

**INDUSTRIE
CHIMICHE
FORESTALI**

ENVIRONMENTAL REPORT

INDUSTRIE CHIMICHE FORESTALI S.p.A.

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Introduction to the Environmental Declaration by the Managing Director

It gives me great pleasure to introduce the 2011 Environmental Report for the **Industrie Chimiche Forestali S.p.A. (ICF)** premises in Marcallo con Casone (Milan). This report marks the fifth three-year validity period of EMAS registration, continuing and consolidating the work started in 2000 by Industrie Chimiche Forestali S.p.A. and undertaken previously by Forestali S.r.l. from which the current Company inherited its working method, human resources, and plants. Respect for the environment and sustainable development have become aspects of primary importance for the people that work at the plant. The fundamental steps towards an integrated company management system, taken in 1997 with the adoption of a Quality Management System in compliance with the ISO 9001 standard, Environmental Management in compliance with the ISO 14001 standard and CE Regulation N° 761/2001, a Safety Management System in compliance with the OHSAS 18001/2007 standard, have become established and are strategic tools for ongoing improvement for ICF as well. This document is the update of the ICF S.p.A. 2011 Environmental Report in compliance with the requirements laid down in the new EC Regulation for the Eco Management and Audit Scheme (EMAS) that the Company has voluntarily adopted, in the certainty that this will valorise and extend the commitment made in relation to environmental problems more and more.

The chapter that follow deal with topics that are certainly of interest, such as:

- A brief introduction to our Company and its activities.
- The environmental policy that is in line with the Company's strategic guidelines.
- The urban, geological, and territorial setting of the area occupied by the plant, highlighting the impacts on the surrounding environment.
- A complete, detailed description of ICF S.p.A.'s plants, production processes, and products, with an indication of their application on the market.
- The organisational structure with particular reference to the responsibilities and activities of the environmental management departments.
- The direct and indirect environmental aspects that result from ICF S.p.A.'s activities, along with explanatory compendiums in the forms of trend tables and graphs.
- The criteria adopted to evaluate the significance of the environmental aspects and impacts.
- A description of the measures, equipment installed, and instruments used to contain and minimise the environmental impact.
- A description of the programme and goals for improvement in the environmental field.

The final glossary will certainly be of use in understanding the technical and specialist terms and abbreviations used in the text. Participation in the Community EMAS System has called for the collaboration and involvement of all the plant's personnel, who have taken some time out of their daily commitments to dedicate to EMAS.

I wish to thank each and every one of them for the work done.


Guido Cami – Managing Director

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1. PRESENTATION OF THE COMPANY

Brief presentation of the Company

Industrie Chimiche Forestali S.p.A. (ICF) has been in business since 1918 ICF S always being leading Italian company for making components for footwear industry. The complete range of ICF products includes: adhesives, composite materials for toe-puffs, counters, stiffeners, linings, and reinforcing.

In the upholstered furniture sector it works with the Durabond brand, making and marketing solvent and water based adhesives.

Industrie Chimiche Forestali S.p.A. operates in the Marcallo con Casone (MI) operating unit, the Forestali S.A. de C.V. (Anonymous Company with Variable Capital) commercial branch in Mexico, and the Adhesive Based Chemicals company that works in the industrial adhesives sector.

It has a significant profile on international markets: currently it exports to more than 60 countries around the world, with more than 65% of its turnover being exported.

Market shares for the activity

Within the EU the countries involved are Germany, France, Spain and Portugal, while worldwide it works in Mexico, South America, Canada, USA, Japan, China, Taiwan, Vietnam, India, Pakistan, Turkey, North Africa, the Middle East and Eastern Europe.

The path travelled towards the EMAS

As Forestali ICF applies a policy that covers Quality, the Environment, and Safety. In 1997 it achieved the goal of having its Quality System certified according to the ISO 9001 standard. Also in 1997 it took a definite step related to its environmental commitment by taking part in the Federchimica “*Responsible Care*” project. Immediately after this, in 1998, it adopted an Environmental Management System and achieved environmental certification according to the ISO 14001 standard.

In April 2009 it obtained certification of its Safety Management system in compliance with the OHSAS 18001:2007 standard.

In order to make its commitment to the environment public and accessible to its clientele, the authorities, and anyone that enquires about the same, as Forestali it has complied with EMAS Community Directive 1836/93 since 2000 and this was validated and registered against n° 100056 of 30/05/01. This Environmental Declaration was drawn up according to CE EMAS Regulation 1221/2009 and is the fourth renewal.

The commitment in then environmental field takes concrete form with an ever more extensive study and production of *environment-friendly products* (water-based adhesives) that also comply with the criteria laid down in the *Community Regulation for Ecological Quality of Footwear 2002/231/CE*.

2. ENVIRONMENTAL POLICY

Diffusion of the Environmental and Safety Policy

The Environmental Policy for the Marcallo con Casone plant was drawn up in March 1998 and was subsequently updated over the years up to this edition of september 2010.

The next page contains the full current text.

The Environmental Policy is diffused and made known to the Company employees at specific instruction and training meetings and other sensitisation occasions.

The importance of the Environmental and Safety Policy

This policy is made known by distributing it to outside operators working on the site in compliance with the environmental criteria laid down and distributed to public auditing authorities. It represents the starting point and point of reference for identifying the environmental objectives and programmes for annual improvement.

At meetings called for the review purpose, Top Management looks at the permanent validity of the Environmental Policy and evaluates its adequacy or the need for revision following any changes to circumstances or activities.



The Environmental and Safety Policy Declaration

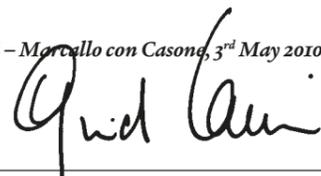
Industrie Chimiche Forestali S.p.A.'s primary objective is to constantly increase the level and competitiveness and profitability. These objectives are pursued by protecting the Health and Safety of workers and citizens, and protecting the Environment. ICF S.p.A. therefore wishes to work respecting the safety of its employees, its clients, and the surrounding population, predicting any significant accidents arising and limiting any harmful effects of the same. Top Management is aware that some of the production activities engaged in involve hazardous substances and chemical processes that have significant risks of accidents associated with them. Top Management is also aware that to guarantee Safety, avoiding any accident arising, an in-depth knowledge of the processes to be carried out and the dangers associated with them is essential. It is therefore necessary for the personnel to be adequately trained and that the plants be designed and built to high standards of Quality and Safety, as well as them being operated according to criteria that put Safety before any other consideration related to economic advantage. Industrie Chimiche Forestali S.p.A. is committed to keeping up an Environmental and Safety Management System based on the ISO 14001:2004 and OHSAS 18001:2007 standard, in order to make sure that:

- *Dangers to the environment and safety are identified and assessed.*
- *The risk of a significant accident, taken as being the combination of the probability of it occurring and the gravity of the effects, is kept as low as reasonably achievable, given the current state of knowledge and techniques.*
- *The laws and standards in force in relation to the environment and safety are respected.*
- *Transparent, collaborative relations are maintained with the Public Authorities and citizens.*
- *Modifications to the plants are weighed up and evaluated to ensure that they do not compromise the Safety and Environmental requirements.*
- *All employees are informed, trained, and prepared to work fully aware of the potential risks associated with their activities.*
- *Suitable procedures are adopted to deal with emergency situations in order to limit the resulting damage.*
- *The system's performance is constantly evaluated and suitable corrective action is taken to correct any deviations and to improve performance.*

All ICF S.p.A. employees and those for contractors working on the Marcallo con Casone site are called to conform to the spirit of this policy.

ICF, in the person of its Managing Director, declares that it is committed to providing and guaranteeing the means to attain the objectives of ongoing improvement and reduction of the environmental impact and safety in the workplace risks. ICF S.p.A. is certain that this commitment will be complied with by all employees in order to reach this efficiency and reliability milestone.

Managing Director – Guido Cami – Marcallo con Casone, 3rd May 2010



3. DESCRIPTION OF THE ACTIVITY

Industrie Chimiche Forestali: Yesterday

Forestali was founded in 1918 when Forestali in Maccagno in the Varese Province, to extract pyroligneous acid from wood. In the 1920s it started making formaldehyde as a derivative of pyroligneous acid, initially in Maccagno and then at the plant in Sesto S. Giovanni.

In the 1930s ICF's activities were stepped up with the launching of the Società Italiana Resine SIR to make phenolic resins in Sesto S. Giovanni. In 1941 it started making special impregnated fabrics for the footwear industry. In the 1950s it started making adhesives.

Having sold SIR, production of formaldehyde continued in Maccagno until 1983, the year in which Industrie Chimiche Forestali stopped making basic chemicals and finally set about tackling the segment that comes before the footwear sector.

In 1984 it changed its name and form of company from Industrie Chimiche Forestali to Forestali S.r.l., keeping the abbreviation ICF in the Company logo. In 1987 Forestali transferred production from the Sesto S. Giovanni plant to the new premises of Marcallo con Casone in the province of Milan.

On 31st December 1999 it ceased production at the Maccagno plant where it made toe-puffs counters and stiffeners.



Industrie Chimiche Forestali: Today

Currently, the only production site of Marcallo con Casone makes: toe-puffs, counters, stiffeners for the footwear industry, adhesives for the footwear and upholstered furniture industries.

The Marcallo premises house the activities of the ABC s.r.l. Company that also belongs to ICF and makes industrial adhesives.

The future of Industrie Chimiche Forestali

The new challenges posed by a global market see ICF giving particular attention to environmental aspects, deemed to add value to their own product, and the company ethical standard that was to be complied with.

The Company is therefore committed on two fronts: Designing products that are ever more environment-friendly, minimising their environmental impact on the territory, monitoring its own Environmental Management System. Environmental improvement of production processes and products is a strategic objective for ICF and is therefore seen as strengthening its competitive role and meeting emerging social needs. Strategies have been launched for acquiring new markets and possible new partnership agreements are being looked at, always in line with the environmental goals set beforehand.



3.2 – The Marcallo con Casone plant

Geographic location

The Marcallo con Casone plant is located in the south-western area of the Province of Milan, just a few kilometres far from the town of Magenta. It borders on the Regional Ticino Park and is about ten kilometres from the Ticino River, very closed to Malpensa Airport.

This area is characterised by high intensity industry and infrastructures, along with a still significant amount of agricultural activity.

The dominating weather conditions in the area, obtained from the Lombardy-Milan Meteorological Centre, updated in 2010 (based on the last 10 years), indicate: a maximum temperature of 39 °C in July and a minimum of -6,5°C in February. Annual mean precipitation is about 650 mm, with 4 days of snow, 25 storms in the summer season, and 35 days of mist.

Zoning of the area and surrounding areas

The existence of numerous irrigation ditches and artificial irrigation canals, some no longer working, bear witness to the recent past during which agriculture exceeded the industrial sector.

Communication network

It is located in an area full of infrastructures and communication routes, mainly: State Road n° II Padana Superiore about 300 m to the south, A4 motorway Milan – Turin about 1 km to the north, Milan – Turin State Railway line about 1 km to the south, intercontinental Milano-Malpensa airport (about 20 km away), and there important additions to the infrastructures are planned that involve the municipality of Marcallo con Casone itself - the most significant of these include the high-speed (TAV) train railway line and connection with the SS 336 freeway to the airport, work on which was completed in 2008.

The geological conformation of the area

The geological conformation of the area includes quaternary fluvio-glacial deposits that surface in a gravelly - sandy form and recent post-glacial alluvial deposits on the Ticino River plain. The latter provides underground drainage of a regional nature in relation to the upper water table.

Size of the production site

The premises cover about 55,000 sq.m., of which 22,800 sq.m. are covered and are used for production and stores, as well as housing ABC s.r.l.



