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- Vinavil in the binders industry
Re-inventing itself, understanding changes, making the most of the experience of the past and believing totally in the Company mission. And at the same time without denying its origins and without letting... to understand the technical and cultural development of a Company which today operates successfully throughout the world.
Re-inventing itself, understanding changes, making the most of the experience of the past and believing totally in the Company mission. And at the same time without denying its origins and without letting itself be intimidated by cumbersome legacies or unexpected problems. These could very well be the secrets of Vinavil, a long-standing company in the Italian chemicals sector which, strengthening over time, is now a successful enterprise. This success is even more obvious when one reads its history (included separately in this brochure) and reflects on a sector, such as the chemicals sector, which over the last century has undergone rapid and not always painless changes. Today, in fact, almost independently from the external variables which so much influence the other players in the sector, Vinavil continues to grow constantly from year to year and is now embarking on a new development phase. Knowing Vinavil helps, therefore, not only to symbolically understand the history of modern Italian chemical industry, but also to understand the technical and cultural development of a Company which today operates successfully throughout the world.
Vinavil S.p.A. was established in 1994 following the acquisition by the Mapei Group of the polyvinyl-acetate polymers business, at the time operated by EniChem-Synthesis. The company has developed a strong Research & Development, dynamic Commercial/Marketing Organisation and efficient Technical Service, Vinavil is currently the most important Italian company in the dispersion polymers sector. Its growth is founded on innovation and respect for the environment, continuing to expand the dispersion products offer, increasing its sales and volumes all over the world. The company is an acknowledged key player in the Italian chemical industry, operating in a market with high levels of growth, particularly in the Mediterranean area. The North American operating units in Chicago, USA, and Montreal, Canada, the Suez plant in Egypt and Vinavil headquarters building in Via Valtellina 63, Milan and the reception.

From 1994 (when VINAVIL was acquired by Mapei) to the present days, volumes and sales have been increased by more than threefold with respect to the initial values, with a parallel increase of the R&D costs and investments, which have increased by approximately 40%. This trend, both in Italy and globally in the world, is likely to continue in the future.
VINAVIL: PROFILE OF A COMPANY

Vinavil S.p.A. was established in 1994 following the acquisition by the Mapei Group of the polyvinyl-acetate polymers business, at the time operated by EniChem-Synthesis. The company has created a heritage dating back many years ago and continues the Italian tradition of fine and secondary chemistry. The Vinavil brand has been known for decades by many people in the market place, as well as in industry, thanks to its universal Vinavil adhesive, the first and most famous “white glue”, which all Italian families have at home in its distinctive red and white packaging.

Vinavil is an important part of the history of the Italian chemical industry. Thanks to over 90 years of experience and technological know-how created through on-going Research & Development, dynamic Commercial/Marketing Organisation and efficient Technical Service, Vinavil is currently the most important Italian company in the dispersion polymers sector.

Its growth is founded on innovation and respect for the environment, continuing improvement of its existing products and constant development of new ones. Its objective is to meet the needs of the adhesives, water-based paints, textiles and construction markets. Vinavil exports every year 50% of its production to well over 40 different countries, and is one of the leading European companies in this market. It is an international player that strengthens its position day after day as a reliable and innovative partner to operators in the transformation chemicals sector worldwide.

Vinavil has its headquarters in Milan. The Italian facilities in Villadossola (Verbiana) and Ravenna are strategically located to offer fast delivery service to both Northern Europe and the Mediterranean area.

The North American operating units in Chicago, USA, and Montreal, Canada, the Suez plant in Egypt and...
the Singapore office complete Vinavil international dimension. Vinavil is determined to continue pursuing its growth and internationalisation plans and is currently expanding its operations to new markets, including the Middle East and Africa. Vinavil is strongly expanding in Eastern Europe and in the Far East, as well as in North America.

IN CONSTANT GROWTH

Over the last 18 years Vinavil has moved forward at a rapid pace. Its commercial and production structure is continuously expanding in both Italy and the United States. Vinavil’s technological developments in the field of adhesives and its investments in manufacturing and especially in Research & Development are the foundations on which Vinavil builds its success.

From the left. The factory in Villadossola (VB), Italy. The factory in West Chicago, U.S.A. The factory in Ravenna, Italy. The factory in Suez, Egypt.

Vinavil white glue in its traditional packaging.
VINAVIL is universally known for its famous white glue in its characteristic red and white container, whose shape originates from the samples of experimental products of the years 1945-1950. They were carried out using 20 l metal containers of milk and 2 l bottles of wine, equipped with an upper spherical-shaped dome.

IN CONSTANT GROWTH

Over the last 18 years Vinavil has moved forward at a rapid pace. Its commercial and production structure is continuously expanding in both Italy and throughout the rest of the world. Today Vinavl S.p.A. has around 330 employees, a turnover of some 200 million Euro and an annual production of more than 200 thousand tonnes, half of which is exported to over 40 countries. The Company’s development strategy, its flexible organisation, constant commitment to ever-increasing globalisation and continued investment in manufacturing and especially in Research & Development are the foundations on which Vinavil builds its success.

the Singapore office complete Vinavil international dimension. Vinavil is determined to continue pursuing its growth and internationalisation plans and intensify them further in terms of commercial and manufacturing activities. Vinavil is the domestic market leader in the sectors of adhesives and water-based paint binders. With its network of agents and distributors throughout the world, it has a significant presence in Germany, Austria, Switzerland, Benelux, France, Spain, Denmark, the UK, Greece, Turkey, Hungary, the Middle East and Africa. Vinavil is strongly expanding in Eastern Europe and in the Far East, as well as in North America.
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VINAVIL GROWTH IN ITALY

