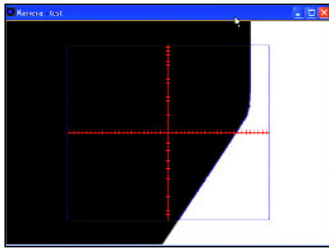


Why do I need a COPRA® RollScanner?

A: Because it is the fastest method to measure the active surfaces of a roll.

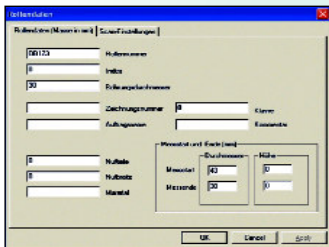


Active areas are all outer surfaces, but in most cases, no undercuts and always visible in the silhouette. Thus the measuring job is simplified to a 2D-problem. The COPRA® Roll

Scanner starts the measuring process at a known point of the mandrel and is automatically following the roll contour. With a tactile comparison it would be necessary to define the centre plane of the roll.

Who can operate the device?

A: Every (careful) worker.



All essential information is reduced to select the right mandrel size and a unique roll name/number. Additional information, like bore diameter or groove sizes are optional and used for additional description.

Do I have to develop a measuring plan for each roll?

A: No.

Measuring machines usually require an input of the contour to be scanned (teach-in method) and how the device will find the measuring path. As every roll is different this increases the effort substantially - even worse if the contour to be scanned is not available in electronic format. With the COPRA® RollScanner the measuring job is done automatically. The analysis of the measurement result is done automatically based on the design specification. The analysis is done by a recalculation of tangentially linked lines and arcs from the measured contour points and an automatic comparison with a CAD drawing.

Is there a possibility to also managing roll data?

The RollScanner has a data base link to COPRA® DBMS and is archiving the results automatically. The design department can easily access the measuring results.

How can I get drawings from my existing old rolls?

The image processing feature, i.e. the calculation of tangentially linked lines and arcs from the contour points, allows a fast generation of drawings for stock rolls. As a result of integrated logical design rules like maximum and minimum radius, preferred chamfer angles etc. there is only little reworking for the compensation of wear needed to get perfect drawings.

Can I make use of my old and worn out rolls?

A: Yes.

The COPRA® RollScanner archives used rolls in a recycling data base. A big advantage of using stocked rolls lies in the resulting reduction of costs for manufacturing new tool sets. Why not produce a roll from an already existing one that is no longer needed? Reworking stocked discarded or useless rolls pays back quickly by saving the costs for raw material and working processes such as boring and milling.

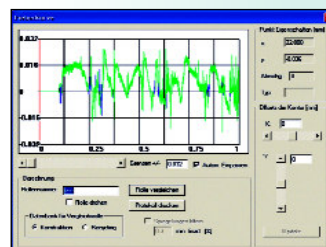
70% of the total production cost for a new roll result from costs for raw material and hardening, 30% from design and shaping. Experience shows that by reengineering a used roll total cost can be reduced to about 15% due to the fact that the new roll can usually be produced at a minimum of time required for chip removal. The most effective way of saving costs is to use a highly similar, oversize roll. Which roll fulfils these requirements is identified by an intelligent similarity search process of the COPRA® data base management system.

Is there an Interface to CAD Systems available?

A: Yes!

The contour of every roll being scanned is stored in a DXF-file and can thus be used in CAD systems.

How can I integrate COPRA® RollScanner into my QM system?

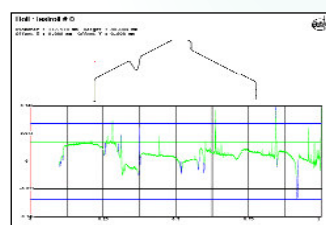


The control of the process reliability postulates the control of the roll forming tools. This can be done fast and easily with the COPRA® RollScanner. If the designed roll is available

as CAD-drawing, then it can momentarily be compared with the actual scanned roll. The quality diagram shows the appearing deviations. Thus it is possible to determine quickly if a roll is within the required tolerance.

It is also possible to show the position of a big deviation in a roll by picking the deviation in the finger print with the mouse. Big variations in tolerance can immediately be recognised. In practice it is especially in the area of radii as a general rule not possible to recognize manufacturing errors. With the COPRA® RollScanner the quality of a roll can be proved in a reliable and doubtless manner.

How do I protocol the scanned result?



A protocol is automatically generated from the measuring process to be printed or saved in PDF format. This allows to create a quality history for every roll.

