



SILENTEX® DIRECT FILL TECHNOLOGY

Creating value for exhaust system manufacturers





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Nearly all car manufacturers use high performance glass sound-absorbing material for silencers. The direct filling technology already represents 60-70% of the applications and is expected to keep on growing. (Owens Corning estimates)



INTEGRATED SOLUTION PLATFORM FOR SILENCER MANUFACTURING

Owens Corning has been providing sound-absorbing glass materials and glass filling equipment for silencers and mufflers for more than 30 years.

The company is a leader in glass science responsible for numerous innovations in glass including Advantex® brand and high performance glass.

Our state-of-the-art facilities and research centers allow us to work in partnership with our customers to develop solutions from raw material to machine technology and application expertise.



FURNACE &
GLASS SCIENCE

INNOVATIVE
CHEMISTRY

ADVANTEK® BASED
TYPE 30® ROVING

ENGINEERING
CAPABILITY

MACHINE
DESIGN

TOOLING DESIGN
& APPLICATION
EXPERTISE

**CUSTOMER
SOLUTIONS**



SILENTEX® DIRECT FILLING PROCESS

This brochure describes Owens Corning's answer to the Worldwide automotive industry and Tier One suppliers' need for sound-absorbing materials for silencers and mufflers: Silentex® texturizing and filling machine equipment. This integrated solution benefits from proprietary technologies including Owens Corning's Advantex® patented, boron-free E-CR glass formulation and patented texturizing nozzle.

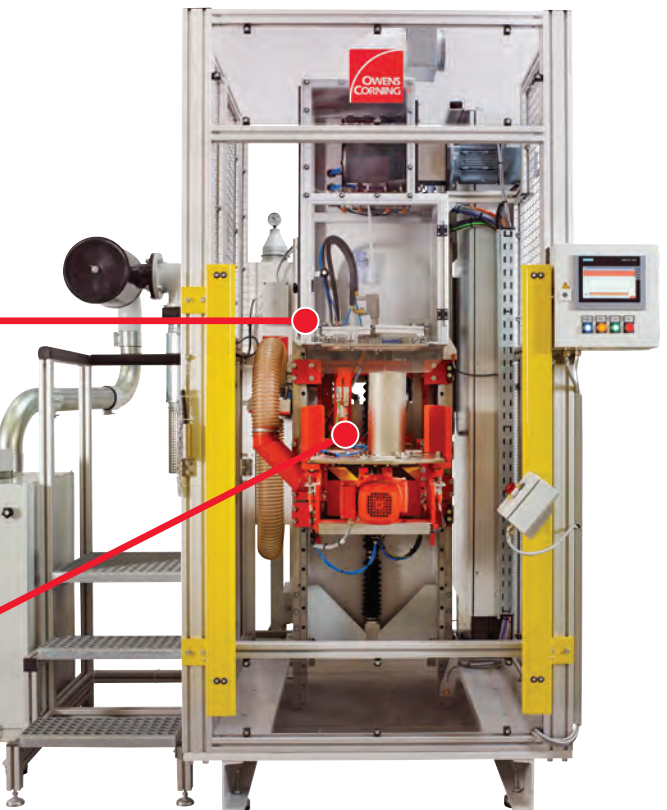
Patented texturizing nozzle separating the Advantex® strand into individual filaments. Up to 4 nozzles possible



