

Instructions for use Ceramic and Graphite Crucibles

Silica glass in the production of crucibles

All of our crucibles are essentially made of vitreous silica, which is nothing more than high purity silica sand fused at a temperature of over 2000°C.

Quartz glass has very interesting properties that fully justify its use in the manufacture of dental crucibles:

- Very low expansion rate, which makes it exceptionally resistant to thermal shock.
- Low sensitivity to metal oxides, providing long-lasting corrosion resistance to dental alloys.

Features and applications of crucibles for electronic casting machines

Areas of application

Almost any type of alloy can be cast in our crucibles, e.g. nickel-chromium and chrome-cobalt, palladium alloys and high gold alloys

Types of crucibles:

	Ceramic Crucible for NPA	Graphite Crucible for PA
Thermal shock Resistance	Sehr gut	Sehr gut
Adhesion of dental alloys	Normal	Normal
Alloy recommendations	Ni-Cr, Cr-Co	EM-Legierungen
Life span	~15 Ni-Cr, Cr-Co	~15 Au

Safety instructions

The response to heat shock is more pronounced with electronic melting than with flame melting, so it is important to follow the instructions below: Wir empfehlen, den Tiegel vor dem ersten Gebrauch im Ofen mit den Zylindern vorzuwärmen.

- Make sure that no alloy feed gets stuck between the crucible walls. This is because dental alloys have 30 times the expansion of glassy silica, and as the temperature rises, this difference inevitably causes the crucible to break.
- After casting, avoid impacts with metal objects such as screwdrivers or spatulas to clean the crucible. The shocks as caused by these tools significantly weaken the crucible.

Crucibles for electronic casting machines erode more than crucibles for flame melting. We have to pay close attention to the wear of these crucibles and replace them as soon as cracks appear or ceramic pieces come loose.

Casting of high gold alloys

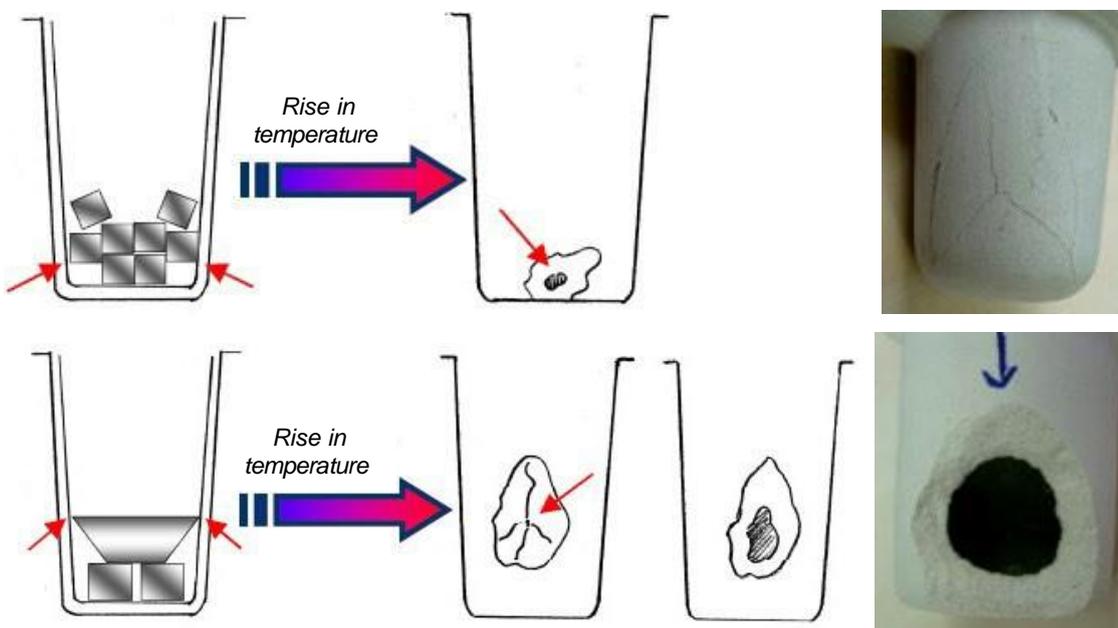
Edelmetalllegierungen sind kaum induktionsempfindlich, daher erfordern die meisten elektronischen Gießmaschinen die Verwendung eines Graphiteinsatzes, der die Rolle eines Ofens um das Edelmetall herum einnimmt.

Determining the causes of crucible damage

Fractures due to thermal expansion

When loading the crucible, it is important to properly arrange the ingots or the feeders inside the crucible. If the metal is accidentally blocked between the walls of the crucible, the pressure on the crucible during heating will be very strong, as the expansion of the metal is 30 times higher than that of ceramics, which can lead to cracks and fractures.

In most cases, the cracks spread in a cobweb-like manner from a point on the side of the crucible.

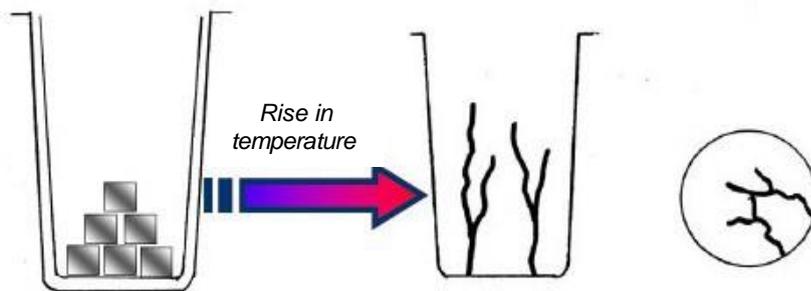


Fractures due to thermal shocks

During fueling, the temperature of the crucible in contact with the metal rises from room temperature to about 1300 °C in less than a minute. The temperature difference between the hottest area (at the bottom of the crucible) and the coldest (in the upper part of the crucible) can cause cracks in the crucible due to thermal shocks. More precisely, the difference in expansion of the ceramic between the two areas creates constraints that cause cracking

In most cases, the cracks spread vertically upwards from the bottom of the crucible (the hottest part) to the top of the crucible (the coldest part).

In order to avoid the destruction of crucibles by thermal shocks, we use vitreous silica as the basic material for our crucibles. The glassy silica is characterized by the fact that it expands very little at high temperatures.



Fractures due to moisture in the crucible

A few months may pass between the manufacture and use of the crucible, during which time it becomes charged with ambient moisture. During stoking, this moisture seeping through the pores of the crucible causes very high pressure against the walls, resulting in cracks or breakage.

It is important to dehydrate the crucible before first use to remove all moisture in the pores. We recommend preheating the crucible with the cylinder before casting in the cylinder furnace. If the crucible is used regularly, this process will not be necessary for future pours.

What to do if the crucible breaks or is worn out?

A few months may pass between the manufacture and use of the crucible, during which time it becomes charged with ambient moisture. During stoking, this moisture, which seeps through the pores of the crucible, causes very high pressure against the walls, which can lead to cracks or breakage.

If you cannot determine the cause of the damage, please contact us and send us your defective crucible. If it is a quality problem, we will send you a new crucible, otherwise we will try to find a solution so that you can use it.