


SACMI

# Built to Innovate: SACMI Dry Moulding

# AGENDA

- Sacmi
- Sacmi Cellulose  Molding
- Sacmi Dry Molding Industrial Line




We don’t just create machines, we generate trust
SACMI
ENDLESS INNOVATION SINCE 1919


CERAMICS
COOKWARE
BEVERAGE
CERAMICS
FOOD
CERAMICS
SACMI
every day,
for a lifetime

# SACMI in figures

QUALITY OF BUSINESS, QUALITY OF LIFE

SACMI

ENDLESS INNOVATION SINCE 1919

# We are where you are

## Our network speaks our customers' language.



SACMI

ENDLESS INNOVATION SINCE 1919

**Brand and logo recognized** and registered in more than

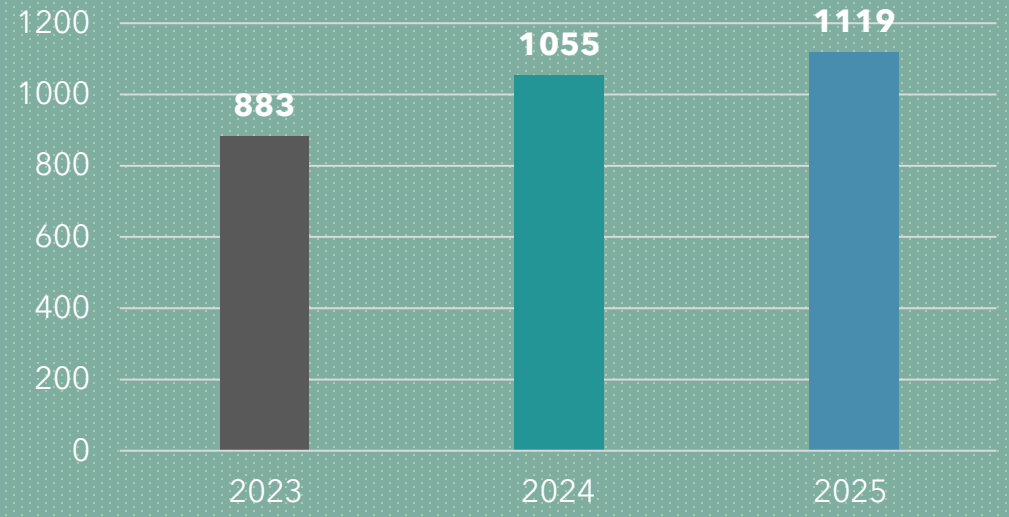
**100 countries**

**>70 companies in 25 countries,**

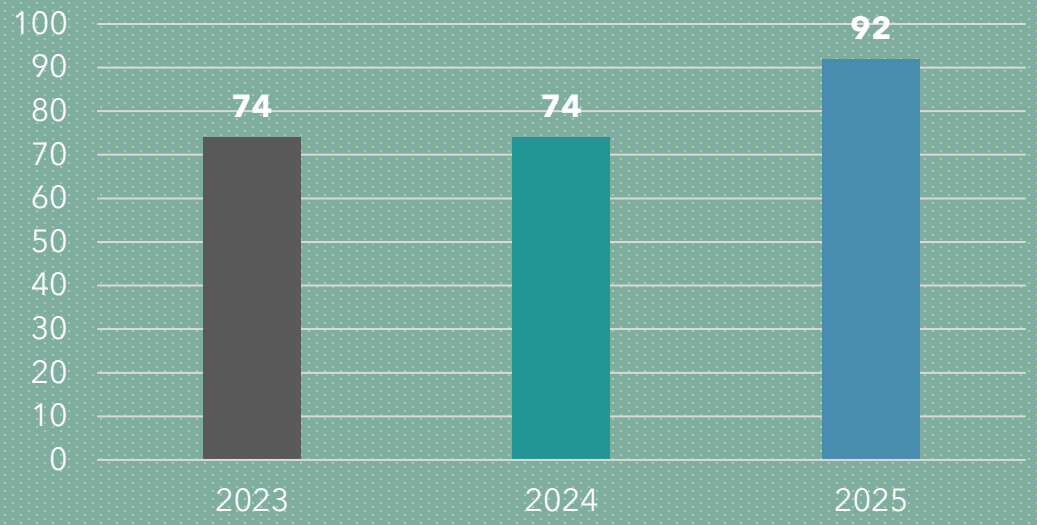
29 of them manufacturers

# Economic sustainability 2025

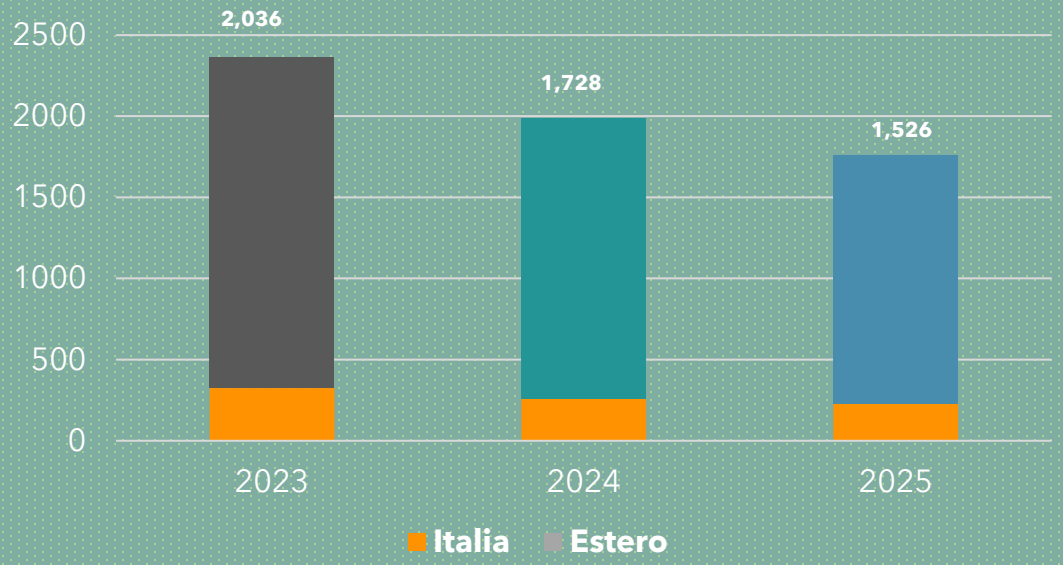
## Net equity (in millions of euro)



