Metkon Application Note

Metallographic Preparation of Hydraulic brake pipe

INDEX

1. INTRODUCTION

2. APPLICATION REQUIREMENTS

3. SAMPLE PREPARATION PROCESSES

4. RESULT

metkon®
METALLOGRAPHY

INTRODUCTION

This application note includes metallographic preparation procedures of brake pipe samples.

Pipe samples with different shapes and dimensions to be investigated

APPLICATION REQUIREMENTS

A. SECTIONING

MICRACUT 151 accomodates diamond and abrasive wheels up to 150 mm (6") diameter and the speed range is between 0 and 1000 rpm. The gravity feed loading design minimizes sample deformation.The sliding weight arm with counterweight allows precise force application. The digital micrometerenables the operator to set the cutting width with a resolution of 1 micron. The digital micrometer is interchangable and the customer can mount other types of micrometers if and whenever required. The coolant tray is removable from the front of the instrument for easy cleaning.

MICRACUT 151's cutting chamber is fully enclosed by a transparent hood. Blade dresser is optionally available. At the end of the cut, an audible signal notifies the operator.

		Order Code	Description
Equipment Used	:	*16 04*	*MICRACUT 151 Precision Cutter*
Clamping Device	:	*GR 0401*	*Specimen vise for long specimen*
Cutting Disc	:	*19-150*	*ø 150 Diamond Cut-off wheels (Metal Bonded, medium conc.)*
Cutting Fluid	:	*19-902*	*METCOOL Nature Friendly Soluble Oil, 5 lt.*

B. MOUNTING

ECOPRESS 100/200 have preprogrammed moulding sequences built-in (factory set) from which you can choose according to your own applications. You only need to place the sample in the mould, select the program number for your specific application and depress the "Start" button. That's it! ECOPRESS does the rest for you! After pressing the start key, the fully automatic program sequence is executed with the preselected parameters. 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.

		Order Code	Description
Equipment Used	:	*25 07*	*ECOPRESS 100 Automatic Mounting Press*
		26 06-02	*Mould Assembly, 40 mm with intermediate ram*
Mounting Powder	:	*29-002*	*Red Phenolic Powder, 1 kg.*

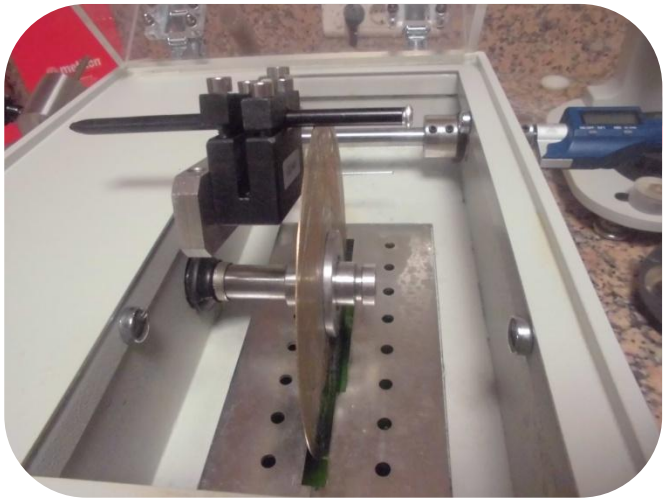
C. GRINDING & POLISHING

Forcipol 2V Having two discs and variable speed range between 50 and 600 rpm,Forcipol 2V is the most universal grinder/polisher, especially for labs having wide veraity of materials. When coupled with Forcimat, Forcipol 2V becomes a versatie automatic sample preparation system with high operator comfort.

The FORCIMAT Automatic Head is mounted on a rigid hardened post which is fixed to the base of the FORCIPOL grinder/polisher. It can be adapted to all FORCIPOL series grinder/polishers, and is easily and rapidly positioned by means of a quick-locking clamping mechanism.

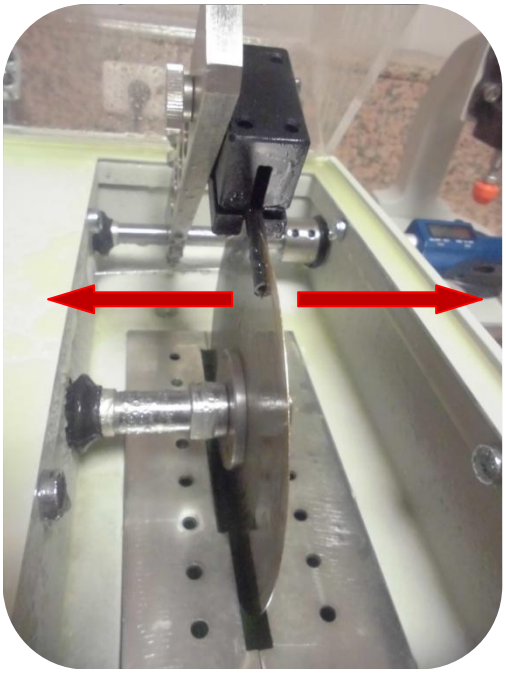
The sample holder can prepare 6 samples simultaneously and it is driven by a 90 Watt DC motor at 120 rpm. The pneumatically applied individual force is adjustable between 5 N (1.1 lb.) and 60 N (13.5 lb.) from the front panel and is displayed on a guage. The housing is made of GRP with a touchpad front panel.