Fig. 01 – Topographical map of the Municipality of Marcallo con Casone

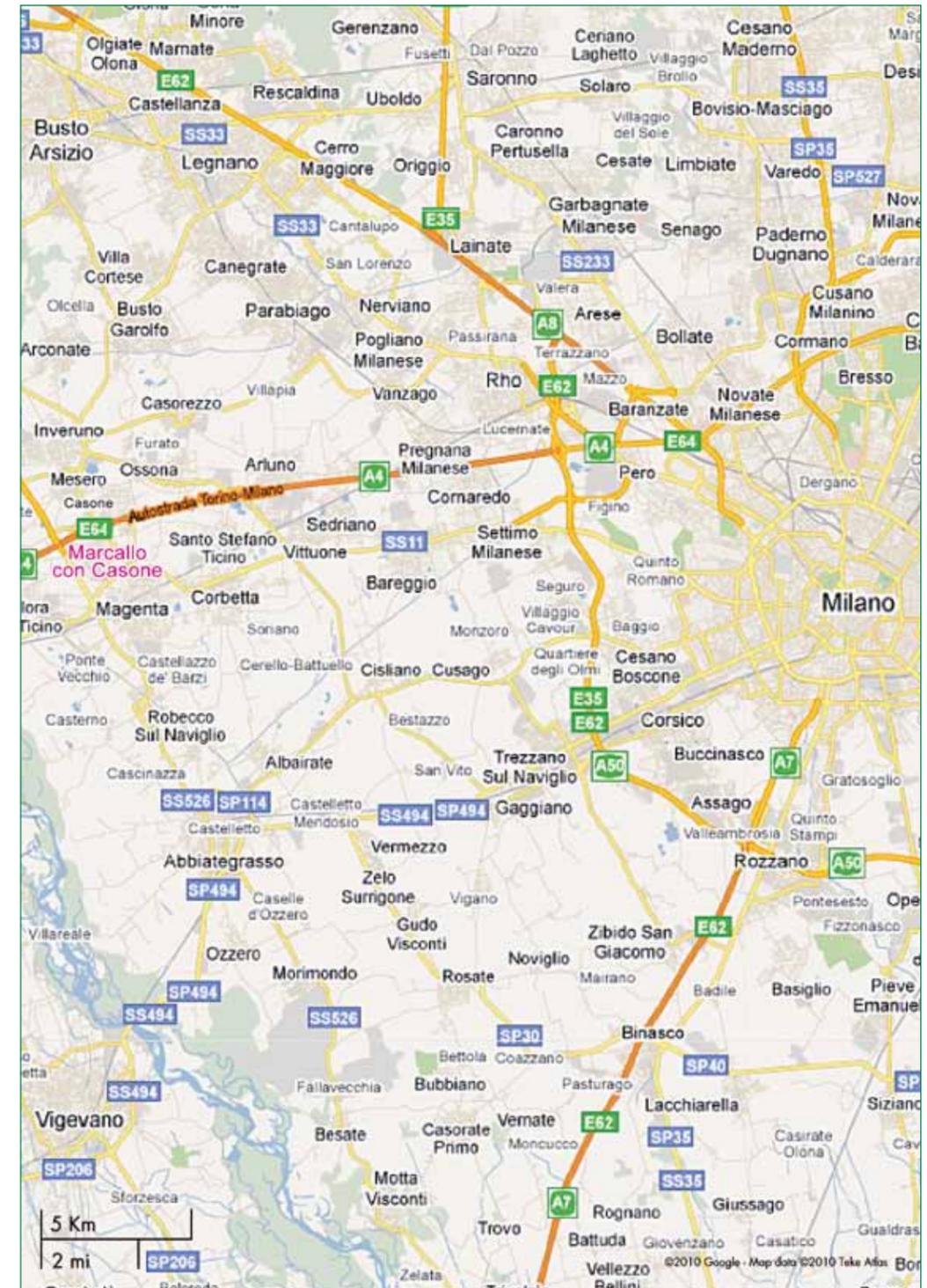


Fig. 02 – Territorial setting. Road map.

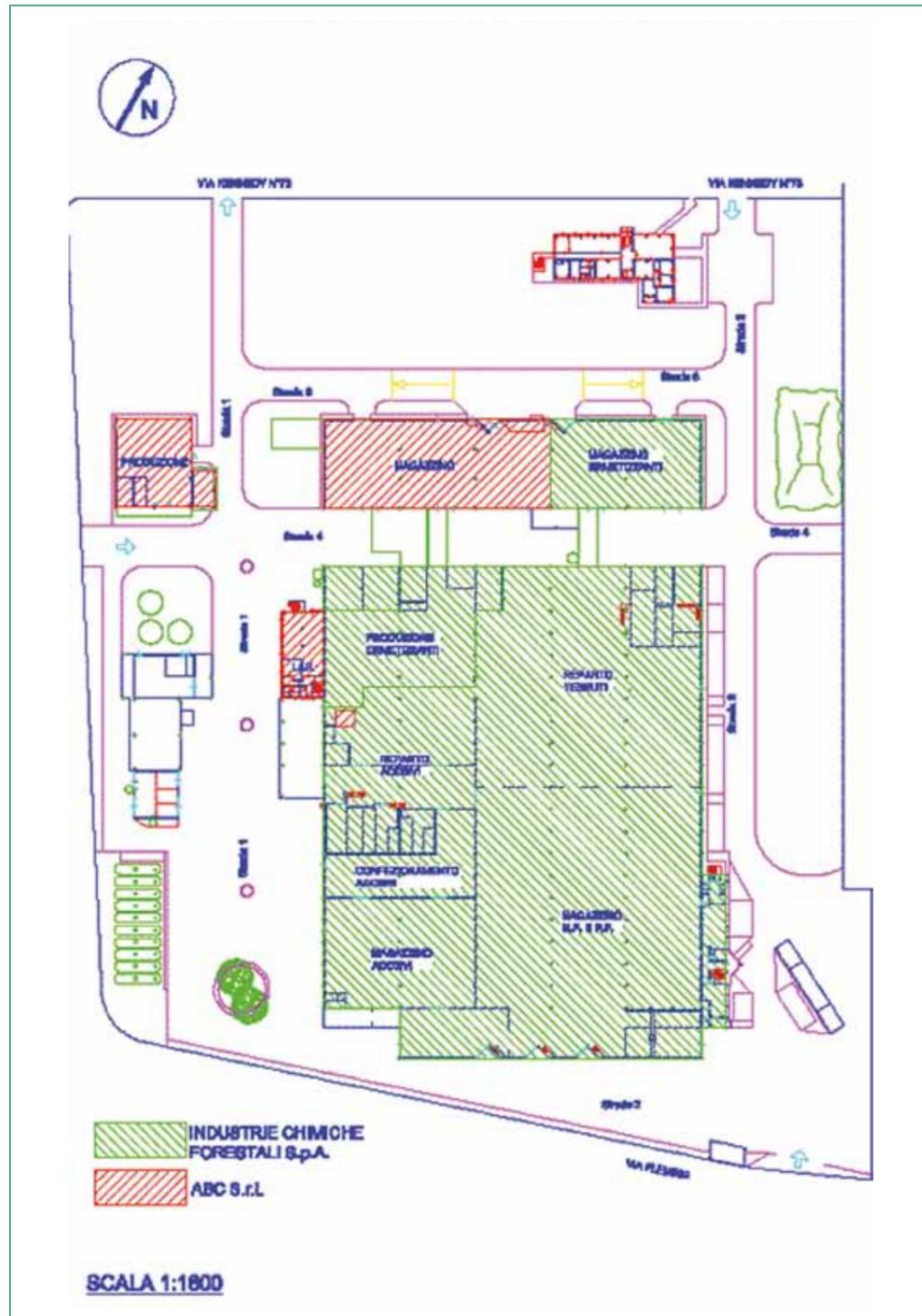


Fig. 03 – Company site arrangement. Scale 1:1600

3.3 – Plants and production processes

Production on site

Main ICF S.p.A.'s activities are:

- Adhesive production
- Production of special fabrics

Both production processes are discontinuous in batches to suit the market's demands. The production of adhesives constitutes the most properly chemical aspect of the activities. The adhesives produced are marketed in containers of various weights and sizes.

Adhesive production

The production of adhesives constitutes the most properly chemical aspect of the activities. The adhesives produced are marketed in metal containers of various weights and sizes. The major adhesives include:

- Polychloroprene adhesives
- Polyurethane adhesives
- Water-based adhesives

Polychloroprene adhesives

These are made by dissolving solid components in a suitable mixture of solvents loaded into a mixer at ambient pressure and temperature. Loading operations are done with a localised suction that leads to an emission point guarded by active carbon filters. After the dissolving phase and before discharging for packaging, the dryness and viscosity parameters of the adhesive are checked.

Polyurethane adhesives

These are made by dissolving polyurethane polymers obtained from the reaction between isocyanates and polyols in autoclaves in suitable solvent mixtures at ambient pressure and temperature. Loading operations are done with a localised suction that leads to an emission point guarded by active carbon filters. Once additives and stabilisers have been added, the following parameters of the adhesive are checked: dryness, viscosity, initial resistance to heat, and gas-chromatograph analysis of the solvents.

Water-based adhesives

The raw materials, dissolved in water, are mixed by being slowly stirred at ambient temperature in an atmospheric dissolver, along with small quantities of various additives like anti foaming agent, antioxidants, and vulcanisation catalysers.

FABRIC PRODUCTION

The term fabric refers to items made for footwear industry and leather goods as toe-puffs, stiffeners, counters linings, and reinforcing obtained by subjecting a support fabric (or non fabric) to suitable treatment. The working processes include various processing phases like impregnation, hot-melt spreading, powder spreading, and coextrusion, direct coating.

These phases are not necessarily sequential but can be in an order that depends on the formulations required in each case.

Impregnator or (Bruckner) drying machine

This machine is used to impregnate a fabric or woven non woven with a suitable polymer composition by passing it through a bath that contains starch. Subsequently the impregnated fabric passes through a heated, ventilated area where the water is removed.

The machine is equipped with automatic systems to check the weight and thickness, and the semi-finished item obtained is coiled onto reels or cut into sheets (finished product).



Preparation of starches

This is done in a particular area of the fabric department and involves homogenising various components in atmospheric dispersers fitted with a stirrer and systems for loading the raw materials called for in the recipe.

Hot-melt spreading line

This line is used to apply hot-melt adhesive on impregnated supports by melting the adhesive at a temperature between 160° and 220 °C and sending it to the spreader, made up of a flat head extruder.

Coextrusion line

This line makes special types of toe-puffs and stiffeners in polymers or mixtures of polymers rather than on an impregnated support that have particular application characteristics - multi-layer film in polymer material.

It is made up of a line with a polymer hopper feed and cooling and coiling calender.

Powder spreading line

This line is used to apply powder products to impregnated supports. A “spreader” releases a defined quantity of powder to be applied to the support, which is sent into an oven kept at a temperature of 130° - 170 °C causing the powder to melt. As it exits it meets a water-cooled calender at 7 - 8 °C through which the product passes before being cut or coiled. The finished product is cut into sheets with a standard size of 140x100 cm and in some cases, customised by flexographic printing (before cutting).

Direct coating line

Direct coating The line is used to apply thermoplastic adhesives material to the support to give perfect finishing on surface.

WORKING AND ENVIRONMENT

All working phases are done using equipment and instruments described in detail in Chap 8 “Environmental efficiency”, to control and minimise the environmental impact and risk of injury. The points at which emissions are released into the atmosphere are monitored by active carbon dampers, a cryogenic system for recovering solvents, water scrubber, and sleeve filters (see explanatory table – Tab 02 on page 35).

The washing water is collected in a dedicated tank and then treated in a primary plant before being discharged into the consortium’s public sewer as industrial waste. All waste is suitably selected in terms of type and recycled or disposed of. The processes described are shown in block diagram form below.