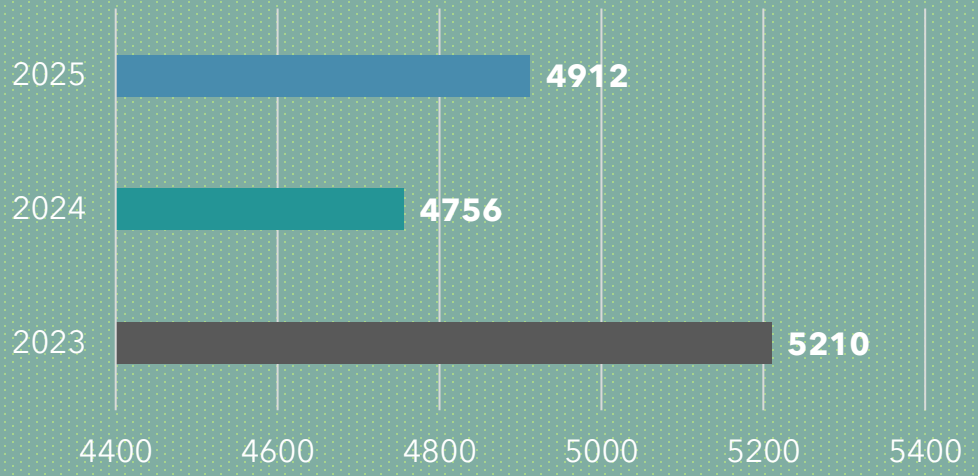

## Investment (in millions of euro)




## Revenues (in millions of euro)




## N° of employees (on 31.12)



# Our businesses

## A SOLE PARTNER, FROM CONCEPT TO TECHNOLOGY, PRODUCTS AND SERVICES

### TILES

### TILE FINISHING

### WHITEWARE

Employees: 2,338
Contribution to revenues: 46%

### RIGID PACKAGING

### PACKAGING & CHOCOLATE

Employees: 1,512
Contribution to revenues: 38%

### ADVANCED TECHNOLOGIES

### ADVANCED MATERIALS

Employees: 408
Contribution to revenues: 11%

### LOGISTICS ENGINEERING & FORWARDING

### INTRALOGISTICS

### WINE

### ENERGY

Employees: 654
Contribution to revenues: 5%

# Innovation & research

**>100**

**ACTIVE PARTNERSHIPS**

with **Universities** and research bodies on **strategic projects**

**230**

**MILLION € INVESTED**

in the last three years, 92 million in 2025 alone

**6,521**

**PATENTS REGISTERED**

in the Group's history. One of the 'Top 10' Italian companies by number of European patents in 2025

**300**

**HIGHLY QUALIFIED TECHNICIANS**

employed in Group Labs and research facilities

# RIGID PACKAGING

SACMI develops **multi-material packaging solutions** for the most diverse platforms, to meet the needs of beverage and food producers all over the globe.






CCM (Continuous Compression Molding)

**Up to 2,850 caps/min**

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# Sacmi Cellulose Molding

## Steam molding

Cycle time: 6,7sec
Low water consumption
Energy: up to 80% less than standard wet molding

