GILCAST S ER

Synthesegips Service

Gypsum-bound goldsmith's embedding material for casting precious-metal alloys

Advantages of Gilcast S ER
- Optimum consistency
- Smooth surface with maximum reproduction of detail
- Ease of removal from mould
- Uniform quality

Properties

Mixing ratio powder : water	1 kg : 360 - 400 g
= Mixing volume	770 - 790 ml
(see Table 1)	
Processing time	approx. 10 min.
(mixing, deaeration, pouring, deaeration of contents of flask)	
Waiting time before preheating	60 min.
Preheating temperature	500 to max. 750° C
Preheating cycle	see Table 2

Directions for use

The temperature of both the **Gilcast S ER** and the water to be mixed with it should be 20 - 23° C. If the temperature is lower, the setting time may be unduly prolonged. The setting time can be reduced by the use of water whose temperature is above 30° C and not more than about 35° C.

The ratio of powder to water can be varied to suit the application within the limits stated above. The weight of powder required for a particular volume of embedding material can be calculated, but the quantities given in Table 1 for various common sizes of cylindrical flask can be taken as a guide.
The necessary quantity of water is placed in the mixer and the chosen quantity of **Gilcast S ER** ist stirred in portionwise. It is advantageous, but not essential, to use a stirred vacuum mixer. If mixing is carried out by hand, particular care should be taken to mix the powder and water intimately.

The embedding material prepared in this way is poured into the flask in which the previously prepared wax patterns have been positioned. The mix is compacted by gentle vibration, and, if at all possible, pouring is carried out under vacuum.
If the flasks are not filled under vacuum, the material should be poured carefully down the sides, so that the wax patterns are gradually covered from below, In any case subsequent application of vacuum is recommended, in order to remove any air bubbles clinging to the patterns.

Allow the filled flasks to stand for 60 min before preheating. They may then be placed in the oven, which should be preheated to a temperature of 180° C.

The preheating period depends on the size and number of flasks. Flasks 100 mm in diameter and 200 mm high need to be heated up to the casting temperature in predetermined stages over a period of 12 h, while for smaller ones (e.g. 50 mm in diameter x 50 mm high, or 90 mm in diameter x 100 mm high) the heating-up period need be no more than 8 - 10 h. An example is given in Table 2.

When the alloy is poured, the manufacturer's directions should be observed.
When the flasks have cooled to room temperature, the castings can be removed by methods suitable for the alloy in question.

Surfaces can be cleaned with commercial pickling solution.

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Special note

Do not mix **Gilcast S ER** with other products.

Shelf life

Gilcast S ER can be stored for at lease one year in closed moisture-tight containers.

If **Gilcast S ER** has been stored at temperatures differing considerably from that at which it is to be used, the required quantity should be conditioned for several hours at a temperature of 20 - 23° C before mixing.

Prolonged storage at temperatures greater than 30° C shortens the useful life of **Gilcast S ER**

Packaging

Paper bags, plastic lined 25 kg

Table 1

Quantities for various sizes of cylindrical flask

Flask diameter	height	**Gilcast S ER**: water 100 : 38		100 : 40	
		powder	water	powder	water
mm	mm	kg	g	kg	g
100	100	1.00	380	0.95	380
100	150	1.50	570	1.45	580
100	200	2.00	760	1.93	772
100	230	2.32	882	2.25	900
90	100	0.80	304	0.78	312
90	150	1.20	456	1.18	472
90	200	1.60	608	1.58	632

Table 2

Example of 12-h preheating cycles
Oven already at approx. 180° C

Duration	Temperature
4 hrs	180° C
4 hrs	180° C rising to 720° C
3 hrs	at 720° C (maximum permissible: 750° C)
1 hrs	cooling down and staying at appropriate casting temperature

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Faults on finished castings and their possible causes

1. Bubbles

a) Ratio powder : water not correct, mix may be too thick
b) Powder/water not sufficiently mixed
c) Working time exceeded or investment disturbed while setting
d) Vibration and/or vacuum not sufficient
e) Surface of wax pattern greasy, dirty or electrostaticly charged

2. Flashes or Fins

a) Ratio powder : water not correct, mix may be too thin
b) **Gilcast S ER** has been stored contrary to instructions and has absorbed moisture
c) Working time exceeded or investment disturbed while setting
d) Flask placed in furnace with insufficient setting time. Allow the filled flask to stand for 60 min. before burnout
e) Flask heated too rapidly
f) Flask burned out and allowed to cool before casting
g) Flask filled too early, settlement causes an inhomogeneous mould
h) Burnout of wax too rapid
i) Metal cast with an excessive pressure; adjust rotation speed of machine to weight of metal and type of work to be cast
k) Metal cast with an excessive temperature
l) Flask allowed to dry before burnout; avoid interruption of working cycle

3. Rough surface "Orange peel"

a) Rough surface on wax pattern
b) Improperly sprued pattern
c) Flask burned out without sufficient setting time. Allow the filled flask to stand for 60 min. before burnout
d) Flask heated too rapidly or maximum temperature exceeded
e) Poor quality of metal
f) Metal cast at an excessive temperature

4. Incomplete castings

a) Pattern improperly sprued; sprues too thin, too long or too few
b) Wax burnout incomplete
c) Mould or metal too cold when casting
d) Insufficient metal

5. Porous castings

a) Pattern improperly sprued
b) Wax burnout incomplete
c) Mould or metal overheated
d) Poor quality of metal; never use more than 50 % old metal in cast.

6. Darkened rough castings which resist deoxidizing in pickling solution

a) Burnout temperature too high
b) Metal overheated

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7. Shiny castings before pickling

a) Wax burnout incomplete
b) Metal too cold when casting

8. Foreign particle inclusions in castings

a) Setting time of investment (60 min.) not observed before burnout
b) Flask heated too rapidly
c) Molten metal contained foreign particles
d) Flask unclean prior cast
e) Crucible old and disintegrating
f) Crucible not dry before use; graphite has a tendency to absorb moisture and break down.

9. Investment particles

a) Sharp corners or bends in sprue system
b) Setting time of investment (60 min.) before burnout not observed
c) Flask heated too rapidly
d) Working time of powder/water-mix exceeded

10. Water marks on castings

Flasks filled too early, settlement of parts of mix, caused by:
a) recommended mixing temperature 20 - 23° C not observed
b) Mixing ratio powder/water is not correct
c) Investment has absorbed moisture when stored contrary to recommendations.

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