BLOCK DIAGRAM POLYURETHANE ADHESIVE PRODUCTION

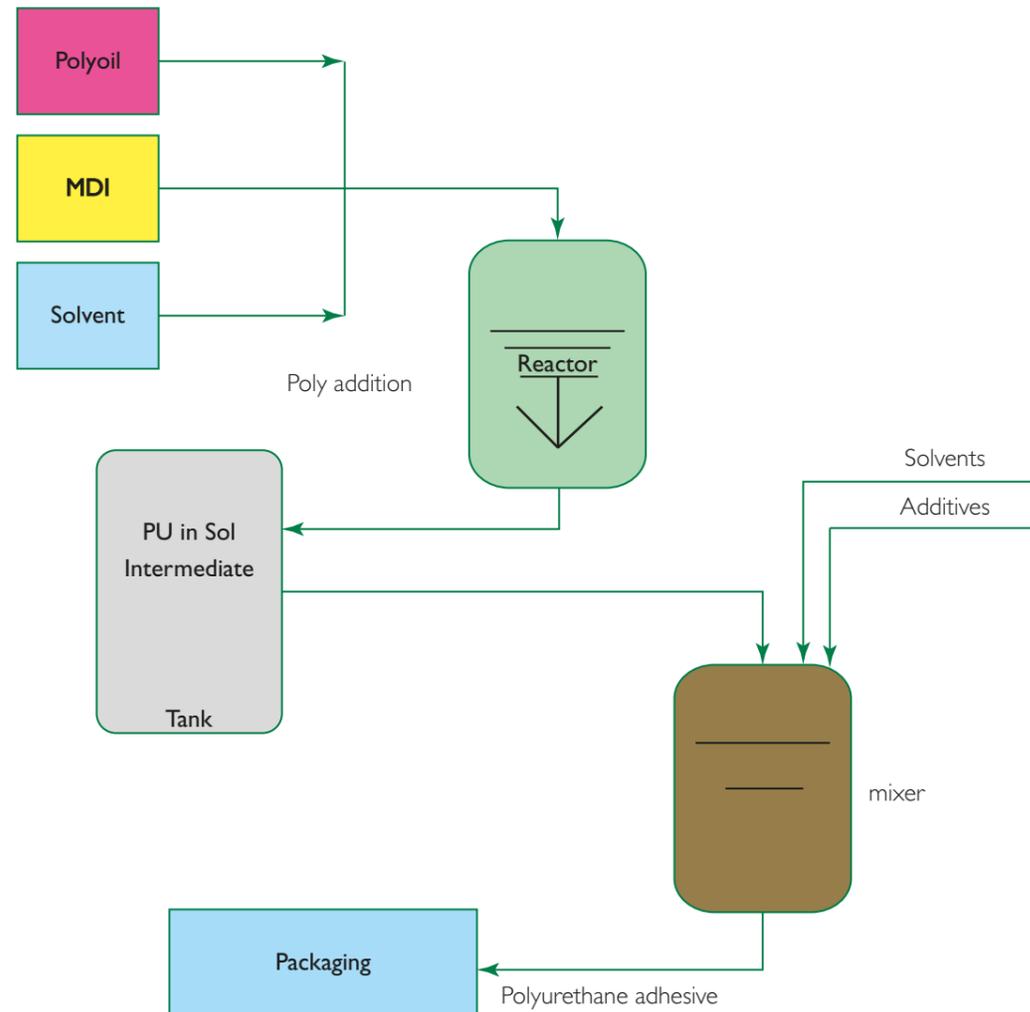


Diagram 1

DISSOLVING ADHESIVE BLOCK DIAGRAM

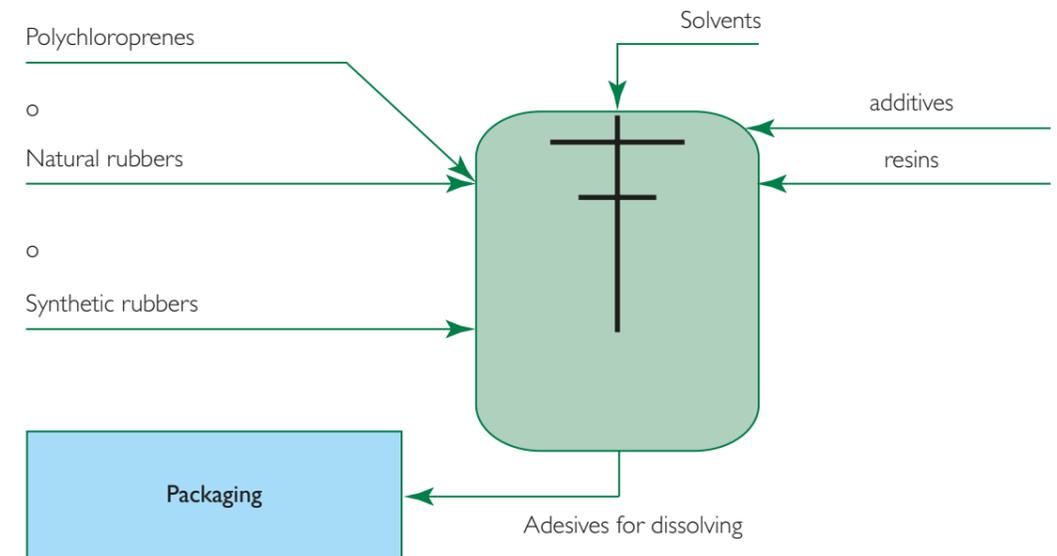


Diagram 2

WATER-BASED ADHESIVE

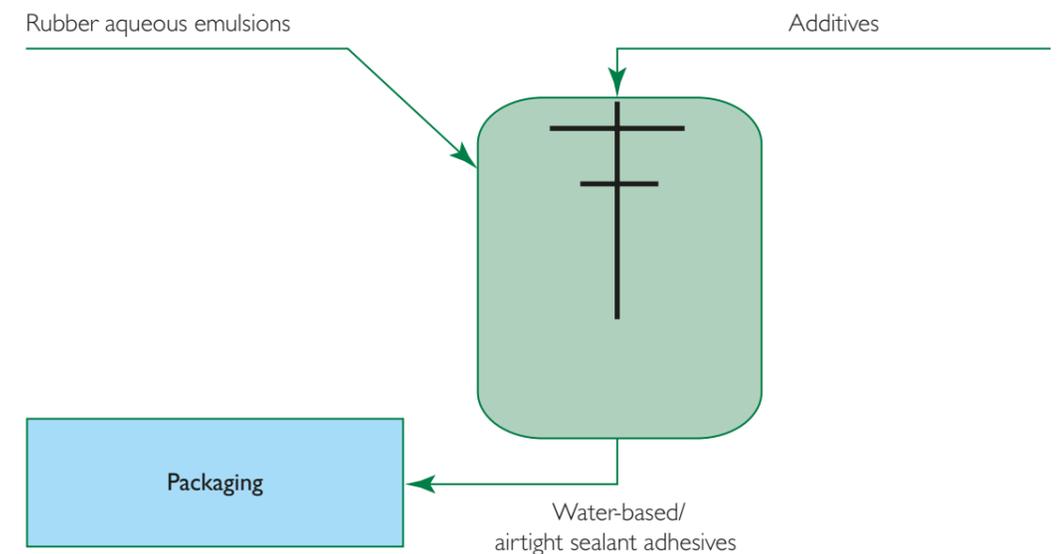


Diagram 3

BLOCK DIAGRAM OF SPECIAL FABRIC

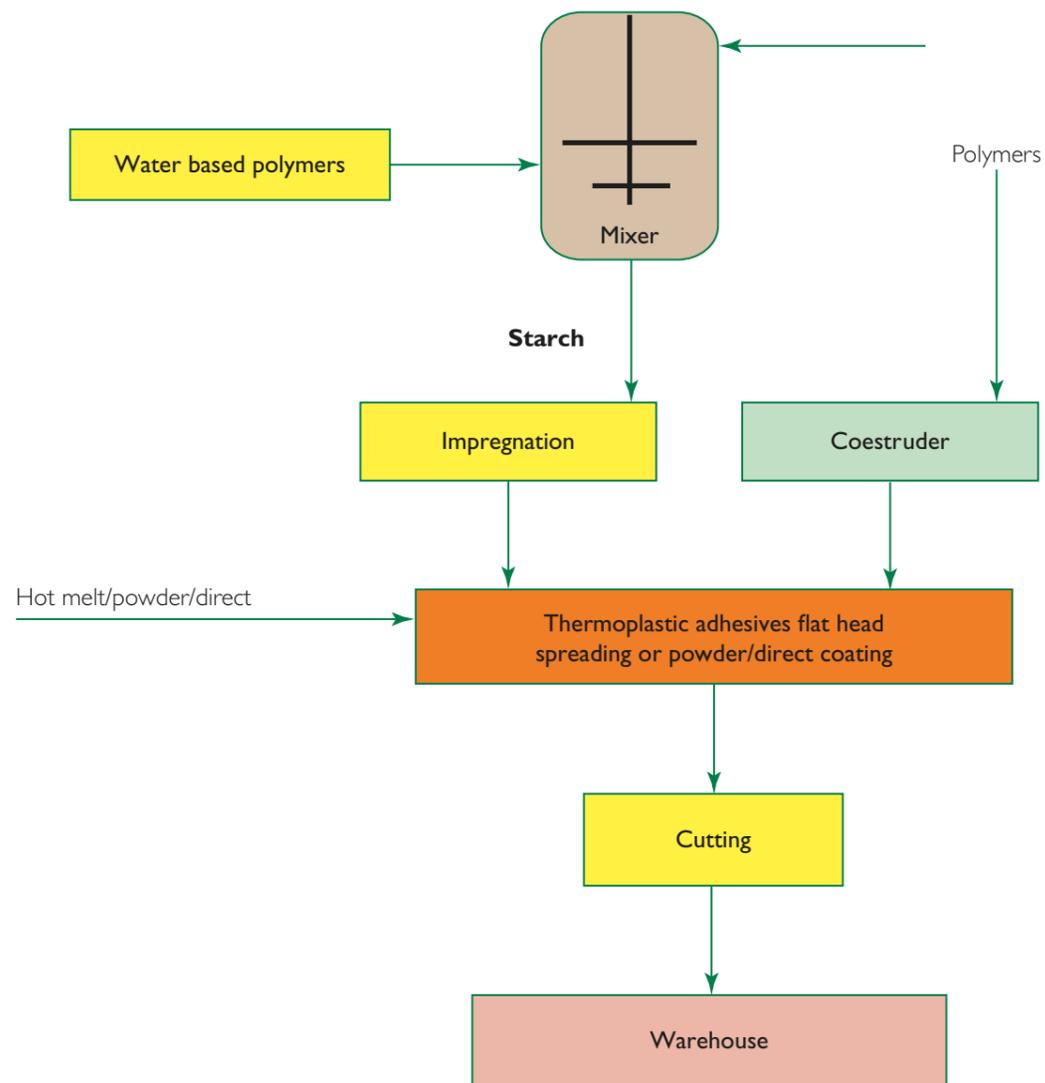


Diagram 4

4. ICF S.p.A.'s Products

ICF's adhesives are made according to the sector in which they are to be used and their industrial applications: Footwear (mainly) and upholstered furniture.

4.1 – ADHESIVES

Nature	Chemical / physical characteristics	Industrial application
Polyurethane	High-viscosity adhesives, highly heat resistant and high bonding performance. Heat reactivated.	Bonding of the bottom (sole – upper).
Polychloroprene	Highly heat resistant adhesives, from quick to moderately quick setting.	Bonding of the bottom and joining (folds, lining, gluing cleaning soles, and constructing the heel).
Water-based	Polyurethane water-based adhesives with high heat resistance.	Bonding of the bottom.