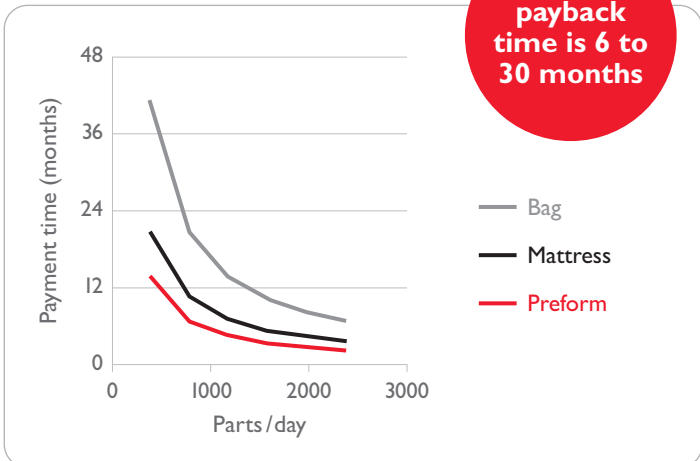
Filled silencer



Silencer filling station

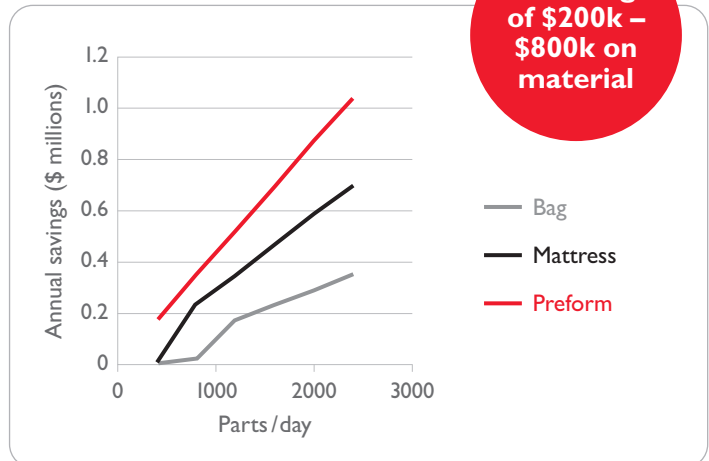


AVERAGE PAYBACK TIME IN REPLACEMENT OF BAG, MATTRESS OR PREFORM



Average payback time is 6 to 30 months

AVERAGE ANNUAL MATERIAL COST SAVING IN REPLACEMENT OF BAG, MATTRESS OR PREFORM



Av. savings of \$200k – \$800k on material

Source: Data are based on Owens Corning various assumptions regarding labor cost, part weight, parts produced per year and EU market prices in euros.

DIRECT FILLING PROCESS PERFORMANCE AND BENEFITS VS. ALTERNATIVE TECHNOLOGIES

Performance	Direct fill	Bag	Mattress	Preform
EURO6, smell, smoke	●	●	●	●
Operator independent, acoustic quality	●	●	●	●
Poke-Yoke	●	●	●	●
Filling of complex shapes	●	●	●	●
Cost	Direct fill	Bag	Mattress	Preform
Materials (direct rovings; 1 single SKU for all parts)	●	●	●	●
Logistics	●	●	●	●
Operator (=)	●	●	●	●
Shop floor space and SKU management	●	●	●	●
Investment	●	●	●	●



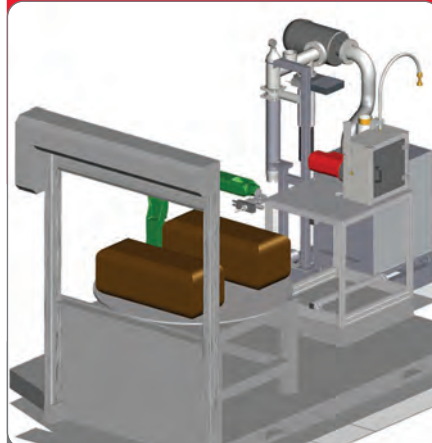
SILENTEX® DIRECT FILLING MACHINES

VERTICAL MACHINE



Semi-automatic filling of spun mufflers.

SPECIALTY MACHINE



Direct filling of clam shell mufflers.

MANUAL MACHINE



Filling of bags or industrial silencers, mattress winding and special applications.

Consistent texturization is key for better acoustics:

The heart of the Silentex® direct filling solution is the injection nozzle separating the Advantex® glass strand into 5,800 individual filaments. This best in class texturization provides the acoustic performance of the filling material.

Wide range of filling equipment:

Owens Corning offers a wide range of filling equipment and application expertise, to help our customers meet their productivity targets. The reliability of our machines ensures low total cost of ownership – many of our machines are still operating in excellent condition after more than 20 years of service.

Advantex® 7000 Tex single-end glass roving is the recommended product for efficient texturization and fast filling speeds, helping to reduce overall cycle time.

Depending on needs, several machine options include:

- PLC Siemens or Allen-Bradley
- Automatic fill weight check
- Remote interface
- Climate room for glass fiber conditioning
- Bar code scanner
- Tool recognition
- Poke-Yoke: mechanical, sensors or vision system.



WHY CHOOSE OWENS CORNING?

Globally available products manufactured in multiple facilities providing unrivaled supply redundancy.

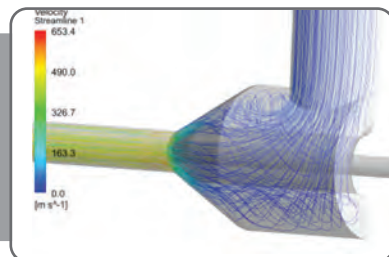
- L'Ardoise, France
- Amarillo, Texas, USA
- Rio Claro, Brazil
- Yuhang, PR China
- Kimchon, South Korea
- Taloja, India



Our customers are welcomed by our local technical support (Chambery, France; Novi, Michigan; and China Composites Center, Shanghai). Combined with global account coordination, our local presence provides them with outstanding response times and vital market intelligence.



Deep expertise in the best use of Silentex® material and machines, silencer design and filling optimization, versus final product and manufacturing performance required.



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