VINAVIL GLOBAL GROWTH IN THE WORLD
Ravenna plant
Liquid raw materials storage tanks.
Ravenna plant
Liquid raw materials storage tanks.
As a result of continuing industrial upgrading and development programmes, Vinavil total global capacity is around 400,000 t/year in 2012. Currently, our key product range allows us to serve a wide variety of markets, with peaks of excellence in the wood adhesives segment. Specifically, Vinavil leads the water-resistant adhesives market.
As a result of continuing industrial upgrading and development programmes, Vinavil total global capacity is around 400,000 t/year in 2012. Currently, our key product range allows us to serve a wide variety of market sectors ranging from adhesives to textiles and from the construction industry to the chewing-gum market. The Mapei Group absorbs around 50% of Vinavil production and it encourages the push towards speciality products for diversified application sectors and for particular market niches.
To quote but one example, Vinavil adhesives offering includes over 50 products for widely diverse applications, with peaks of excellence in the wood adhesives segment. Specifically, Vinavil leads the water-resistant adhesives market.
LEADERSHIP IN PRODUCTS

In our state-of-the-art Research & Development laboratories in Milan and Villadossola, highly-qualified personnel ensure that our product range is constantly updated to meet the needs of major producers in Italy and abroad. Vinavil is active in industrial expansions, in line with its traditional philosophy of considering research as the primary driver of business development.

For the shipment of liquid products, Vinavil uses technologically-advanced vehicles and equipment to ensure top-quality customer service in strict compliance with current environmental and safety regulations.

Details of the tank storage of special products for exclusive use by Mapei. The search for new products for niche areas of expertise is the VINAVIL key to success. Research efforts aim at the definition of polymers, capable of satisfying the most sophisticated requirements. The reinforced collaboration with industrial partners is aimed at better understanding the end user’s needs and key problems. Examples of such uses were projects to consolidate ground surface to prevent dust discharge (Seveso in Ravenna factory).

Vinavil technical assistance plays an important role in backing the client during the application of the new products.
LEADERSHIP IN PRODUCTS

In our state-of-the-art Research & Development laboratories in Milan and Villadossola, highly-qualified personnel ensure that our product range is constantly updated to meet the requirements of an increasingly demanding customer base and rapidly evolving legislation. Alongside our established products for traditional uses, specialties are being developed including extrapure grade solid polymers used as bases for chewing-gum components, dispersions employed in protective coatings for cheese preservation, anti-shrinking agents for polymer artefacts (particularly for the automotive industry), secondary suspension agents for VCM (vinyl chloride) polymerisation, products for water-based paints that are environmentally friendly, have low VOC emission, etc.

We also take into account highly-specialised uses which, while not affecting the bottom line, address customers’ immediate and key problems. Examples of such uses were projects to consolidate ground surface to prevent dust discharge (Seveso in 1976, San Rossore estate in 1978), or cement-asbestos parts to be applied prior to asbestos removal. These types of products were also used in the area of artwork restoration, including the gluing onto synthetic meshes of fragments of Giotto and Cimabue frescoes, which had crumbled during the Assisi earthquake of September 1997, an operation which enabled complete restoration of the vaults of the Basilica of Saint Francis.

As a result of its efforts, Vinavil S.p.A. has succeeded in tripling its production volume over a period of ten years with only minimal increases to the number of operating personnel, achieving in 2001 a positive income which continued to grow over the years and reaching in 2011 sales for more than 164 million Euro. Today, Vinavil S.p.A. is a strong manufacturing company with good growth prospects founded on its knowhow and on a globally-established brand.

Vinavil also fits perfectly into Mapei Group dynamic structure, which further stimulates its growth and expansion, in line with its traditional philosophy of considering research as the primary driver of business development.
Villadossola plant.
Transportation of raw materials by rail tanks.
Villadossola plant.
Transportation of raw materials by rail tanks.
Vinavil is constantly present in our daily life. Vinavil's best-known product since the 1950s, the all-purpose glue made from polyvinyl-acetate (obtained through vinyl-acetate polymerisation) in its distinctive red container, can be found in millions of homes worldwide and is used to secure construction materials and in the framework of our houses. Vinavil polymers are also used as components in numerous construction chemicals.
Vinavil is constantly present in our daily life. Vinavil best known product since the 50s, the all-purpose glue made from polyvinyl-acetate (obtained through vinyl-acetate polymerisation) in its distinctive red and white bottle. However, the renowned white glue is not the Company only product. Vinavil also offers special application solutions, such as solid polymers for the chewing-gum industry, binders for many cosmetic products (blush, mascara, shampoo, hairspray) labelled as PVA (polyvinyl-acetate). Few people know that the coating of hard cheeses skin is made with Vinavil as binder. Vinavil is found in a large number of items around us such as paints, furniture, cardboard boxes, books, newspapers, and packaging as well as on the walls and in the framework of our houses. Vinavil polymers are also used as components in numerous construction chemicals.
The world of Vinavil includes a wide variety of products. Vinavil offers its customers the full range of vinyl-acetate homopolymers, including base products which can be used as raw materials as well as dispersion systems. Vinavil’s success in the polymer dispersions sector is based on its innovative technology and commitment to excellence, with a focus on quality and customer satisfaction. Innovation are the winning tools that have made Vinavil the leading Italian company in the polymer dispersions sector.
The world of Vinavil includes a wide variety of products. Vinavil offers its customers the full range of vinyl-acetate homopolymers, including base products which can be used as raw materials as well as ready-for-use modified and/or plasticised products for the joinery and carton packaging segments. Eight major product lines group together improving products that are consistently able to meet the most demanding requirements of the Italian and international marketplace. Water-based paint binders, adhesive dispersions, redispersible polymer powders, solid polymers for the chewing-gum industry, special use beads, vinyl adhesives for the DIY market, acrylic polymers for miscellaneous uses and special tailor-made polymers. Experience and innovation are the winning tools that have made Vinavil the leading Italian company in the polymer dispersions sector.
EIGHT MAJOR PRODUCT LINES

Dispersion and/or modified and/or plasticised homopolymers

In the area of vinyl-acetate homopolymers, Vinavil offers a vast array of products used mainly as industrial raw materials. Different in solid content and application, the products are designed for adhesives to be sprayed, to carton packaging adhesives to be machine spread and wood adhesives to be applied by brush.

