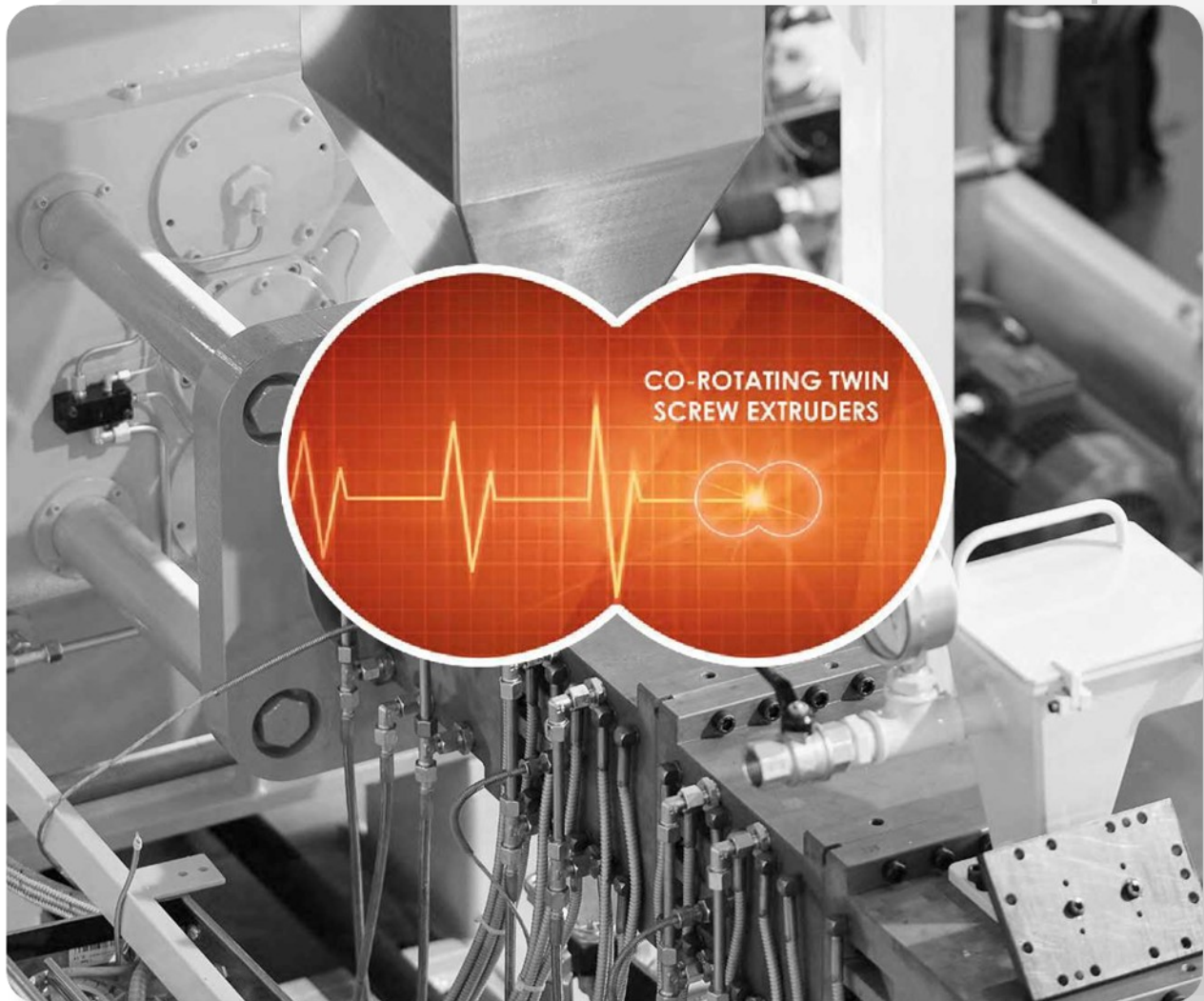


ADVANCED COMPOUNDING AND EXTRUSION SYSTEMS

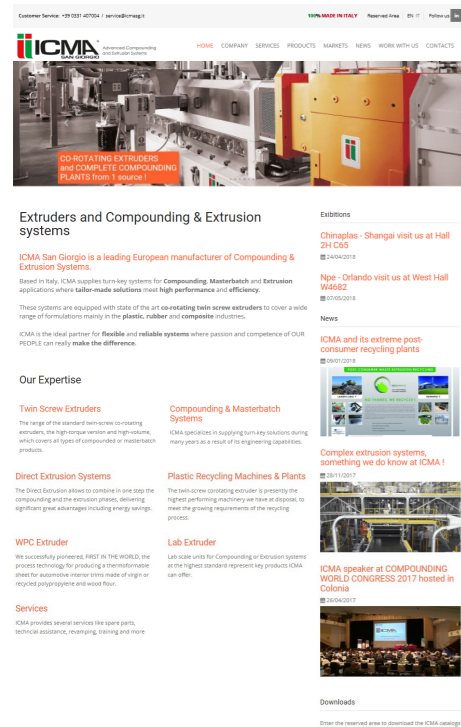


 **ICMA**[®]
SAN GIORGIO



Advanced Compounding and Extrusion Systems

OVER 100 YEARS OF INDUSTRIAL ACTIVITY



www.icmasg.it

Follow us



For more than 100 years the Colombo family perform his entrepreneurial activity in the metallurgical and mechanical industry, initially starting a foundry specialized in cast iron and special alloys castings, and still today is a leading company in its sector.

- **1945** ICMA San Giorgio was born as manufacturer of machinery for wood processing, and later reconverted in the manufacturing of high-precision machine tools that were adopted by the major Italian and International company producers of airplanes, helicopters and cars.
- **1965** ICMA focuses on the emerging plastics industry designing its first patented twin-screw extruders, creating the foundation for the company's core. The culture of high-precision technology is transferred to this activity.
- **1974** ICMA develops **Wood-stock** technology to produce thermoformable sheets made with a blend of polypropylene and wood flour. This revolutionary technology is adopted for the production of door panels and car interiors trims from the world's leading car manufacturers. As a matter of fact, it is ICMA to develop, first in the world, the process technology of the so-called Wood-Plastic Composites.
- **From 1980 to present** ICMA has been developing a series of co-rotating twin-screw extruders for the processing of technical compounds, filled, reinforced, polymeric alloys, thermoplastic rubber, masterbatch, etc. leading us quickly to become one of the best-known companies in the world. These skills are also successfully used to develop Extrusion/Compounding solutions for the production of composite sheet/foil, pipe and profiles.

ICMA TODAY

ICMA, today, is managed by a highly professional and dynamic team that has impressed a strong industrial and market development through the expansion of production sites, the markets reached and significant investments both in terms of human resources and manufacturing potential.

THE STRENGTH OF ICMA

EXPERIENCE, KNOWLEDGE AND ENGINEERING

Through more than 40 years of R&D, design, manufacturing, and processes experience, ICMA possesses a deep knowledge in compounding solution that is transferred to every project. Customers rely on ICMA for high quality, state of the art solutions backed by training and high level of technical support and service. ICMA staff, with their passion and skill, assists and leads customers to their success.

INTEGRATED PRODUCTION

Every key parts of the extruder is manufactured exclusively by ICMA to ensure a high and consistent quality of the final system. ICMA workshop is equipped with the most advanced, high-tech work centers that allow high precision manufacturing.