Tab 01

Principal raw materials used to make adhesives

- Polyurethane adhesives: *MDI, polyols, organic solvents, and additives.*
- Polychloroprene adhesives: *Resin, rubber and organic solvents.*
- Water-based adhesives: *Aqueous polymer emulsions and additives.*



Risks associated with raw materials and finished products being on site

Polyurethane adhesives:

- Noxious MDI. For handling this substance the handling criteria must be applied that are shown in the supplier's safety schedule, that is, mask, safety glasses, gloves, and protective clothing.
- Inflammable, irritant / noxious organic solvents. The solvents are handled via dedicated lines for the mixer tanks.

The reaction between MDI and polyoil generates a harmless polymer. Thus the only risk associated with handling polyurethane adhesive is the INFLAMMABILITY and IRRITABILITY risk due to using solvents like: ethyl acetate and acetone.

Polychloroprene adhesives:

- Organic solvents: Inflammable and irritant / noxious, dangerous for the environment.

The risk associated with using polychloroprene adhesives is that of INFLAMMABILITY, IRRITABILITY/NOXIOUSNESS and in some cases a DANGER FOR THE ENVIRONMENT.

Water-based adhesives:

- Aqueous polyurethane/polychloroprene polymer emulsion.

No risk associated with handling the raw materials and no risk when using the adhesive.
Low environmental impact.

The risks associated with using the raw materials used to make the adhesives are updated to comply with the 29th update of Directive 67/548/CEE on the classification and labelling of chemical substances. ICF has also decided to already implement Regulation CE 1272/08 "CLP" at this stage, also showing the new label on the safety schedule in addition to that called for in the 31th update of Directive 67/548/CEE.

Unlike the widespread practice in the sector of denaturation of solvents with organic chloro derivatives, the organic solvents used by ICF S.p.A. to make adhesives are raw materials with a high degree of purity, not denatured using chlorinated hydrocarbons and therefore less aggressive in relation to the environment.

4.2 - TOE-PUFFS, COUNTERS AND STIFFENERS

Toe-puffs, counters and stiffeners constitute the structural part that gives a shoe shape - In the very front and back parts respectively. Made of impregnated fabrics, extruded and hot-melt or powder bonded, they meet the various performance needs that depend on the type of shoe. (safety shoes, sports shoes, classical shoes, etc.). The effects achieved are: soft, elastic, agile, semi-rigid, and rigid.

Risks associated with raw materials and finished products being on site

Its raw materials used include: fabric, fabric non fabric, aqueous solutions of natural and synthetic rubber, inorganic contents, and heat-melt resins. All the raw materials are non dangerous and similarly the finished product is entirely risk free in terms of handling.

4.3 - LINING AND REINFORCING

The lining and reinforcing are used to line the inside part of the shoe or to reinforce some parts. The liners and reinforcing are bought, dyed, have adhesive added, and are then marketed. ICF S.p.A. is the exclusive distributor for Italy of the "Cambrelle" lining made by Dupont. For this range of items as well ICF S.p.A. makes sure that the quality level requested by suppliers and others is met in order to guarantee a product of high quality for its clientele.

All the products in the footwear sector, adhesives, toe-puffs and stiffeners, linings and reinforcing, comply with the Commission Decision of 17th February 1999 that establishes the criteria for assigning a community mark for quality ecological footwear (Decision 2009/563/CE), with reference to CE Regulation 2000/1980 for attributing the ecological quality mark (Ecolabel).

All ICF S.p.A.'s products are free of: chrome VI, arsenic, cadmium, lead, free formaldehyde, pentachlorophenol, and azo dyes. This allows the footwear manufacturer to apply for the ecological mark to be applied to their footwear since all the raw materials used conform to the community standard.

In anticipation of the contents of the Community Regulation, ICF S.p.A. has been involved with their suppliers for some time in demanding high quality standards for the raw materials used for their production processes. Today ICF S.p.A. can give its Clients guarantees not only as regards quality aspects, but also as regards the safety aspects when using the product.

4.4 – UPHOLSTERED FURNITURE ADHESIVE SECTOR

These are solvent and water-based adhesives. The solvent based adhesives are similar to those used in the footwear industry. Water-based polychloroprene adhesive (IDROFAST line) are products that, in addition to guaranteeing excellent application and bonding performance, are not dangerous, solvent-free, and have a low environmental impact. In this specific segment ICF is carrying out ever more in-depth research.

4.5 – PACKAGING

- Adhesives in cans of different shapes and sizes, 200 litre drums, 1000 litre IBC.
- Toe-puffs, counters and stiffeners in sheets (1 × 1,4 m).
- Lining and reinforcing in 50 or 100 m rolls.

Internal handling is done using forklift trucks in a flame retardant version in the case of adhesives. Loading and delivery on vehicles is done using wood pallets.

5. ORGANISATIONAL STRUCTURE

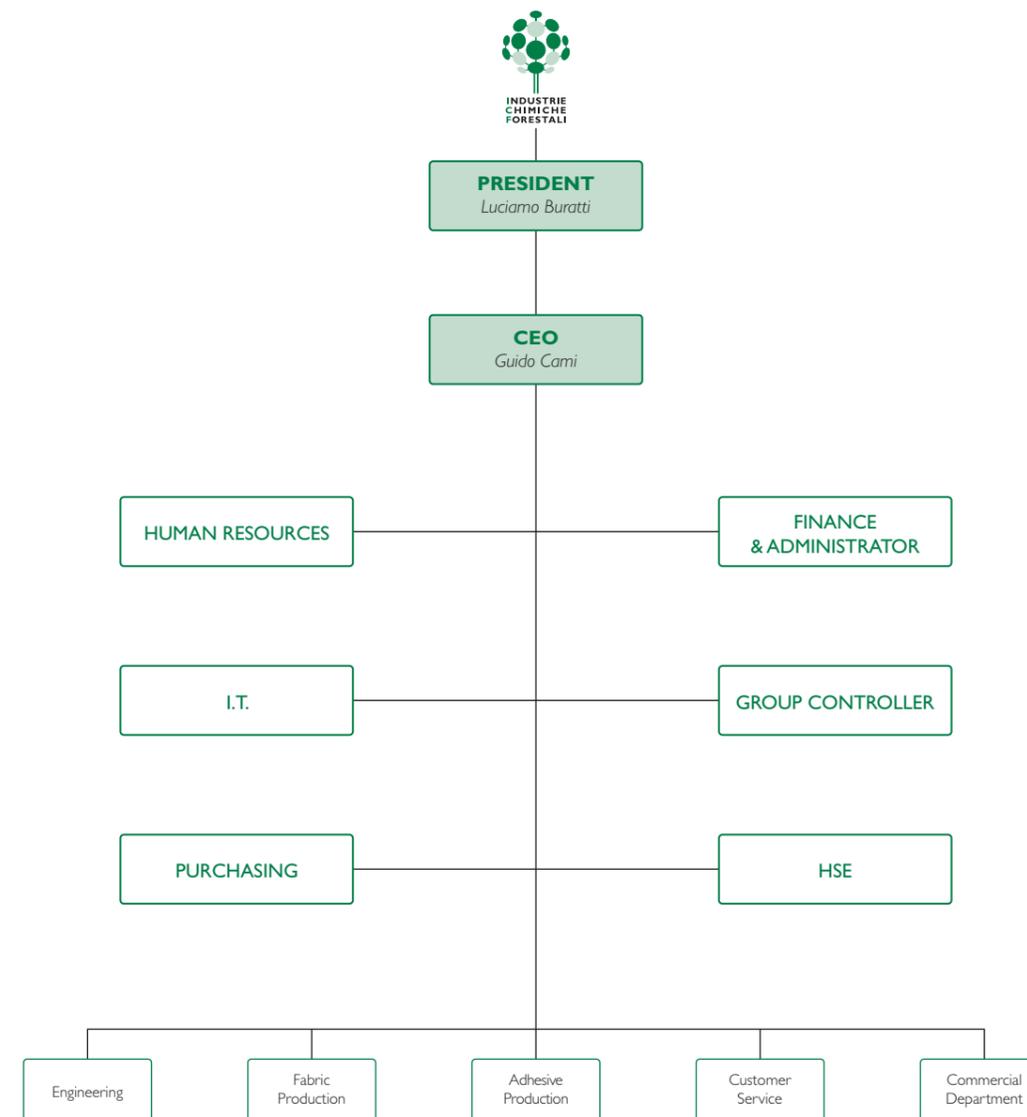


Fig 04 – Organisational chart for Industrie Chimiche Forestali S.p.A.

In particular, when it comes to environmental management, the *Management's Representative*, who is also the Quality, Environment, and Safety Manager is tasked with:

- Identifying all the needs connected with effective implementation of the EMS.
- Coordinating and managing internal audits of the EMS.
- Promoting the necessary corrective and preventive actions.
- Reporting to the Managing Director on EMS performance in order to guarantee a constant level of efficacy.

6. ENVIRONMENTAL MANAGEMENT SYSTEM

Environmental Management Manual

The Company has set up and keeps an Environmental Management System (EMS) active according to the UNI EN ISO 14001/04 standard, to guarantee application of the Environmental Policy, updating of improvement goals, and defining and developing environmental programmes.

Other EMS documents

The main reference document is the *Environmental and Safety Management Manual* that contains the basic elements of the EMS, describes the general organisational criteria, the Environmental policy, and how it is applied to the various sectors of ICF activity, leaving operating details to related documentation like:

- a. *Operating procedures* that describe the manner, conditions, and responsibilities for carrying out the activities in an environment-friendly way.
- b. *Operating instructions* for detailed, specific descriptions of activity details.
- c. *Operating Manuals* for plants.
- d. *Safety and Emergency Plans*.
- e. *Environmental records*.

Environmental management

For correct implementation, application, and guarantee of the EMS, ICF S.p.A. has mainly seen to the following aspects:

- Top Management's constant commitment to maintaining and drawing up the behavioural and operational guidelines expressed by the Environmental Policy, the objectives, and Environmental Programmes established.
- The appointment of a Health, Safety, and the Environment Manager, as well as Management's Representative, tasked with coordinating, developing and keeping the EMS active, as well as the activities resulting from it.
- Involving all departments in planning environmental activities and programmes, and improvement of environmental performance.
- A procedural system for recording and managing applicable environmental standards, laws, and regulations, which ensures constant updating and communication of aspects that affect all the departments involved and guarantees the plant's conformity to the current provisions by means of periodic programmed audits.
- A procedural system for identifying the environmental aspects and impacts that result from the production site's activities, classifying them according to established significance criteria, and defining and planning improvement objectives and programmes.

- A procedural system to detect, record, and analyse any non-conformity and take suitable corrective and preventive actions.
- Environmental information and training programmes for in-house personnel and contractors operating on the site as well as visitors.
- Specific training courses in the field for all personnel that engage in activities that have a significant environmental impact, favouring attendance by employees, in the form of dedicated training opportunities and accepting requests in the environmental and safety field put forward by the same.
- A procedural system for receiving reminders coming from outside with an environmental facet and reporting to the certification body in case of disputes with the public administration or serious accidents.
- A documental system of in-house environmental procedures and provisions that regulate both system aspects and operating aspects.
- A system of procedures for evaluating and approving tender companies and companies that supply products and services, authorised disposal sites, and external laboratories.
- Monitoring of environmental parameters and functioning of the plant in the manner and at the frequency established, and recording the same.
- Audits planned and carried out by in-house personnel that are qualified to check correct application of the EMS and evaluate possible areas of improvement.
- Periodic reviews of the EMS carried out by Top Management on the basis of information gathered to allow an overall evaluation of the adequacy of the Environmental Policy, environmental programmes and objectives, and therefore of the EMS as a whole.

7. ENVIRONMENTAL ASPECTS OF THE ACTIVITY

ICF has identified and evaluated the significant direct and indirect environmental impacts by means of significance criteria suitably chosen and dealt with in this chapter.

