

LEADING THE WAY TO FILTRATION



GAS AND LIQUID FILTRATION

 **testori**[®]
TESTORI GROUP



For more than 100 years, Testori product innovation, technical know-how and international presence have been the bases for a **successful history of excellence and a favourable future** in the filtration industry. We believe that this broad know-how and our high standards represent the right launch-pad for Testori international leadership. **Invaluable assets in human resources, technological equipment and production tools**, on-going product innovation combined with a customer oriented approach will strengthen our market share in Italy and worldwide. Testori is considered as a reference partner for **liquid and gas filtration serving industry and the environment**.

Alessandro Bernardini
Alessandro Bernardini
Managing Director

>100 years in technical textiles

Testori Group has been operating for over 100 years in the technical textiles field, specifically applied to industrial filtration for both production processes and environmental protection installations.

absolute leader

The Group is made up of five companies. Absolute leader in Italy, one of the main players in Europe and constantly growing in extra-European markets.

core business

Testori's core business is in the design, production and marketing of textile items (fabrics, cloths, felts, bags etc) for gas and wet filtration. Testori's operations cover the **entire value chain**, from processing the raw materials (fiber and yarn) through to the production of finished items. Testori offers an additional **post sales assistance service** (mounting, maintenance, scientific consultancy). These activities account for 90% of total sales. *The remaining 10% relates to the production of fabrics and technical items for uses other than filtering.*

production

fields of application

The main applications of Testori's products are: cement and aluminum industries, power generation, waste to energy, metals, pharmaceutical, chemistry, food, mining, asphalts, waste water plants and other applications for environment protection. Testori's offering fully meets the needs of all customers: designers/plant constructors (OEMs), bags/cloths manufacturers, end users.

customers

quality assurance

The company is UNI EN ISO 9001:2008 certified, with the quality level maintained by an internal Quality Committee. This Committee coordinates all activities aimed at ensuring the excellent quality and service standards required by the international market.



Belt vacuum filters



Old Testori manufacturing

■.IDENTITY

THE **TESTORI GROUP'S MISSION** IS TO BE AN EXCELLENT INTERNATIONAL BENCHMARK FOR ITS TECHNOLOGY, PRODUCTS AND SERVICES, FOR GAS AND LIQUID FILTRATION IN INDUSTRY AND ENVIRONMENTAL PROTECTION.

To reach its targets and maintain its leadership, Testori leverages three key points:

Know-how - continuous valorization of the vast knowledge acquired over more 100 years (with regard to fibers, fabrics, felts and production processes) thanks to a highly specialized team of experts in engineering and textile innovation.

Brand - with a consolidated reputation among all players in the filtration business; the Testori brand is synonymous with reliability, sobriety and experience.

Vertical Integrated Production - Testori covers the entire value chain: from choosing and processing the raw materials to the production of finished items and installation and maintenance in the field. This enables the Group to offer the market the ideal solution at the right supply chain level (rolled fabric/felt or finished item) and for the right end use (gas or liquid filtration). Testori can fully meet the needs of all customers: designers/plant constructors (OEMs), Bag/Cloths Manufacturers and End Users.

Our vertically integrated production ensures high operating flexibility, reliable production of tailor-made solutions, trouble shooting skills, high-level competence in after-sales service.

Testori's strategy leverages on four aspects to achieve excellence:

Financial solidity, business integrity and dynamic management - entrepreneurial, strategic and managerial skills, a thorough knowledge of all filtration fields, high-level expertise in engineering, make up the assets and go to form the company DNA.

Internationalization - broadening the customer portfolio and extending market leadership through new extra-European companies and new commercial partnerships throughout the world.

Diversification - essentially on three sides:

- Optimization of assistance services and filter media maintenance
- Commercialization of products related to filters that allow customers to buy a "turn-key" technology and to better use the filter itself
- Development of new niche markets

Innovation - the R&D laboratory supplies strategic support to all customers according to different process technologies and different markets. New product launches over the years and the new projects recently started up are a concrete demonstration of Testori's leading position.



MISSION.

>100 years of experience in industrial filtration
>40 years of experience in environmental protection
5 companies devoted to the production of felts, fabrics, bags, cloths and textile items
2 new companies outside Europe
47 % of sales outside Italy
60 % market share in Italy in gas filtration
220 people in the Group
30 thousand square meters dedicated to manufacturing
35 % market share in Italy in liquid filtration
4,5 million square meters/year of needle felts produced
1,4 million/year filter bags produced
150 Thousand/year filter presses cloths
5,5 million square meters/year of filter fabrics produced
20 aluminum smelters supplied by Testori Group
500 thousand bags installed in power generation plants
70 years' experience in the cement industry
10 alumina plants supplied by Testori Group
250 cement plants supplied by Testori Group
80 incinerators supplied by Testori Group
60 years' experience in chemical & pharmaceutical industries



Bags - different felt types



Filters in cement plant



Filter press cloth

■ TESTORI GROUP



IN NUMBERS.



