measured profile data in one and the same diagram.

The software provides among others the good/bad decision for the measured punch profile. measuring data for this punch type has to be evaluated.



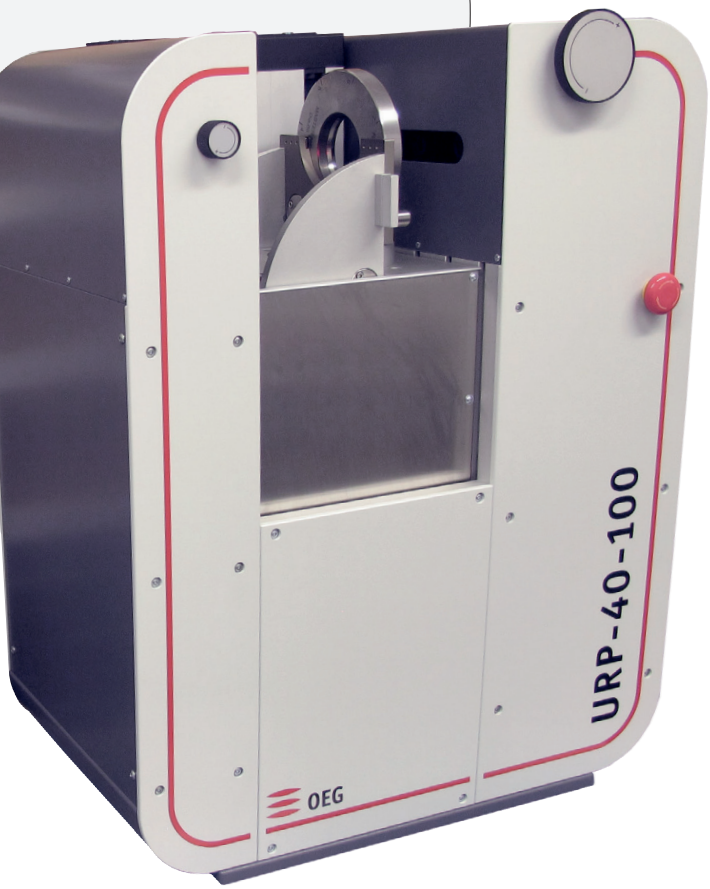






URP - Universal Ring and Punch gauge

The **URP** serves for the highly accurate measurement of the inside diameter of ironing rings and necking dies and the outside diameter of punches and knock outs, used in beverage can manufacture. The **URP** was specially developed for the use in beverage can industry.



URP Measuring function	
Parameter	URP 40-100
Inside diameter (ID) of ironing rings	✓
Mean ID of ironing rings	✓ manually rotation
Outside diameter (OD) of punches	✓
Mean of OD of punches	✓ manually rotation
Necking die option*	✓
Knock out option*	✓

* special adapters and calibration masters are necessary

URP technical parameters	
Parameter	URP 40-100
Measuring accuracy* for ID of ironing rings and outside diameter of punches	±2 µm ±0.079 mil
Measuring accuracy* for outside profile/contour of punches	±2 µm ±0.079 mil
Minimum inside diameter to be measured	40 mm 1.575 inch
Maximum inside diameter to be measured	100 mm 3.937 inch
Maximum outside diameter to be measured	100 mm 3.937 inch
Maximum punch height contour scan	250 mm 9.843 inch
Knock out option** measuring accuracy*	yes ±2 µm ±0.079 mil
Necking die option** measuring accuracy*	yes ±3 µm ±0.118 mil

* calibration masters with roundness <0.5 micron required
** additional adapter and masters are necessary

OEG GmbH · Phone +49 335 5213894 · Wildbahn 8 i · 15236 Frankfurt (Oder) · Germany ·www.oeggmbh.com · info@oeggmbh.com

Ricos & Tomric

Measurement and Evaluation of the inside profile of ironing rings in beverage can manufacturing

RICOS Measuring task

The correct inside profile of ironing rings used in beverage can manufacture is essential for many quality parameters of the produced cans. Therefore it is usual, in particular after the rework of rings, to check the inside ring profile using a measuring system.

A common method for this measuring task is the use of a mechanical tracer. The mechanical tracer itself is able to measure the profile data. But without the possibility to compare the measured data with the desired data according CAD drawing, a statement about the accordance of the profile with the desired profile is hardly possible.

RICOS uses a mechanical tracer as well, but has the big advantage compared to other tracer systems, that an exact statement about the real ring profile in comparison to the profile according CAD drawing is possible. This advantage produced by both the special mechanical construction of **RICOS** and the additional software package **TOMRIC**, which allows the creation of tolerance models.