7.1 – Criteria for evaluating the significance of direct and indirect environmental aspects and impacts

Each of the plant's activities, products, and services is analysed with the aim of identifying its environmental aspects and to evaluate its subsequent current or potential impact factors, on the environment inside and outside the factory, in relation to Operating Procedure ICF P.O.A.S. or "Identification and evaluation of environmental aspects and impacts and safety risks".

A) Identification

The Manager of each Department, Service, or Operating Office, with the assistance of the EMSM uses the "Identification and evaluation of significant environmental impacts" form to record all the environmental impact factors that originate or may originate from its activity.

The analysis of the factors must relate to all possible conditions within the activity, that is:

- Normal operation
- Anomalous situations that can reasonably be foreseen
- Emergency situations.

B) Evaluation

The Manager of each Department, Service, and Operating Office, with the EMSM's assistance, evaluates which important aspects are to be deemed "significant" based on the criteria listed below.

• Significance criteria for environmental aspects

In addition to those regulated by national and regional laws and local Public Health regulations, as well as those subject to specific prescriptions by the environmental authorities, ICF identifies and analyses aspects that are included in one or more of the items listed below as "environmental aspects):

- Those regulated by international treaties.
- Those expected to be regulated in the short term.
- Those regulated by EU standards, not yet implemented in national legislation.
- If an accident makes action by the Fire brigade and/or suitably trained emergency teams necessary.

- Should spillage on the land bring about a dangerous, and/or extensive, and/or damaging pollution of the soil and surface and underground water.
- If they cause an evident impact on the surrounding environment.
- If the external environment affected enjoys particular protection.
- If they bring about heightened consumption of natural resources that are difficult to procure or difficult to renew.
- If the agent that causes the impact is recognised as being toxic or noxious to health and the environment by the environmental standards and the National Joint-Bargaining Contract.
- If they are the subject of repeated complaints by external groups or individual citizens.
- If they represent a possible economic risk.
- If they can be the subject of conditions set by insurance companies or the Company's shareholders.

• Environmental risk index

Evaluation of the significance of direct environmental aspects is done by attributing a Probability of occurrence factor P and a resulting environmental Damage factor D to each environmental aspect. The P and D factors are attributed values from 1 to 4 in terms of probability and increasing damage. The product of the P and D factors provides an Environmental Risk Index **ERI**. Environmental aspects with an **ERI** equal to or greater than 4 are defined significant and are taken into account when choosing improvement objectives.

The **ERI** is assigned to highlight the impacts that are to be tackled as a priority, according to an increasing order of the **ERI**.

The result of this identification and evaluation process must be approved by Top Management.

C) Recording significant environmental aspects

All environmental aspects evaluated are recorded in a register known as the "Environmental aspects register".

This Environmental Aspects register is made up of an orderly collection of tables in the form given by the "Identification and evaluation of significant environmental impacts" form.

The Environmental aspects register is kept by the EMSM.

D) Updating the register

Managers of Departments, Services, or the Operating Office are assisted by the EMSM with updating the environmental aspects register at least once a year, and any changes made are documented on the basis of:

- Amendments to legal provisions
- Reduction of aspects / impacts in line with work done
- New aspects arising from changes to processes or start-ups of new plants/equipment.
- New knowledge in the field of ecology, health, and safety.
- New significance classifications as a result of new problems arising connected with the siting of the plant within the territory.

E) Evaluation results

The following environmental aspects are significant: Significant risk of accident, emissions, liquid waste, hazardous waste, fire risk, water supply, and handling of hazardous substances.

7.2 – Direct environmental aspects

All environmental aspects connected with the activity carried out under normal conditions, when starting up or stopping plants, and especially under emergency conditions, were taken into account and evaluated.

The following direct environmental aspects were found to be significant:

- Emissions into the atmosphere
- Water supply and discharges
- Waste production
- Fire risk
- Handling of hazardous substances
- Significant risk of accidents

Other aspects such as: noise, surface and underground areas, radioactivity from radiation sources, energy consumption, and substances that are harmful to the ozone layer, are present but were found not to be significant. Environmental aspects like asbestos and PCB are not encountered in the Company.

EMISSIONS INTO THE ATMOSPHERE

The Company has reported all the emission points to the competent authorities according to Legislative Decree 59/05. There are 26 emission points, of which 13 relate to process emissions, 6 are from laboratory hoods, 1 from a spray test hood, 2 from air change units, and 4 from heating systems. Of these the emissions from the laboratories, air change units, and heating systems are emissions of little significance according to the Decree of the President of the House of Ministers of 21/7/89, Decree of the President of the Republic of 21/7/91, and Legislative Decree 152/06.

The process emission points are monitored according to a preset programme and the pollutant values are measured periodically (at least once a year).

The results are kept available for the authorities tasked with inspections and have always been below the legal limits. The boiler emission points are checked annually by checking performance and fumes.

The overall picture of the 13 emissions monitored of which 8 are fitted with scrubbing systems is given below (see table 02 on page 27 - analysis carried out in 2010 and 2011).

The process emissions are made up of air flows that contain the pollutants indicated.

DIFFUSED EMISSIONS

The vents from tanks are short-circuited during discharging from tanker trucks. In addition, measurements taken on the vents for all the tanks have not shown emissions of any significance. Each year a solvent handling plan is drawn up and this allows the Company to check for leaks for all diffused emissions generated when using solvents. The value for this item is always less than 3%.



Fig. 05 – Plant layout showing emission points (Scale 1:1600)
Points A, B, and C are points for measuring outside noise

Emission N°	Emission Source	FLOW RATE (m³/h)	Pollutants	Scrubbers installed	Average concentration found mg/Nm³ (2010)	Average concentration found mg/Nm³ (2011)	Emission limit values mg/Nm³	Mass flows measured in kg/h
E1	Adhesive mixers. Vents on mixers and storage tanks	3500 Only when loading	VOS	Active carbon filters	53,0	61,5	150	0,18 0,24
E2	Adhesive packing equipment	4600	VOS	-	97,0	100,8	150	0,47 0,49
E3	Adhesive mixers. Vents on mixers and storage tanks	<100	VOS	Liquid nitrogen cryogenic plant	< 3,0	1273	Limit only as mass flow 100 g/h	< 0,001 < 0,001
E4	Adhesive packing department air extractor	7000	VOS	-	44,7	24,0	50	0,32 0,16
E5	Adhesive packing department air extractor	3000	VOS	-	13,6	20,3	50	0,04 0,06
E12	Impregnator / spreader	23000	COT Powders	Water scrubber	8,5 3,0	7,2 2,7	< 10 < 10	0,17 0,06 0,15 0,06
E14	Granule extruder degassing	< 1000	VOS Powders	-	8,7 1,9	Not used since april 2011	< 20 < 10	< 0,02 < 0,01
E15	Granule extruder loading hopper	2200	Powders	Sleeve filter	0,74	Not used since april 2011	< 10	< 0,01
E19	Point spreading	2800	Powders	Sleeve filter	1,38	1,66	< 10	< 0,01 < 0,02
E20	Hot-melt spreading	1260	COT	-	9,18	11,1	< 20	0,02 0,02
E21	Coextruder	< 1000	COT	-	5,28	12,2	< 20	< 0,01 < 0,02
E22	Flexography	<1000	VOS	Active carbon filter	15,7	13,4	< 20	0,01 < 0,01
E26 **	Airtight sealant mixers	3000	Ammonia	Acid water scrubber	18,4	0,33	< 30	0,055 0,001

** E26 authorisation by Lombardy Regional Government Decree N° VI/66639 of 11/04/1995; E28 Lombardy RGD N° 505 of 23/01/2007. Points E26 and e28 will be discontinued as from the first half of 2010.

Tab 02 Process emissions

All the emission points were authorised by AIA/IPPC Decree N° 12771 of 29th October 2007 issued by the Lombardy Region. As a result some emission limits were revised: in some cases the limits remained unchanged and in others they were lowered. This decree replaces all previous authorisations. In 2009 all the limits were complied with. The mass flow values for 2009 are shown in bold print.

The type of pollutant found in process atmospheric emissions includes:

- VOS coming from the adhesive production plant area.
- CO, CO₂, and NO_x from the heating systems and impregnator. As regards the boilers for the heating system, these are checked regularly according to Decree of the President of the Republic 412/93. The impregnator (E12) is monitored, as per the authorisation, for COT and powders.

The CO and NO_x pollutants are not a determining factor since they are not prescribed.

- Powder coming from the powder spreader and granule extruder.

Table 3a shows the values, expressed in tonnes, for atmospheric pollutants emitted, broken up by type. Table 3b shows the indicators for emissions and quantities produced. The VOS indicator is obtained as the ratio between the number of t emitted and the number of t of adhesive produced per 100. The CO₂ indicator is the ratio between the number of t of CO₂ and the number of t of toe-puffs and stiffeners produced per 100. The powder and ammonia indicators are deemed hardly significant. Since toe-puffs and stiffeners are measured in sq.m., as an approximation 1000 sq.m. was taken as being equal to one t.

Pollutant calculated in tonnes	2009	2010	2011
VOS	1,5	2,0	3,4
CO ₂	842	964	1059
Powders	<0,5	<0,5	<0,5
Ammonia	0,033	0,049	0,002

Tab 3a

Emission indicators / product quantities	2009	2010	2011
VOS	0,026	0,026	0,045
CO ₂	9,2	7,6	10,1

Tab 3b

The improvement in the VOS indicator over the years confirms greater efficiency of the scrubber plants. The CO₂ indicator is linked to seasonal weather condition trends.

WATER SUPPLY AND DISCHARGES

The work done by ICF in Marcallo requires quantities of water of little significance. The most important use relates to service activities like washing plants, while use as a raw material in the processes is very limited. Water consumed is used mainly for: preparing aqueous starch suspensions (as a raw material), washing of plants, drinking water and ablution facilities. Water used as a Raw Material for starch suspensions does not exceed 500 m³/year.

About 1000 m³/year of water is used for washing plants. A total volume of about 35 m³ for cooling is kept in a closed circuit with a top up of about 5% every 2 months. Water consumption is shown in Tab 05 on page 38. Polluted waste water comes from plant washing operations. This is taken to a primary treatment system where it is purified using lime and aluminium polychloride. After treatment the waste is discharged into the TAM "Magentino Environmental Protection" Consortium's sewer in compliance with the limits laid down by the Consortium. Before being discharged ICF's Quality Control analyses the waste water, and twice a year this is done by an external laboratory. In the first case the parameters checked are: COD, surfactants, and NH₄ as prescribed by the Consortium, while external analyses cover a wider range of parameters. Once a year the Magentino Consortium carries out checks to determine the compatibility of the discharges. Table 04 shows the latest data obtained for 2010 and 2011.



Parameter	Values measured by the Magentino Consortium for 2010	Values measured by the Magentino Consortium for 2011	Consortium limits Auth. PE n° 008/05 Marcallo Municipality of 28/04/06 and AIA/IPPC Decree n° 12771 of 29/10/07
COD	395 mg/l	114,5 mg/l	< 1125 mg/l
Total surfactants	3,5 mg/l	0,45 mg/l	< 18 mg/l
NH ₄ Nitrogen	10 mg/l	17 mg/l	< 45 mg/l

Tab 04

Analyses of waste water by the Magentino Consortium and external laboratories confirmed compliance with the authorised limits. All initial stormwater collected from roofs and external paved and asphalted areas are collected in the premises' sewer system, sent to accumulation tanks, and from there to the consortium's sewer system.

Water subsequent to initial stormwater is dispersed into the underground bodies of water via a soak pit.

WATER CONSUMPTION

ICF's water consumption is shown below, with extremely limited quantities being used for the production process.

Water consumption in m ³	2009	2010	2011
Office potable water	831	508	291
Plant potable water (washing, production and ablutions)	9928	10927	11068
Internal bore-hole water (fire-fighting system)	847	1022	1017
Total	11600	12547	12376

Tab 05

The plant potable water consumption has increased over the three years due to growth production.