QUALITY MANAGEMENT SYSTEM

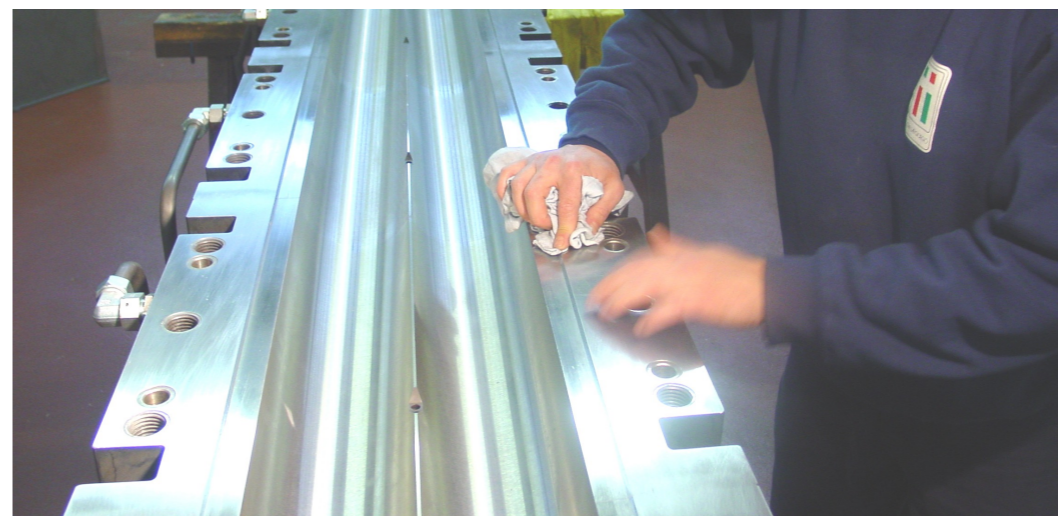
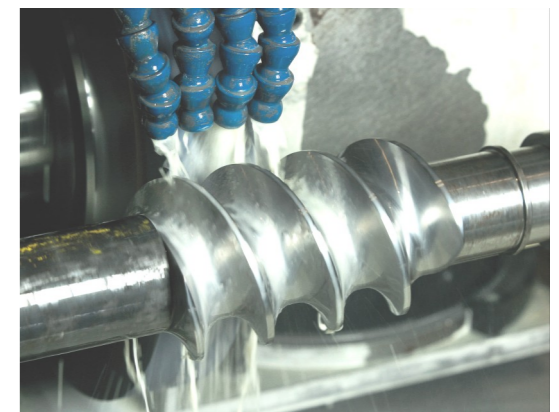
All the parts are thoroughly controlled according to the quality management system UNI EN ISO 9001 procedures. All operations, from the assembly of the extruder to the final erection of the lines, are subject to mechanical, electrical and functional testing before the final delivery to the customer.

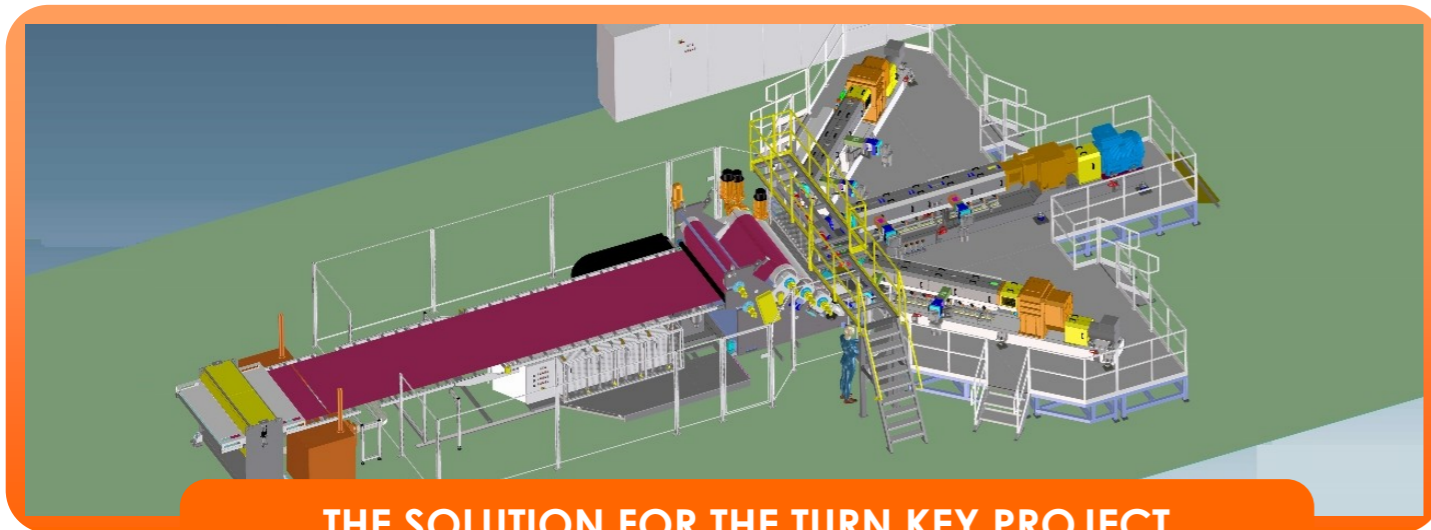
FLEXIBILITY

ICMA has build its success on the ability to talk and listen to the customer so as to achieve the most suitable, tailor-made solution. The ability to respond and deliver deliver accordingly represent a winning key in a fast moving and competitive market.

