



# LEADING PLASTER TECHNOLOGIES

*For SANITARYWARE*  
— ASIA

# BOOST YOUR PERFORMANCE

## It is more than plaster...

At Saint-Gobain Formula, we are offering advanced casting solutions for ceramics, as sanitaryware, tableware, rooftile, handformer.

- ▶ We use premium natural gypsum to manufacture alpha and beta plasters. Advanced calcination and grinding technologies enable us to achieve high performance and consistent products.
- ▶ Our tailor-made solutions are based on our expertise in the ceramic manufacturing process and our "Art of Formulating".

## We are more than a plaster supplier...

At Saint-Gobain Formula, we are your trusted partner with vast industry experience.

- ▶ We offer a full process assessment; from mould-making to casting shop and problem solving for improving your production yield.
- ▶ We can provide training in your plant to improve the plaster-knowledge of your teams.
- ▶ We guarantee total confidentiality: we understand that it is your "know-how" that makes the difference.



# ABOUT US

# formulate together brighter futures



**OUR VISION** Be the worldwide leader in the specialist gypsum and plaster industry.

**SUSTAINABILITY** Through our people and close collaboration with our customers, we provide high quality, customised and sustainable solutions.

### OUR VALUES



Respect



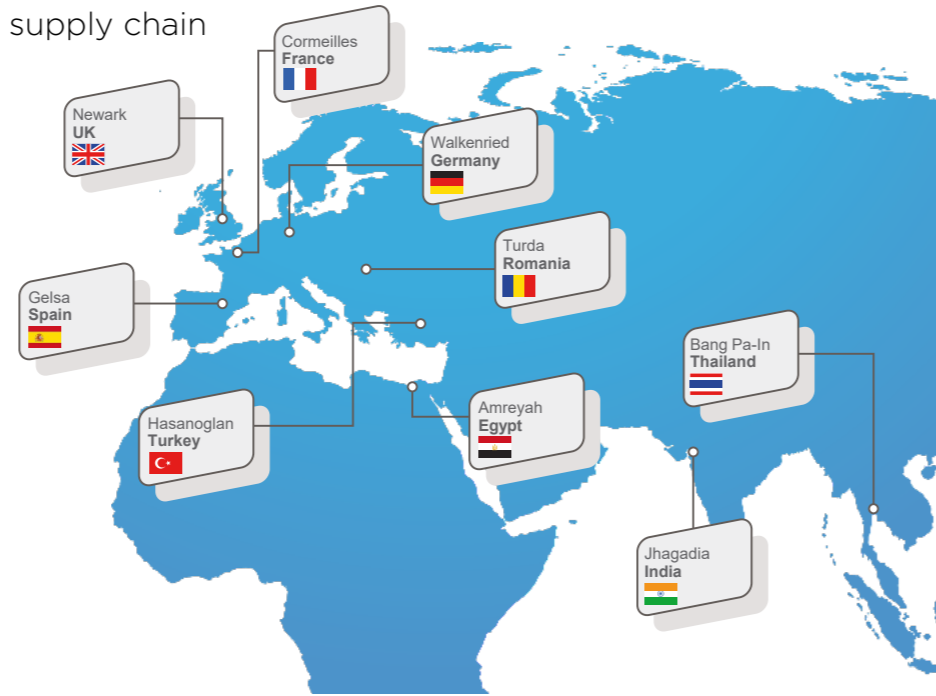
Ambition



Passion

## OUR MANUFACTURING PLANTS

A global supply chain



CERAMICS



CONSTRUCTION MATERIALS



FIBROUS & DECORATIVE PLASTER



FOOD, AGRICULTURE & ENVIRONMENT



DENTAL & PERSONAL CARE



CEMENT



In all ceramic applications (sanitaryware, tableware, rooftiles and hand former), mould properties and performance are key to achieve high quality finished items. Saint-Gobain Formula's ceramic plasters are highly valued for their technical properties, which include controlled porosity, mechanical strength to ensure mould durability, dimensional accuracy and perfect reproduction of fine details, design flexibility and ease of use compared to other techniques.