WASTE PRODUCTION

The types of waste produced in the plant, as classified by Legislative Decree 152/06 part IV, essentially include waste from packaging, sludge, polluted packaging, paper and cardboard, plastic, and timber pallets. Hazardous waste produced includes spent active carbon (coming from emission scrubber filters) that is not disposed of but are returned to the supplier for recycling, and polluted packaging that is recycled after rehabilitation, obsolete or non conforming adhesives that are sent for disposal, and spent oils.

The entire site has a separate collection system that also covers non-productive aspects (offices, canteen, etc.) for paper, plastic, cans, batteries, and photocopier toner. ICF manages all waste by means of the prescribed loading and discharging register and each year it completes the SDF (Single Declaration Form). Waste is disposed of and transported by authorised companies that provide the relevant disposal certificate (4th copy of the form).

Tab 06 shows the main waste from the plant, with the relevant CER codes. The quantities produced are shown in table 07. Basically the waste produced has tended to reduce in proportion to the drop in production experienced in 2008 and 2009. The only figure that increased is that for CER 080409* due to the closing of some depots and return of goods.

Type of waste	Hazardous CER	Non-hazardous CER
Waste from a number of packaging types		150106
Waste from composite materials		040209
Washing water		080416
Paper and cardboard		150101
Plastic packing		150102
Timber packing		150103
Sludge		070212
Obsolete adhesives	080409*	
Obsolete adhesives	080411*	
Packing containing residue of hazardous substances (pollutants)	150110*	
Spent carbon	190110*	
Spent oils	120107*	
Mineral oil discharges	130205*	

Tab 06

WASTE

Type of waste (tonnes)	CER Code	2009	2010	2011
Waste from a number of packaging types	150106	78,8	103,4	75,8
Waste from composite materials	040209	177,7	237,8	235,1
Washing water	080416	23,0	49,5	479,2
Paper and cardboard	150101	44,0	58,0	52,5
Plastic packing	150102	15,0	16,8	14,3
Timber packing	150103	14,7	12,3	24,3
Obsolete adhesives	080409*	35,3	37,8	57,9
Obsolete adhesives	080410*	-	34,8	35,1
Packing containing residue of hazardous substances (pollutants)	150110*	25,6	24,5	25,1
Sludge	070212	90,2	91,7	43,9
Spent carbon	190110*	1,3		
Spent carbon	061302*			1,2
Emulsion oil	120109*		0,6	0,4
Mineral oil discharges	130205	1,1	-	1,2

Tab 07a

Waste indicators	2009	2010	2011	
Adhesive / hazardous waste production	11,0	8,1	15,6	t/t x1000
Toe-puff & stiffener / non-hazardous waste production	8,8	10,7	5,3	m ² /t. x100

Tab 07b

Non-hazardous waste is also associated with fabric production, with CER codes: 040209 + 070212 + 080416. Hazardous waste is associated with adhesive production, with CER codes 080409 + 080411 + 150110 + 190110.

The 2009 indicator for the production of adhesives / hazardous waste was influenced by an increase in CER 080409* due to obsolete adhesives being returned by ICF agents with stores.

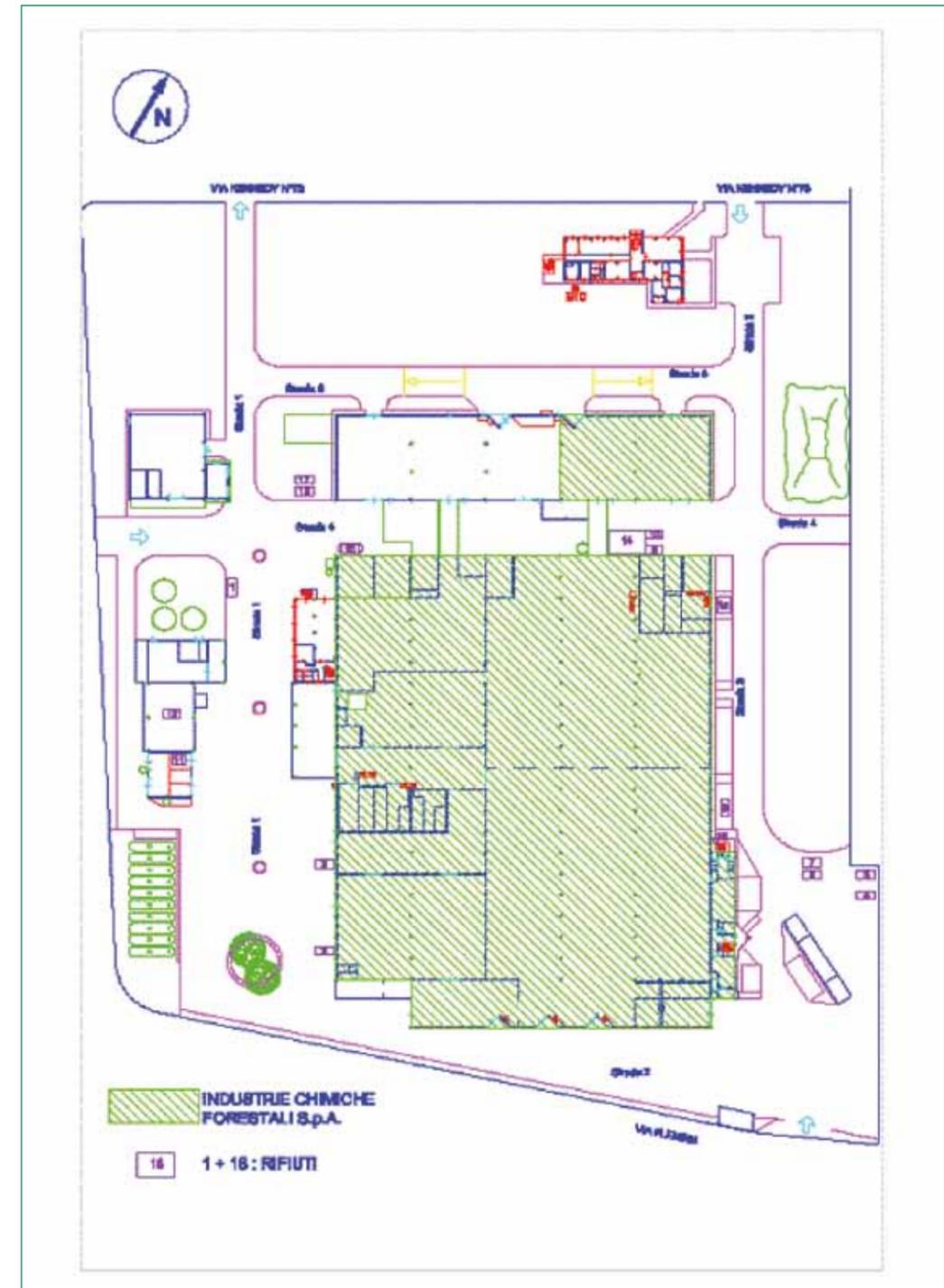


Fig 06 – Plant layout showing collection points for separate waste collection (Scale 1:1600)

FIRE RISK

The Company has drawn up an Emergency Plan along with the ABC S.r.l. Company that is on site, and made it known to all the employees.

It covers all sources of risk and especially the fire risk since the production process involves extensive quantities of inflammable materials (organic solvents).

Plans are displayed in all workplaces showing escape routes and a marker to identify the current position. Each workstation has a telephone directory with the external emergency numbers (fire brigade, hospital, emergency services). All fire-fighting equipment is periodically checked. The Company has a Fire Prevention Certificate valid until 13th May 2009, with an application for a renewal due to no changes dated 16/04/09. Also an application was submitted on 20/03/09 for additional activities.

An in-house inter-company fire-fighting and emergency assistance team has been set up with 28 members, of which 12 are also trained to provide first aid.

Every three months the fire-fighting team holds practical and theory sessions. Once a year a fire drill is held during which personnel are evacuated and all ICF and ABC personnel are involved.

Since the adhesive production department and adhesives stores are most exposed to a risk of fire due to the type of products handled or stored, they are equipped with:

- A flameproof electrical system
- Flameproof forklift trucks
- An infrared flame detection system
- A flooding and sprinkler fire-extinguisher system
- Spark-free tools to be used in these areas.
- Working clothes that do not generate static electricity (natural fibres like cotton and wool).

All fire-fighting equipment is periodically checked according to a Company plan.

A new survey was carried out in June 2010 to evaluate explosive atmospheres according to heading XI of Legislative Decree 81/08.

The document prepared once again confirms a risk of explosion in the adhesives department, which was already known and is monitored especially in zone 2 and small areas of zone 1.

HANDLING OF HAZARDOUS SUBSTANCES

The main substances and solvents used in production processes are shown below, with an indication of commercial or chemical name, hazard classification, and risk phrases:

Name	Hazard symbol and risk phrases R	Tonnes 2010	Tonnes 2011	Storage method
Ethyl acetate	F, Xi Inflammable, irritant R 11, 36, 66, 67	635	711	25 m ³ underground tank n° 8A, 25 m ³ underground tank n° 9A, 50 m ³ underground tank n° 10,
Acetone	F, Xi Inflammable, irritant R 11, 36, 66, 67	1420	1582	50 m ³ underground tank n° 7, 25 m ³ underground tank n° 9B,
Butandiol 1,4	Xn Harmful R 20	2,8	2,8	200 litre drums
Dichloromethane	Xn Harmful R 40	373,8	353,3	12 m ³ tank above ground
Diphenylmethane 4,4' diisocyanate (MDI)	Xn Harmful R20, 36/37/38, 42	24,0	19,6	200 litre drums
Naphthenic and aliphatic hydrocarbons	F, Xn, N Inflammable, noxious, dangerous for the environment R 11, 38, 51/53	1320	1341,1	N° 1 x 50 m ³ underground tank n° 4
Isohexane	F, Xi, N Inflammable, irritant, dangerous for the environment R11, 38, 51/53	370	347,4	50 m ³ underground tank n° 2,
Methyletichetone (MeK)	Xi, F Irritant, inflammable R 11, 36, 66, 67	231	248	50 m ³ underground tank n° 6,
Perchloroethylene	Xn, N Noxious, dangerous for the environment R 40, 51/53	20,8	15,0	3 m ³ tank above ground
Tetrahydrofuran	Xi, F Irritant, inflammable R11, 19, 36/37	11,8	14,1	200 litre drums
Toluene	Xn, F Noxious, inflammable R 11, 20	1428	1242,3	Underground tanks n° 3, n° 5
Trichloro-s-tirazine-2,4,6-trione	Xn, O, N Noxious, combustion supporting, dangerous for the environment R 8, 22, 31, 36/37, 50/53	1,1	1,3	60 kg drums
N Methyl pyrrolidone	Xi, R 36/38	3,2	2,8	200 litre drums

Tab 08

Safety schedules are available for all the hazardous substances, supplied by the suppliers to provide the information required for handling them, updated in compliance with the 31th update of Directive 67/548/CEE, implemented by Legislative Decree 65/03 and the CE 1907/2006 “Reach” regulation.

WORKING ENVIRONMENT

Safety schedules, for both hazardous and non-hazardous substances, are kept by the Company Doctor and the HSPM. An extract from the schedules for hazardous substances is also available in the departments. The Company Doctor has launched a health plan to monitor any exposure by operators at risk. The working environment is checked each year at the various workstations for chemical pollutants, particularly: organic substances, volatile dust, and isocyanates. *Table 09* shows an extract from the environmental monitoring carried out on 23rd July 2011.

Workstation	Pollutant	Value measured mg/m ³	TLV-TWA limits mg/m ³
Polyurethane production	Isocyanates	< 0,001	0,034
Polyurethane production	Ethyl acetate	11,2	1440
Chloroprene production	Acetone	32,5	1210
Chloroprene production	Toluene	18,9	188
Adhesive packaging	Acetone	71,4	1210
Powder spreading machine	Total powders	0,18	10

Tab 09

ICF sees to minimising contact with and exposure to hazardous substances with the help of Personal Protective Equipment (PPE) such as:

- gloves, safety glasses, safety shoes, dust masks, solvent masks, and working clothes;
- Evaluations of the chemical risk and injury indices are shown on page 40.