PEOPLE

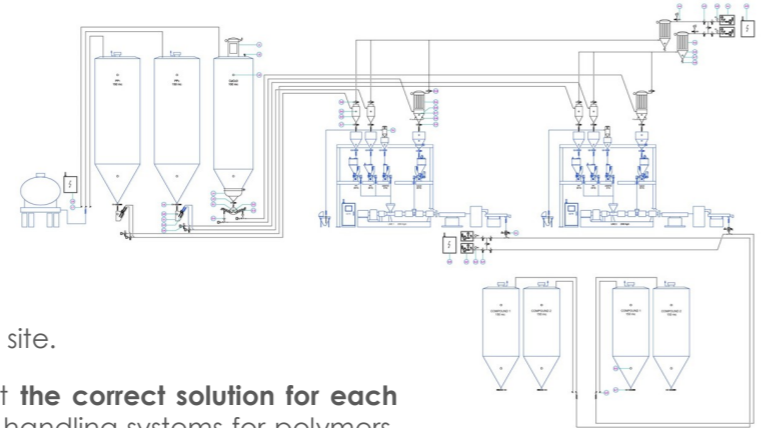
Through years of work and success, ICMA has build a team of highly competent group of people at each levels and strongly loyal to the company. This is a very important aspect, since customers can be sure of a reliable and continuous interface. ICMA staff is the core of the corporate culture.





THE SOLUTION FOR THE TURN KEY PROJECT

The ability of **ICMA** to talk and listen with each client and follow their projects, together with the specific knowledge of engineering, has generated a great know-how in the realization and implementation of turnkey projects.



Every single line **is fully assembled** in ICMA workshop consistently check and tested before shipment, so as to ensure a shortest "time to production" after erection at the final site.

The gained experience allows ICMA to select **the correct solution for each phase of the process**, from the most complex handling systems for polymers, powders and fibers, to the most suitable solution for the most accurate materials metering. The selection of additional components, such as the screen changer and polymer metering pump, can become one of the win factors of each project.

Same attention is paid in the of most suitable solution for the cutting system in term of best performance, quality and reliability.

Solutions for the transport, storage and packaging of the compound, complete the turnkey system for the **final and total success** of the project.



CUSTOMER SERVICE



HELP DESK

Our target is to help our customers to work at maximum operational efficiency. Our staff is available at HELP DESK 16 hours a day.

TRAINING SERVICE



With our 40 years of experience in the compound industry and with our continuous research and development, we have accumulated a unique and unrepeatable technological and process knowledge.

We have condensed this knowledge into training seminars on co-rotating technology.

Our seminars go far beyond the primary operational knowledge, but deepen process issues that make the difference in an increasingly competitive market.

SPARE PARTS SERVICE



We have in stock a great availability of the most important parts of the extruders, for an immediate service.

The internal production of the screw elements, of the barrel modules and of the other vital parts of the extruder guarantees us an absolute quality control.

R&D SUPPORT / LABORATORY

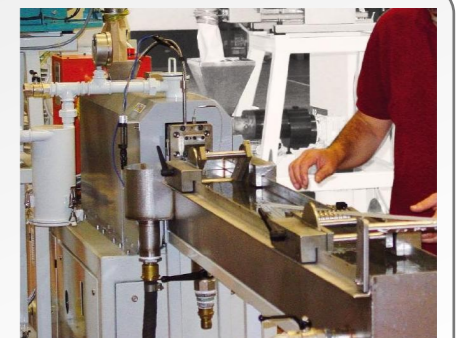
Our experienced laboratory personnel and versatile equipment help customers in solving a variety of research and development which could also be assisted with computerized process simulations.

The laboratory is also available for pilot test with small batch production and pre-marketing sampling.

The laboratory is equipped with a pilot line with **MCM 25 HT** co-rotating twin-screw extruder to perform feasibility and processability tests for all materials and compounds with fillers, fibers or liquids.

The second phase involves a test for the industrialization of the product on industrial size extrusion lines, fully equipped with the auxiliaries necessary to cover every need.