THE 5 COMPANIES OF THE TESTORI GROUP

- In **Italy**, the headquarters, located in Novate Milanese, controls Tessitura Euganea, which operates in the North East of Italy manufacturing gas filtration products. Filter-Tex in Maranello, (local Unit of Tessitura Euganea) is specialized in assistance services and in supplying bags for gas filtration to the ceramics industry. The main production site in Novate Milanese, covers an area of 26 thousand square meters; this site is dedicated to R&D, design, production and marketing.
- In **France**, Testori has controlled TTL France since year 2000. TTL is a world leader in the production and distribution of multi-channel bags for the primary aluminum industry. TTL is also specialized in the production of items for filtering gas using hi-tech fibers and in the manufacture of products for wet filtration.
- Testori has recently inaugurated two new companies outside Europe to guarantee a wide offering to local customers. The **US company** supplies felts and fabrics to bag and cloths manufacturers, while **Testori Emirates** produces and sells hand-made products for gas and liquid filtration.

An extensive, consolidated network of agents ensures timely availability of Testori products all over the world. Testori organizational structure horizontally integrates the various companies in the Group, bringing benefits in operating flexibility, economic efficiency and close contact with the customer.

- Production, Sales & Service Units
- Sales & Service Unit
- Agent & Distributor

■ TESTORI'S GLOBAL



Italy

Testori SpA - Headquarters

All solutions for gas & liquid filtration; textile items; services

Tessitura Euganea Srl

Bags and pockets for gas filtration

Filter-Tex

(Local Unit of Tessitura Euganea)

Installation, assistance and production of gas filtration bags

France

TTL France S.A.

Bags, multi-channel bags, and services for gas filtration; cloths & bags for liquid filtration

U.A.E.

Testori Emirates Filtration Factory LLC

Manufacturing of bags and filtering fabrics for liquid and gas filtration

United States

Testori USA

Felts & Fabrics supply and technical assistance for liquid and gas filtration

PRESENCE.

**Fields of Application:
industrial filtration processes and
environmental protection**

Testori Group core business is in the design, production and marketing of textile items and products for **gas and liquid filtration applied in industrial production processes and in the field of environmental protection.**

The main fields of application where Testori has accrued a high level of specialization are:

- industrial process filtration: cement and aluminum industries; pharmaceutical; chemicals, food & milling; mining
- filtration related to environmental protection: incinerators & power generation; steel works & aluminum; waste water treatment
- production of technical fabrics and items for purposes other than filtration, for use in various fields (automotive, transports, food etc.)

All cited fields can use Testori filter media for both solid/liquid and solid/gas separation.

Gas filtration adopts mainly felts (but also fabrics) while liquid filtration uses mainly fabrics (but also felts). **Felts and fabrics are supplied both in rolls and hand made products.**



Asphalt plant - courtesy of Bernardi Impianti



Drum filters - chemical plant



Filter press detail



Air slide belt

■ APPLICATIONS



ENVIRONMENT.

PRODUCTS FOR ANY NEED

Handmade products

- Filter bags (or filter sleeves) for any wet and liquid filtration process
- Cloths for liquid filtration in filter presses, belt presses, disc filters, drum filters and rotating filters
- Bags for liquid filtration
 - Centrifuge bags and liners
 - Octopus bags
 - Bags (pockets) for pressure and vacuum filters (Kelly, Strainer, Scheiber)
- Bags for gas filtration
 - Multi-channel bags (from 2 to 32 channels)
 - Stellar bags/pockets
- Discs for pressure and vacuum filters (liquid filtration)

Testori vertically integrated production allows the **optimal customization of products** following the customer's design and needs.

Rolls

- **Needlefelts for gas filtration (occasionally for liquid filtration)** produced with many fibers, available in different weights and with special treatments for finishing, thermo-setting, glazing, impregnation or coating... with the aim to improve their resistance to chemical corrosion and hydrolysis and to ease dust-cake removal
- **Fabrics for gas and liquid filtration.** The modern warping and weaving departments produce a wide range of fabrics to filter:
 - **Gas:** fabrics in cotton, polyester, acrylic, polypropylene, polyamide and aramid. For the chemical & pharmaceutical industries, Testori produces also antistatic fabrics in polyester and polypropylene
 - **Liquids:** the range of fabrics includes items in 100% staple yarn, monofilament or multifilament, and also mono-multi or multi-staple mixtures. A wide range of fibers is used: polyester, polypropylene, special polyamide, PVC and PTFE. Different scrims (plain, twill, sateen), particular finishes and calendering enable us to optimize lifetime, capacity, resistance to clogging and cake release



Needle felt



Mono/multifilament woven fabrics



Antistatic fabrics

PRODUCTS



Multi-channel bag (aluminium industry)



Cages and bags



Star bag (vacuum cleaners)



Needlefelt bag



Centrifuge bag



Filter press cloth



Octopus bag

ROLLS.