Various training sessions have made it possible to achieve a degree of sensitivity to and knowledge of the symbols and risk phrases, and caution advice among those involved in production. Both biological monitoring (blood tests for operators) and the number of incidents related to this aspect show that the preventive method adopted is correct.

RISK OF SIGNIFICANT ACCIDENTS

ICF falls with the area of being subject to art 6 of Legislative Decree 334/99 that does not call for drawing up of an external emergency plan. With the issuing of the new legislative decree, also known as the Seveso ter Decree, ICF found itself in the area of being subject due to it exceeding the 200 tonne storage quantity for solvents and finished products that pose a danger to the environment (R 51/53).

The requirements resulting from this obligation were:

- Reporting to the Environment Ministry, Lombardy Region, Milan Province, Marcallo con Casone Municipality, Prefect of Milan, Provincial Fire brigade Headquarters, and industrial risk assessment committee.

- Drawing up a preliminary safety report according to art 1 of Lombardy Regional Law of 23rd November 2001.
- Adaptation of the Company’s Environmental and Safety Policy.

All reports and documents prepared were sent to the relevant bodies by registered post on 2nd March 2006 (deadline laid down by Legislative Decree 238/05, 6th March 2006).

On 10th March 2008 the Technical Evaluation Schedule and Information Schedule on risks of significant incidents for the citizens and workers were updated. *Table 10* lists the incident scenarios identified and the related frequency of occurrence. ICF S.p.A. has implemented permanent training on these aspects for operators in the Adhesives department and a preventive plant maintenance programme. Evacuation drills are held on a quarterly basis.

Starter event	Incident scenario	Frequency of occurrence
		Events per year
EIR 1	Pool fire (long duration)	2.86E-07
	Dispersion of toxic/noxious vapours	7.96E-04
	UVCE	2.63E-05
EIR 2	Jet fire	5.80E-08
	UVCE	3.74E-08
EIR 3	General fire in the adhesives dept.	1.97E-07
	Explosion in the adhesives dept.	1.50E-06
EIR 4	Fire in the finished products store	5.00E-05

Tab 10

7.3 – Indirect environmental aspects

Alongside the direct environmental aspects for which ICF S.p.A. exercises total control, the indirect aspects were also taken into consideration and analysed as called for in CE Regulation 1221/2009 EMAS. The criteria identified for evaluating the significance of the indirect environmental aspects are identical to those for direct aspects and an IRA index is drawn up. This index is subsequently multiplied by a correction factor of 0,4, 0,7, 1 to indicate the Company’s capacity to control the indirect environmental aspect. For indirect aspects the significance criterion also starts from values equal to or greater than 4 on the IRA index. The indirect environmental aspects identified are connected with the environmental activities and conduct of: raw material suppliers, maintenance operators and analysis laboratories, clients (packing to make comply with ecolabel), electromagnetic fields (high voltage line outside the Company). All of these aspects were found not to be significant.

However, these generated the following improvement objectives respectively: improvement and rationalisation of deliveries, harmonising of environmental and safety procedures, involvement of maintenance operators in the company in the fire-fighting team, and using packing to be returned, with only the inner polythene bag being disposed of.

As regards management of the activities referred to above, ICF has drawn up specific procedures to evaluate the degree of attention and conduct of the individual suppliers / contractors in general in relation to the environment, and especially whether these parties have adopted an environmental management system or not. They are instructed and informed on the means used at ICF to work in an environment-friendly and safe way that they are required to conform to for all their areas of responsibility. ICF checks the risks in the company by asking contractors to inform it of risks connected with their specific activities, and provides them with an extract of the risks to be found in ICF.

Especially as regards relations with the company that shares the premises, ABC, agreements have been in place since 2006 that provide for ICF to provide services such as:

- Utilities: water, electricity, heating, and compressed air.
- Use of civil water drain (owned by ICF) into the consortium's sewer.
- Maintenance service
- Emergency and fire-fighting services

ABC certified its own Environmental Management System according to the UNI EN ISO 14001/04 standard in March 2007.

Electromagnetic fields

– Law 36/2001, Decree of the President of the House of Ministers of 8/7/2003.

On 24/07/03 the low frequency (50 Hz) electromagnetic fields were measured, with a view to characterising the working areas located near the power lines used to convey electricity that pass in the immediate vicinity of the plant.

The maximum value found in the goods receiving yard, was about 500 times lower than the legal limit as an electrical field and about 40 times lower than the legal limit for magnetic induction.

7.4 – Reference laws and compendium of data for non significant environmental aspects

The principal laws that are applicable to ICF's activities are:

Pollution of the atmosphere

– Decree of the President of the Republic 203/88, Decree of the President of the House of Ministers of 21/7/89, Ministerial Decree of 12/07/91, Decree of the President of the Republic of 25/07/91, Lombardy Regional Government Decree N° 7/4178 of 6/4/01, Ministerial Decree 44/04 of 16/01/04, and Legislative Decree 152/96 “Environmental standards”.

The Company obtained an AIA for the various emission points that, where necessary, are controlled by suitable scrubbers (see *table 02* on page 35). From time to time the Company checks the emissions and the plant management conditions. The Company also prepares a solvent managing plan that takes into account provisions for any checks by the competent authorities. About 3,500 kg of solvents are recovered each year from the company's cryogenic plant, which are mixed and reused in the production process.

Water discharges

– Legislative Decree 152/06 “Environmental standards”, Legislative Decree 152/99 “Draft laws on industrial water discharges” and subsequent amendments, and Lombardy Regional Law N° 62 of 1985.

ICF is subject to this standard because it discharges industrial water and so it has obtained the relevant authorisation from the competent body.

A.I.A. (Integrated Environmental Authorisation) I.P.P.C.

– Legislative Decree 59/05

The company has carried out the resulting processes provided for by the legislative decree by completing the online format of the Lombardy Region's application and submitted the same by 28/02/06 along with the technical attachments to: The Lombardy Region, Milan province, and Marcallo con Casone Municipality. On 30th April 2006 it had a public notification published in the “Il Giorno” newspaper in compliance with art 5, 7th comma of Legislative Decree 59/05, as per the notification received from the Lombardy Region on launching AIA/IPPC procedures. During November the Company received Authorisation Decree N° 12771 of 29th October 2007.

Soil pollution

– Ministerial Decree 471/99 (ex art 17, Legislative Decree 22/97) “Rehabilitation of polluted sites”, Lombardy Regional Law N° 62 of 1985, and current Lombardy Region Health Regulation -

The Company set up devices to eliminate the risk of polluting the soil as a result of accidental spillage, since all production areas are indoors and paved.

The 10 underground tanks are clad with a double lining and gap filled with nitrogen, and subjected to weekly pressurised checks for leaks in the lining, as well as annually for corrosion. All drainage takes place in separated areas, with any spillage being collected in specific tanks. The other 22 tanks above ground that contain raw materials and finished products (adhesives) are located within the covered, paved areas and are separated by walls (containment basins). Each year outside laboratories analyse the industrial bore-hole water (for fire-fighting use), and this has not shown any pollution taking place. Specific checks are carried out for the presence of organic solvents and chlorinates. The May 2009 analysis showed a value for organic solvents and chlorinates that was at the limit of the instrument's reading range.

Waste

– Legislative Decree 152/06 “Environmental standards”

The Company produces non hazardous waste almost exclusively (more than 88%). Plastic and paper are sent for recycling. Hazardous waste takes the form of spent carbons that are completely regenerated, polluted packaging that is rehabilitated and recovered, and any adhesives returned by clients that cannot be recycled in production.

Packaging

– Legislative Decree 152/06 “Environmental standards”

Raw materials packaging:

The main types of packaging include: 25 kg paper bags, 1 m³ cardboard boxes, metal drums, and cellophane big bags. Clean packaging is compacted and sold to others for recycling, while dirty packaging includes “multi-material packaging” waste or “packaging polluted by hazardous substances”.

Finished product packaging:

The types and quantities of packaging used for finished products in 2007, 2008, and 2009 are shown in the table below and expressed in kg as per the CONAI communication.

Type of packing	2009	2010	2011
Plastic	11500	12300	12200
Metal	62500	65100	66100
Tin straps	571000	587000	583500
Cardboard	23000	23650	22900
Timber pallets	26100	27000	26800

Tab 11

External noise

– Law 447/95 “External noise”, Decree of the President of the House of Ministers of 14/11/97, Decree of 16/03/98, Lombardy Regional Law N° 13 of 10/07/01 “Determination of limiting values for noise sources”

As regards external noise, it should be pointed out that the factory is located in an area zoned as an “industrial zone” with daytime and night-time limits of 70 and 60 dB(A). The Marcallo con Casone Municipality decided noise zoning for the municipal area in Council deliberation n° 47 of 30th September 2005, confirming the immission limits for exclusively industrial areas of the Decree of President of the House of Ministers of 14/11/97. The Company only runs two shifts and stops all production activity at 22:00. The measurements taken in 2008 produced the following results:

Measurement position	dB(A) daytime	dB(A) night-time
A	58,3	Not active
B	59,4	Not active
C	63,9	Not active

Tab 12 - Noise levels at the boundary. The measuring points are shown in fig 05.

– Legislative Decree 81/08, Heading VII, Chapter I & II “Noise in working environments”

Every three years (most recent on 30th October 2009) ICF has the noise on the premises mapped. Most of the workstations have sound levels between 80 dB(A) and 85 dB(A). Areas were highlighted with exposure exceeding 80 dB(A) near the end of the impregnation line and adhesive area when the cranes are being used. Training sessions are held for all production operators. Soundproofing of some parts of machines was done, resulting in a reduction in the noise pollution. Operators that ask for PPE are given the same. The Company health plan includes hearing checks.

Vibrations

– Legislative Decree 187/2005

ICF S.p.A. does not use machinery that gives rise to vibrations. The only source of vibrations is the use of forklift trucks for handling raw materials and finished products inside the departments, but that occasionally also travel on asphalted roads on the production site. ICF has therefore seen to measuring the vibrations caused by using the forklift truck on 13th July 2006. The values shown that were related to the various tasks never exceed the reference limits for vibrations in the body and on the hand and arm.

Safety

– Legislative Decree 81/08, Heading IX, Chapter I “Hazardous substances”

The Company has seen to preparing a Risk Assessment and Probability of occurrence with the resulting removal of reduction of the principal sources of danger by means of technological innovation on the one hand and organisational and procedural aspects on the other. A chemical risk assessment was also carried out in September 2008, supported by environmental monitoring and personal device measures, which highlighted an exposure risk that for Adhesive production was “High for safety and significant for health”, and for Fabric Production was “Low for safety but significant for health”. No risk exists for the offices and chemical laboratory. The health plan was subsequently draw up.

The injury situation in the last three years shows a decline compared to the previous three years. Tables 13a and 13b show the frequency and gravity indices.

Year	N° injuries	N° days lost	Total N° of employees
2009	2	15	78
2010	3	80	77
2011	0	0	76

Year	Hours worked	Frequency index	Gravity index
2009	127637	15,6	0,12
2010	130285	23,1	0,61
2011	126142	0	0

Tab 13a and 13b: Number of injuries and injury indices.

The 2010 data shows a slight worsening compared to 2009, when there were only 2 injuries. Although there is room for improvement, this data places the Company in line with data for the chemical sector, which is: If 10,4 and Ig 0,26 (source FEDERCHIMICA).

Transporting goods

– Directive 94/55/CE updated to the fifth technical update by the Ministerial Decree of 02/08/2005 by the Transport 6 Infrastructure Ministry -

Transporting of hazardous finished products and receiving of hazardous raw materials is done in compliance with the ADR standard, updated in 2011.