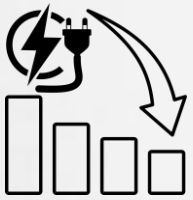



## Dry molding



Different product targets

# Steam molding



**Less energy consumption**,
up to 50% less depending on the products



**High quality** of the finished products



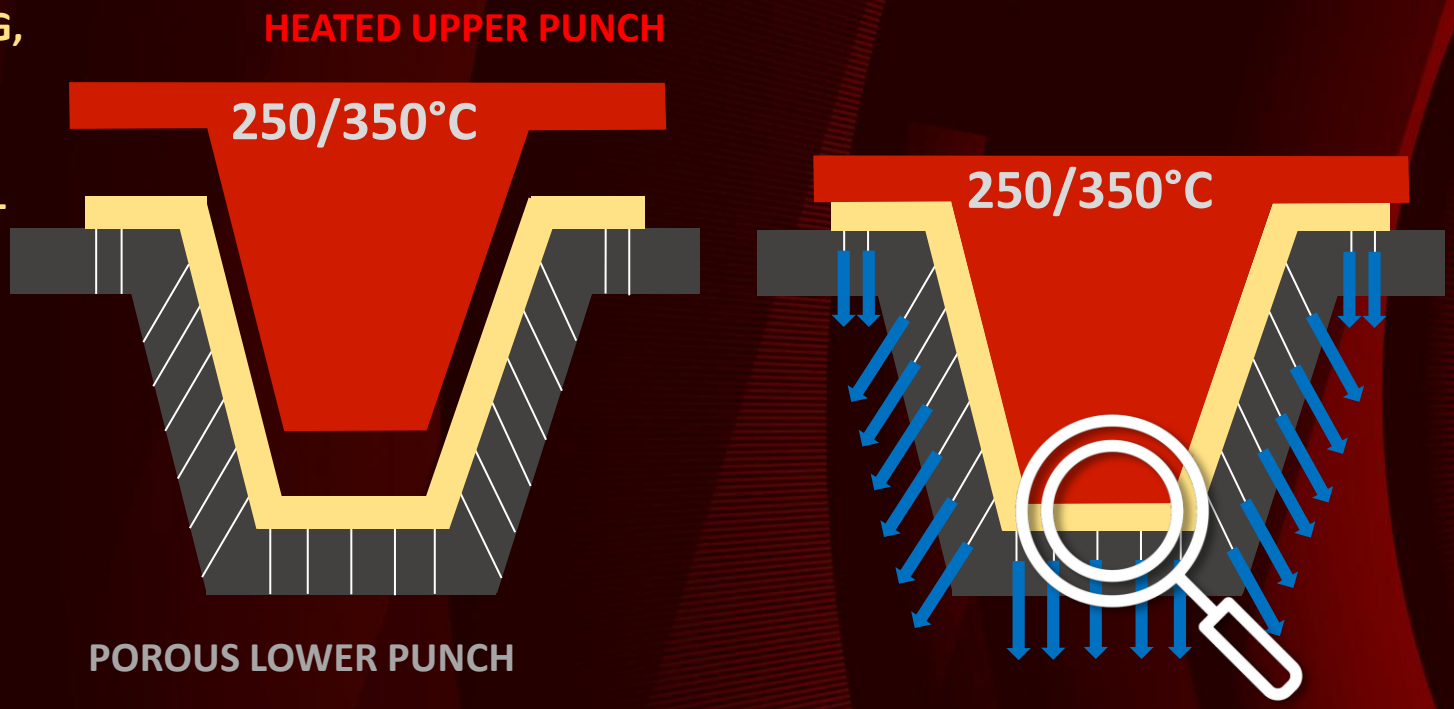
**Higher consistency** of weight

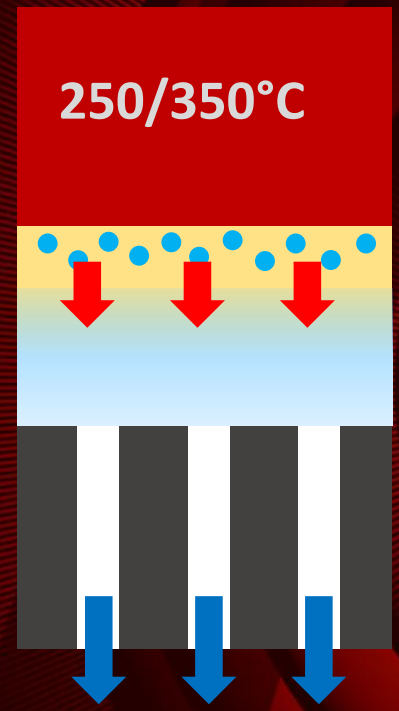


**Less raw material** consumption

# Steam molding

AFTER DOSING, WET PULP LYING ON POROUS TOOL




STEAM PRESSURE DUE TO WATER EVAPORATION

LIQUID WATER INSIDE PULP PUSHED OUT
DUE TO STEAM PRESSURE

SACMI PACKAGING INNOVATION SUMMIT

# Steam molding




SACMI PACKAGING INNOVATION SUMMIT

# **Sacmi Dry Cellulose Molding** – Starting materials and Products

**Materials**
- Fluff Pulp
- Pulp sheets
- Carton board
- Airlaid

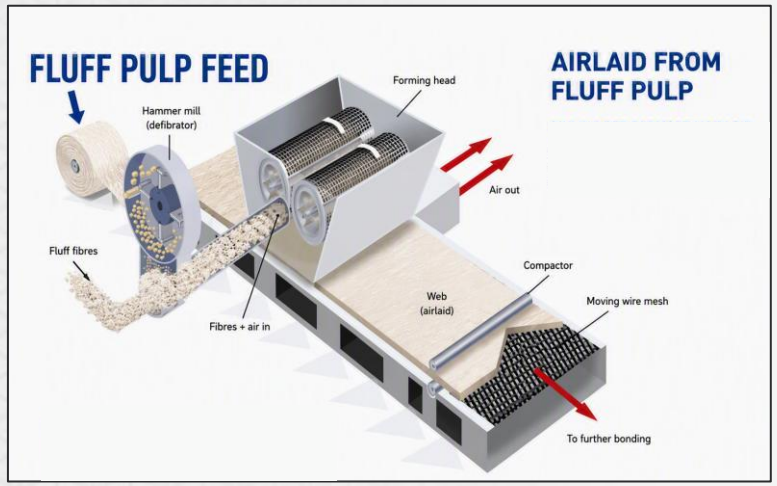
**Products**
- Coffee capsule
- Cap
- Cup Lid
- Neck/Spout/Shoulder
- Single serve container