BESIDES FILTRATION... TECHNICAL ARTICLES & FABRICS

Wide range of products

This field is of particular interest to Testori since it represents both diversification aspect and a highly synergic market; the company is able to leverage specific technologies and materials that form part of its know-how. The wide range of products comprises: **cloths for the rubber industry, cloths for the military and aerospace sector, fabrics for air conditioning manufacturers, fabrics for the food industry and for fluidized transport of powders.**

These are known under the name Testori AERTES™ and are available in rolls or in different formats for the transport of powders by means of the fluidification technology with textiles. The fields of application are: air slide belts in cement industries, hoppers, ship holds, transport trucks and trains, lime plants, chemical and mining industry, fly ash and alumina.



.DIVERSIFICATION

INNOVATION, SERVICE AND QUALITY

Working within the Group along the entire value chain, from the choice of fiber to the finished product and customer service, the **internal R&D laboratory provides strategic support to the market and to all the corporate functions dedicated to business development, to production and supply. Over the years,** Testori R&D has launched many new products developed for specific markets thanks to professional technical interaction with OEMs and End Users.

The R&D department has recently been fitted out with **instruments to provide a focused consultancy service, for engineering services and direct maintenance on plants.** Here are some examples of Testori services:

Analyses

- Permeability, thickness and weight tests
- Tensile tests and shear tests
- SEM and optical microscopy photos
- Burst tests
- VDI (Verein Deutscher Ingenieure) / ISO 11057: efficiency tests
- Powders analyses: dimension and composition

Technical assistance with highly specialized people

- Consultancy from the choice of raw material to the finished product and after-sales service (plant inspection with analyses, diagnosis and solutions)
- Design & Engineering department
- Installation, maintenance and removal of bags at the end of service (disposal included)
- Leakage test with fluorescent powder
- Quality control (100%) complete traceability of products

A quality Committee is in charge of all the activities aimed at ensuring compliance **with the quality standards** adopted by Testori (certification ISO 9001: 2008). The Committee progressively updates the standards of effectiveness, efficiency and synchronization of all production processes aimed at **meeting the quality and service requirements of the international market.**



R&D laboratories



Burst test



Assistance service

QUALITY.

OUR FIRST 100 YEARS OF ENTREPRENEURIAL HISTORY

1830

Giovanni Antonio Testori starts the felt production for handmade paper manufacturing.

1905

Testori in Novate Milanese - The brothers Giacomo and Edoardo Testori establish the company still bearing their name, for the production of filtration fabrics and panels for seed oil pressing.

The twenties

Specialization in
industrial filtration

The Società Anonima Fratelli Testori (S.A.F.T.) - full name of the company - becomes the leading supplier of National Oil Mills belonging to the Genoese businessman Gerolamo Gaslini. In 1927, led by engineer Angelo Testori, industrial filtration becomes the company's primary operation.

1932

Abroad

Testori makes an agreement with Binet (a French company producer of felts for paper mills) and develops the manufacture of woollen fabrics for gas filtration.

