

# Metkon Application Note

**SAMPLE : Tractor Spare Part**

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A tractor is a vehicle specifically designed to deliver a high tractive effort (or torque) at slow speeds, for the purposes of hauling a trailer or machinery used in agriculture or construction. Most commonly, the term is used to describe a farm vehicle that provides the power and traction to mechanize agricultural tasks, especially (and originally) tillage.

Most of the spare parts are applied manual welding. But nowadays robot weldings are taking its place. And the penetration depth control is the most important in such kind of applications.



## APPLICATION REQUIREMENTS



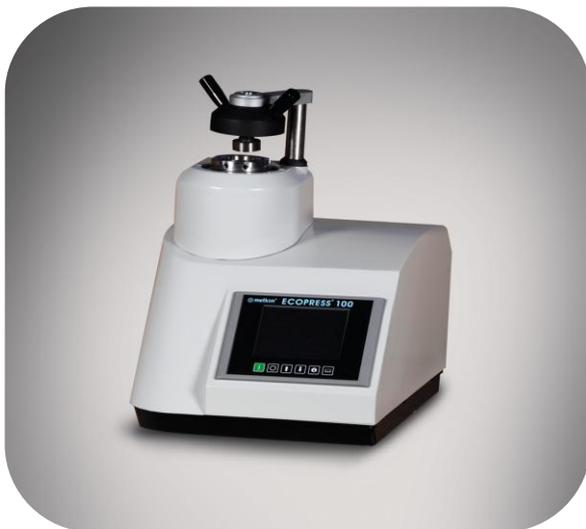
SERVOCUT 401 offers the advantage of combining different cutting techniques and methods into the same machine to obtain superior cut surfaces for a broad range of heavy duty cutting applications.

SERVOCUT 401 has X-Y-Z triple axes cutting capability:

**Z-axis Chop cutting:** The specimen is clamped and the cut-off wheel approaches the specimen.

**Y-axis Table-feed cutting:** Feeding the clamped specimen into a rotating cut-off wheel using a T-slotted feed table.

**X-axis Parallel Cutting (optional):** Parallel serial sectioning in the x-axis with optional movable x-bed.



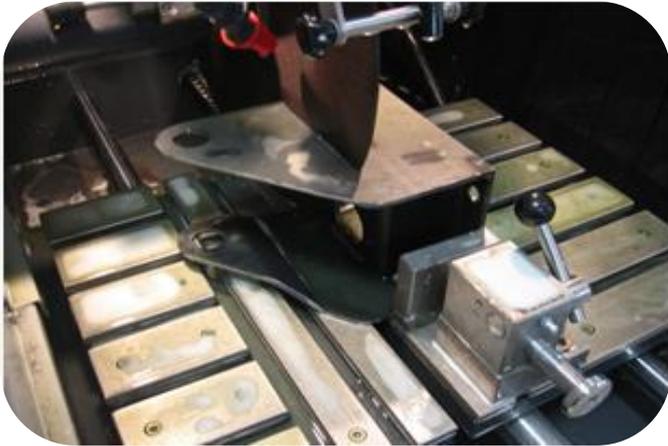
ECOPRESS 100 is an easy to use automatic mounting press. It has advanced software with programmable HMI touch screen controls. Robust bayonet closure allows for quick and safe operation. ECOPRESS offers a wide selection of mould assemblies from 25 to 50 mm in diameter. Two mounts can be produced simultaneously with the use of an intermediate ram. The pressure, heating and cooling are automatically controlled and the total cycle time of a complete cool mount takes 8 to 10 minutes. The parameters can be changed and adjusted during the mounting process.



All materials testing laboratories in the industrial, research or educational field have a demand for sample preparation. Whether your requirements call for individual components or basic sample preparation, FORCIPOOL family of instruments will meet your needs. FORCIPOOL Series of instruments are available as Single wheel and Dual wheel Units (200/250/300 mm wheel size). Both single or double wheel versions are available with constant, dual or infinitely variable rotating speeds with digital display. This allows the setting of the optimum speed for each individual preparation process. The modern electronics provide a smooth speed variation.

## SAMPLE PREPARATION PROCESSES

### SECTIONING



**Equipment:** Servocut 401 - AA  
**Clamping Device:** GR 0030  
**Cutting Fluid:** Metcool  
**Order No:** 19-902  
**Cut off Wheel:** Cut-off Wheel for Medium Hard Steels  
**Order No:** 19-042

**Description :** The sample is attached with quick acting clamping device to Servocut 401 - AA. And the feed rate should be set as 250 rpm.

### MOUNTING



**Equipment:** Ecopress 100  
**Mould Assembly Dia.:** 40 mm  
**Mould Release Spray**  
**Order Code :** 29-099  
**Mounting Powder:** DAP  
**Order Code:** 29-012

**Description:** By using DAP Mounting Powder the temperature is set to 190 °C and the pressure is set to 250 bar. After 5 min. curing time the mounted sample obtained is as on the left.

Equipment: Forcipol 2V - Forcimat

**Description:**

After automatic grinding of the sample 2 steps of polishing (rough&final) needs to be taken to observe the welding penetration clearly. Rough polishing is done for 2 mins with 25N before observation on Stereo Zoom Microscope.



**Preparation Method**

Parameter Step	Surface	Abrasive	Lubricant	Force per	Time	Disc Speed	Relative
				Sample, N	min.	rpm	Rotation
MP 1. Step	Paper Grinding Disc	180 grit	Water	20	1	300	Contra
	DEMPAX 38-040-180	SiC					
MP 2. Step	Paper Grinding Disc	320 Grit	Water	20	1	300	Contra
	DEMPAX 38-040-320	SiC					
MP 3. Step	Paper Grinding Disc	600 Grit	Water	20	1	300	Contra
	DEMPAX 38-040-600	SiC					
Rough Polishing	FEDO-6J	6 $\mu$ Suspension	Diamon Lub.	25	2	320	Contra
	39-015-250	39-430-M	39-502				
Final Polishing	FEDO-1	1 $\mu$ Suspension	Diamon Lub.	25	1	320	Contra
	39-065-250	39-410-M	39-502				

**Etching:** %10 Nital

**RESULT**

Under Stereo Zoom Microscope it is observed that the weld part on the right is penetrated as required. However the left welding penetration is very low.

And the hardness values measured from weld metal, heat affect area and the sample is as below.

- 1.st Area: 272 HV1
- 2.nd Area : 147 HV1
- 3.rd Area : 116 HV1