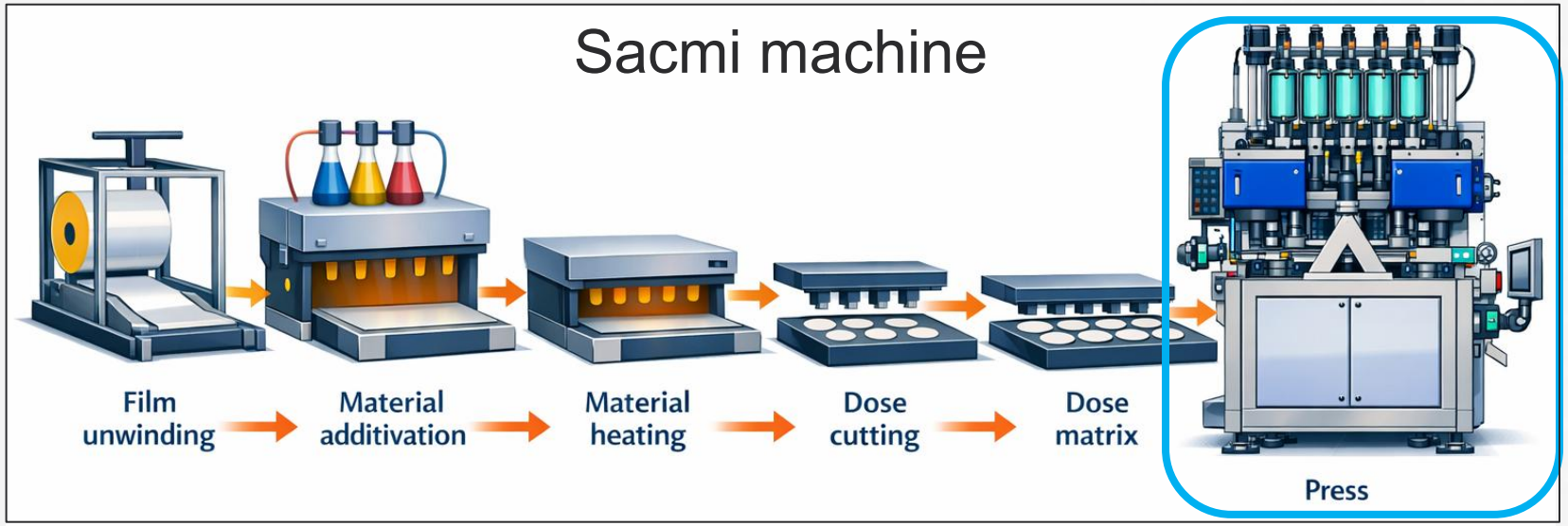
**Feature**
- Robust and defined threads and undercuts
- Vertical wall
- Deep-drawn ratio
- Density up to 1,4g/cc
- Adjustable thicknesses distribution
- Reduced or zero scrap