The fifties and sixties

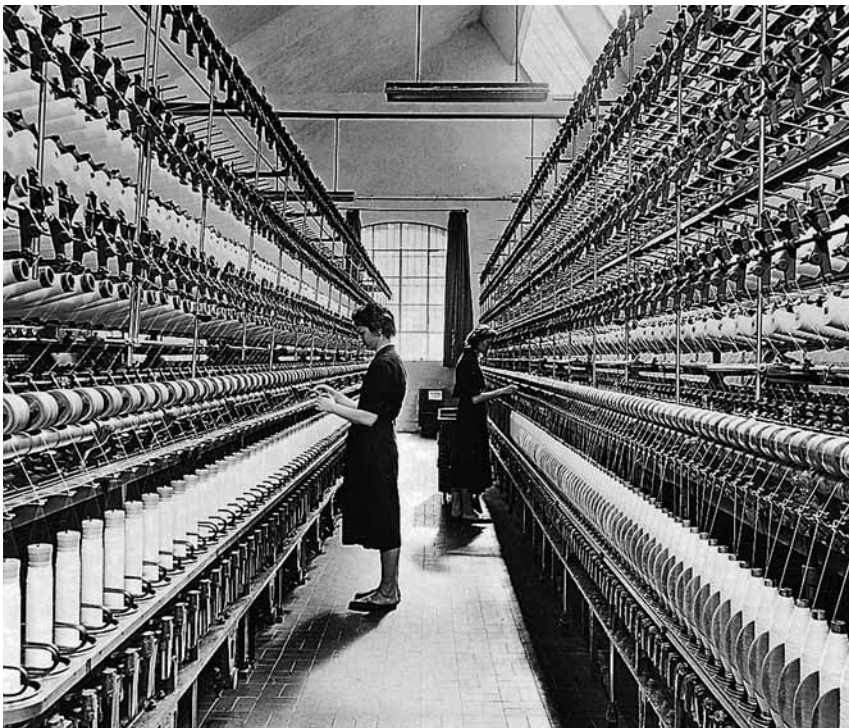
Diversifying applications

The company produces felts and fabrics for liquid and gas filtration for a wide range of industrial fields (chemical, metals, pharmaceutical, environmental protection).

The seventies

Innovation

Using the new synthetic fibers invented in the US, Testori was one of the first in Europe to start up production of non-woven felt for filtration. The first needlefelt plant was installed in 1971 followed, in 1973, by the pioneering use of the thermo-welding techniques.



Production (the fifties) - warping



Felt production: staple



Felt cords - cocoa press

.HISTORY

The company improves its efficiency and introduces modern automation systems for the production processes, increases its position in the domestic and international markets, striking agreements, making acquisitions and setting-up joint-ventures. Between 1996 and 2000, the companies Tessitura Quadrelli, Tessitura Euganea, Filter Tex were acquired and Toscana Filtri was founded. Abroad, TTL France was acquired in 2000; it was specialized in gas filtration with hi-tech fibers and world leader in the production of multi-channel bags for the aluminum industry. Furthermore, an extensive network of agencies guarantees a capillary service throughout the world.

Testori Group is absolute leader in the domestic market of industrial filtration and a key player in Europe. Using integrated processes, it assures control over the entire production process. The R&D activities promote the development and use of ever higher performance fibers to keep abreast of the evolution of the market and customer expectations.

The new ownership and the new managing director are bringing a wealth of experience and financial health to the Testori Group, in order to become a benchmark in the worldwide market for products and services in liquid and gas filtration. The leverages used to achieve excellence are: investments in capital equipment, human resources and internationalization projects (new companies in the USA and Emirates). Vertically integrated production and capillary presence on the market are the two key factors for Testori's future growth.

The eighties and nineties

Growth and internationalization

2000

Consolidation of R&D and customer service

Today

Excellence and internationalization



Warping - beam



Laser cut



Testori Headquarters (Novate Milanese)

WHO CHOOSES TESTORI GROUP

End Users

- **Cement, Lime & Gypsum**

ITALCEMENTI | BUZZI-UNICEM | HOLCIM | HEIDELBERG
LHOIST | TITAN | RIYADH CEMENT | VICAT | LAFARGE
RAS AL KHAIMAH CEMENT | CARMEUSE

- **Aluminum and nonferrous metals**

ALCOA | VEDANI CARLO METALLI | ALUMINIUM BAHREIN B.S.C. | RUSAL
HYDRO | DUBAL SERVICE LIMITED | TRIMET ALUMINIUM | ALCAN RIOTINTO

- **Steel**

RIVA | FERRIERE NORD | THYSSENKRUPP | ARCELOR MITTAL
ACCIAI SPECIALI TERNI | TENARIS GROUP | KHOUZESTAN STEEL
LUCCHINI - SEVERSTAL

- **Coal fired boilers**

ENEL - Torre Nord | E.ON | ESKOM - Majuba | STUDSTRUP | STRAKONICE

- **Incinerators**

A2A | VEOLIA | NOVERGIE | TIRU | IDEX | HERA

- **Pharmaceutical-Chemical-Food**

SOLVAY | BARILLA | DE CECCO | FERRERO | BASF | SANOFI
BOEHRINGER INGELHEIM | BRACCO | MICRO-MACINAZIONE
RHOM & HAAS | DSM

OEMs

- **Gas Filtration**

TERMOKIMIK | REDECAM | CTP TEAM | STG Group | I.M.A.
BOLDROCCHI | INTENSIV | BERNARDI (Asphalts) | SIM (Asphalts) | SOLIOS
ALSTOM | A.A.F. | HAMON ENVIRONMENTAL

- **Liquid Filtration**

DIEMME | DIEFENBACH | COMI CONDOR | FLSMIDTH | COMBER

and many others...



.REFERENCES





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