

# Reinforced Cut-off Wheels

– THE SMARTER ALTERNATIVE  
FOR OPTIMAL CUTTING

High Surface Quality  
Durable and Stable  
Cost-effective

The Aka-Cut cut-off wheels are developed and optimised to help you achieve the best cutting result in the most convenient way.

- Surface Quality = A plane surface without heat damage or deformation allows for the shortest possible grinding and polishing times
- Low Breakage Risk = The fibre reinforcement makes the wheel better to withstand the internal stress and tension when cutting surface hardened materials
- Cost-effective = High-performing cut-off wheels for routine sectioning





# Aka-Cut

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## Metallographic Cutting

Cutting is often the first step in metallographic sample preparation. In most laboratories the aim is to prepare samples as fast as possible to achieve maximum throughput in support of production.

To achieve that, all preparation steps must be optimised regarding quality and time. This is especially important for the cutting process, the use of inferior products may give short cutting times, but will result in heat damage and/or deformation. This again will result in much longer grinding times to remove the introduced damage, or, incorrect interpretation of the microstructure if not all damage has been removed.

Therefore, the cutting process has to be carried out correctly. One of the most important parameters is the use of the correct cut-off wheel which is optimised for the material type and hardness to be cut. The Akasel cut-off wheels are manufactured according to the highest standards and designed to provide the best cutting results for metallographic sectioning.

## Reinforced Cut-off Wheels

The Aka-Cut 350 HV, Aka-Cut 500 HV and Aka-Cut 650 HV are reinforced with a special fibre web on both sides for maximum durability and stiffness.

There is also a metallic flange surrounding the arbor hole at the centre of the disc, which reinforces the area, thus increasing the durability further and removing the potential for accidental damage to equipment.

Due to the increased stiffness of the wheel, the cuts are straighter and leave no unplaneness at entry point, resulting in less grinding to make the sample surface plane.

The cut-off wheels' three-dimensional surface design increases coolant distribution, effectively reducing heat buildup during cutting. This enhanced cooling minimises thermal damage and deformation.

Compared to non-reinforced wheels it can much better withstand the internal stress and tension in surface hardened workpieces and will reduce the risk of wheel breakage. Even if accidentally hitting the cut-off wheel when placing and/or clamping samples, it will not necessarily break.

## Aka-Cut 650 HV

Aka-Cut 650 HV can be used for cutting all types of harder steel, and is especially suited for hardened samples with a hardness of 500-700 HV. This is an  $\text{Al}_2\text{O}_3$  cut-off wheel with resin bond.

## Aka-Cut 500 HV

Aka-Cut 500 HV can be used for cutting all types of medium hard steel, and is especially suited for hardened samples with a hardness of 250-500 HV. Aka-Cut 500 HV is an  $\text{Al}_2\text{O}_3$  cut-off wheel with resin bond.

## Aka-Cut 350 HV

Aka-Cut 350 HV can be used for cutting all types of softer steel, and is especially suited for ferrous materials with a hardness of 200-350 HV. This is a resin bonded  $\text{Al}_2\text{O}_3$  cut-off wheel.

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# Cut-off Wheel Insights:

## Q-value, Ra-value and Recommended Hardness Range

### Wearability and Surface Finish

Value	Aka-Cut 650 HV	Aka-Cut 500 HV	Aka-Cut 350 HV
Material	Hardened tool steel 100MnCrW4 680 HV	Tool steel X40CrMoV51 450 HV	0.45% C steel Normalised 180 HV
Q	4-6	4-6	4-6
Ra	0.2-0.3 µm	0.2-0.3 µm	0.2-0.3 µm

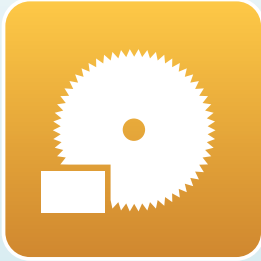
Parameters for testing
Cutting feed: 0.5 mm/s
Material diameter: 40 mm
Periferical speed: 43 m/s

"Q-value" is a measure of a cut-off wheel's wearability. A Q-value of 4 means the wheel can make four times as many cuts as a wheel with a Q-value of 1. When using a cut-off wheel with a Q-value of 1, the wheel's wear is equivalent to the material that has been cut.

"Ra-value" refers to surface roughness, specifically average roughness (Arithmetic Average Roughness). An Ra-value of 0.2-0.3 µm is approximately equivalent to the surface produced when using Rhaco Grit P320 on 0.45% C steel for 60 seconds.

### Overview of Cut-off Wheels and the Recommended Hardness Ranges

Hardness	Aka-Cut 650 HV	Aka-Cut 500 HV	Aka-Cut 350 HV
700 HV	X		
650 HV	X		
500 HV	X	X	
350 HV		X	X
250 HV		X	X
200 HV			X
Wheel dia.	Product no.:		
254 mm/10"	11251160	11251140	11251130
305 mm/12"	11301160	11301140	11301130
356 mm/14"	11351160	11351140	11351130
406 mm/16"	11411160	11411140	11411130



# Cutting Additives

– THE SMARTER ADDITIVE  
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Together with Aka-Cool, the additive for the recirculation cooling unit, the Aka-Cut cut-off wheels will perform at their very best. Aka-Cool improves the cooling and lubricating ability of the water and acts as corrosion protection for both cut-off machine and sample material.

Aka-Cool is free from amine and boric acid, common in many other machine coolants. It has optimum skin compatibility and an extremely low allergy potential. Aka-Cool guarantees a very long service life of the coolant and a safe and economical process flow.

Both in regards to cost and personal safety Aka-Cool is the optimal choice.

When excessive foaming of the cooling water occurs, Aka-NoFoam offers the ideal solution. The formation of foam drastically reduces cooling of the samples during cutting and can result in thermal damage of the material. Aka-NoFoam eliminates foam and thus increases the cooling ability of the cooling water.



Name	Contents	Product no.
Aka-Cool	1 l	19201015
Aka-Cool	5 l	19201017
Aka-NoFoam	500 ml	19501013

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