Saint-Gobain Formula offers a comprehensive range of sanitaryware plaster formulations for slip casting, multi casting, spagless, medium pressure casting processes and case moulds with dedicated products adapted to specific customer requirements.

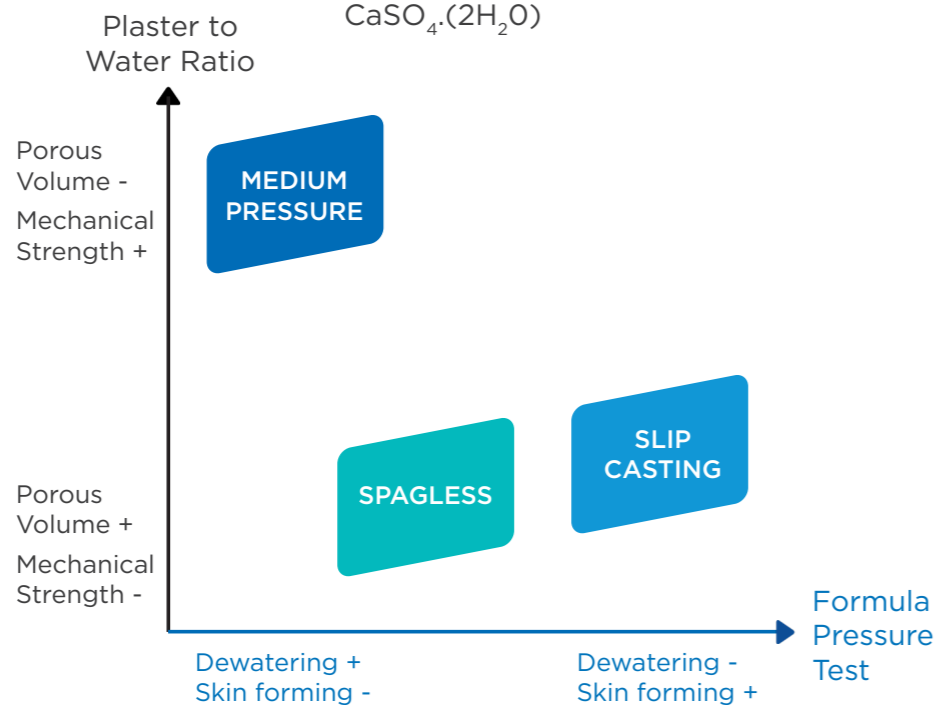


# PLASTER MOULDS

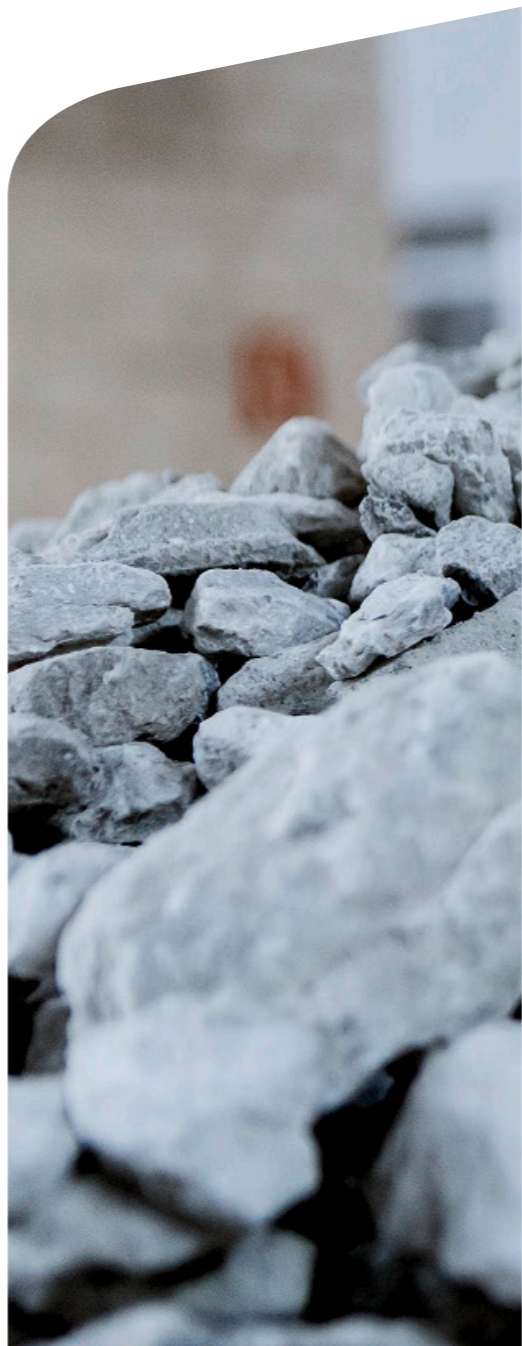
## LEADING TECHNOLOGY

Plaster is the hemi-hydrated form of calcium Sulphate, and it is made by calcining gypsum. When the dry plaster powder is mixed with water, it becomes gypsum again.

We can adjust the plaster to water ratio, setting time, absorption and permeability according to your mould making process and the properties required by your casting production and your ceramic slip.



