

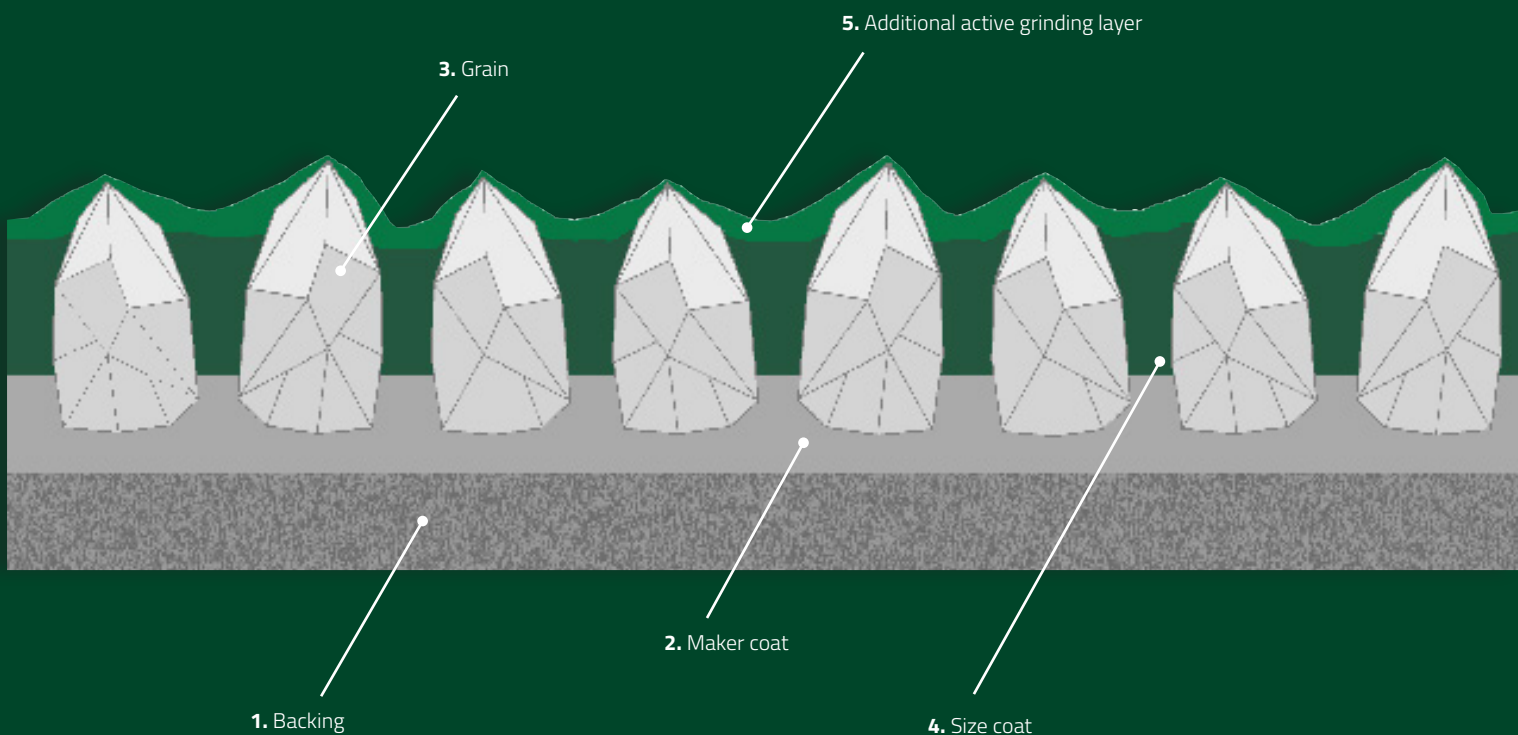
# Coated Abrasives

## — Introduction

Coated abrasives consist of a more or less flexible backing material on which abrasive grains are connected by binder. The product range of coated abrasives includes grinding belts, rolls, discs and sheets.

The abrasive consists of the following four, optionally five, components together:

1. Backing
2. Maker coat
3. Grain
4. Size coat
5. Optional: Additional coating (TOP SIZE)



## 1. Backing

The backing forms the base for the adhesion of the abrasive grain. It transfers the cutting forces to the workpiece. The backing material must be strong enough to withstand the grinding pressure and, if necessary, flexible enough to take on contours. The following backings are usually used:


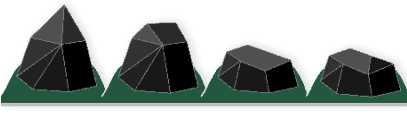

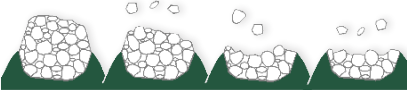
- Paper
- Cloth (J / X / Y)
- Fiber
- Blended fabric

## 2. Maker Coat

In the basic bond, the abrasive grain is glued by the maker coat with the backing material. A bond made of synthetic resin is mainly used. It gives the grain a secure hold and alignment.

### 3. Grain

The abrasive grain is responsible for the material removal. It penetrates the material and lifts off the chip. The main criteria of the abrasive grain are hardness, toughness and sharp edges. The following synthetic abrasive grain materials are used:

Grain type	Bond / Toughness	Structure	Properties / Wear properties
Aluminium oxide	hard / tough	crystalline, irregular	 <p>Wedge-shaped, block, drop formed grit / micro wear, self-sharpening</p>
Zirconium corundum	hard / very tough	crystalline, even	 <p>Wedge-shaped, block, drop formed grit / micro wear, self-sharpening</p>
Silicon carbide	very hard / less tough	crystalline	 <p>Sharp-edged, brittle, highly friable / micro wear</p>
Ceramic grain	hard / very tough	micro crystalline	 <p>Sharp-edged, pointed grit / micro wear, self-sharpening</p>

In addition there is also the compact grain, which is a composite agglomeration of different grain types. Through a synthetic resin the bond consists of many individual corundum or SiC grains, which build a big grain together. The advantage is that the compact grain

has a continuously uniform grinding effect. As soon as a grain becomes blunt it breaks out of the bond and a new, sharp grain takes its place. The surface result is even, the removal is continuous and the service life is long.

### Abrasive grain distribution

With coated abrasives various types of spaced distribution / densities enable the grain to be used optimally. The spaced distribution describes the density of the abrasive grains on the surface. There are 3 types:

- open coat
- half-open coat
- closed coat

In the case of closed coat, the abrasive grain covers the entire surface. The many cutting edges enable faster removal. The use of this closed coat is recommended if there is no clogging problem and a smooth surface is required. With an open coat, the distances between the abrasive grains are larger and allow better chip and dust removal. They are used in grinding applications where grinding chips would otherwise lead to clogging of the abrasive. This would have reduced cutting force and shortening the working life.

### 4. Size coat

The size coat assists the make coat in holding the abrasive grain. It fills the gaps in the middle of the grains and supports against forces that act on the grain during grinding. This second layer of synthetic resin combined with the base bond ensures the final grain adhesion.

### 5. Additional coating

Most of the coated abrasives are equipped with an active grinding coat layer. Active ingredient coatings with grinding aids give the grinding tool properties that positively support the grinding process. The additional layer increases the service life of the abrasive grain and reduces the heat development on the workpiece.