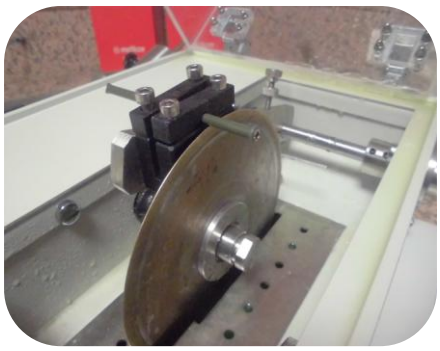
	Order Code	Description
Equipment Used	*36 09-250*	*FORCIPOL 2V*
	30 09	*FORCIMAT AUTOMATIC HEAD*
Equipment Accessories	*31 21*	*PVC Wheel, 250 mm*
	31 63	*Splash Guard, 250 mm*
	39-003-250	*Ø 250 mm, Special Magnetic Foil*
	39-093-250	*Ø 250 mm, Thin Metal Plate(5 pcs)*
Sample Holder	*33 01*	*Specimen holder, 6 x Ø40 mm*



The sample fixed with GR 0401 specimen vise and attached on the sliding weight arm.

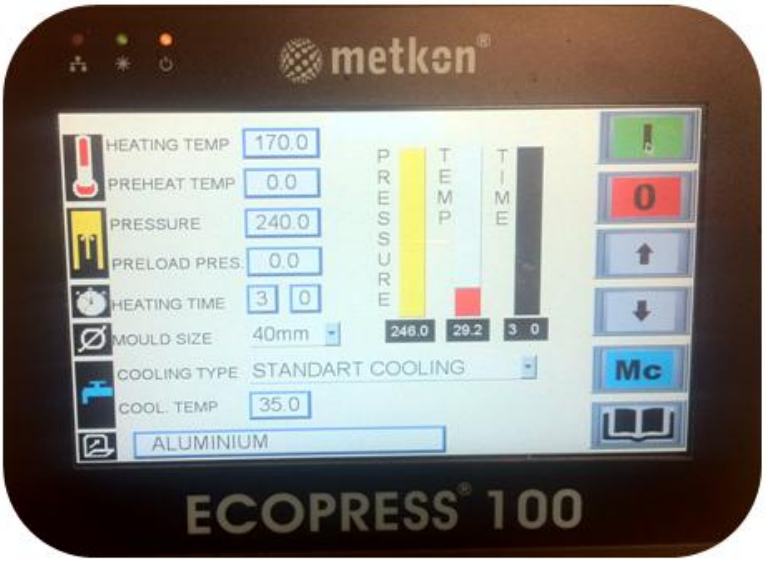
The wheel speed is adjusted to 700 rpm and load weight around 500 gr and cut the sample vertically.

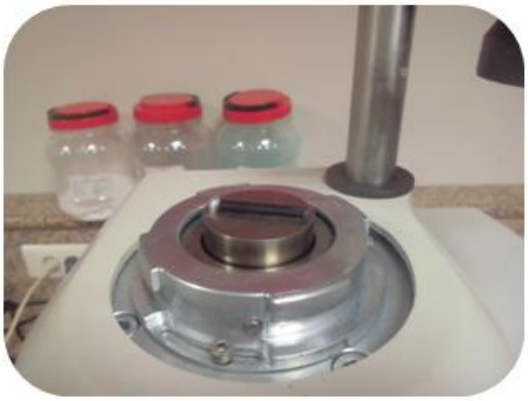




By the help of Digital micrometer suitable sample position can be adjusted according to cutting line.

Sample divided 2 pieces and ready for mounting.





After that divided specimens mounted with ECOPRESS 100 hot mounting machine. Operation parameters are shown as above picture.

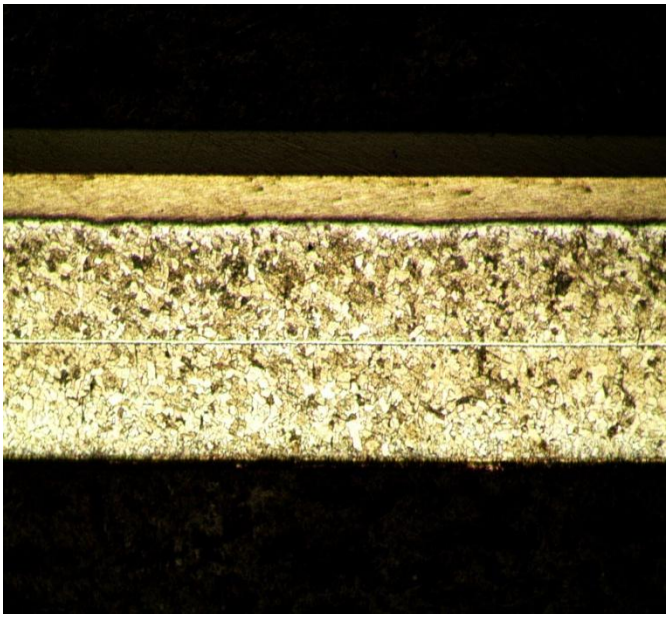
Red Phenolic powder is used for mounting operation.

