

TOOLS & TECHNOLOGY

#techguide



ECOROLL AG Werkzeugtechnik

ECOROLL AG Werkzeugtechnik is the leading supplier of tools and machines for mechanically improving the surfaces of metal components. In close cooperation with our customers, demand-oriented tools and machines for **burnishing** and **deep rolling** as well as **processing cylinders** are designed, manufactured and marketed throughout the world.





Our Global Sales Network

ECOROLL's worldwide sales network enables individual and prompt support for our customers and prospects. In almost every industrial nation, our partners are at your disposal to develop customized solutions for your special needs in close cooperation with you. Milford, Ohio (USA) is headquarters of ECOROLL Corp, the subsidiary company founded in 2003.

Australia - Austria - Belarus - Belgium - Brazil - Bulgaria - Canada - China
Czech Republic - Denmark - Finland - France - Germany - Hungary - India - Iran
Italy - Japan - Luxembourg - Malaysia - Mexico - Netherlands - Norway - Poland
Romania - Russia - Singapore - Slovakia - Slovenia - Spain - South Africa - South Korea
Sweden - Switzerland - Taiwan - Thailand - Ukraine - USA - United Kingdom

A close-up photograph of a roller burnishing process. A cylindrical metal workpiece is being polished by a rotating roller. The roller is a yellowish-brown color and is mounted on a blue metal fixture. The workpiece is held in a lathe, and the background is blurred. The text "ROLLER BURNISHING" is overlaid in white on the top left of the image.

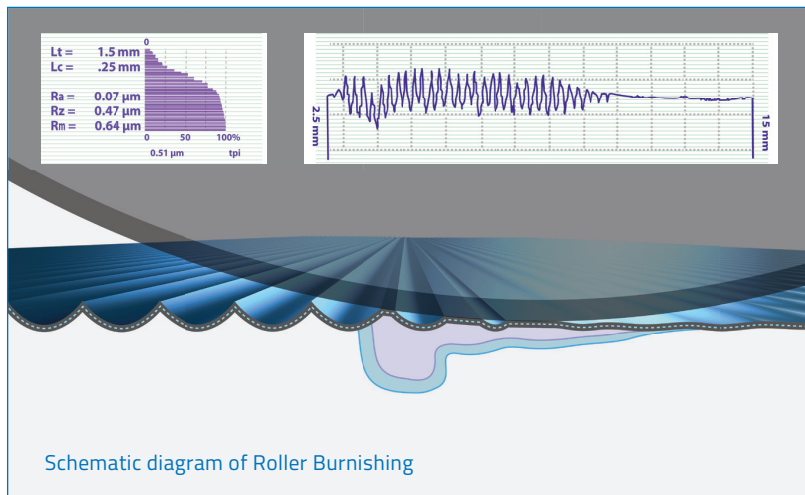
ROLLER BURNISHING

Reduction of the surface roughness up to 1/20

The economic alternative for producing high-quality component surfaces

- Produces mirror-finish or pre-defined surfaces
- For use with either conventional or CNC-controlled machines
- Complete processing in one setting
- Short cycle time and elimination of set-up and auxiliary processing time
- Increased surface hardness
- Increased wear resistance
- Low energy demand
- For use with minimum quantity lubrication

In roller burnishing, when the compressive stress that occurs at the contact point between the roller burnishing tool and the workpiece surface exceeds the workpiece's yield strength, plastic deformation results. The roughness peaks are pressed down in nearly a vertical direction into the surface and as a result the material flow fills the roughness valleys from below. The resulting smooth surface occurs due to the flow of the entire surface near the material's edge layer, not because the roughness peaks are bent into the surface or flattened (a widely held, but false assumption).





DEEP ROLLING

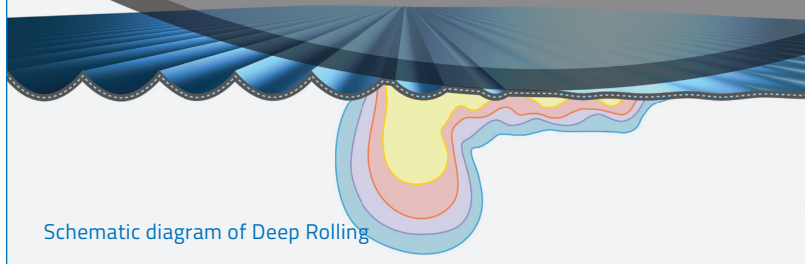
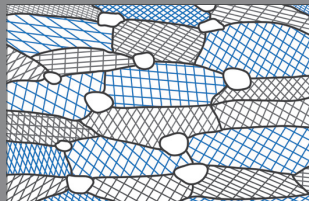
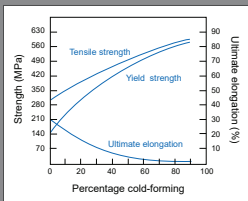
Increase the service life up to a factor of 5