When hazardous raw materials are received, checks are carried out on: quantity, quality, and delivery notes.

Outgoing finished products are transported by transport companies authorised to transport hazardous goods. A safety consultant was appointed for hazardous goods as per Legislative Decree 40/00 in September 2001, and they prepare a report each year that they send to the employer. During 2009 no incidents occurred involving ICF's goods.

Vehicular traffic

The number of vehicles entering and exiting the Company in 2009 was about 1900 units.

Radioactivity

– Legislative Decree 230/95 “Radiation Protection”

Within the Company there is a radioactive source, which consists of the thickness measuring device fitted on the coextruder machine. The radioactive source consists of the Stronzio 90.

ICF has duly reported this source to the Labour Inspectorate.

It is checked annually by a radio-protection study (qualified expert).

The results show exposure 10 times lower than the legal limits for workers not exposed.

Substances that are harmful to the ozone layer

– Ministerial Decree N° 147 of 15/02/06 “Regulation and repair of leaks of substances that are harmful for the stratospheric ozone layer according to (CE) Regulation N° 2037/2000” -

The Company houses refrigeration plants that contain 40 kg of R22 (HCFC) fluids. A plant booklet was set up with annual checks by a competent technician. R407 refrigerant fluids are also on site and are subject to periodic checks.

ENERGY CONSUMPTION

Electricity is consumed for all the services in the plant, especially the production process. The data shown is expressed in tep. This data is compared with production data broken down for adhesives and toe-puffs and stiffeners. As from 2006 meters were installed for ICF's departments. For calculating the indexed consumption levels, the energy consumption for the various departments and machines are shown.

Electricity consumption in tep	2009	2010	2011	2010 adhesives dept.	2011 adhesives dept.	2010 fabric dept.	2011 fabric dept.
Consumption	953	1084	1095	90,3	86,3	275,1	299,3
% variation on an annual basis		13,7	1,0		-4,4		8,8
Methane gas consumption in tep	376	402,9	513,7				
% variation on an annual basis		7,1	27,5				
Total consumption	1329	1486,9	1608,7				
% variation on an annual basis		11,9	8,2				

Tab 14

Production	2009	2010	2011
Adhesives in kg	58355854	7695750	7657753
% variation on an annual basis		32,0	-0,5
Toe-puffs and stiffeners in sq.m.	3300546	4060000	4335500
% variation on an annual basis		23,0	6,8
Granules in kg	89213	25000	
% variation on an annual basis		-72	-100

Tab 15

Indexed electricity consumption	2009	2010	2011
Consumption /adhesives (tep/t)	0,009	0,01	0,01
Consumption /toe-puffs & stiffeners (tep/1000 sq.m.)	0,07	0,07	0,07
Indexed methane consumption	2009	2010	2011
Consumption /toe-puffs & stiffeners (tep/1000 sq.m.)	0,10	0,10	0,12

Tab 16

Since 2011 granules production definitively stopped.

8. ENVIRONMENTAL EFFICIENCY

ICF has set up all the measures necessary and installed equipment and/or instruments to keep the internal and external environmental impacts to a minimum

To contain emissions into the atmosphere

- A water scrubber has been installed for purifying the fumes coming from the impregnator, to damp down the pollutants - VOS, NO_x and powders produced following work done by the machines referred to above. This plant has an hourly capacity of 26000 m³/h for 16 hours 5 days a week, and guarantees higher damping down performance of 80%.
- N° 2 sleeve filters have been installed to damp down the powders comprising mainly resins, coming from the granule extruder hoppers and powders coming from the point spreading plant. These plants performance stands at 95% and process a capacity of 2200 and 2800 m³/h, guaranteeing damping down of 95% of incoming powders. The powders collected are reused in the production process.
- N° 1 active carbon filter is installed to contain VOS emissions in the vicinity of the mixers in the adhesives department. These filters guarantee 50% damping down of the pollutants treated. ICF S.p.A. programmes regeneration of the carbon after 3 months to guarantee maintenance of damping-down performance. The mixers' vents are connected to a liquid nitrogen cryogenic scrubber plant that guarantees 99% recovery of VOS, equal to 500 kg of solvent mixtures per week.

Industrial waste:

- A 40 m³ containment tank is used to collect all the process water resulting from washing the plants, with subsequent treatment in the pre-treatment plant and sent to the consortium's purification plant.

To contain the quantity of waste disposed of:

- A campaign is in place for recovering and recycling paper, cardboard, and plastic. In 2008 this resulted in about 50 tonnes of paper and cardboard and 18 tonnes of plastic being recovered that would otherwise have been sent for disposal at dumpsites.
- Spent active carbons are regenerated and not disposed of. The quantities regenerated are around 1 tonne per year.
- Returnable tanks and drums are used for transporting adhesives, dedicated by product and client. This system is used to transport about 500 tonnes/year with a saving of about 3000 drums with a 170 kg capacity.

To contain exposure to noise:

Some parts of the impregnator have been soundproofed, which made it possible to reduce the noise in the workplace at the end of the line by 3-4 dB(A).

Organisational types of actions (shifts) have significantly lowered equivalent exposure to noise on a weekly basis.

9. ENVIRONMENTAL PROGRAMME

All the environmental programme objectives for the 2008-2010 three-year period have been completed, with the exception of that for “making solvent storage tanks inert” that proved more complex to achieve and so this has been abandoned at this time.

The following improvement works were carried out to protect the environment in the 2009-2011 three-year period:

- Upgrading of the first stormwater collection tanks: Work done in 2010.
- Loading managed using software for the solvents in the adhesives department, with a reduction in emissions and minimising exposure of workers: Work done in 2009.

Improve energy efficiency: work done in 2011.

Overall the works done came to 2% of the Company’s turnover in the 3 year period in question.

Updating of ICF S.p.A.’s Environmental Programme for the 2010-2012 period is dealt with below.

Objective	Environmental aspect	Programming	Responsibility & resources	Deadline
Solvent recovery scrubber system for E1 emission points	Air Emissions. Total damping down of the quantities of VOS emitted into the environment	Feasibility study, collection of quotations	Maintenance manager Costs: € 150,000	Study 2010 Completion 2012
Photovoltaic plant	Produce some electricity from renewable sources. Install a series of photovoltaic panels on the roof of the company to produce energy	Design to be developed with specialist companies in the sector	Maintenance Manager and Environmental Management System Manager Estimated cost: € 50,000	2012
Reusing waste dusters from the production process	Recover some of the waste produced. Recycle shredded product in the coextrusion process	Project to be developed in various phases: 1: Research & Development 2: Upgrading of coextruder machine	Maintenance Manager and R&D	2011 and 2012

10. VALIDITY OF ENVIRONMENTAL DECLARATION

This Environmental Declaration, with data updated to December 2011, relates to the third renewal of the EMAS registration of the Marcallo con Casone production site.

In accordance with CE Regulation 1221/2009 ICF S.p.A. will update the Environmental Declaration annually from 2011.

Each Environmental declaration is a controlled document with its own issue date.



11. ACCREDITED ENVIRONMENTAL AUDITOR

The Accredited Environmental Auditor that validated this Environmental Declaration, in terms of the EMAS Regulation is **CERTIQUALITY** N° 4 Via G. Giardino, Milan, Accreditation N° IT-V-0001.

The NACE code for which the Environmental Declaration is validated is: NACE Code 20.52 for companies in the chemical sector, makers of glues and adhesives.

For further information, clarification, or anything else relating to this document, contact Dr Antonio Sassi, Quality, Environmental, and Safety System Manager for:

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GLOSSARY

(Definition of technical terms used in Industrie Chimiche Forestali's Environmental Declaration)

Pyroligneous Acid: A mixture of natural organic acids extracted from wood, comprising mainly acetic acid and other (superior homologue) acids of an organic nature.

Hot-melt adhesives: Adhesives that are melted by heating obtained from the granular extruder.

Polychloroprene Adhesives: Adhesives obtained by dissolving polychloroprene rubber.

Polyurethane Adhesives: Adhesives obtained from the synthesis of two types of chemical products like isocyanates and polyols.

Environment: The context within which an organisation works, including the air, water, land, natural resources, flora, fauna, human beings, and the interrelations between these.

Environmental Aspect: The element of an organisation's activity, product, or service that can interact with the environment. A Significant Environmental Aspect is an environmental aspect that has a significant environmental impact.

ATEX: Community directive on risk assessment for explosive atmospheres.

Environmental Audit: A process of systematic, documentary checking to determine and evaluate, with objective evidence, whether an organisation's Environmental Management System conforms to the criteria defined by the organisation itself for auditing the Environmental Management System and to inform Top Management of the results of this process.

CO: Carbon Monoxide. A polluting emission resulting from combustion with a shortage of oxygen.

CO₂: Carbon Dioxide. A polluting emission resulting from total combustion of an organic substance with an excess of oxygen.

Coextruder (extruder): Equipment that makes it possible to obtain fabric for toe-puffs formed by 2 layers of polymer material, with fabric between them.

Dual life: Double life.

Validation of the Environmental Declaration: An act by means of which an Environmental Auditor accredited by a suitable Body, examines the Environmental Declaration, with a positive outcome.

CLP: Community regulation 1207/2008 on labelling, classification, and packaging of chemical products.

Co-rotating: Rotating in the same direction.

dB(A): Measurement of the sound level in the human ear obtained as the result of a ponderation curve A (range of the frequencies that can be perceived by the human ear).

Dissolver: A receptacle fitted with blades or helixes that mix, homogenise, and dissolve the solid parts of an adhesive.

EMAS (Environmental Management and Audit Scheme): CE Regulation 1221/2009

Granule extruder: A complex piece of equipment that makes it possible to obtain granular substances starting from mixable polymers.

Hot-melt: Resins that melt when heated, applied in the molten state to the fabric using a flat head extruder.

If: Injury frequency index.

Ig: Injury gravity index.

Environmental Impact: Any modification of the environment - negative or beneficial, total or partial - resulting from an organisation's activities, products or services.

Flash point: The temperature at which the vapours of a substance ignite in the presence of naked flames.

MDI: Methylene diisocyanate. A substance used for synthesis of polyurethane adhesives.

Nm³: Normal cubic metre. Gas volume at 0 °C and a pressure of 1 Atm (atmospheric pressure).

NO_x: Nitrous Oxides. A polluting emission resulting from combustion of methane gas.

Environmental Policy: A declaration made by an organisation, containing its intentions and principles in relation to its overall environmental performance, which provides a reference scheme for the activities to be carried out and to define the objectives and mileposts in the environmental field.

Polyols: Complex organic substances used for synthesis of polyurethane adhesives.

Environmental Programme: Description of the company's specific objectives and activities in relation to better protection of the environment for a specific site, including a description of the measures adopted or planned to attain these objectives and, if applicable, the deadlines set for applying these measures.

Responsible Care: A Federchimica programme to promote constant attention within the association to ongoing improvement in safety and the protection and healthiness of the environment.

Environmental Management System (EMS): The part of the general management system that includes the organisational structure, planning activities, responsibilities, practices, procedures, processes, and resources for processing, implementing, pursuing, reviewing, and keeping the environmental policy active.

VOS: Volatile Organic Substances.

Tack: The stickiness of an adhesive.

EPT: Equivalent petroleum tonnage. A unit of measurement in the International Metric System used to express consumption for electricity and methane gas.

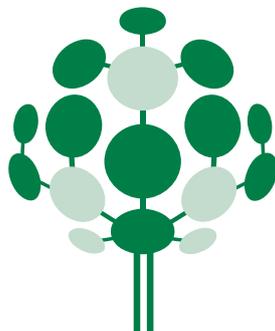
The conversion table is:

1 kWh E.E. medium/high voltage = $2,3 \times 10^{-4}$ tep

1 Mm³ methane gas = 82×10^{-5} tep

WNW: woven no woven.

Wh: Watthour: Hourly electricity consumption for 1 W of power.



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