Dispersion vinyl-versatic copolymers

Vinyl-versatic copolymers are used in the wall coating industry. The individual products in this line are designed to have specific features from which the different formulations used in the paint and coating segment can be obtained.

Vinyl-ethylene copolymer dispersions

Vinyl-ethylene copolymers are used in a variety of sectors. Vinavil offers a range of adhesives with different characteristics for each application. Our product range consists of adhesives for the furniture industry, designed for various applications (synthetic wadding, bound materials, pigment printing, woven non-woven etc.).

Vinyl-acetate polymers for the food industry

Our products for the food industry consist of two types: solids (with different molecular weight according to the application) and aqueous dispersions. The latter are used for hard cheese coatings. In the latter area, innovative vinyl-ethylene and acrylic products are also being developed.

Vinavil product range

VINAVIL products are exclusively aqueous dispersions or solids. The dispersions are a homogeneous distribution of polymer particles in water with different chemical composition. The solids are made of vinylic polymers or copolymers in form of bulk, flake, powder, bead, pearl and pastille.
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EIGHT MAJOR PRODUCT LINES

Dispersion and/or modified and/or plasticised homopolymers
- Adhesives for the construction, carton packaging and joinery industries
- Cement mortar additives
- Textile finishes

In the area of vinyl-acetate homopolymers, Vinavil offers a vast array of products used mainly as industrial raw materials. Different in solid content and viscosity, the diverse formulations of these products are appropriate for each specific application: from textile finishes, requiring fluid products to be sprayed, to carton packaging adhesives to be machine spread and wood adhesives to be applied by brush.

Dispersion vinyl-versatic copolymers
- Water-based paint and wall plastic coating binders.

Vinyl-versatic copolymers are used in the wall coating industry. The individual products in this line are designed to have specific features from which the different formulations used in the paint and coating segment can be obtained.

Vinyl-ethylene copolymer dispersions
- Adhesives for the binding of paper or wood with plastic materials
- Adhesives for the cigarette industry
- Water-based paint binders
- Binders for textile applications

Vinyl-ethylene copolymers are used in a variety of sectors. Vinavil offers a range of adhesives with different characteristics for each application. Our product range also includes dispersions for low-VOC water-based paints as well as cross-linkable products for the textile industry, designed for various applications (synthetic wadding, bound materials, pigment printing, woven non-woven etc.).

Vinyl-acetate polymers for the food industry
- Cheese coating
- Binder for the gum base used in chewing-gum

Our products for the food industry consist of two types: solids (with different molecular weight according to the customers’ specific requirements), used as binders for chewing-gum bases, and dispersions used for hard cheese coatings. In the latter area, innovative vinyl-ethylene and acrylic products are also being developed.
Copolymer solutions in the market

Acrylic products as self-adhesives in the automotive industry and in protective films. The viscosity of each of these polymer solutions is suitable for uneven surfaces or vertical applications. Vinyl fixatives are used to consolidate extremely dusty or damaged surfaces.

Solid vinyl-acetate homo and copolymers for thermoforming of composite materials. Bead products obtained by polymerisation of vinyl-acetate in water suspension. They have different molecular weight according to their different applications. These agents also require a chemical modification of the polymer through the introduction of limited amounts of other monomers.

Acrylic copolymers as binders and paints and membranes.

The availability of different acrylic monomers allows us to obtain dispersion products with extremely versatile chemical-physical characteristics, which may be offered for numerous applications in the different sectors in which Vinavil operates.

Redispersible powders (vinyl-acetate copolymers) adhesive for cementitious adhesives. Even if added in small quantities, the powders allow to reach the highest standards in term of adhesion, malleability, scratch resistance, flexibility and water repellence performances. They are used in the Mapei cementitious products.
The polymer in form of redispersible powder is a key component for cementitious adhesives. Even if added in small quantities, the powders allow to reach the highest standards in term of adhesion, malleability, resistance, flexibility and water repellence performances. They are used in the Mapei cementitious products.

Copolymer solutions
- Acrylic adhesives
- Vinyl fixatives for the construction market

Acrylic products as self-adhesives in the automotive industry and in protective films. The viscosity of each of these polymer solutions is suitable for different applications: low viscosity if the adhesive needs to penetrate porous substrates or form thin glue lines; high viscosity for uneven surfaces or vertical applications. Vinyl fixatives are used to consolidate extremely dusty or damaged surfaces.

Solid vinyl-acetate homo and copolymers
- Anti-shrinkage agents for the thermoforming of composite materials
- Solvent adhesives for wood flooring
- Wood-paste binder
- Permanent hair sprays
- Co-binders for printer inks

Bead products obtained by polymerisation of vinyl-acetate in water suspension. They have different molecular weight according to their different uses. Anti-shrinkage agents also require a chemical modification of the polymer through the introduction of limited amounts of other monomers.

Acrylic copolymers
- Water-based paint and enamel binders
- Wood and cement structure primers and paints
- Overprint varnishes
- Flexographic inks
- Additives for water-proofing membranes
- Textile printing binders
- Tapes

The availability of different acrylic monomers allows us to obtain dispersion products with extremely versatile chemical-physical characteristics, which may be offered for numerous applications in the different sectors in which Vinavil operates.

Redispersible powders (vinyl-acetate copolymers)
- Additives for tile laying powder adhesive
- Cement mortar additives
- Grout additives
- Thermo-insulation systems
- Plaster panel additives

Because of their different structural features powders obtained by spray drying, the dispersions are used, among others, in cement materials to increase adhesion, malleability, scratch resistance, flexibility and water repellence properties.
Ravenna plant. Vinyl-acetate polymer emulsion synthesis reactors.
Villadossola plant.
A detail of the polymer emulsion filtering systems.