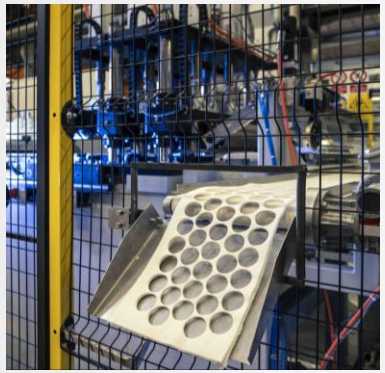



# Sacmi Dry Cellulose Molding – Sacmi Process



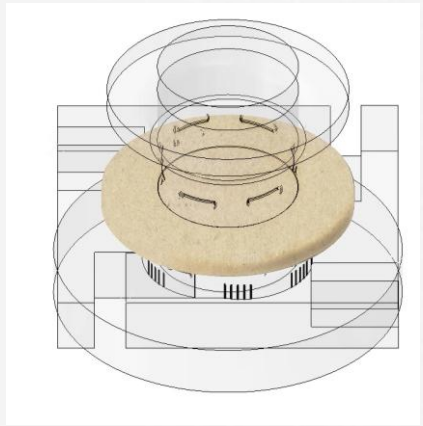




## Optimized material scrap



## Discrete dose matrix

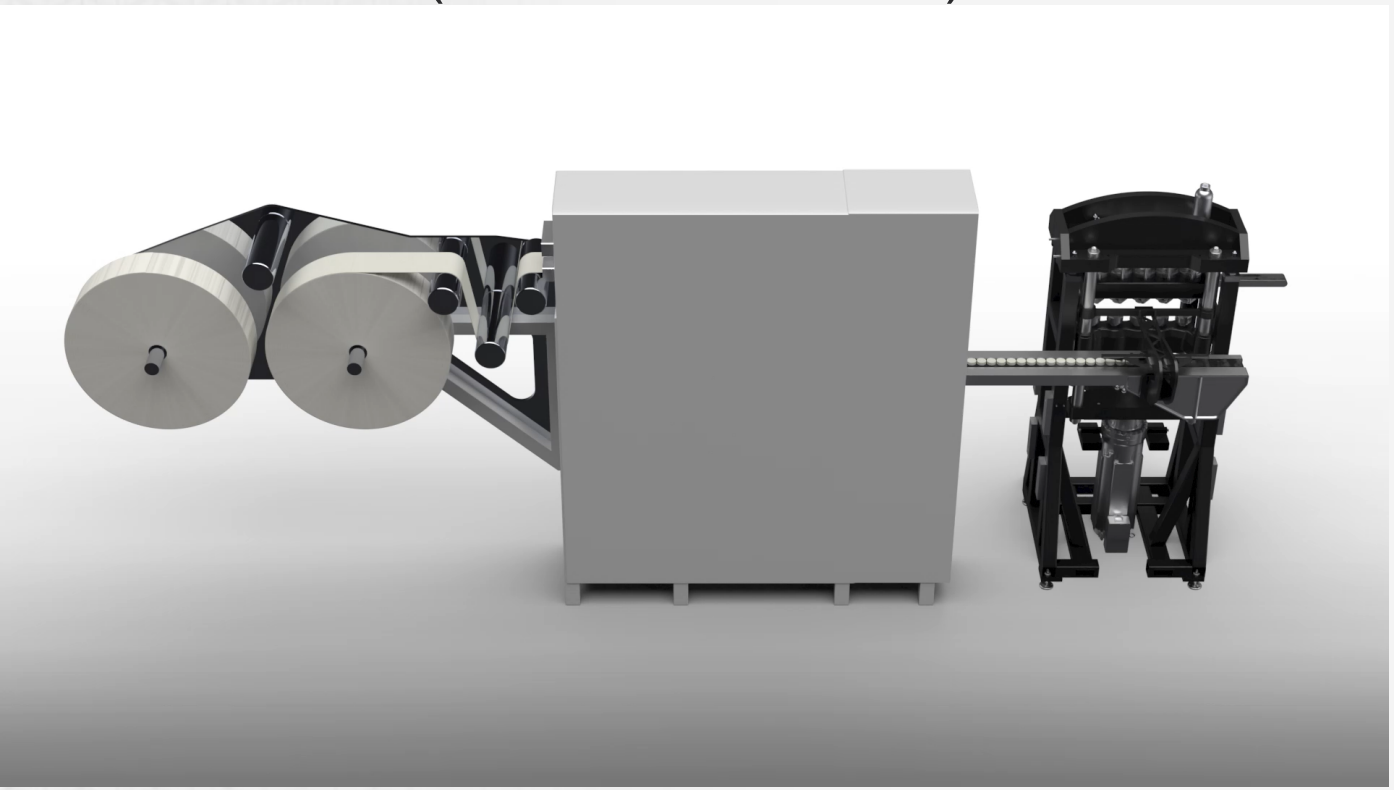




4,2s cycle time

# **Sacmi Dry Cellulose Molding** – Discrete dose (with partner)

From fluff pulp to discrete airlaid doses
(no web scheleton)

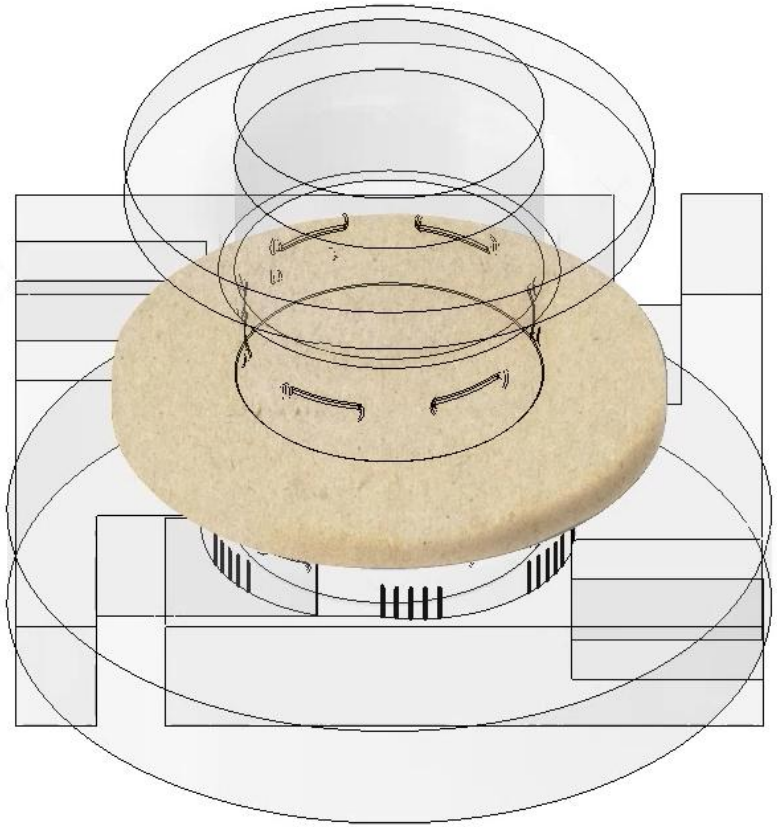


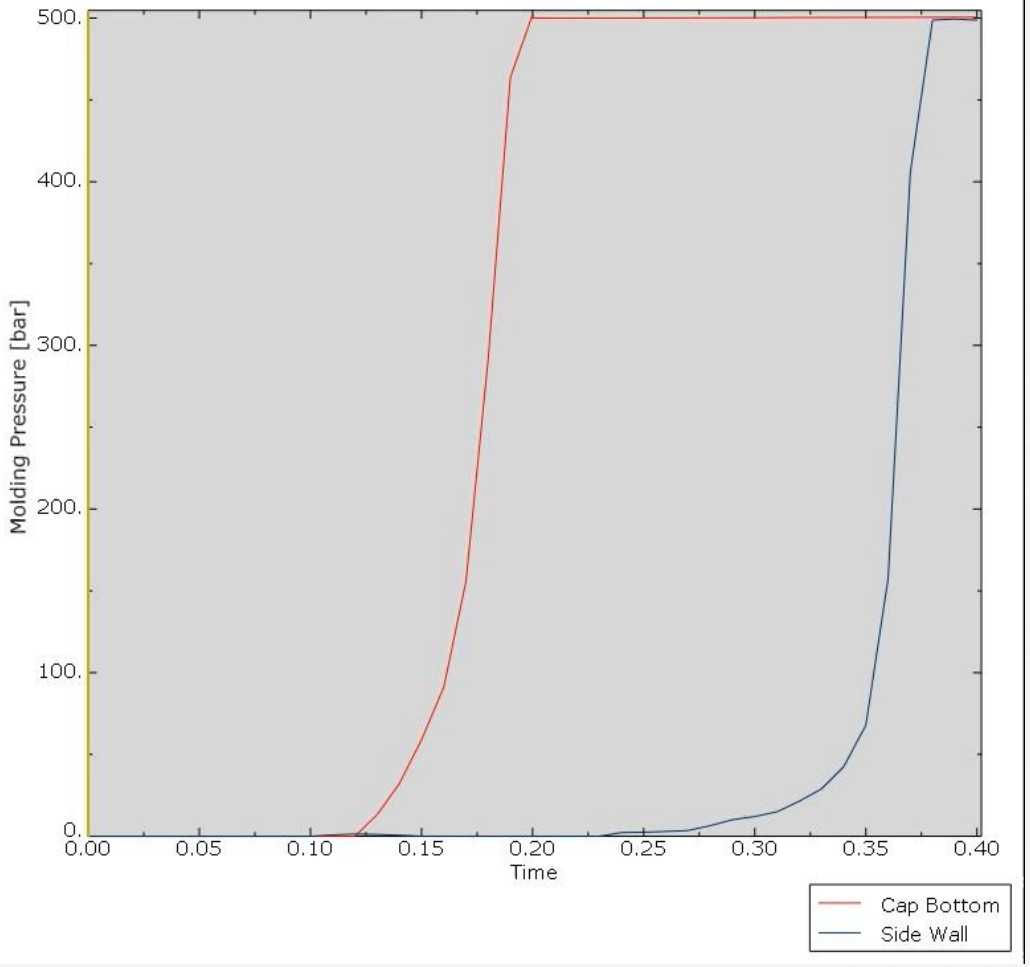


## Characteristics:

- No scrap process
- Product performance and and weight optimization
- Compatible with high productivity line
- Impact on TCO

