GILCAST S SP20

Synthesegips Service

Gypsum-bonded investment compound for casting bronze (art casting)

Advantages of GILCAST S SP20

- excellent suitability for bronze casting
- favorable processing consistency
- smooth cast surfaces with optimal detail reproduction
- easy removal
- constant quality

Properties

Mixing ratio	
Powder : Water	1kg : 0.36 – 0.40 l
= mixing volume	0.77 – 0.79 l
	(see table 1)
Working time from start of addition (= mixing, evacuating, pouring out, vacuum treatment of cuvette contents)	approx. 20 min.
Waiting time before preheating	at least 120 min.
Preheating temperature	500 up to max. 750°C
Heating speed	accord. to table 2

Directions for use

GILCAST S SP20 and the mixing water should have a temperature between 20 – 23°C before the actual mixing. Water temperatures above 30°C to approx. 35°C reduce the setting time, lower temperatures will increase the setting time.

The mixing ratio can be varied within the above-mentioned range depending on the area of application. The quantity suitable for the cuvette used can be calculated from the stated mixing volume. For detailed data see table 1.

The required amount of water is filled into the mixing vessel and **GILCAST S SP20** is added in the chosen ratio. The use of a vacuum mixer is recommended, however, not obligatory. When mixing manually, care should be taken that the powder and water are thoroughly homogenized.

The prepared investment compound is poured into the casting cuvette with the properly prepared wax patterns ensuring slight vibration and under vacuum, if possible.

If the cuvettes are not filled under vacuum, the investment compound should be carefully poured down the sides of the cuvette such that the wax patterns are covered by the investment compound from the bottom. A subsequent vacuum treatment of the filled cuvette is recommended in any case to remove any air bubbles which might adhere to the wax patterns.

The holding time before the preheating is 2 hrs. Then, the cuvette is positioned into the cold oven or an oven heated to 150°C to 180°C.

The heating speed depends on the size and number of cuvettes. When using cuvettes of 100 x 200mm, heating up to the casting temperature will be in fixed stages within 12 hours. For smaller cuvettes (e.g. 50 x 50 mm to 90 x 100mm), a heating time of a total of 5 and 8 hours, respectively, is sufficient. Table 2 contains examples of heating cycles.

When casting the alloy, the instructions of the alloy manufacturer are to be observed.

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The cast can be removed after cooling down to room temperature and observing the method suitable for the alloy.

A commercially available pickling agent may be used to clean the surface.

Special note

Do not mix **GILCAST S SP20** with other products.

Shelf life

GILCAST S SP20 can be stored for at least one year in closed moisture-tight containers.

If **GILCAST S SP20** 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 of **GILCAST S SP20** at temperatures greater than 30° C has a negative effect on the storage life.

Packaging

Paper bags, plastic lined	25 kg

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Table 1

Quantities for various sizes of cylindrical flask

Cuvettes (cylindrical)		GILCAST S : water			
Diameter mm	Height mm	100 : Powder kg	38 Water g	100 : Powder kg	40 Water g
100	100	1.0	380	0.95	380
100	150	1.5	570	1.45	580
100	200	2.0	760	1.93	772
100	230	2.32	882	2.25	900
90	100	0.8	304	0.78	312
90	150	1.2	456	1.18	472
90	200	1.6	608	1.58	632

Example of 12-h preheating cycles

A) Positioning in the pre-heated oven (150°C)

Time of exposure:		
	2 hrs.	at 150°C - 180°C
	2 hrs.	up to 300°C
	2 hrs.	up to 500°C
	4 hrs.	up to 700°, max. 750°C
	2 hrs.	Cooling down and holding at casting temperature

B) Positioning in the cold oven

Time of exposure:		
as soon as possible		up to 150° C – 180°C
	2 hrs.	at 150° - 180°C
	2 hrs.	up to 300°C
	2 hrs.	up to 500°C
	4 hrs.	700°C
	2 hrs.	Cooling down and holding at 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 SP1** 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

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.

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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

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

The recommendations are given to the best of our knowledge after careful control. We guarantee the quality of our products. Any further liability cannot be accepted since the proper application of our products is outside of our control.

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