**Formula Pressure Test** is our innovative testing method to ensure the performance of our advanced plaster solutions.



### Why should I use a plaster mould to manufacture my sanitaryware?

- ▶ It gives the best quality with an exact reproduction of the shape and details.
- ▶ It brings a high degree of production flexibility and does not require a high investment.
- ▶ It allows the production of complex designs and small series required to innovate in the sanitaryware market.

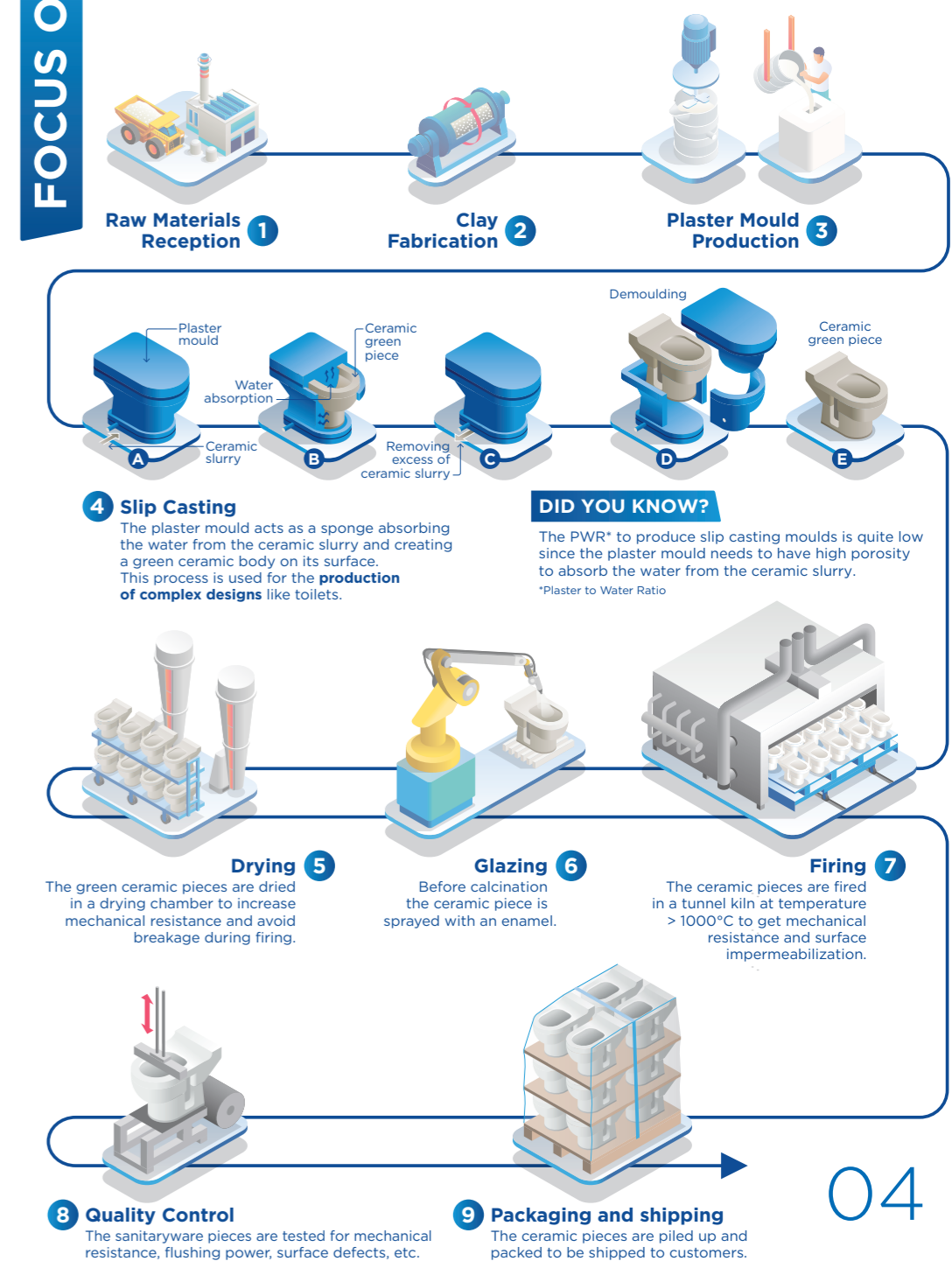
We adapt our plaster solution to your casting technology