These lines include co-rotating twin screw extruders **MCM/60HT** and **MCM/40HP-T** and are fully equipped for the verification of each specific productive parameter of the compound, of flat sheet also coupled, or of profiles with a wide combination of materials and different fillers/reinforcements.





V / HT series extreme flexibility

COMPOUNDING SYSTEMS

WE SERVE THE COMPOUNDING INDUSTRY WITH ADVANCED TECHNOLOGICAL SOLUTIONS THAT COVER THE COMPLETE RANGE OF APPLICATIONS/FORMULATIONS

STANDARD SYSTEMS FOR COMPOUNDING

- Systems for filled and reinforced materials with **mineral, metallic, organic and fibres**
- Systems for color or additives **masterbatches**
- Systems for **techno-polymers** and **polymeric alloys**
- Systems for **conductive polymers**
- Special flame resistant **HFFR** compounds
- Systems for compound with **natural fibers**
- Systems for **adhesive resins** and **Hot melt**
- **High capacity** systems for **PVC**
- High capacity systems for the **petrochemical plant**

REACTIVE COMPOUND SYSTEM S

- Cross-linked polyethylene- **XPE**
- Polymerization/extrusion of **thermoplastic polyurethane**

SYSTEMS FOR THE COMPOUNDING OF ALL RANGE OF THERMOPLASTICS RUBBERS

- **TPO** polyolefin matrix modified with EPDM
- **TPV** polyolefin matrix modified with vulcanizable EPDM
- **SBS** or **SEBS** co-polymer modified with polyolefins or styrenic resins-**TPE**



EXTRUDERS WITH SPECIAL DESIGN

ICMA range of supply is completed with a special execution extruders for the production of reactive or extremely thermo-sensitive compounds (i.e. XPE, PVC, HFFR) in three different versions:

- Special version featuring a "clam-shell" barrel opening arrangement
- Sliding barrel
- Cascade design, where a co-rotating extruder is combined with a single-screw extruder to discharge the pressure generated by the pelletizing systems.



Special design with barrel opening system

A COMPLETE RANGE

ICMA PROPOSES FOUR CLASSES OF CO-ROTATING EXTRUDERS WITHIN THE MCM SERIES.

V class:

The **V class** extruders are available in ten different sizes, ranging from 40 to 220 mm in screws diameter. By taking full advantage of the modular design, the extruders are configured specifically for the type of process and optimized for the best performance of the product.

HT class:

The **HT class** extruders are available in sizes ranging from 30 to 140 mm. They are equipped with enhanced gearboxes and screw shafts and can transmit up to 40% more torque than the V class extruders of the same size and rotation speed. The HT class is designed in particular for those processes that require more specific energy.

HP family

The latest addition: the **HP family**, is top of the range in terms of performances. It is available in 2 distinct classes: **HP-v** that combines a boosted specific torque with a higher free volume available; the **HP-t** class is instead characterized by the highest available torque.

The innovation was not limited to the increase in the volume / torque values, but also a series of technological solutions for energy efficiency have been studied and introduced, minimizing overall energy losses.

The HP class is designed for the most demanding compounding production, and is able to process materials that require high specific energy, with higher capacities and reduced energy consumption. The innovation that the HP class brings is underlined by a new and captivating design.



HP class dedicated to techno-polymers

HV class

Designed to respond to a specific market demand, the **HV class** is based on the concept of extreme free volumes. This feature allows very high productivity for those compounds characterized by a reduced specific energy.



HV class



From RE-CYCLING to UP-CYCLING

SYSTEMS FOR RECYCLING/COMPOUNDING

CHANGE YOUR BUSINESS, FROM "COMMODITY" TO THE MOST PROFITABLE "SPECIALTY" PRODUCTS. TO RECONVERT YOUR BUSINESS YOU NEED NEW IDEAS AND TOP CLASS EXTRUDERS

- Use the cheapest materials even post consumer waste
- Engineer your polymer with fillers or reinforce it with fibers
- Reduce energy consumption
- Reduce maintenance costs

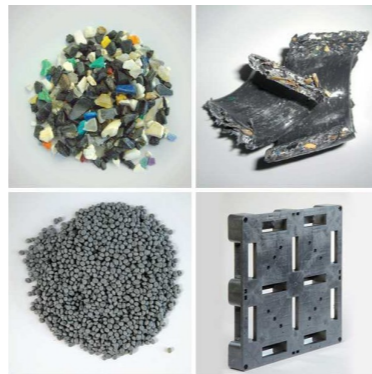
THERE ARE 4 POINTS TO CONSIDER FOR ONE SOLUTION: CO-ROTATING TWIN-SCREW EXTRUDERS