# Sacmi Dry Cellulose Molding – Sacmi Mold Technology



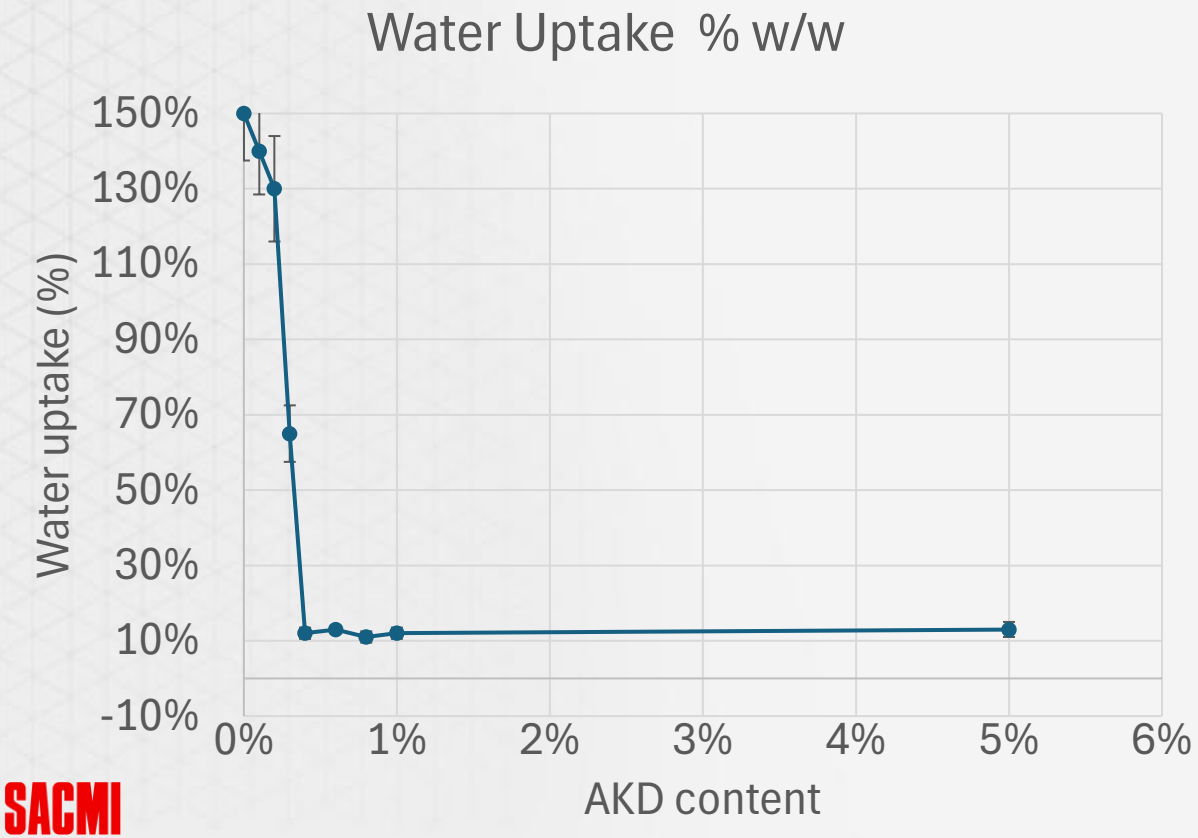


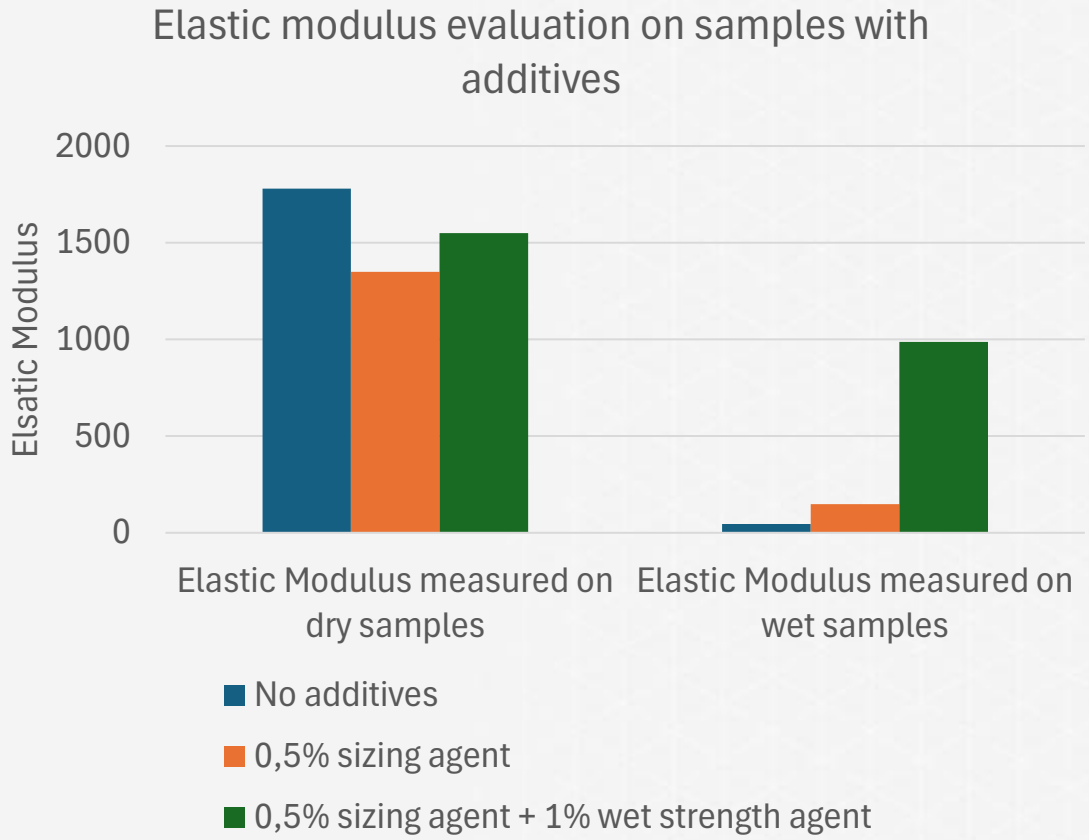

- Precise dimensions and shapes
- Robust threads
- Smooth on both sides
- Deep-drawn parts
- No post-trimming

# Sacmi Dry Cellulose Molding – Water and OG resistance and gas barriers

## Standard additives

- Sizing agents (AKD) – water uptake below 15% (w/w). AKD content <0,5%.
- Wet strength agent (PAE) – increased modulus in wet state.
  - PAE distributed into the airlaid



# Sacmi Dry Cellulose Molding – Water and OG resistance and gas barriers

- **IML or post-molding lamination (with partner)**
  - Full water and OG resistance
  - OTR < 0,0005 cc/(pkg*day)
  - WVTR
  - Sealability
  - Good adhesion with cellulose fibers

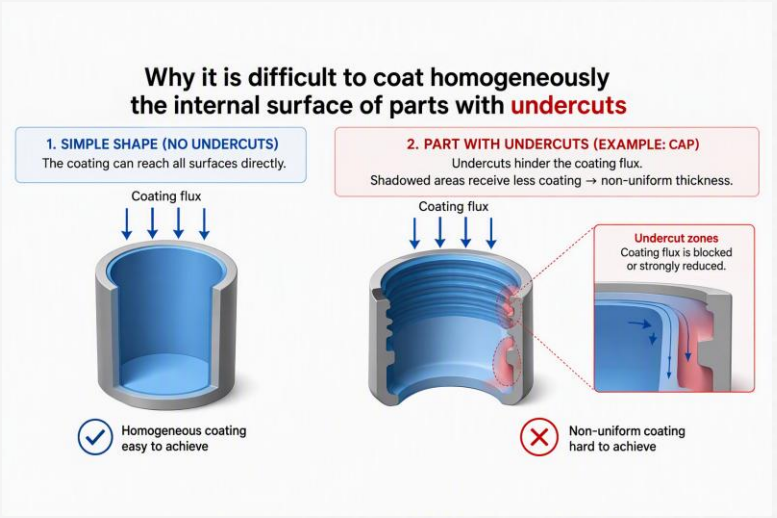


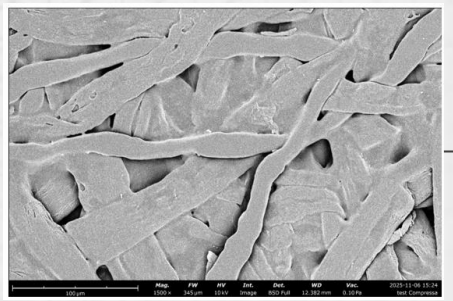
| IML | Post-molding lamination |
|---|---|
| Reduced scrap | Available technology |
| Implementable in the mold | Need of specific machine |
| Technology constraints (e.g. possible film sticking to the mold) | Technology constraints (e.g. post-trimming) |
| | Higher impact on TCO |

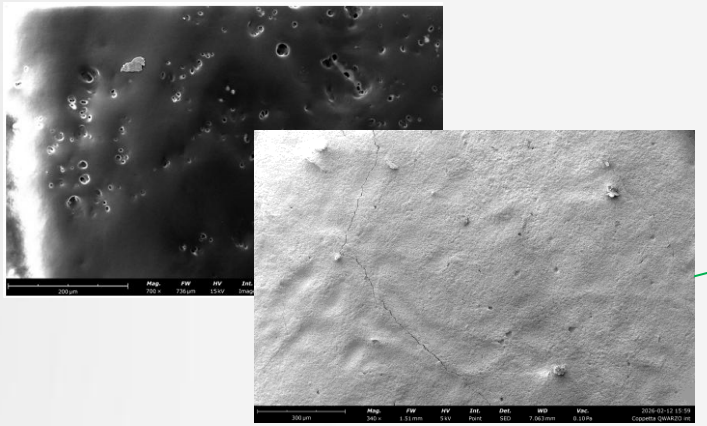
# Sacmi Dry Cellulose Molding – Water and OG resistance and gas barriers

