

# CERAMIC

TECHNOLOGY MANUFACTURER PRODUCTS

Technical Data on Ceramic Products

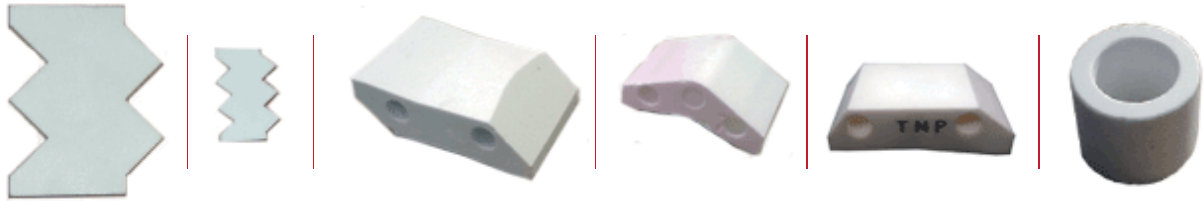


**TMP**

Technology Manufacturer Products

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## About Ceramic



### Brief Description on Ceramic

There are two kinds of ceramic, old ceramic and fine ceramic. The old ceramic is produced by fracturing, molding, and burning a clay material, whereas the fine ceramic is produced by conditioning a ceramic material with additives, molding it, and burning it at high temperature. The term "ceramic" here means the fine ceramic. There are many kinds of ceramic such as alumina ceramic that is characterized by high hardness, nonconductivity, corrosion resistance, and inexpensive price, zirconia ceramic that is used for a knife and other cutting tools, silicon nitride ceramic, and silicon carbide ceramic. The ceramic is molded by mixing 80% of higher alumina oxide ( $Al_2O_3$ ) with various additives and then pressing them under high pressure using a powder press machine. The ceramic products are often similar in appearance; however, the products have different quality levels from 20 to 100 depending on the particle size, additive composition, applied pressure, and burning temperature and time. It is difficult to cut the pressed ceramic even with a diamond cutter, whereas the cast ceramic is easily cut with the diamond cutter. The difference in their abrasion resistances is up to 5 times. You should think about it carefully if you give priority to the abrasion resistance. We have carried out a variety of tests and will continue the research on ceramic having higher abrasion resistance to produce high quality ceramic.

### Industrial Innovations by Our Engineers

Our engineers first introduced the idea of utilizing the ceramic in industrial abrasion resistance products and developed a ceramic belt cleaner approximately 30 years ago. We also developed a liner, blower, hose, pipe based on the ceramic technology. Today, many competitors offer similar products.

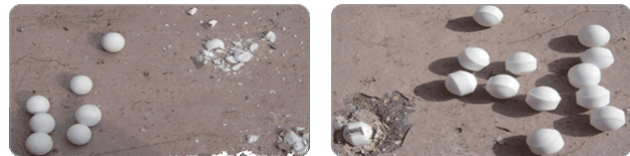
From left, a tip for a large pipe, a tip for a small pipe, 3 belt cleaner tips, and a small diameter ceramic pipe

Recently, we have developed a new type of belt cleaner, which is lightweight and highly cleanable and durable. We have also developed a ceramic hose based on a new idea, which has several times higher abrasion resistance than conventional hoses.

### Ceramic through an Electron Microscope



### Comparison between the cast and pressed ceramic



The upper left and right photos show the cast-molded and press-molded ceramic, respectively. The press-molded ceramic has sunk into a concrete base.

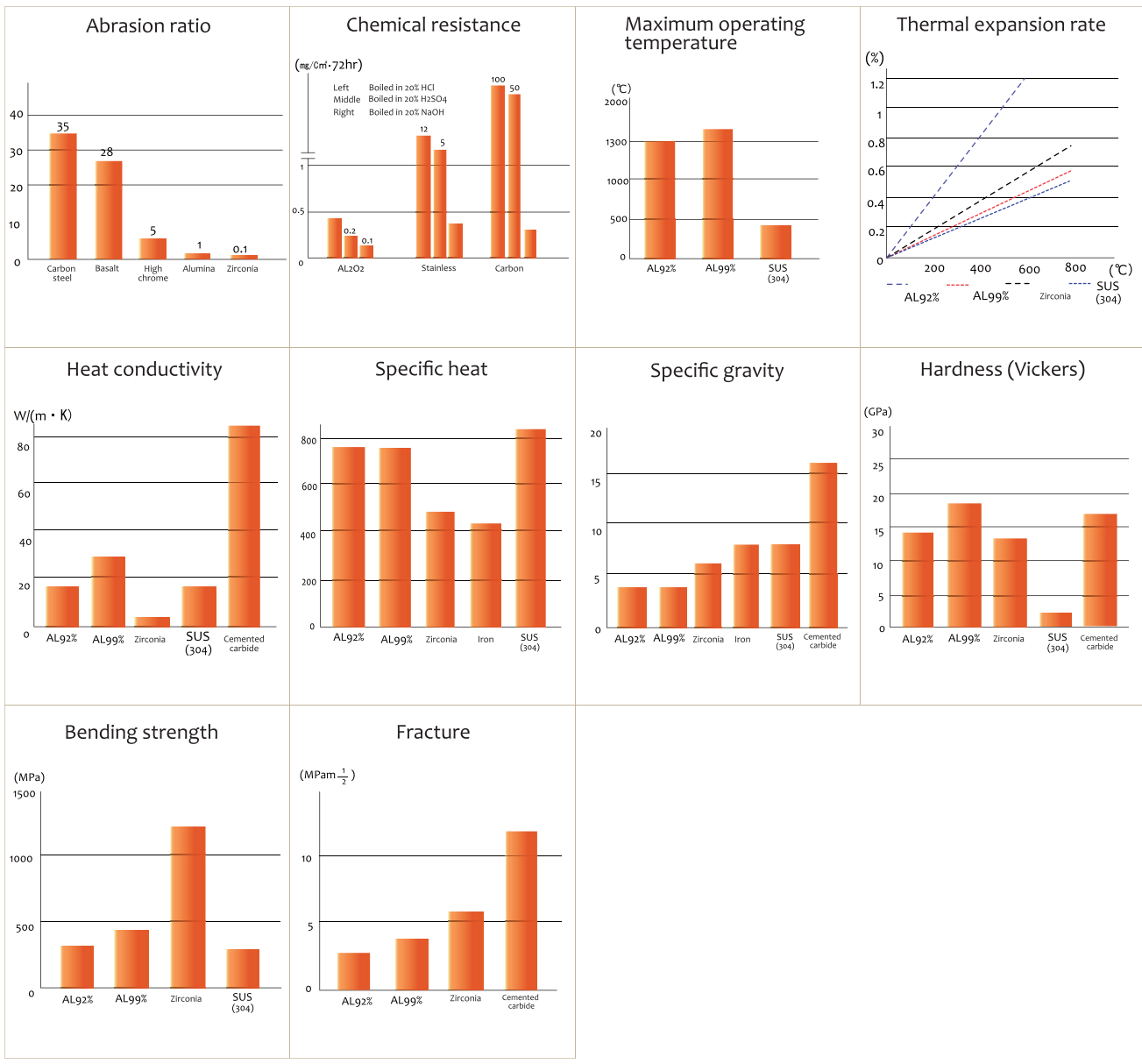


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## Ceramic Test



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