Because of their particular adhesive features, Vinavil products are used as binders in a variety of industries. The five main areas of application include:

- **AREAS OF APPLICATION**
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Because of their particular adhesive features, Vinavil products are used as binders in a variety of industries. The five main areas of application include:

- Adhesives industry
- Construction additives industry
- Paints and coatings industry
- Textile industry
- Food industry

Most of Vinavil products are water based dispersions or solvent-free solids. All of them ensure very low emissions of volatile organic compounds (VOC).
Vinavil glue in its distinctive bottle: particularly suited for wood binding and model building.

Adhesives obtained from Vinavil polymer are used for tile laying.

Ethylene, vinyl-ester and acrylic-based homopolymer and copolymer dispersions for the carton packaging, wood and plastic materials industries. Solid homopolymers for the solvent adhesives industry.

Various gluing problems, even the most difficult, are resolved using liquid dispersions of Vinavil polymers, rather than traditional solvent adhesives. In 2004, Vinavil started making environmentally-friendly water-based acrylic self-adhesives, for the production of self-adhesive compounds for tapes and labels.

Even when products with specific performance features are required, such as moisture and heat resistant water-based products, Vinavil has a wide range of solutions available.

The R&D centre is always very attentive to the environmental sustainability of products and their formulations.

AREAS OF APPLICATION

The VINAVIL binders are used in various applications. All products are water based and then solvent-free, with an extremely low content of volatile organic compounds. The total absence of solvents reduces the safety risks from the point of view of the environment and of the health of those who produce and apply the products.

CONSTRUCTION

ADDITIONS INDUSTRY

Powder homopolymers and copolymers for the building industry.

Vinyl-ester, vinyl-ethylene, acrylic and styrene-acrylic copolymers for the coatings industry.

In this sector there is growing demand for environmentally-friendly, technically well-performing and easy-to-apply materials. Vinavil offers a series of binding agents, available both as liquid dispersions and as redispersible powders, for use as essential components in multiple products. The introduction of new adhesive systems for concrete super plasticisers made it possible to optimise the performances of hydration-based concretes and to ensure the quality of concrete in the construction of structures that require high requirements. The introduction of new adhesive systems for concrete super plasticisers made it possible to optimise the performances of hydration-based concretes and to ensure the quality of concrete in the construction of structures that require high requirements.
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ADHESIVE INDUSTRY

Ethylene, vinyl-ester and acrylic-based homopolymer and copolymer dispersions for the carton packaging, wood and plastic materials industries. Solid homopolymers for the solvent adhesives industry.

Various gluing problems, even the most difficult, are resolved using liquid dispersions of Vinavil polymers, rather than traditional solvent adhesives. In addition to vinyl dispersions, Vinavil started making environmentally-friendly water-based acrylic self-adhesives, for the production of self-adhesive compounds for tapes and labels. Even when products with specific performance features are required, such as moisture and heat resistant water-based adhesives, Vinavil is ready to meet all customer needs with the most suitable products. The R&D centre is always very attentive to the environmental sustainability of products and their formulations.

CONSTRUCTION ADDITIVES INDUSTRY

Powder homopolymers and copolymers for the building industry. Vinyl-versatic, vinyl-ethylene, acrylic and styrene-acrylic copolymers for the coatings industry.

In this sector there is growing demand for environmentally-friendly, technically well-performing and easy-to-apply materials. Vinavil offers a series of binding agents, available both as liquid dispersions and as redispersible powders, for use as essential components in multiple formulations. Tile adhesives, restoration mortars, grouts and thermal insulation systems could not be manufactured without these products. Over the last ten years, water-based...
paints have replaced, on the one hand, solvent-based paints, with obvious environmental benefits and, on the other hand, lime, with considerable benefits in terms of performance. The key to this success has been the availability of water-based polymer binders. Vinavil has pioneered this field in Italy. Thanks to their quality, our products have always set the standard in the industry. Essentially, Vinavil allows multi-sector adhesive manufacturers to formulate truly eco-compatible finished products, making our homes safer and more comfortable.

areas of application

The surfaces to be painted are in general wide areas like the walls of houses or hospitals. This could enhance the risk of release of volatile organic compounds. That’s why it is very important that the binders, in addition to excellent performance, minimize this phenomenon. VINAVIL products fully satisfy this need.

PAINT AND COATING INDUSTRY

Acrylic and vinyl-versatic copolymer dispersions for special applications in the coatings industry. Vinavil’s water-based paints comply with even the strictest environmental requirements and at the same time are fully comparable, and for some aspects, outperform equivalent solvent-based products. Special water-based paints are applied for decorative enamels, wood lacquers, anti-corrosion and flexographic varnishes and road paints. Excellent performance in the various sectors of application, together with 100% non-toxic dispersions, contribute to the high growth potential of these products.
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Vinavil textile finishes are used to improve the functional properties and appearance of fabrics. Even clothes and food are in contact with our body. The polymers in these applications must therefore respect the strongest requirements in terms of purity. VINAVIL has contributed to solve the problem of the disposal of chewing-gum in cities and the slow release of flavors in chewing-gum. The chewing-gum sector: the littering after use (on the sidewalks) and the slow release of flavours during the mastication.

Vinavil dispersion polymers are used in more sophisticated applications in which the binders, thanks to their particular characteristics, play an important role, such as in non-woven fabrics or pigment printing. This sector has always felt the need to use environmentally-friendly products as much as possible. With this in mind, Vinavil has significantly reduced the amount of polluting agents once present in older vinyl-acetate dispersions by using ethylene as a co-monomer. The company's current objective is to develop self-cross-linkable dispersions not containing free or free-able formaldehyde and not containing other volatile compounds that, even if not specifically prohibited by law, may be released in the environment.

TEXTILE INDUSTRY
Vinyl, acrylic and ethylene self-reticulating homo- and copolymer dispersions for the treatment of textile products. Besides surface textile finishing, Vinavil dispersions are used in more sophisticated applications in which the binders, thanks to their particular characteristics, play an important role, such as in non-woven fabrics or pigment printing. This sector has always felt the need to use environmentally-friendly products as much as possible. With this in mind, Vinavil has significantly reduced the amount of polluting agents once present in older vinyl-acetate dispersions by using ethylene as a co-monomer. The company's current objective is to develop self-cross-linkable dispersions not containing free or free-able formaldehyde and not containing other volatile compounds that, even if not specifically prohibited by law, may be released in the environment.