We optimise our formulation to maximise your productivity

Properties	Slip Casting	Multicasting	Spagless	Medium Pressure
Casts/days	1 to 2	2 to 4	3 to 8	8 to 10
Average mould life	100 casts	120 casts	150 casts	500 casts
Mould property for casting	Absorption	Absorption	Absorption	Filter press
Mould recovering after casting	Drying	Drying	Dewatering	Dewatering

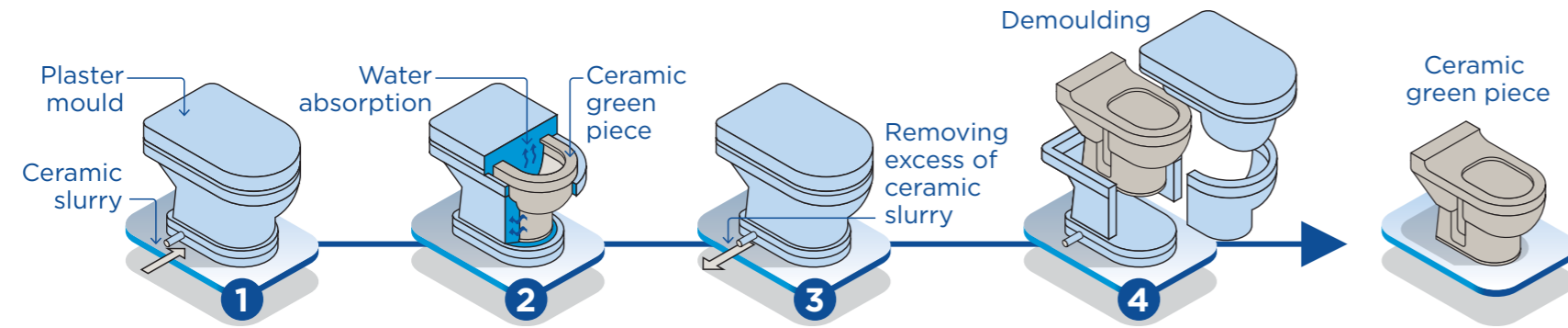
## FOCUS ON

### SANITARYWARE CERAMIC PRODUCTION



# SLIP CASTING

## ABSORPTION HIGH POROSITY



The casting technique, in which clay slip is poured into plaster moulds, is the traditional technique used for the production of ceramic items. The porosity of the plaster mould absorbs the water from the slurry and thus causes a deposit of material to form on the inner wall of the mould, taking the shape of the mould. The thickness of this “skin” is function of the time over which it is allowed to form.