Smoothing, cold work and induction of residual compressive stresses in a single process

- Complete processing in one setting
- For use with either conventional or CNC-controlled machines
- For a wide range of work pieces
- Prevents or hinders stress corrosion crack formation or growth
- Significantly increases service life and fatigue strength
- Extraordinary increase of fatigue strength

Deep rolling is a forming process used to effect positive change in a component's edge zone properties. The process is unique in that it is the only process for increasing component service life that combines these effects:

- Generation of compressive stresses
- Cold working in the edge layer
- Smoothing a component's surface, which removes micro-notches





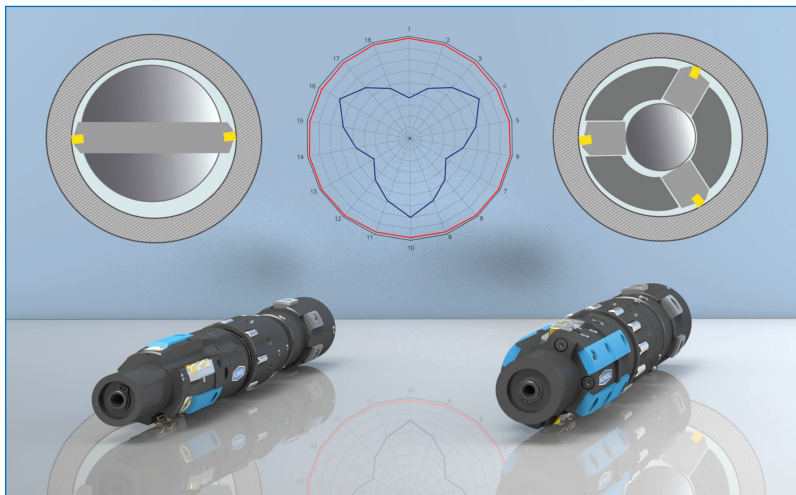
PROCESSING CYLINDERS

Reducing the machining time up to 90%

Fast and efficient internal machining

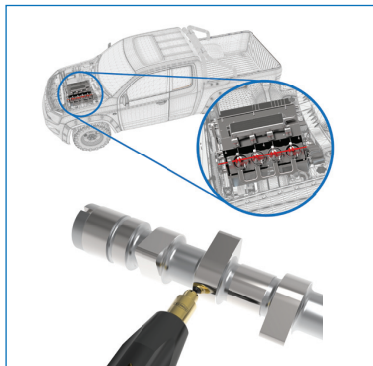
- Produces surfaces with very low residual surface roughness, reduced friction and less wear
- Notably decreases irregularities in circular form
- Suitable for cold drawn or hot rolled tubes
- For diameter range 28 to 800 mm
- Possible processes: Combined boring – skiving – roller burnishing, skiving on lathes

The OMEGA system by ECOROLL combines skiving and roller burnishing to manufacture hydraulic cylinders and cylinder tubes. It has almost completely replaced honing, the other production process used for these products, because this combination offers unequalled speed and cost-effectiveness. In this application area, ECOROLL tools can even offer four processes in one working cycle: pre-drilling, drilling out, skiving, roller burnishing. With the modular, building block system, the optimum tools for any tube quality or processing length can be configured.

