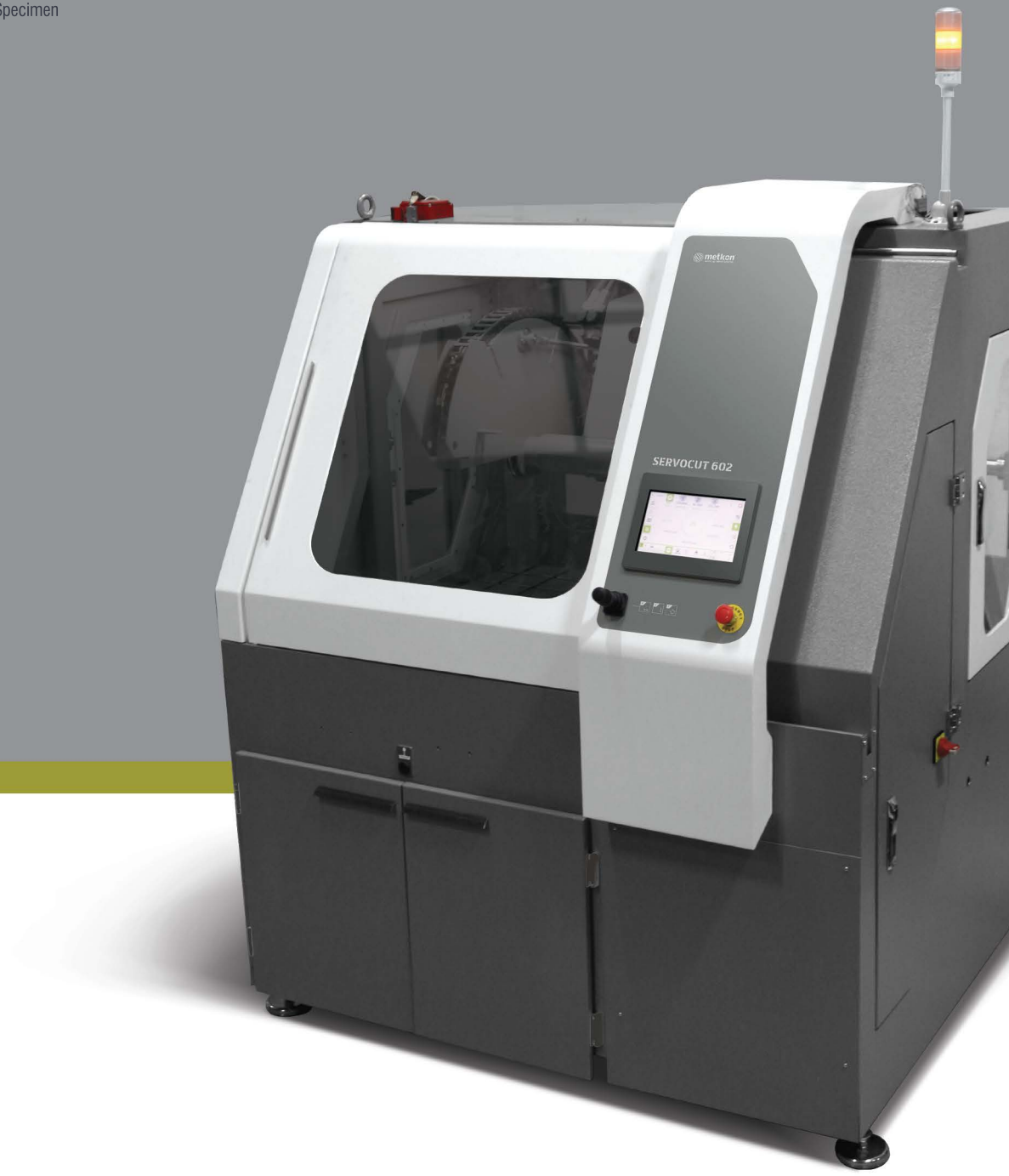
metkon
Technology behind Specimen



CUT-OFF WHEEL

SELECTION GUIDE



QUARTER CENTURY OF EXPERIENCE

metkon.com

TECHNICAL INFORMATION

Preparing a specimen for metallographic or micro structural analysis consists of several operations and the first step is to locate the area of interest.

Sectioning or cutting is the most common technique for obtaining this area of interest. Proper sectioning guarantees minimal micro structural damage. Excessive subsurface damage and damage to secondary phases (e.g. graphite flakes, nodules or grain pull-out) should be avoided.

Depending on the material, the sectioning can be categorized into two areas: Abrasive Cutting and Precision Cutting.

Abrasive cutting is generally used for metal specimens and is accomplished with SiC or Al O in resin or rubber bonded cut-off wheels. Abrasive cutting should be performed wet with a sufficient amount of cooling fluid that includes lubrication and corrosion protection.

Proper blade selection is required to minimize burning and heat generation during cutting which degrades both the specimen surface as well as the blade cutting efficiency.

Precision cutting is accomplished with thin diamond blades. Precision cutting is especially useful for cutting ceramics and minerals as well as some metallic materials.

Selecting the right cut-off wheel ensures freedom from burn and distortion and is the best way to save time and consumables.

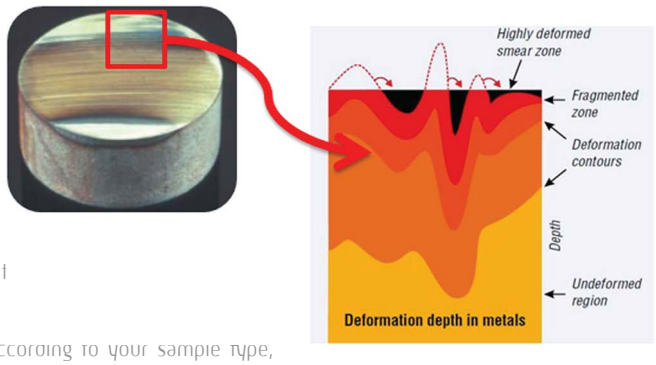
Correct cutting produce specimens which are in perfect condition for the next preparation steps. The most commonly used abrasives for the cutting of different materials are SiC and Al_2O_3.

