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# Vitrified Ceramic Grinding Wheels with Improved Performance on Hard Chrome Plating



Hard chrome plating is classified as difficult-to-cut because of its high hardness. Grinding wheels tend to have lower cutting ability and wheel life when grinding these materials compared to common metals. To achieve better performance on hard chrome plating, we recommend Noritake "CXE" ceramic wheels.

High Performance Vitrified Ceramic Grinding Wheels for Maintaining Excellent Cutting Ability.

## CXE Grinding Wheels

### [Scope of Application and Expected Benefits]

| Metallic materials |                                     | Non-metallic materials                  |                                     | Other                    |
|--------------------|-------------------------------------|---|-------------------------------------|--------------------------|
| Ferrous materials  | Non-ferrous materials (Al/Cu, etc.) | Inorganic materials (glass and ceramic) | Organic materials (rubber, plastic) | Advanced materials       |
| ●                  |                                     |   |                                     |                          |
| Shorter cycle time | Improved tool life                  | Improved machining quality              | Improved workability                | Environmentally friendly |
| ●                  | ●                                   |   | ●                                   |                          |



## What is Difficult-to-Cut Chrome Plating?

In grinding, there are various materials described as difficult-to-cut materials. Chrome plating is generally divided into decorative chrome plating and hard chrome plating (industrial purpose chrome plating). In the field of grinding, the latter one is classified as a difficult-to-cut material (in this article, we will refer to Hard Chrome plating as simply "chrome plating").

The main characteristic of chrome plating is its very high hardness, which is why it is called a difficult-to-cut material. The hardness of chrome plating depends on the plating method, but its Vickers hardness ranges from Hv750 to Hv1100, which is hard compared to other common metals <sup>[1]</sup> (Fig. 1).

Another important feature of chrome plated materials is their low coefficient of friction. The surface of chrome-plated material is covered with a coating of dense chromium trivalent oxide ( $Cr_2O_3$ ).

Since this metal chromium surface slides when in contact with other materials, the  $Cr_2O_3$  on the surface will wear slightly, and the wear powder will work as a lubricant <sup>[2][3]</sup>.

Due to the characteristics described above, chrome-plated materials are used in industrial components in various fields. With rolling-mill rolls, for example, by applying chrome plating to the surface of the roll, surface wear can be prevented. Chrome plating is applied to moving parts that rub up against each other like shafts, piston rods, and bearings to improve wear resistance and lower friction (Fig. 2).