FOOD INDUSTRY
Vinyl homopolymers for the chewing-gum industry and vinyl-acetate dibutyl-maleic-ester copolymers for the cheese industry. These have been recently joined by 2 products that are proposed for niche areas and for more specialized uses: the gum base that makes it possible to remove the chewing gum from the areas of application surfaces after use only by a simple washing. This product is covered by a patent which has been extended all over the world. It has been awarded by the 2011 OSCAR MASI prize for innovation. The award has been assigned by AIRI, the Italian Association of Industrial Research; polymer content, only stabilized by polyvinyl alcohol, suitable, in the food and pharmaceutical industries, for the coating of flavors and of active principles which require a slow release.

Vinavil produces special solid polymers, used in the production of base gum for chewing-gum, and dispersion polymers for the covering film for certain hard-skin products, ensuring, in line with the requirements of the most influential international supervisory organisations.
Even clothes and food are in contact with our body. The polymers in these applications must therefore respect the strongest requirements in terms of purity. VINAVIL has contributed to solve two problems in the chewing-gum sector: the littering after use (on the sidewalks) and the slow release of flavours during the mastication.

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**FOOD INDUSTRY**

*Vinyl homopolymers* for the chewing-gum industry and vinyl-acetate dibutyl-maleic-ester copolymers for the cheese industry. These have been recently joined by 2 products that are proposed for niche areas and for more specialized uses:

- a particular polymer component of the gum base that makes it possible to remove the chewing gum from the surfaces after use only by a simple washing. This product is covered by a patent which has been extended all over the world. It has been awarded by the 2011 OSCAR MASI prize for innovation. The award has been assigned by AIRI, the Italian Association of Industrial Research;
- a vinyl dispersion, with a low polymer content, only stabilized by polyvinyl alcohol, suitable, in the food and pharmaceutical industries, for the coating of flavors and of active principles which require a slow release. Vinavil produces special solid polymers, used in the production of base gum for chewing-gum, and dispersion polymers for the covering film for certain hard-skin cheeses. Very strict and careful checks ensure these products’ full suitability for specific use, quality and shelf-life, in line with the requirements of the most influential international supervisory organisations.
The engineering team at Villadossola factory designs new plants using advanced computer-aided techniques.
Vinavil S.p.A. has succeeded in tripling its production volume over a period of ten years with only minimal increases to the number of operating personnel, achieving in 2001 a positive income. This performance continued to improve over the years, reaching in 2011 sales for more than 164 million Euro. This demonstrates the commitment to engineering excellence which has always characterised this company. Vinavil has adopted the best manufacturing technologies and a constant efficiency improvement strategy for its sites worldwide.
Ravenna plant.
View of the yard with products packaged in mini-tanks and ready for shipment.

THE ENGINEERING TEAM
Vinavil has a dedicated engineering team in place made up of professionals specialised in the area of manufacturing systems and processes. The team reviews, designs and tests new manufacturing plants and the automation and better efficiency of existing plants in all Vinavil sites.

The site, opened in Egypt in 2002, was originally equipped with two reactors to which a third one was later added. It has an annual manufacturing capacity of 140,000 tonnes and a production capacity of 110,000 tonnes. The site is currently expanding and its full manufacturing capacity worldwide stands at some 400,000 tonnes, with Mapei Group alone absorbing almost 50% of Italian production.

MANUFACTURING CAPACITY
In 2011, Vinavil production at the Villadossola and Ravenna facilities was over 202,500 tonnes, and a 2.5 increase is expected in 2012. Since Mapei acquired the company, significant investments have been made to expand manufacturing and services. To quote an example, the Villadossola ethylene copolymer production was immediately restarted, reaching maximum site capacity within a short time. Also in Villadossola, a new powder plant was built and at the same time in the two sites five new emulsion polymerisation reactors were installed. Additionally, a new line for the production of polyvinylidene fluoride (PVDF) was added. In Villadossola, a new acrylic copolymer production line was added. In Ravenna, Vinavil started manufacturing processing deals for its parent company, Mapei, in the area of concrete super-plasticisers and set accelerators.

The VINAVIL Engineering team designs new facilities and cooperates with the production to improve technical assets, to start new plants and to optimize yield of the sites. This collaboration is aimed to the full integration between Engineering and Production Managers, who are physically sitting next to each other.

Ravenna plant.
View of the yard with products packaged in mini-tanks and ready for shipment.
The VINAVIL Engineering team designs new facilities and cooperates with the production to improve technical assets, to start new plants and to optimize yield of the sites. This is possible also thanks to the full integration between Engineering and Production Managers, who are physically sitting next to each other.

**MANUFACTURING CAPACITY**

In 2011, **Vinavil production at the Villadossola and Ravenna facilities** was over 202,500 tonnes, and a 25% increase is expected in 2012. Since Mapei acquired the company, significant investments have been made to expand manufacturing and services. To quote an example, the Villadossola ethylene copolymer production was immediately restarted, reaching maximum site capacity within a short time. Also in Villadossola, a new powder plant was built and at the same time in the two sites five new emulsion polymerisation reactors were installed. Manufacturing capacity doubled, both for homopolymers and for vinyl-versatic copolymers. In Villadossola, a new acrylic copolymer production line was added. In Ravenna, Vinavil started manufacturing processing deals for its parent company, Mapei, in the area of concrete super-plasticisers and set accelerators.

The site, opened in Egypt in 2002, was originally equipped with two reactors to which a third one was later added. It has an annual manufacturing capacity of 35,000 t/year. The North American plants (Laval, Canada and Chicago, USA) have been equipped with new polymerisation reactors to achieve a total capacity of over 80,000 t/year, and two powder plants with a manufacturing capacity of approximately 20,000 t/year. Today, Vinavil’s total capacity worldwide stands at some 400,000 tonnes, with Mapei Group alone absorbing almost 50% of Italian production.