Product				Benefits
Supraduro SN 75E		1.47:1	12 - 17 min	- Consistent performances - Optimized mechanical properties and water absorption - Formulated for working at low plaster to water ratio (PWR)
Molda SN 75C		1.51:1	12 - 17 min	- Consistent performances - Optimized mechanical properties and water absorption - Higher fluidity, suitable for complex product designs
Molda SN 75CL		1.51:1	17 - 22 min	- Consistent performances - Optimized mechanical properties and water absorption - Long setting time
Molda SN 80		1.25:1	12 - 18 min	- Designed for slip casting - Gentle absorption - Adapted for low plaster to water ratio



# MULTI CASTING

## INNOVATIVE TECHNOLOGY

### MC Multicasting plaster

range has been developed to improve the absorption rate and mould life. Our Multicasting products allow customers to improve productivity by increasing the number of casts in a given period of time.

- ▶ MC Multicasting plaster characteristics include:
- ▶ Porosity is not affected by a variation of plaster to Water Ratio (+/- 20%).
- ▶ Fluidity of MC plasters remains stable during pouring.
- ▶ Plaster can be poured as soon as it has been blended.  
Casting time is longer, even though the plaster starts to set earlier.

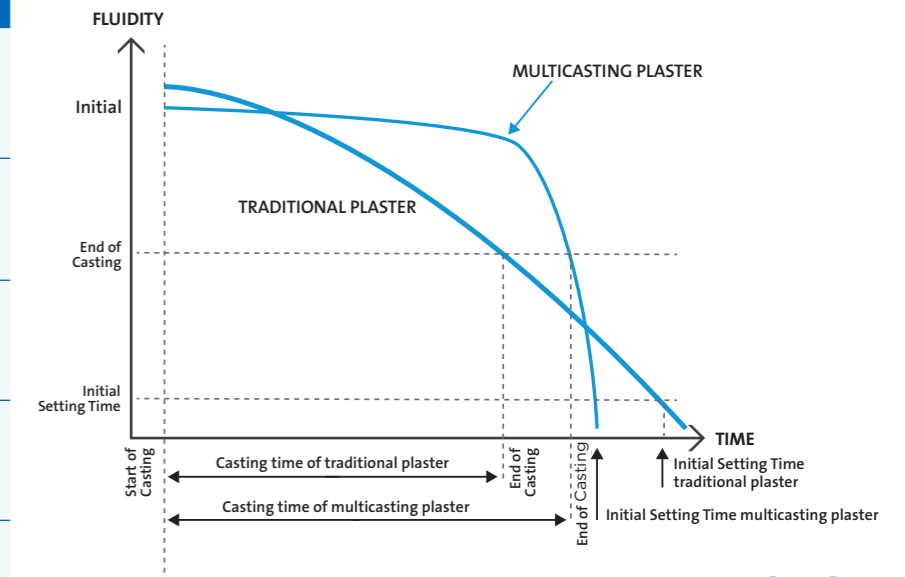
**The mechanical strength of the moulds is significantly improved, thus enabling a quicker release of the piece and improved performances.**

Product				Benefits
Supraduro MC 65		1.52:1	15 - 20 min	- Designed for sanitaryware - Multicasting plaster - High mechanical strength
Supraduro MC 70		1.43:1	10 - 15 min	- Designed for sanitaryware - Multicasting plaster - High absorption capability
Supraduro MC 70QV		1.35:1	12 - 18 min	- Design for slip casting in sanitaryware - Strong absorption, fast thickness - Superior product for multicasting
Supraduro MC 75		1.35:1	14 - 17 min	- Designed for multicasting - High water absorption capacity - Consistent performance
Supraduro MC 75L		1.35:1	15 - 20 min	- Designed for multicasting - High water absorption capacity - Longer setting time