DID YOU KNOW THAT?

When the cutting motor reaches its maximum load the feed rate is automatically adjusted if needed reduced, resulting in perfect cuts and eliminating sample and machine damage.

Pulse cutting mode is a standard feature in all automatic models for cutting extra hard specimens. The T-table or the cut-off wheel will move backwards for a few mm.and then stop for a short amount of time in a cycle. This pause in cutting allows more coolant into the cutting area to minimize sample damage.

Inappropriate disc cause extremely heat generation on sample surface. This causes very deep layer of microstructure deformation on the specimen. For this reason, you can not obtain correct microstructure and hardness values.
Choosing correct disc is essential for metallography and hardness analysis.



Hard cut-off wheels must be used for **Soft materials**
Soft cut-off wheels must be used for **Hard materials**

Find the cut-off wheel according to your materials hardness and see t the correct wheel for your cut-off machine.

Below table is a perfect guide for choosing best cut-off wheel according to your sample type, hardness and application requirements.

Material	Requirement	-	20 HRC	30 HRC	40 HRC	50 HRC	60 HRC	70 HRC	+
Non-Ferrous	Superior Surface Quality	TRENO-NF							
Non-Ferrous	Precision Cutting				TRENO-HP				
Ferrous	Superior Surface Quality	TRENO-H							
Ferrous	Ultra Thin Cutting			TRENO-HT					
Ferrous	Cost Effective Solution			CUTO-M					
Ferrous	Precision Cutting				TRENO-MP				
Ferrous	Extremely Long Life			TRENO-DUR					
Titanium/Ductile Materials	Superior Surface Quality			TRENO-Ti					
Ferrous	Superior Surface Quality			TRENO-M					
Ferrous	Ultra Thin Cutting				TRENO-MT				
Ferrous	Cost Effective Solution					CUTO-S			
Ferrous	Superior Surface Quality				TRENO-S				
Ferrous	Superior Surface Quality						TRENO-SS		
Very Hard Metals	CBN Cutting							CBN	
Ceramic/Glass	Diamond Cutting							DIMOS	

Below table shows available diameters and order code for all types of cut-off wheels:

Cut-off Wheel Type	Ø100	Ø125	Ø150	Ø200	Ø250	Ø300	Ø350	Ø400	Ø432	Ø500	Ø600
TRENO-Ti					19-019/S						
TRENO-NF					19-020/S	19-040/S	19-060/S	19-070/S			
TRENO-H					19-021/S	19-041/S					
TRENO-M					19-022/S	19-042/S	19-062/S	19-072/S	19-082/S	19-092/S	19-097/S
TRENO-S					19-023/S	19-043/S	19-063/S	19-073/S	19-083/S	19-093/S	19-098/S
TRENO-SS					19-024/S	19-044/S	19-064/S	19-074/S			
TRENO-DUR					19-026						
TRENO-HT					19-031						
TRENO-MT					19-032						
CUTO-M					19-022/A						
CUTO-S					19-042/A						
TRENO-HP			18-150/S	18-200/S				19-400			
TRENO-MP			18-151/S	18-201/S				19-401			
DIMOS Metal Bonded	19-100	19-125 19-130	19-150 19-157	19-150 19-157	19-250	19-300					
DIMOS Resin Bonded		19-126	19-151	19-201	19-251	19-301					
DIMOS for Petrography				19-203	19-252	19-302					
CBN		19-127	19-152	19-202							

Long Life Abrasive Cut-off Wheels

TRENO-DUR	LIFE	5+
	CUTTING SPEED	4
	SURFACE QUALITY	4

TRENO-DUR brings you an exceptionally fast-cutting and long-lasting wheel. It is extremely cost effective when considering wear rate. It provides optimum specimen surface quality and cutting speed. Ideal for high volume cutting operations, process control labs, cut-check applications etc.. Available as Ø250 mm diamater.

Premium Quality Abrasive Cut-off Wheels

TRENO-Ti/H/M/S/SS	LIFE	4
	CUTTING SPEED	5
	SURFACE QUALITY	5

TRENO series abrasive cut-off wheels provide best specimen surface quality and fastest cutting speed with optimum wheel life. It guarantees minimum heat generation and perfect specimen surface. Reduces time and consumable consumption for next sample preparation processes. Available as from Ø250 to Ø600 mm diameter. 6 type of TRENO wheels makes possible to cut all type off materials with a superior surface quality.

Ultra Thin Presicion Abrasive Cut-off Wheels

TRENO-MT/HT/MP/HP	LIFE	4
	CUTTING SPEED	5
	SURFACE QUALITY	5

Ultra Thin TRENO series abrasive cut-off wheels have same properties with standart TRENO wheels. Ultra Thin TRENO wheels are ideal for sectioning small specimens like screws, nuts or any other precision parts. It provides extremely low heat generation thanks to it's low thickness. They an available as 0.5 mm thickness in Ø150 mm diameter, 0.8 mm thickness in Ø200 mm diamater and 1.0 mm thickness in Ø250 mm diameter.

Cost Effective Abrasive Cut-off Wheels

CUTO-M/S	LIFE	4
	CUTTING SPEED	3
	SURFACE QUALITY	3

CUTO series abrasive cut-off wheels are suitable for routine laboratory applications requiring a balance between wheel life and performance. It offers very good price/performance ratio. Available as Ø250 and Ø300 mm diameter.