**THE ENGINEERING TEAM**

Vinavil has a dedicated engineering team in place made up of professionals specialised in the area of manufacturing systems and processes. The team reviews, recommends and creates through specialised companies the most innovative engineering solutions for the design, construction and testing of new manufacturing plants and the automation and better efficiency of existing plants in all Vinavil sites.

Villadossola plant.
Left. Detail of the loop reactor for the production of high-pressure ethylene copolymers.

Right. Cooling tower.
Ravenna factory. Detail of a state-of-the-art insulated storage tank.
Ravenna factory.
Detail of a state-of-the-art insulated storage tank.
Health, safety and the environment are the three core values on which Vinavil bases its principles. Vinavil has obtained major international certifications in the environmental protection and certified quality. In line with these principles, Vinavil has met emissions limits than those prescribed under law.

Villadossola factory. Water tank fire.
Health, safety and the environment are the three core values on which Vinavil bases its growth strategy. Preventing and reducing the environmental impact of processes and products means protecting the health of our employees, customers and local communities. In line with these principles, Vinavil has obtained major international certifications in the areas of quality, safety and environment protection. In all its manufacturing plants, Vinavil has adopted the best technologies available in order to comply with even more restrictive emission limits than those prescribed under law.
Vinavil considers the certification a key tool to run all business activities. VINAVIL is one of the few Italian companies to have received from Certiquality (National Institute for Certification of Excellence, which is given to those companies performing at the best from the point of view of quality, environmental protection and certified quality).

The success and the development of VINAVIL S.p.A. are based on its ability and skill in efficiently meeting its customer needs and expectations, in compliance with the current legislation. VINAVIL guarantees the safety of its plants and processes together with the protection of the environment and the health of its employees and stakeholders.

VINAVIL counts on its qualified research structures, competitive technologies, and efficient marketing organization, in order to compete on the international market with other qualified and valuable companies. VINAVIL is strongly committed to Villadossola factory. Biological wastewater treatment system used for purifying water before it is released into the Ovesca torrent.

Moreover, the Vinavil plants obtained the Environmental System Certification according to ISO 14001 (Ravenna in 2004, Villadossola in 2007) and the Safety System Certification according to BS-OHSAS 18001 in 2011. All these recognitions allow VINAVIL to gain the “Certification of Excellence” in 2011. VINAVIL believes that all its management systems can be real and effective management tools to continuously improve the level of its quality, safety and environmental performances. In line with such philosophy VINAVIL is an active partner in the international project Responsible Care®, worldwide voluntary initiative of chemical industry for environment, safety and health care.
Vinavil considers the certification a key tool to run all business activities. VINAVIL is one of the few Italian companies to have received from Certiquality (National Institute for Certification) the Certification of Excellence, which is given to those companies performing at the best from the point of view of QUALITY.

THE WORLDWIDE PRESTIGIOUS RECOGNITIONS

The success and the development of VINAVIL S.p.A. are based on its ability and skill in efficiently meeting its customer needs and expectations, in compliance with the current legislation. VINAVIL guarantees the safety of its plants and processes together with the protection of the environment and the health of its employees and stakeholders. VINAVIL counts on its qualified research structures, competitive technologies, and efficient marketing organization, in order to compete on the international market with other qualified and valuable companies.

VINAVIL is strongly committed to become a leading company in quality of products and services, thanks to its technological patrimony, and to strengthen its marketing structure. VINAVIL Company Quality System, including Milan headquarters, Villadossola and Ravenna plants, has been certified by Certiquality since 1995, according to ISO 9001 standard for research, development, production, sales and technical service of acetovinylic, ethylenic, acrylic, styrene-acrylic resins, in solid, solution and dispersed state. Moreover, the Vinavil plants obtained the Environmental System Certification according to ISO 14001 (Ravenna in 2004, Villadossola in 2007) and the Safety System Certification according to BS-OHSAS 18001 in 2011. All these recognitions allow VINAVIL to gain the “Certification of Excellence” in 2011. VINAVIL believes that all its management systems can be real and effective management tools to continuously improve the level of its quality, safety and environmental performances.

In line with such philosophy VINAVIL is an active partner in the international project Responsible Care®, worldwide voluntary initiative of chemical industry for environment, safety and health care.

Off-gas incenator which burns the organic emissions coming from plants and storages.
Morphological analysis by means of optical microscope.

This area, which is the feather in Vinavil cap, currently employs promptly follow, and sometimes anticipate, market demands.
Research is a primary driver of growth for the Company, which invests nearly 5% of its turnover in this activity. This area, which is the feather in Vinavil cap, currently employs 38 people, or 12% of the Company personnel. One-third of the Research and Technical Service staff hold university degrees in scientific fields (mostly Chemistry and Industrial Chemistry, while the rest of personnel holds diplomas in chemical disciplines. The modern and sophisticated research equipment used in the VINAVIL laboratories enable the company to improve innovation in terms of technological development and to promptly follow, and sometimes anticipate, market demands.
The main Research & Development Centre is in Villadossola, Montedison's historical site, which saw the development of many precursors of today's key products and of complex reaction technologies, still highly competitive to date. Villadossola also houses the Technology Centre, which provides technical service for the development of new products and their applications. A research unit also operates at Mapei Milan-based laboratories, mainly in the area of exploratory synthesis. It also provides assistance in the Ravenna manufacturing activities, whose original methods, developed by ANIC (Azienda Nazionale Idrogenazione Combustibili), differ from those developed by Montedison, followed in Villadossola. The Mapei R&D Centre in Laval, Canada also has a ten-member team dedicated to the development and improvement of Vinavil Americas' products and technologies. The various laboratories operate in close contact with each other and with the Villadossola Technical Service team, often seeking assistance from Mapei, universities and scientific and industrial research institutes. All this helps to accelerate the development of new products, the improvement of the existing ones and the transfer of the newly-developed products to the manufacturing plant.