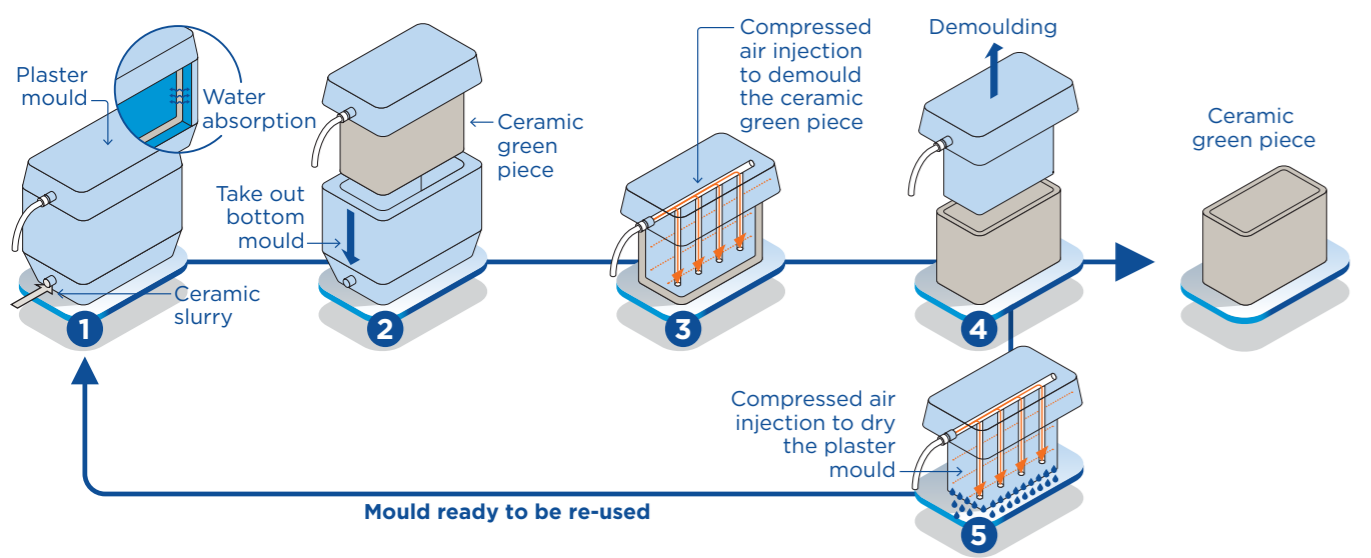
### KEY FIGURES

- Up to **20%** increase in mould life
- Up to **4 casts/day**
- Stable mould making process

**Saint-Gobain Formula MC innovative technology,** is the most suitable solution to be able **to cast up to 4 pieces per day.**

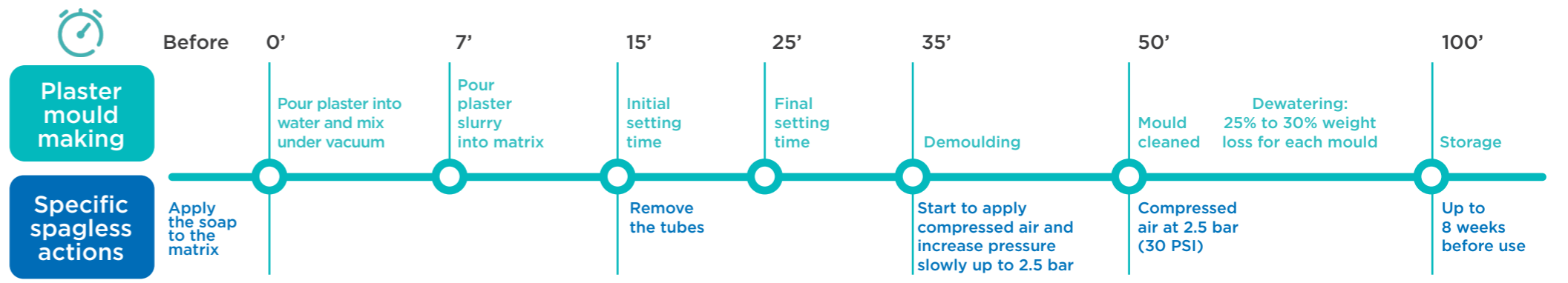
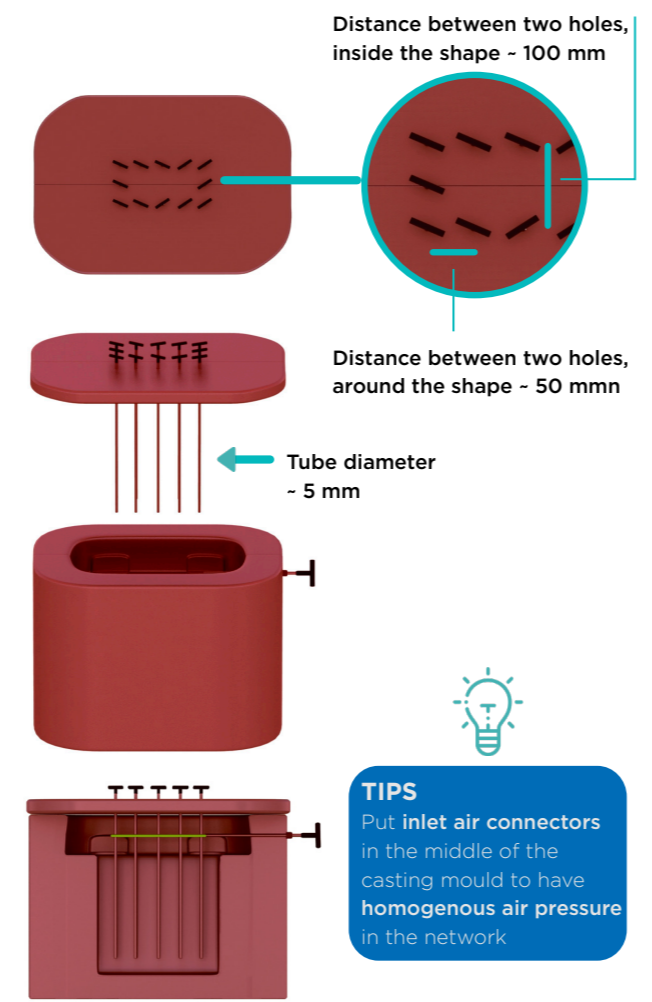


