



Centro di Progettazione, Design & Tecnologie dei Materiali



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The service will be provided by the partnership:

**Consorzio CETMA**  
Mould design

**Modelli Ceramici**  
Mould production

**ACPA SERVICE/Euroconsulting**  
Marketing of the service

**WE ARE PRESENT AT CERAMITEC 2009**  
New Munich Trade Fair Centre - Munich - Germany  
20 - 23 October 2009  
HALL B6  
BOOTH 320

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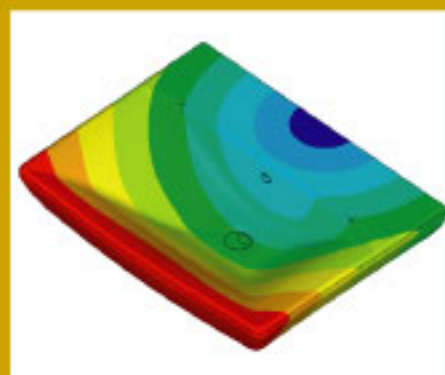
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SI.STA.CER METHODOLOGY

**INNOVATIVE MOULD DESIGN  
METHODOLOGY FOR CERAMIC  
SANITARYWARE PRODUCTION**



The methodology has been developed by CETMA within a research project co-funded by the Italian Ministry of Education, University and Research (MIUR)



# SI.STA.CER METHODOLOGY

Mould design is today performed by a **trial and error approach** and by means of skilled technicians. Even so the time and the related costs required for a new component to enter in production are high and strongly limit the productive capacity and flexibility of ceramic companies.

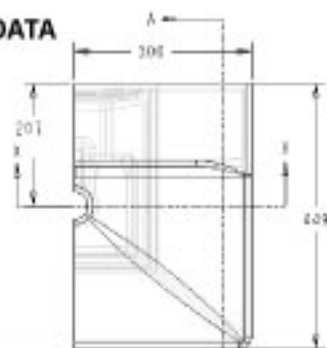
SISTACER is an innovative method to design new ceramic sanitaryware: numerical procedures are used to accurately predict the product deformations during sintering

## Innovative method advantages

- **More accurate and easier mould design** thanks to numerical simulation predictions
- **CNC manufacturing** of counter-deformed model
- Increased **final product quality**: all sanitaryware (washbasin, WCs, bidet) can be produced by using vitreous china
- Significant **reduction of the time** required for the development and prototyping of a new series of products (of about 50%)
- Possibility to produce **new ceramic shapes**, that can be very difficult to be designed by means of the traditional trial and error approach
- Increased **flexibility** and capacity to react to market changes

## 1. INPUT DATA

- drawings of the final product
- slip casting procedure
- drying and firing cycles
- pottery samples



## 2. EXPERIMENTAL CHARACTERIZATION

laboratory and industrial scale tests

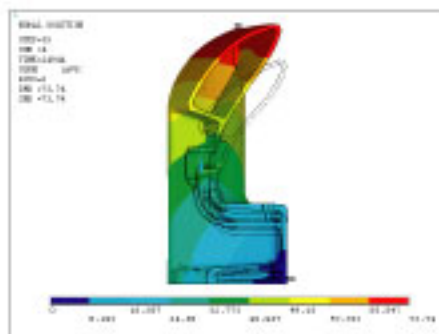


*once defined thermal cycles and raw materials only one experimental characterization is needed to design all products*

## 3. 3D CAD MODEL DESIGN



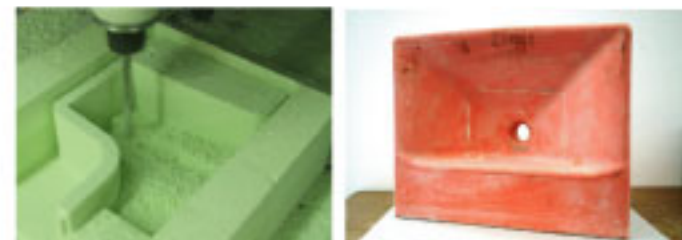
## 4. REVERSE NUMERICAL SIMULATION OF DRYING AND FIRING PROCESSES TO DETERMINE THE COUNTER-DEFORMED MODEL



## 5. PRODUCTION OF 3D CAD MODEL OF THE COUNTER-DEFORMED PRODUCT



## 8. CNC MANUFACTURING FOR 3D COUNTER-DEFORMED MODEL PRODUCTION



## 7. MOULD PRODUCTION



## 8. FINAL PRODUCT