Finally specimens are grinded & polished with FORCIPOL 2V + FORCIMAT with following parameters.

	Surface	*Abrasive*	*Lubricant*	*Force per sample(N)*	*Time(min.)*	*Disk speed(rpm)*	*Head speed(rpm)*
Grind. Step 1	*DEMPAX* [38-040-400]	400 grit SiC	Water	25 N	1 min.	200	*100*
Grind. Step 2	*DEMPAX* [38-040-800]	800 grit SiC	Water	25 N	2 min.	200	*100*
Grind. Step 2	DEMPAX [38-040-1200]	1200 grit SiC	Water	25 N	2 min.	200	100
Polishing Step	FEDO-3 cloth [39-025-250]	*3µ diamond susp.* [39-420-M]	*DIAPAT* [39-502]	20N	3 min.	200	*100*

After polishing operation the samples etched 2% Nital solution.

After the metallographic preparation the samples examined in IMM 901 Metallurgical Microscope *(Order No: 60 01)* with IMAGINE system. Microstructure of sample images can be seen below:



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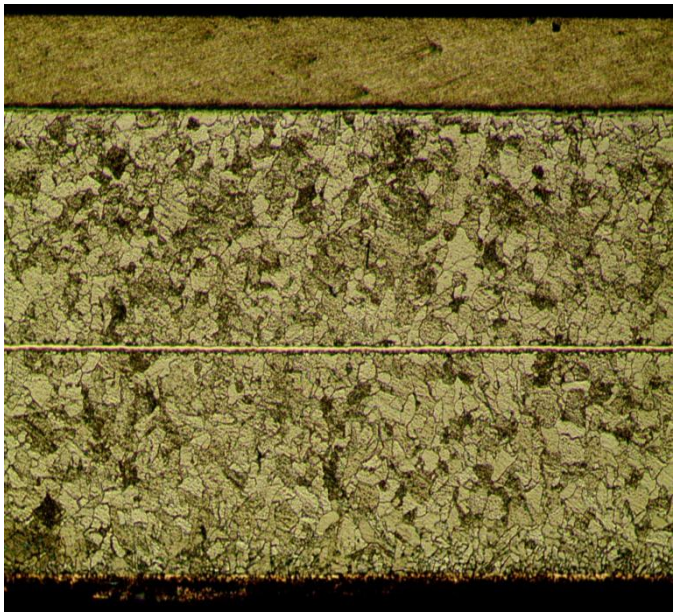

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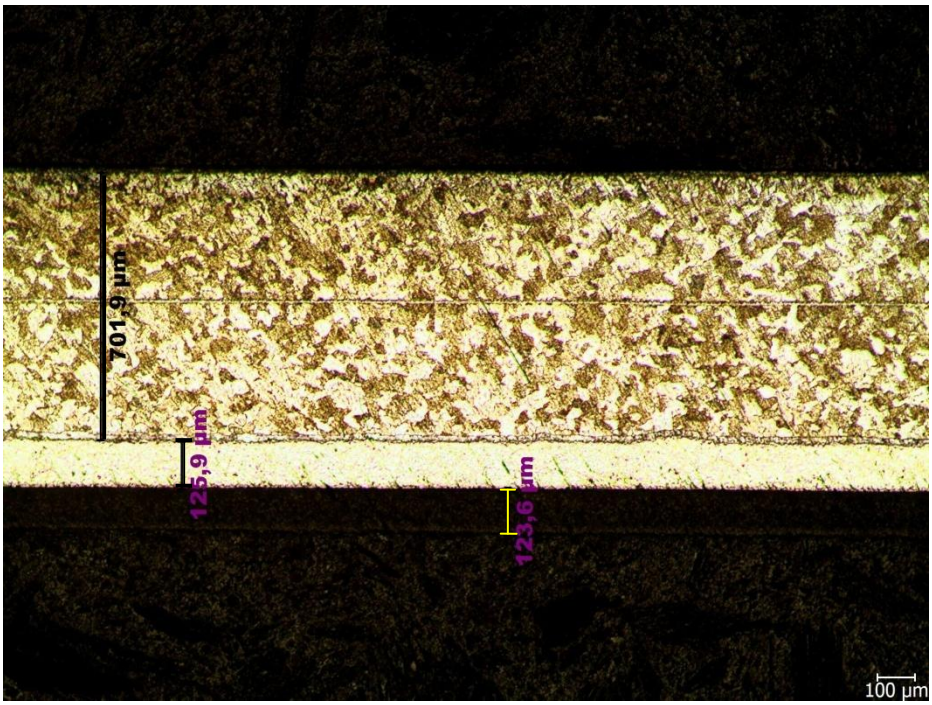

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27.12.2013 – METKON LAB

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