# SPAGLESS



Spagless technology involves the replacement of the drying phase by a dewatering phase with compressed air. Spagless requires specific mould properties. Spagless technology has become popular to increase productivity, with the highest quality and limited investment compared to high pressure casting. It requires technical expertise and adaption of the process, for example the ceramic body slip, casting equipment or mould making.

## Mould Making Process



Saint-Gobain Formula has developed a specific plaster range to get the maximum benefits of the spagless technology.

**KEY FIGURES**  
 Up to **50%** increase in mould life  
 3 to 8 casts/day



Product	Ratio	Setting Time	Benefits
Supraduro S14 JM*	1.35:1	15 - 20 min	- High drying performance - Excellent fine surface details - Extended mould life
Supraduro SM 03*	1.40:1	14 - 19 min	- High absorption capacity - Smooth mould surface - Long mould life
Supraduro SM 09*	1.33:1	13 - 18 min	- Consistent absorption - Smooth mould surface
Supraduro SM 16*	1.33:1	15 - 22 min	- Designed for spagless - High permeability with adapted absorption - Controlled expansion
Supraduro SM 19*	1.45:1	14 - 17 min	- Designed for spagless - High absorption capacity - Fine surface details

\* Requires water temperature control

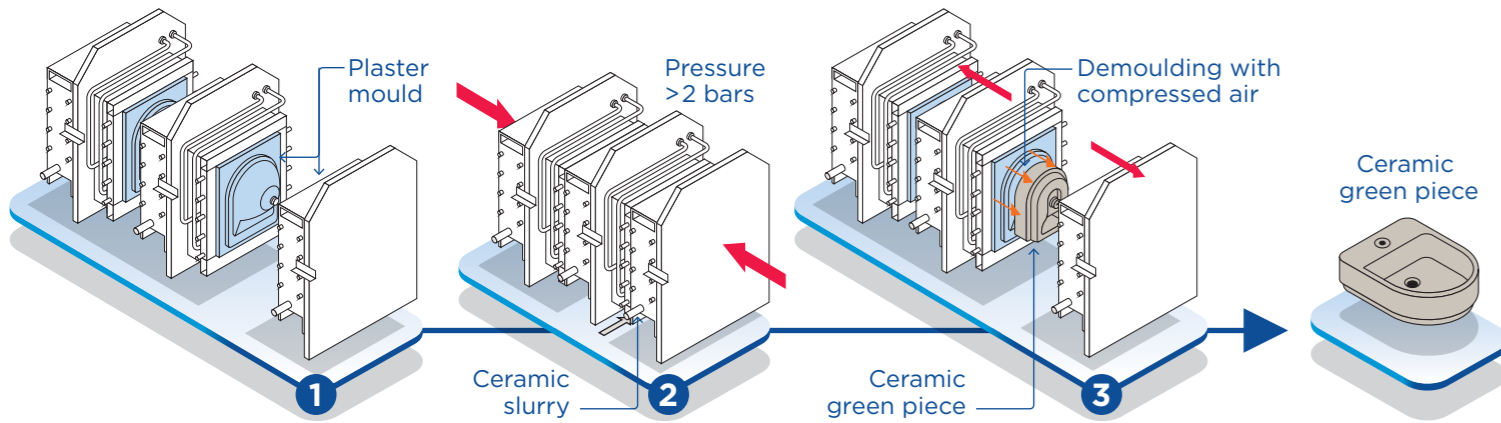
# MEDIUM PRESSURE CASTING

## Medium pressure casting

The mould is no longer used for its natural porosity but as a filter-press. A network is created using porous sleeves or tubes directly casted into the mould. With extensive experience in alpha plaster production, we supply a high permeability dedicated solution for medium pressure casting.

### Main qualities

- ▶ High mechanical properties
- ▶ Fast dewatering time



**KEY FIGURES**

Up to **500** pcs/mould

Up to **10** casts/day

Product				Benefits
Sanidur 28		3.57:1	21 - 27 min	<ul style="list-style-type: none"> <li>- Designed for medium pressure casting</li> <li>- Very high strength</li> <li>- Controlled in expansion</li> </ul>



# CASE MOULDS

Plaster case moulds offer a very high flexibility for the production of new or complicated designs.

It is easy to produce, you can start faster a new design and limit the investment required.