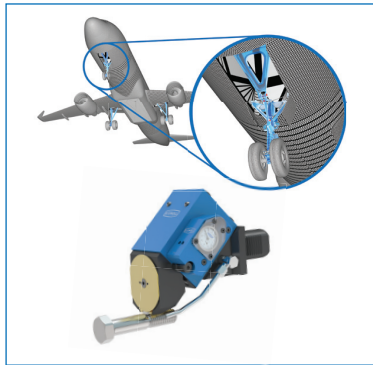


APPLICATION EXAMPLES

Roller Burnishing - Camshaft



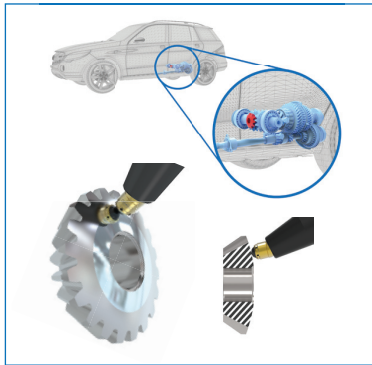
Deep Rolling - High-strength bolt



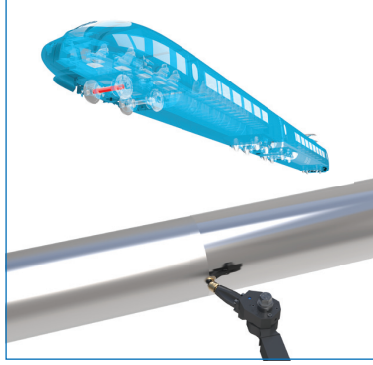
Roller Burnishing - Piston rod



Roller Burnishing - Bevel gear



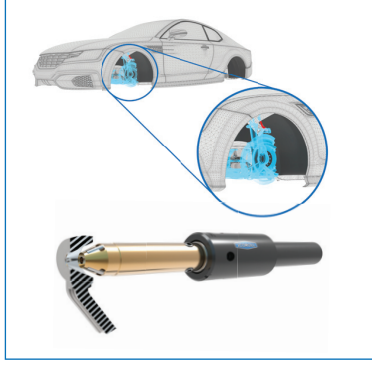
Roller Burnishing - Railway axle



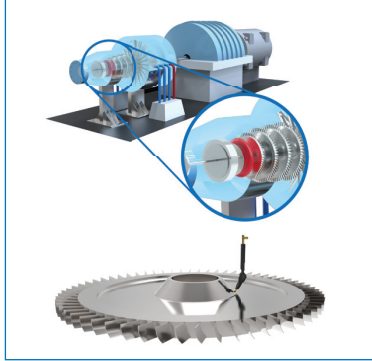
Roller Burnishing - Primary disc



Roller Burnishing - Steering lever

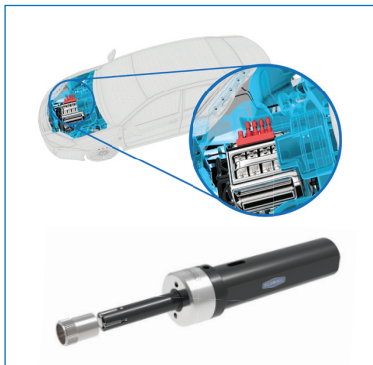


Deep Rolling - Turbine disc



APPLICATION EXAMPLES

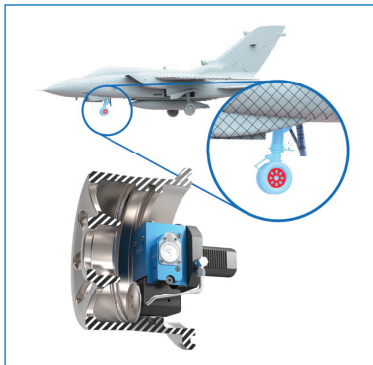
Roller Burnishing - Guide sleeve



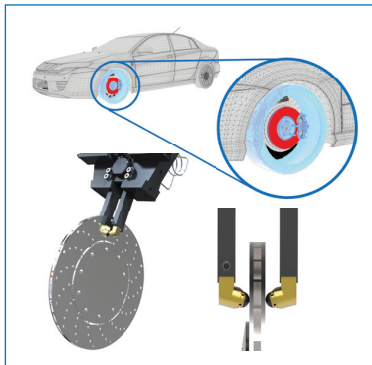
Roller Burnishing - PET-Mold core



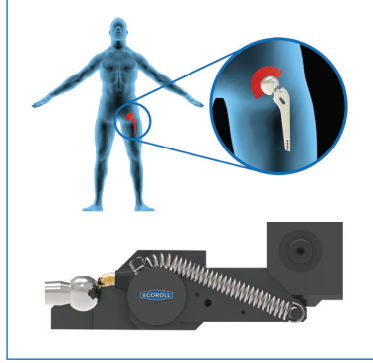
Deep Rolling - Wheel rim



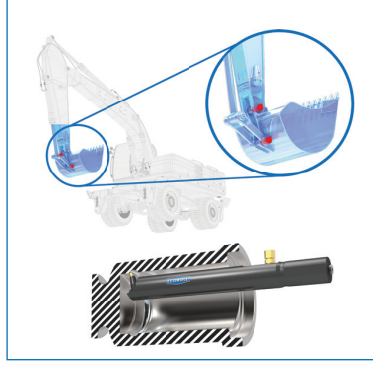
Roller Burnishing - Disc brake



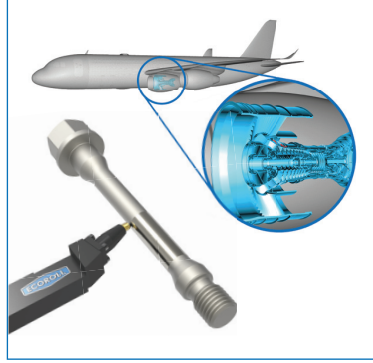
Roller Burnishing - Ball joint



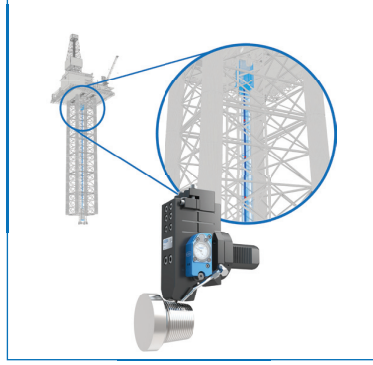
Roller Burnishing - Swivel bearing



Deep Rolling - Tension bolt



Deep Rolling - API thread pin



CONTOURS & TOOLS

Cylindrical bore



Cylindrical outside contour



Cylindrical outside diameter with transition radius



Plane face with transition radius



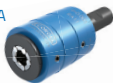
Tapered bore



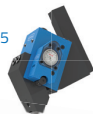
G



RA



EG45



EG5



RK



EG5



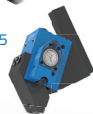
EG5



HG4



EG45



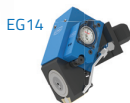
EG5



HG6-2



EG14



HG6



HG4



HG3



RIO/RDO



EG45



HG13



HG6



HG6



SK



HG6



HG13



HG13



Outside taper



Inside contour



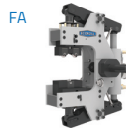