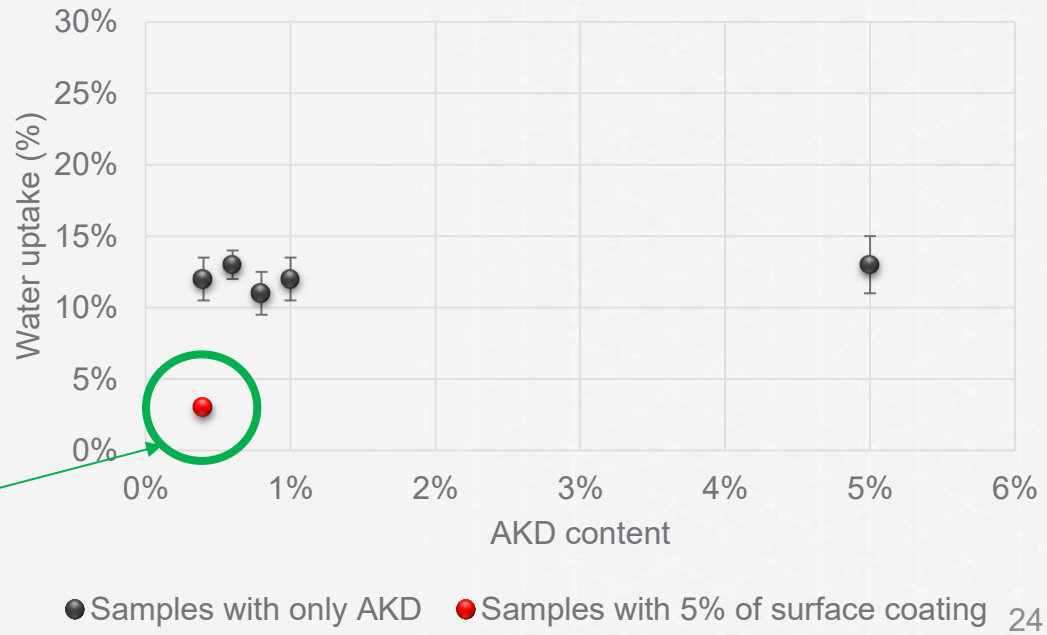
- **Coating of 3D objects (for liquid coating)**
  - Liquid repellency
  - OTR – WVTR
  - Sealability
  - Water uptake<3%
  - COBB120<5gsm
  - Coating content<5% (recyclable with paper)

- **Technology alternatives under development in Sacmi**
  - Dip coating (several alternatives)
  - Spray coating (several alternatives)
  - Comparing lots of coating materials







# Sacmi R&D Laboratory

Instruments to study and verify the characteristics and properties of materials and products:

- Gurley porosimeter
- COBB tester
- Drop Shape Analysis
- Thermobalance
- Mocon
- Disintegrator
- MorFi NEO
- Air jet sieving
- Dynamometer
- Modular Compact Rheometer
- SEM
- DSC
- DMA
- IR

…



























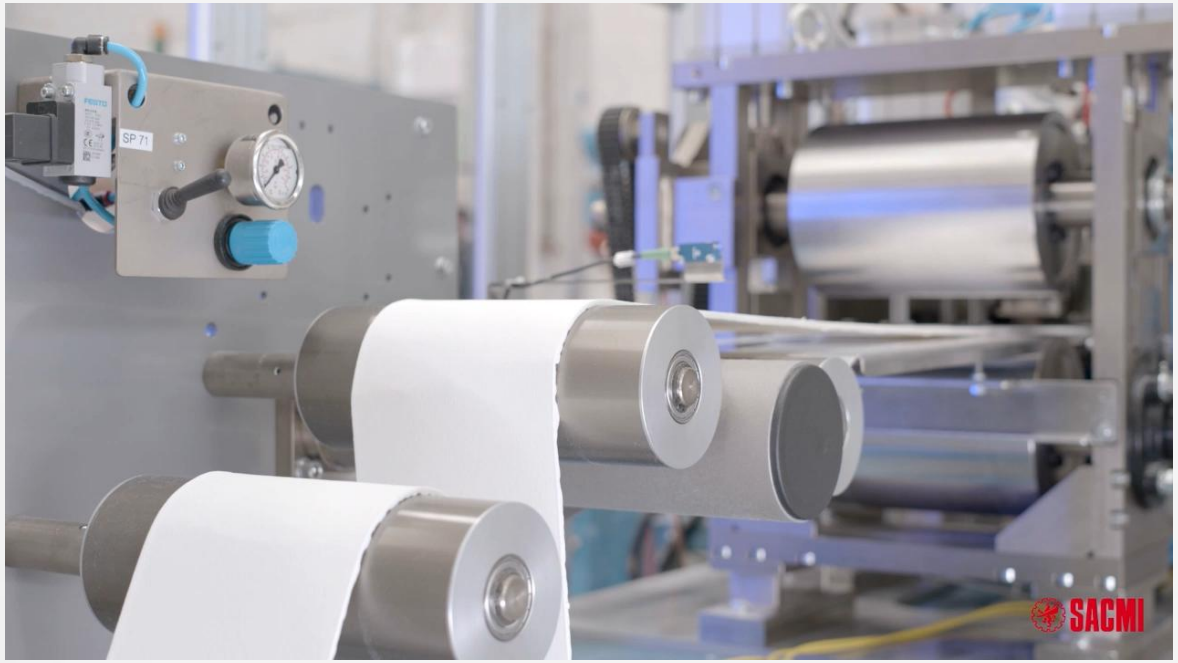

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# Sacmi R&D from laboratory to industrial line

From lab scale test rig … to …




- 3 cellulose single head molding machine
- 1 device for discrete doses
- 2 coating lab lines
- …

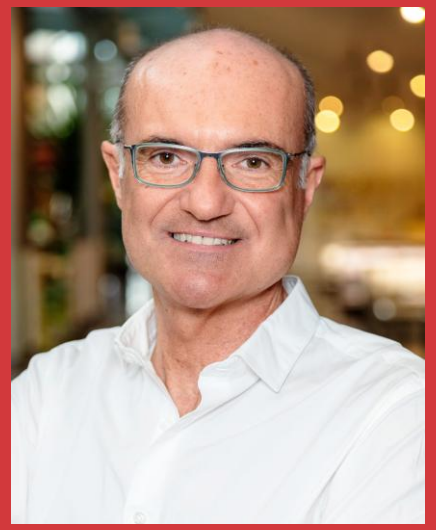
# Sacmi R&D from laboratory to industrial line

- Cycle time< 4,5sec
- Up to 10 cavities
- Up to 8500 pcs/h
- Modular system
- Multipurpose line
- In line quality control

… to industrial line



Scale up developments ongoing.



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# THANK YOU