

Cut-off Wheels

- Superior surface quality
- Faster results

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• Cost-efficiency

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Cut-off wheels specially developed for materialographic specimen preparation



The first step in the materialographic process

The first step in a process sets the pace and determines the quality of the finished result. In the materialographic process, the first step is most often sectioning. The purpose sectioning is to section a representative, yet manageable sample from a large or irregular piece of a given material or to obtain sections at specific angles, e.g. cross-sections. Sectioning makes high demands on a number of factors: Speed, planeness, amount of thermal damage and degree of deformation.

About abrasive wet cutting

The most commonly used method to section a material is abrasive wet cutting. The cut-off wheels consist of two main components: abrasives and bonding material. During sectioning, the cut-off wheel is flushed with a cooling liquid to avoid thermal damage and to remove debris, providing the highest possible material removal.

A complete product range

Struers cut-off wheels have been specially developed for materialographic specimen preparation: they produce specimens that are in perfect condition for the next preparation step. Our large range of different wheels assures that all materials can be cut without structural changes due to overheating or deformation, and guarantees maximum life time of the wheels.

The wheels are designed for Struers machines, taking into consideration the most recent developments in wet cutting techniques. Various abrasives are used for sectioning of different materials. However, AI_2O_3 or SiC in a resin bond is used for sectioning most metals.

The selection of bond hardness must be based on an evaluation of the hardness of the material. Soft materials should be sectioned with cut-off wheels having a hard bond as the grains retain their abrasive ability for a long time. Harder metals require a softer resin bond, which gives a fast replacement of abrasive grains. For the sectioning of materials with hardness above HV 700, diamond or CBN (cubic boron nitride) are used as the abrasive. Because of the high cost of these abrasives only the outer rim of the wheel is covered with abrasive particles in a resin or a metal bond. Metal bonded wheels are used for sectioning of brittle materials, such as ceramics or minerals, while bakelite bonded wheels are used for more ductile materials, such as sintered carbides or composites containing predominantly hard phases.

Intelligent cut-off wheels

All Struers abrasive bakelite wheels have built-in compensation to wear.

As a conventional cut-off wheel with uniform abrasive density wears, the sectioning performance changes from the outside to the inside. The number of grains is reduced, the load of each grain increases and the wheel appears to get softer and softer. The drawback is higher wear and a less controllable cut. The abrasive density on a Struers wheel varies across the wheel radius - with increasing density towards the center of the wheel. This means that the sectioning performance remains constant even as the wheel wears to a smaller diameter (see illustration on page 5). That is converted into less wear and better control of the section.

3D cut-off wheels* for increased performance

Struers was the first to offer cut-off wheels with a hexagonal surface pattern. The cutoff wheels are designed so that each side has a 3 dimensional hexagonal surface pattern, also called the 3D surface.

With the 3D cut-off wheels cooling of the workpiece is much more efficient. As the aim in materialography is to obtain the true, undisturbed structure, less heat damage due to more efficient cooling is an important step towards faster, more reliable preparation results. In addition, with the 3D design the problem that debris builds up during cutting is completely eliminated. The cutting table and the entire cutting chamber stay clean as the small particles easily are washed away. Cleaning of the equipment is far easier, and the risk of overflowing because of a blocked outlet is greatly reduced.

Premium cut-off wheels for increased yield or speed

The Struers Premium cut-off wheels were developed for high-volume serial sectioning, typically in the automotive industry. A unique combination of hard abrasives, thinness and a spiral-shaped surface pattern has resulted in excellent abrasive properties. This results in more sections per wheel or a higher turnaround time.

Cost efficiency

Selecting the right cut-off wheel is not just a matter of preparation quality, it is also the best way to save time and consumables. Choosing the correct wheel for an application will produce a surface which requires less subsequent preparation steps. Thus producing specimens in a shorter time and at a lower cost per sample.

channels between the hexagons is transported into the

cut, thus cooling the workpiece much more efficiently.

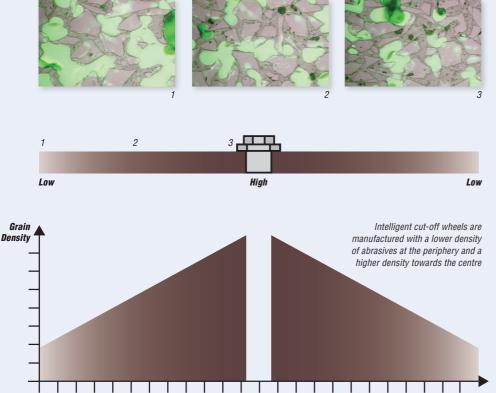
Struers range of cut-off wheels are under constant improvement and gives you:

- Specimens that are in perfect condition for the next preparation step with no thermal damage
- A complete product programme covering all materials and materialographic applications
- High quality wheels with built-in compensation to wear. The result is controlled cutting and uniform results
- 3D wheels offering less heat damage due to more efficient cooling. In addition the 3D surface means improved handling of cut-off debris and easier cleaning of the equipment
- Specimens in a shorter time and at a lower cost per sample
- Premium wheels with ultra-hard, self-sharpening grains and spiralshaped, thin wheels. The unique properties enable an increasing number of sections or sectioning speed



How to select the correct cut-off wheel:

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											iterials	iterials	y resin
Struers offers a wide variety of wheels, which means that you can select the hardness that optimally balances durability with finish.		1400									Aore ductile materials	brittle materials	predominately resin
		1000									More d	More	
If the hardness of the material is known, use the table at the top of the page. In the table at the bottom, you will then find the cut-off wheel codes for the specific cut-off machines. If the hardness of the material is not known, find a suitable cut-off wheel according to material group in the table		700						_			_		Mounted materials,
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f your material.		250											
. Move to the right, unt erial group that fits you only have one material to	r application. If you o cut, find the wheel	180					-						
vhere your material's ha lose to the middle of th le. For two or more ma	e interval as possi-	120				_	_						
an find a wheel that cov	vers the whole hard-												
ess range. For workpie arger diameters, it may o choose a material gro	improve the result	80				-					Abrasive SiC Al ₂ O ₃	Bond Bakelite Bakelite	
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