In this respect, once experimentation based on at least five industrial trials is complete, the Formula Director at the...
In our R&D labs, highly qualified people keep our product lines up-to-date, discover new applications and recommend customers how to use our products. Vinavil is strongly committed in assuring safe plants for the workers and the surrounding environment, as well as in implementing an environmentally friendly chemistry.

RESEARCH AND TECHNOLOGY

The main Research & Development Centre is in Villadossola, Montedison’s historical site, which saw the development of many precursors of today’s key products and of complex reaction technologies, still highly competitive to date. Villadossola also houses the Technology Centre, which provides technical service for the development of new products and their applications. A research unit also operates at Mapei Milan-based laboratories, mainly in the area of exploratory synthesis. It also provides assistance in the Ravenna manufacturing activities, whose original methods, developed by ANIC (Azienda Nazionale Idrogenazione Combustibili), differ from those developed by Montedison, followed in Villadossola. The Mapei R&D Centre in Laval, Canada also has a ten-member team dedicated to the development and improvement of Vinavil Americas’ products and technologies. The various laboratories operate in close contact with each other and with the Villadossola Technical Service team, often seeking assistance from Mapei, universities and scientific and industrial research institutes. All this results in an intensive research activity, which enables the development of new products, the improvement of the existing ones and the transfer of the newly-developed products to the manufacturing plant.

In this respect, once experimentation based on at least five industrial trials is complete, the Formula Director at the Synthesis Department prepares the process manual, verifies and validates any additional changes and revises the operating instructions accordingly.

TECHNICAL SERVICE

Another strong point of Vinavil research is the Technical Service Laboratory which is able to test products in the application phase for the three sectors (adhesives, construction and textiles) and support customers by recommending the most suitable product and best application methods. Customer support before and after sale is key to Vinavil growth. Support is provided to all customers who request it or who have problems with a particular application. These situations often lead to co-operations for the formulation of special-use products or the development of new applications together with the customer.

COMMERCIAL AND MARKETING ORGANIZATION

All highly qualified personnel has acquired in-depth experience in the Research & Development and Technical Service laboratories. This outstanding hands-on knowledge allows our sales force to be successful on two different levels: firstly, in gaining a deep understanding of customers’ needs and requests, and secondly, in providing accurate and objective information to the Company R&D department, together with the Marketing team.
Chemical analysis and equipment for water monitoring.
Chemical analysis and equipment for water monitoring.
Attention to sustainability is the main driving force behind the Research Center of Villadossola. The elimination of solvents, the progressive replacement of PBT’s (Persistent, Bioaccumulative, Toxic) and the definition of safe products with high performances and durability are the driving criteria of Vinavil.

**Research for People and the Environment**

One of the main objectives of Vinavil’s research is to develop products with an increasingly higher safety profile for users, harmless for those who work with them, and recyclable at the end of their life cycle. Vinavil aims to be a business that respects the environment where it operates, and that integrates social responsibility in all its activities. In some cases, in cooperation with its key customers the Company anticipates law provisions, eliminating sensitive components from its formulas. For example, the binders are produced without using any ethoxylated alkyl phenols, which may be classified as toxic for reproduction.

**Sustainability: The Innovation Strategy for the Chemical Industry**

The Chemical Industry is characterized by strong scientific and technological bias, aimed at conserving natural resources and environmental quality. It develops innovations and new solutions for the improvement of people’s health and quality of life for future generations. Sustainability is the key note to dictate the progress of the whole Chemical Industry in the next decades. The Chemical Industry is at a crossroads since its market is asking for new sustainable products, following the vote by the European Parliament in favour of the REACH Regulations, which in turn will force the Chemical Industry to carry out a severe and costly assessment on how to implement them: this has to be seen as an opportunity to take advantage of, rather than a threat.
Attention to sustainability is the main driving force behind the Research Center of Villadossola. The elimination of solvents, the progressive replacement of PBT’s (Persistent, Bio-accumulative and Toxic materials) and the definition of safe products with high performances and durability are the driving criteria of Vinavil.

**RESEARCH FOR PEOPLE AND THE ENVIRONMENT**

**One of the main objectives** of Vinavil’s research is to develop products with an increasingly higher safety profile for users, harmless for those who come in contact with them and with the lowest possible environmental impact. To this end, formulas have been developed where all hazardous components are progressively eliminated, and the content of VOCs which may potentially be released into the environment has been minimised. Today, in each market segment where it operates, Vinavil can offer products compliant with the regulatory requirements applicable in the different countries.

In some cases, in co-operation with its key customers the Company anticipates law provisions, eliminating sensitive components from its formulas. For example, Vinavil has already removed from its food packaging products components like phthalates, suspected of modifying the endocrine system and of being potentially carcinogenic; for the same reason, paint binders are produced without using any ethoxylated alkyl phenols, which may be classified as toxic for reproduction.

**SUSTAINABILITY: THE INNOVATION STRATEGY FOR THE CHEMICAL INDUSTRY**

The Chemical Industry is characterized by strong scientific and technological bias, aimed at conserving natural resources and environmental quality. It develops innovations and new solutions for the improvement of people’s health and quality life for the future generations. Sustainability is the key note to dictate the progress of the whole Chemical Industry in the next decade. Europe can get a leading position, since its market is asking for new sustainable products, following the vote by the European Parliament in favour of the REACH Regulations, which in turn will force the Chemical Industry to carry out a severe and costly assessment on how to implement them: this has to be seen as an opportunity to take advantage of, rather than a threat. The Chemical Industry is at a
Wood Failure Percentage (WFP) determination according to ISO 6238.

R&D labs: specific tests useful for the improvement of the product range.

From the left.

Lab scale reactor in the first phase of a new product development.
Contact angle equipment for surface tension investigation.
Wood coating application by spray.
Flocking machine for textile (artificial velvet).

