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## Yttria CeraCast Powder

### Yttrium Oxide Based Castable Dry Powder Mixture

Yttria CeraCast Powder is a dry Yttrium Oxide ( $Y_2O_3$ ) powder mix which, on adding around 50 wt% water and stirring, can be poured/cast into silicone molds to form parts. After casting and drying, firing the cast part to only 1300 C results in a high-density (typically  $\geq 85\%$ ) yttria refractory.

#### Key Attributes

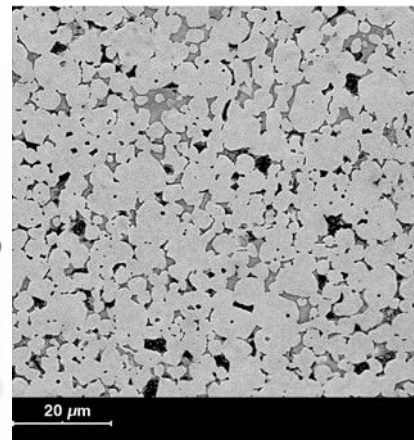
- Based on highly stable refractory – Yttrium Oxide ( $Y_2O_3$ )
- Prepared as a slurry from dry mixture by just adding water
- Readily prepared into near full density parts by cast-and-sinter technique or by press-and-sinter
- Low shrinkage during drying
- Low sintering temperature of only 1300 C for obtaining  $>95\%$  yttrium oxide over 85% dense
- Use temperature  $\geq 1300$  C and possibly to 2000 C
- Water-based – easy cleanup.

#### Use Notes

1. Mix powder well with water to a uniform consistency. Recommended mixing ratio is 31-36% water with 64-69% powder mix, by weight. Less water can lead to greater density in the final part. Mixing time should be less than five minutes. Vinegar can be used in place of water to increase the green strength of the cast piece.
2. After mixing, quickly pour or trowel the suspension into a silicone mold, paper cup, etc. Place the mold on a vibrating table or tamp the mold for a short while to remove bubbles from the suspension.
3. Dry at 60 C overnight and then carefully remove the part from the mold.
4. Sinter the part by heating to 600 C (rate: 1 C/min) and holding for 0.5-1 hour(s), and then heating to 1300 C (rate: 10 C/min) and holding for 1 hour.

Example 35 g. powder + 16 cc water (or vinegar) casts a 'puck' of 22 cc [1.5" D, 0.7" H].

ALSO: The powder can be pressed with conventional hydraulic press, followed by sintering with the conditions above (step 4).



SEM Image of Sintered  
95% Yttria Pellet

#### Specifications

Active Ingredients	Yttrium Oxide ( $Y_2O_3$ )
Max Use Temperature with All Atmospheres	$\geq 1300$ C (2372 F) possibly to 2000 C (3632 F)
Fired Composition	95% $Y_2O_3$ with special mineralizers (sintering aids)
Color	White
Shelf Life (months)	Indefinite ... but avoid getting wet before use
H F R Ratings	1-0-0
Other Notes	Mineralizer ingredients may be unwanted and tend to volatilize above 1300 C ... thus can potentially lead to all-yttria parts/components.

#### Sizes and colors

Yttria CeraCast Powder is white colored powder.  
Standard Sizes: 1 qt. or 8 oz epoxy-lined can

#### Ideal Use

- Casting your own specialty refractory shapes
- Producing high-density yttria parts at only 1300 C sintering in any atmosphere
- Making electrically and thermally insulating ceramic shapes

#### Safety Information

- Consult SDS before use.
- For industrial use only

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