The mechanical construction of **RICOS** offers the following advantages:

- the sensitive tip of the tracer is absolutely protected against damage at any time, except during the measurement itself;
- the electronic control unit of the tracer is protected inside the housing;
- the tracer unite is mounted inside the housing and thereby protected against damage and disadjustment;
- **RICOS** offers a system of easy replaceable position adapters to guarantee, that always the area of interest (around ironing edge and land, if land is present) can measured with high precision. A pin carrier with 3 pins is present to do this for axial direction and two so called stops are present for radial direction.

The measurement software of **RICOS** contains a test if the measured profile is always inside the tolerance tunnel. The software calculates a result table from the profile with numerical values of all position and angle values of interest.

Additional there is implemented a 2-point-measurement tool. By using this tool the operator can select 2 points on the measured profile and software will calculate:

- absolute and relative positions
- angle of gradient from straight line through points
- radius of circular arc through this points and the point on profil between

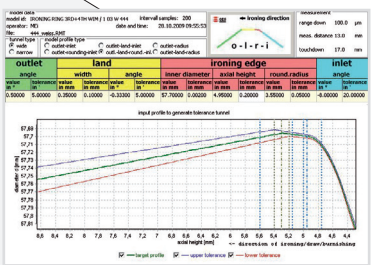
TOMRIC

TOMRIC is a special software, which was developed to enable the evaluation of the measured profile data. As the important data of the ring drawing are entered in the software, **TOMRIC** creates a detailed profile model including also the tolerances (the so called tolerance tunnel model For each type of ring a special tolerance tunnel model can be created. By help of the model, a good/bad decision can be made after the measurement.

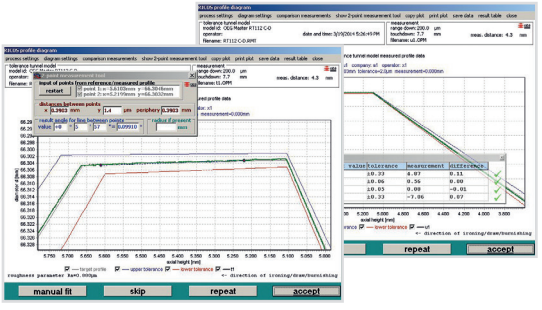
The picture above shows the input mask of **TOMRIC** to create the tolerance tunnel model.

Only by interaction of the measuring system (which provides the real ring profile) and the **TOMRIC** software (which allows the presentation of the measured profile in relation to the desired profile and tolerances), a correct evaluation and assessment of the ring is possible.

RICOS and **TOMRIC** are absolutely special designed for the measuring and evaluation demands in the beverage can industry. Therefore **RICOS** allows an easier and faster ring measurement in connection with a perfect evaluation of the measuring results than currently known systems.



Input mask of software **TOMRIC**



Measured ring profile overview

Zoom of land area of the measured ring profile

Ring & Punch Inspector

Visual inspection of inside surface quality and profile of ironing rings and outside surface quality of punchs for beverage can manufacture

The **RING & PUNCH INSPECTOR** provides fatigue free and detailed inspection of the inside surface of each kind of ironing ring.

Using a stereo zoom microscope and a special illumination, a high contrast image is provided to the operator. The mechanical setup was specially designed to meet the needs in beverage can manufacturing and enables the exact positioning of the ring and punch under the microscope. The stereo zoom microscope has a large zoom factor, which provides as well overview and detailed inspection.

Ring inspection

The ring is mounted on two stable bearings, which enables the rotation of the ring very easily and sensitive. During rotation the inside surface remains constantly in the image plane of the microscope. According the inside form of the ring, different viewing angles can be adjusted. The **RING & PUNCH INSPECTOR** can be adapted to all ring sizes.

Punch inspection

The punch is mounted on two stable bearings, which enables the movement of the punch under the micorcope. During the punch movement, the outside surface remains constantly in the image plane of the microscope. 2 additional bearings on the left and right side enable the inspection of the complete punch. The **RING & PUNCH INSPECTOR** can be adapted to all punch sizes.

The **RING & PUNCH INSPECTOR** is the perfect completion of the tool room equipment!

Attachments

The **SPECIAL WORKBENCH**, shown on some of the product pictures does not belong to the standard scope of supply of the measuring equipment. It must be ordered additionally.

The **SPECIAL WORKBENCH** allows a comfortable and fatigue free work with the can tool metrology systems. It has the following features:

- special stable table construction;
- passive vibration isolators (standard)
- semi active vibration isolators (optional, if tool room is located close to body maker);
- work plate of the instruments and table plates are on the same height;
- special PC-case with door (lockable);
- 4 cases for attachments (like calibration rings, punches etc., certificates).