INTERNATIONAL STANDARDS
Vinavil tests products in its laboratories for suitability, applying the strictest criteria such as those required by the ISO, CEN, ASTM and DIN associations. Vinavil also participates in the work of international commissions for the definition and correct performance of the analyses and tests in use in the industry.

It may indeed choose the road which leads to resisting the changes, but this is certainly a short-sighted, losing approach. Vinavil has developed strategies aimed at consumers and industrial users; incentives for sustainable solutions. In so doing, we may erect legitimate barriers against the entry, from other markets, of products with characteristics not meeting the European standards of sustainability.
crossroads. It may indeed choose the road which leads to resisting the changes, but this is certainly a short-sighted, losing approach. Vinavil has bravely chosen the road which leads to product innovation, considering sustainability as the guiding star for its path. Sustainability may represent a factor of competitiveness, as long as the relevant characteristics are acknowledged by the market as a value. This can be achieved through:

- diffusion of information and education strategies aimed at consumers and industrial users;
- definition of coherent standards;
- legislative programme providing incentives for sustainable solutions.

In so doing, we may erect legitimate barriers against the entry, from other markets, of products with characteristics not meeting the European standards of sustainability.

**INTERNATIONAL STANDARDS**

Vinavil tests products in its laboratories for suitability, applying the strictest criteria such as those required by the ISO, CEN, ASTM and DIN standards. Special-application products, e.g. in the adhesives segment, have obtained specific certifications from national and international certification organisations. The characteristics of the different production lots are periodically tested in the laboratories to make sure that the chemical, physical and application properties are reproducible and meet the requirements of the relevant classes. Vinavil experts also participate in study groups as well as national and international commissions for the definition and correct performance of the analyses and tests in use in the industry.

R&D labs: specific tests useful for the improvement of the product range.

From the left. Lab scale reactor in the first phase of a new product development. Contact angle equipment for surface tension investigation. Wood coating application by spray. Flocking machine for textile (artificial velvet).
Villadossola R&D Centre.
Overview of the new
Standard Climatic Chamber.
Vinavil is consolidating its role as supplier to fine chemistry companies and as contributor to Mapei Group growth in the global market. Vinavil strategy focuses on strengthening the Company with new product lines and developing top management and marketing abilities: the Company’s true assets. The future is within Vinavil — the future is within us.

Ravenna plant. New raw materials storage tanks.
Vinavil is consolidating its role as supplier to fine chemistry companies and as contributor to Mapei Group growth in the global market. Vinavil strategy focuses on strengthening the Company with new product lines and improving the existing ones. Vinavil main asset is its ability to grow. Toward this end, Vinavil devotes increasing energy and large investments, using financial resources as well as research, design, construction, management and marketing abilities: the Company true assets. The future is within Vinavil - the future is within us.
Vinavil aims at becoming more and more competitive all over the world. Its philosophy is to put particular emphasis on niche areas, developing products environmentally sustainable and aimed at the most demanding customers. This strategy will help the company to succeed in its determined effort towards continuous growth and success.

The third phase in Vinavil's long history is underway. When Mapei acquired it in 1994, the Company was effectively re-established and made once again competitive. Today, through a bold programme of expansion and diversification, Vinavil is poised for continued success and growth.

This ambitious programme, to be conducted in agreement with the authorities, in synergy with the customers and using authoritative external sources of knowledge (universities, CNR, excellence centres, etc.) is based on managerial, financial, technical and commercial resources internal to the Group. Vinavil future is truly within Vinavil.
Vinavil aims at becoming more and more competitive all over the world. Its philosophy is to put particular emphasis on niche areas, developing products environmentally sustainable and obtainable from renewable resources. This will help the company to succeed in its determined effort towards continuous a growth and success.

**The third phase in Vinavil’s long history is underway.** When Mapei acquired it in 1994, the Company was effectively re-established and made once again competitive. Today, through a bold and ambitious investment programme, we are planning a “quantitative leap” that will result in twice our current manufacturing capacity in the medium term.

Vinavil is establishing itself as a major supplier of specialties for the formulated products and fine chemistry industry, both for Mapei Group and for the international market, able to compete with the top players in the sector.

Vinavil’s expansion, planned to take place in line with Mapei strategic growth, will include the launch of new product lines and the expansion of existing ones.

At the same time, related-services will be enhanced, including but not limited to energy self-production (a cogeneration system in Villadossola for higher energy efficiency) and product flow rationalisation, with substantial changes in internal and external logistics.

All this to make Vinavil even more competitive in the domestic and global market, boosting the ongoing virtuous cycle which underlies the Company’s growth and improvement process, while ensuring total respect for the environment.

In addition to these planned investments, Vinavil will capitalise on its advantages over competition by interacting more and more closely with the parent company Mapei, leveraging its strong presence in the domestic and international market and as a world-renowned brand.

This ambitious programme, to be conducted in agreement with the authorities, in synergy with the customers and using authoritative external sources of knowledge (universities, CNR, excellence centres, etc.) is based on managerial, financial, technical and commercial resources internal to the Group. Vinavil future is truly within Vinavil.
Products containing Vinavil polymers were used for the renovation of La Scala Theatre.

VINAVIL IN THE BINDERS INDUSTRY

These examples highlight the Company's ability to meet the international industry requirements.
VINAVIL IN THE BINDERS INDUSTRY

The binders industry is a very important sector for Vinavil. Numerous innovative products, created to solve the many problems found on site, are obtained using Vinavil polymers. Vinavil makes a highly-qualified contribution to the formulation of the most advanced products for the building and furniture industry and, in particularly difficult cases, its role proves to be fundamental to finding the most efficient solution. The restoration of historical buildings of great artistic value and many major projects completed throughout the world are tangible evidence of Vinavil commitment in this area. The following are some of the important completed works in which Vinavil has made a decisive contribution. Aside from the effectiveness of the products, these examples highlight the Company ability to meet the international industry requirements.