How does the system help me during set-up of new roll sets?

Very often individual areas of the forming rolls have to be reworked during the set-up of the machine.

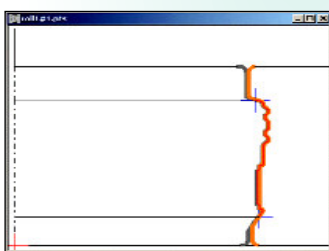
These changes need to be documented, otherwise the set-up has to be repeated again if a roll is broken or worn out. The COPRA® RollScanner needs only a few minutes for the full documentation and helps this way to avoid costly machine down-times.

How does a COPRA® RollScanner help me if I am making my rolls using CNC machines?

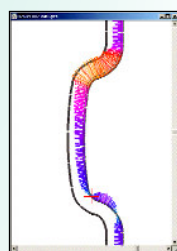
There are some typical errors that might occur during roll manufacturing with CNC lathes that cannot be checked by measuring just roll width and diameter. These errors are caused by an incorrect radius compensation or abrasion at the tool tip. In combination with a small sheet thickness this will result in faulty profiles. One major reason is the squeezing of the material causing unwanted plastic deformations. Finding errors like that without a COPRA® RollScanner is very time-consuming and almost difficult - if possible at all.

How to verify the roll gap?

The roll gap calculation is very important, especially for thin material. Sometimes this information is even more important than the geometry of the individual rolls. Squeezing of the material will e.g. result in failure at the burst test of radiator tubes. For the roll gap calculation each individual roll is scanned. A software module aligns the respective rolls automatically to a predefined sheet thickness. The deviation between the nominal and the actual gap is shown with a quality diagram and a graphical super-elevation along the roll contour.



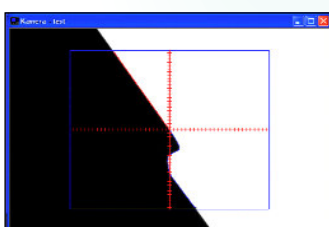
Automatic alignment of both rolls



Report of the roll gap

Does optical measuring method allow measurement of faces that cannot be measured with a mechanical sensing device?

Rolls are containing active faces with very little inner radii like



strip guides. Unlike mechanical measuring units that have the limitation of the gauging ball diameter the COPRA® RollScanner is able to measure unlimited small inner radii.

What about life time of this device?

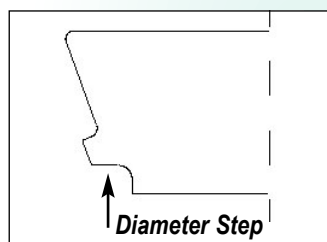
Optical measurement is free of abrasion. The measuring process is realized with a CMOS image sensor being positioned by means of glass scales. Both measuring systems are working without wear. The measuring precision is guaranteed for years without adjusting.

What about accuracy when scanning small rolls?

The measuring accuracy is almost independent from the roll size. There is only a little thermal and absolute positioning error of the glass scales (3µm/m). In principle the measuring accuracy is not influenced by the roll size and weight.

Can I scan any kind of rolls?

A: Yes - with 3 axis.



The roll is in scanning position. At the diameter step the focus can not be in the centre of the roll due to the horizontal plane. Therefore the camera automatically puts the focus on the outside diameter line.

Automatic focusing with a third axis enables measuring of any roll as long as the contour to be scanned is completely visible in the centre plane. Any shoulder however has to be measured with the front edge. This edge is perpendicular to the centre plane and so no more visible as a sharp edge. An accurate measurement without focussing to this distance would not be possible. Therefore the COPRA® RollScanner can move the camera perpendicular to the centre plane with high accuracy to focus the front edge of shoulders.

Can the COPRA® RollScanner also measure profiles?

A: Yes.

Embedded profile cuts can be measured with an on-axis light option. Thin profile cuts are measured with the standard backlight. In both cases the profile must be free of burrs.

Software is adapted to the measuring problem

The operation of the COPRA® RollScanner is adapted to the special demands of the roll forming industry. There is no preparation needed for defining working planes, coordinate systems or measuring regions.

Ability to operate in shop floor

A measuring laboratory is recommended but not needed



The encapsulated construction enables operation in a shop floor environment

for the COPRA® RollScanner. The encapsulated construction enables the operation in a shop floor environment. It is only important that the rolls are clean and stored at a similar temperature as the COPRA® RollScanner.