Types of “Micron Hard” are currently offered in two grades of P/M High Speed Steel and four grades of Cemented Carbide.

### Characteristic Position of the Materials

- **P/M HSS with fine grain crystal**
- **Cemented Carbide with fine grain carbide**
- **High Rigidity and Low Content Cemented Carbide**

### Materials and Features

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### Mechanical Properties

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*Lower hardness is available upon request.*
Ultra-fine Wire Series of Hard Materials “Micron Hard”

- Extremely fine wires with high hardness, “HSS Micron Hard”, which are already heat-treated. Dia.0.04 mm is available.
- As sintered fine wires, “Carbide Micron Hard”, which have excellent straightness. Dia.0.3 mm is available.

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■ General Specifications and Characteristics

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■ Shapes of Typical Products

- Straight pin
- Stopped pin
- Tapered pin
- Multi-stopped pin
- Ball hooked pin

■ Essential Points of the Development

- High Speed Steel Micron Hard
- Cemented Carbide Micron Hard

- Cemented carbide
  - Applied to mechanical milling (patent)
  - Grain size: 113 μm ~ 2 μm
  - Carbide size: 5 μm ~ 0.3 μm

- Cemented carbide
  - Ultra fine grain of WC
  - Special sintering process (patent)
  - WC size: 0.8 μm ~ 0.3 μm

■ Typical Application Examples

- Classification of Typical Uses

- Dot Matrix Printer (Printer Head) Type of material: P/M High Speed Steel

- Punch for Through-Hole of Semiconductor Package Type of material: Cemented Carbide

- Electrode to Make Nozzle Hole of Fuel Injector Type of material: Cemented Carbide

- Cartridge Micron Hard
  - Ejector pin for dies
  - Pin gauge for bore
  - Guide wire
  - Probe pin (IC inspection terminales)
  - Pin gauge (ceramic package)
  - Probing pin (for ceramic condenser)

- HSS Micron Hard
  - Probe pin (IC inspection terminales)
  - Pin gauge (ceramic package)

- IT-related
  - Probe pin (IC inspection terminales)
  - Pin gauge (ceramic package)

- Mobile and Digital field
  - Through-hole processing of ceramic green sheet

- Automobile-related
  - Probe pin (IC inspection terminal)
  - Through-hole processing of ceramic green sheet

- High precision machining

- High performance

- High rigidity carbide

- Suitable for small dia. drilling

- Suitable for punching of thinner hole (below ø1.1 mm)

- Suitable for thinner probe pin

- High wear resistance HSS

- High strength, high rigidity
  - Suitbe for sintered carbide with fine grain
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shapes of the products

- Long, Straight, Tapered, Stepless

Essential Points of the Development

- High Speed Steel Micron Hard
- Cemented Carbide Micron Hard

Typical Application Examples

Classification of Typical Uses

- IT-related
- Carbine Micron Hard

Example of shape of printer dot pin

Example of shape of Probe Pin

Example of Through-hole Punch

Example of Electrode

Typical Examples of Applications

- Dot Matrix Printer (Printer Head) Type of material: P/M High Speed Steel
- Punch for Through-Hole of Semiconductor Package Type of material: Cemented Carbide
- Electrode to Make Nozzle Hole of Fuel Injector Type of material: Cemented Carbide

Performance and Characteristics

- High strength, High rigidity, High wear resistance, High hardness

- Suitable for thinner probe pin below φ 0.1 mm

- Suitable for punching of thinner hole (below φ 0.1 mm)
Types of “Micron Hard” are currently offered in two grades of P/M High Speed Steel and four grades of Cemented Carbide.

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