Plaster moulds are easy to produce. You can start your new sanitaryware design faster and with low investment.

### Main qualities

- ▶ Extreme hardness
- ▶ Flawless dimensional stability
- ▶ Excellent surface finishing

**KEY FIGURES**

Small series : Best value for money

Up to 100 working moulds produced with one case mould

# Case mould plaster for modelling

Product				Benefits
Olafdur		3.33:1	9 - 14 min	<ul style="list-style-type: none"> <li>- For case and block moulds</li> <li>- Very high strength</li> <li>- Very high dimensional accuracy (limited in expansion)</li> </ul>



# BEST PRACTICE

## PLASTER TO WATER RATIO

- ▶ Weight each mix accurately.
- ▶ Always add plaster to the water, NOT water to the plaster
- ▶ Allow the plaster to soak at least one minute (to help remove the air and allow each particle to be saturated with water).
- ▶ Use the PWR (Plaster to Water Ratio) mentioned in our Product Datasheet:
  - PWR too high : plaster becomes too thick and it could lead to air bubble entrapment.
  - PWR too low: plaster particles may sink before the plaster sets (giving an uneven quality and abnormal mould swelling, with the additional risk of hairline cracks). Tiny air bubbles may be trapped under mould surface which will start to appear as the mould starts to wear. A low plaster to water ratio increases the mould's absorption capacity to the detriment of its mechanical strength.

## CLEANING

- ▶ Gypsum is a very powerful setting accelerator. Cleaning immediately all the blending equipment after every mix is highly recommended.

## BLENDING

- ▶ Use only mechanical blending.



3 blade propeller  
**Diameter of the blade:**  
1/4 to 1/3 high of the mixing bucket  
**Mixing speed:**  
200 rpm to 400 rpm  
**Mixing time:**  
2 to 5 minutes

- ▶ Use automatic equipment to ensure perfectly reproducible conditions everytime.

## TYPE OF WATER:

- ▶ Low dissolved salt (< 400 ppm), to avoid risk of efflorescence.
- ▶ Temperature between 15°C and 20°C (hot water may accelerate the setting time).

## DRYING

- Good drying ensures good mechanical properties
- ▶ and consistent mould life.
- Drying should start minimum 10-12 hours after
- ▶ mould making.
- Temperature < 40°C in dry condition to avoid crystalline water to evaporate.



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