Thread
(internal)



Thread
(external)



Free-form surface





ECOROLL MechKon App

Product configurator and calculators

ECOROLL's MechKon freeware app combines several useful tools for engineers, technicians, designers, machine operators and decision makers

Product configurator

Find the ideal tool for your application based on your workpiece's contour and keep yourself up to date on ECOROLL AG's tools and technology by using the integrated product catalogue

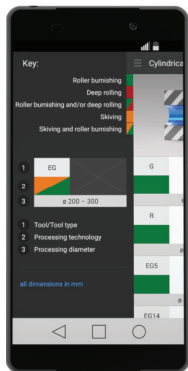
Calculators

Make use of several modules to determine :

- Roughness
- Hardness
- Cutting data
- Tolerances
- Unit converter
- Method of cut-off length



Guide



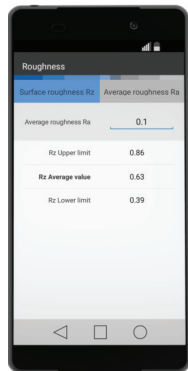
Configurator



Catalogue



Roughness



iOS



Cutting data

Cutting data

Tool - Workpiece

a [mm] Number of teeth z

Cutting parameters: Rotational speed

V_c [m/min] a_n [1/min]

Feed rate

V_f [mm/min] f_z [mm/c]

Processing

Distance [mm] Duration [min]

Reset

Hardness

Hardness

Vickers hardness

Diamond pyramid 130°, F = 98.0 N HV10

Brinell hardness

Steel ball 0.102 • F/D² = 35 N/mm² HB

Rockwell hardness

Ball 1.5875 mm, F = 98.0 N HRB

Ball 1.5875 mm, F = 98.0 N HRF

Diamond cone 130°, F = 1471 N HRC

Diamond cone 130°, F = 98.0 N HRA

Diamond cone 130°, F = 98.0 N HRD

Tensile strength

1 MPa = 1 N/cm² MPa

Shore hardness

With optional observation for cast alloy SH

Tolerances

Tolerances

Tolerance range

Minimum

Average

Maximum

Nominal dimension

Bole Shift

Calculators

Unit converter

Torque

Pressure

Energy

Area

Speed

Force

Length

Mass

Temperature

Volume



Android





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