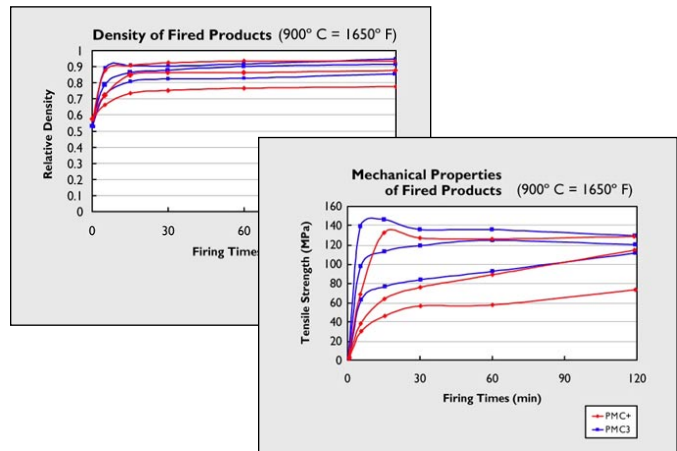


Understanding the Animated Density & Tensile Strength Charts for Precious Metal Clay®

The scientists at Mitsubishi Materials Corporation have performed hundreds of tests on Precious Metal Clay (PMC®) to insure its strength. The PMC Guild has converted several of these tests into an animation that illustrates the interdependent role of time and temperature in firing PMC.



How to read the chart

The vertical scale indicates hardness. The bottom edge shows soft clay and the top identifies the hardness of cast fine silver. The objective is to get as high on the chart as we can. The horizontal scale shows the passage of time, up to two hours.

Understanding the results

Each test was run many times at three specific temperatures. The results were averaged to create the lines you see here. The first line you will see shows the results obtained when PMC+ (red) was fired at its lowest recommended temperature (1110°F / 600°C). The second red line shows PMC+ fired at 1290°F / 700°C, and so on. The red lines are followed by blue lines, which report the same temperatures for PMC3. The final frame superimposes all six tests. It is helpful to pause the animation at this frame to digest the information.

DENSITY CHART

The top edge of this chart represents cast fine silver and is assigned the value of 100%. A point halfway down, for instance, would read as 50% and would be half as dense as conventional silver. In each firing scenario, the lines arc upward rapidly. This tells us that most of the hardening happens within the first fifteen minutes or so. Notice that the curve associated with the highest temperature is the steepest. This tells us that temperature is important—this sample gets harder faster than the others. A bump early in the PMC3 firing indicates a hardness derived from stress that is not viable in practice.

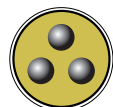
You will notice that the lines level out as they travel across the page. This indicates that the hardening process is complete. To say it another way, five minutes early in the process makes a big difference. Five minutes, added or removed from late in the process doesn't make much difference.

TENSILE STRENGTH CHART

Tensile strength refers to the ability of a metal to resist being broken when stretched. It is one of several ways to test strength. This would be especially relevant when making chain links, for instance, and less relevant when making button earrings. The vertical scale indicates strength (higher is better) and the horizontal scale shows length of firing time. Each test was run at three specific temperatures.

When tested in this way, the range of firing temperatures shows greater differences in strength. The data clearly shows that both time and temperature matter, but temperature matters more. Fire to as high a temperature as possible for maximum strength.

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