



## Gypsum-bonded investment compound for casting precious metal alloys

### GILCAST S SP20 offers:

- excellent suitability for bronze casting
- also suitable for very large cuvettes (0.5t to 1t)
- favorable processing consistency
- smooth cast surfaces with optimal detail reproduction
- easy removal
- constant quality

### Characteristics

Mixing ratio  
Powder : Water  
= mixing volume  
(see table 1)

1kg : 0.36 – 0.40l  
0.77 – 0.79 l

Working time from start of addition approx. 20 min.  
(= mixing, evacuating, pouring out, vacuum treatment of cuvette contents)

Waiting time before preheating at least 90 min.

Preheating temperature 500 up to max. 750°C

Heating speed accord. to table 2

### Processing

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 1.5 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.

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.

### Please observe!

Do not mix GILCAST S SP20 with other products.

### Storage life

In well-closed, humidity-tight drums for at least 12 months.

Material that was stored under heavily deviating temperatures, is to be conditioned for some hours at 20 - 23°C before use.

A longer storage at temperatures above 30°C has a negative effect on the storage life.

### Packaging

Plastics bucket 20 kg  
Paper backs with film lining 25 kg  
Fibre drums with film lining 45 kg

The above information is given to our best knowledge and after thorough examination. We guarantee perfect quality of our products, however, shall not be liable for further processing results which are normally beyond our control.





**Table 1**

Quantities of use for various cuvette sizes

Cuvettes (cylindrical)

Mixing ratio GILCAST S SP20: Water

Diameter mm	Height mm	100 : 38		100 : 40	
		Powder kg	Water g	Powder kg	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

**Table 2**

Examples of heating cycles spanning 12 hours

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:		up to 150° C – 180°C
as soon as possible	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.





### Casting defects and their causes

#### 1. Bubbles

- a) Mixing ratio of powder : water was not observed, mixture is too thick
- b) Powder / water insufficiently mixed
- c) Working time exceeded or investment interfered with during setting
- d) Vibration and/or vacuum insufficient
- e) Surface of the wax pattern is statically charged, greasy or dirty

#### 2. Flashes

- a) Mixing ratio was not observed, mixture is too thin
- b) Humidity intake of GILCAST S SP20 because of improper storage
- c) Working time exceeded or investment interfered with during setting
- d) Holding time of muffle before preheating was not observed
- e) Muffle heated too quickly
- f) Muffle excessively cooled down before metal cast
- g) Inhomogeneity of muffle filling because of sedimentation (muffle filled too early)
- h) Temperature during wax melting increased too quickly
- i) Metal cast with excessive pressure, adjust rotational speed of casting machine to metal weight and type of casting
- k) Metal cast at excessive temperature
- l) Muffle dried out before preheating Avoid interruptions of the processing course.

#### 3. Rough surface, "orange peel"

- a) Wax pattern with rough surface
- b) Cast channel system insufficient, defective
- c) Holding time of muffle was not observed
- e) Metal quality insufficient
- f) Metal overheated

#### 4. Incomplete cast

- a) Casting channels too narrow, too long or insufficient
- b) Wax did not completely melt
- c) Muffle or metal too cold when casting
- d) Metal quantity not sufficient

#### 5. Porous cast

- a) Casting channels not matched
- b) Wax did not completely melt
- c) Muffle or metal overheated
- d) Metal contaminated (scrap metal addition not exceeding 50%)

#### 6. Cast with dark, rough surface which cannot be pickled

- a) excessive preheating temperature
- b) Metal overheated

#### 7. Cast with bright surface before pickling

- a) Wax did not completely melt
- b) Metal too cold during casting

#### 8. Cast with foreign particle embeddings

- a) Holding time of muffle was not observed
- b) Muffle heated too quickly
- c) Metal contaminated
- d) Muffle contaminated before investment
- e) Casting pot worn, gives off particles
- f) Casting pot not dry before use. Humidity is absorbed by graphite and results in the destruction of the pot

#### 9. Cast with investment compound embeddings

- a) Sharp edges or borders in the casting channel system
- b) Holding time of muffle was not observed
- c) Investment heated too quickly. Check heating cycle
- d) Working time of the mixture, investment compound/water exceeded

#### 10. Water courses on the cast surface

- Filling of muffle too early, mixing parts are sedimenting; caused by
- a) Deviation from the recommended mixing temperature of 20 - 23°C
  - b) Non-observance of the mixing ratio
  - c) Humidity intake of the investment compound because of improper storage