RECYCLING/COMPOUNDING SYSTEMS

Recycling, degassing, reinforcing/filling in one single process

- Recycling systems for **high moisture content** polyolefin waste or **with high pollution percentages**
- Recycling/compounding systems for polyolefin waste with a **wide spectrum of viscosity/density**, to be reinforced or filled
- Recycling / compounding systems **for industrial yarn waste**
- Systems for **PET** recycling without pre-drying and crystallization



RECYCLING / COMPOUNDING / DIRECT EXTRUSION SYSTEMS

- Direct extrusion/Recycling systems for **HDPE** bottles/jug into filled or reinforced sheets
- Direct extrusion/Recycling systems for **non-washed heterogeneous plastic waste** into sheet, pipes and profiles
- Direct extrusion/Recycling systems for the automotive industry for the transformation of polyolefin waste into reinforced substrate, laminated with tufted carpet/moquette/non-woven
- Direct extrusion/Recycling systems of HDPE bottles/butt scraps into dimpled membranes



DIRECT EXTRUSION OF PET FOIL WITHOUT CRYSTALLIZATION AND DEHUMIDIFICATION



UP-CYCLING OF POST – CONSUMER WASTE



LANDFILL ?



INCINERATOR ?



ECO IMPATTO

new technology for plastic recycling

The **ECO IMPATTO** technology allows to significantly improve the **aesthetic and functional** qualities of those products made with heterogeneous plastics, increasing their penetration on the markets for those products that already exist (construction, public works, etc.).

It opens up new and very interesting opportunities in **emerging applications** where the aesthetic aspect is fundamental and which are, for this reason, now precluded to heterogeneous plastics (ex. street furniture, walkways, piers, etc.);



It extends the range of recyclable plastics, even in those Non-selectable fractions that today cannot be used for mechanical recycling and therefore destined for energy recovery (incinerators) or landfill (in the worst case).

It is the perfect solution to recycle post-industrial composite film **waste** for food packaging design by complex structures that may include PET, PA, EVOH, PP, PE, aluminum foil or metallised films and also many other functional polymers such as adhesives, lacquers etc.

ECOSHEET-PRO

The Eco-Innovative Alternative to Plywood

ECOSHEET-PRO will:

- Reduce the environmental impact of waste and reduce disposal costs for municipal authorities and waste management organizations
- Avoid the dispersion of resins and adhesives present in plywood/chipboards (such as formaldehyde 10) when landfilled or Avoid CO₂ emissions when incinerated at the end of life.

ECOSHEET-PRO is the eco-alternative to plywood panels in construction and creates new business opportunities by offering:

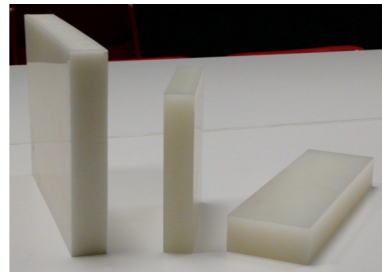
- A sale price that could matches traditional plywood
- A board that can be reused, up to 10 times
- Strength performance that matches plywood
- Easy to work with (accepting nails and screws)
- Has the dimensional stability required for formworks use
- Lightweight: in line with 18mm thick plywood
- Moisture resistant: does not degrade when exposed to rain or wet concrete
- Excellent surface finish that is maintained over its service life



IN LINE COMPOUNDING/DIRECT EXTRUSION SYSTEMS

DIRECT EXTRUSION/COMPOUNDING SYSTEMS FOR FILLED/REINFORCED SHEETS

- PP/HDPE sheets with mineral fillers, high thickness version available
- PP - PA - PET sheets **reinforced with glass fiber**
- **Sound insulation** sheets , with a high content of Barium Sulfate
- **Electromagnetic absorber** sheets or **magnetizable sheets** with a high content of metal fillers
- Sheets filled with any kind of **industrial powders/waste**
- Direct extrusion of rigid PVC highly filled flat/corrugated sheets, **without pre-mixing**



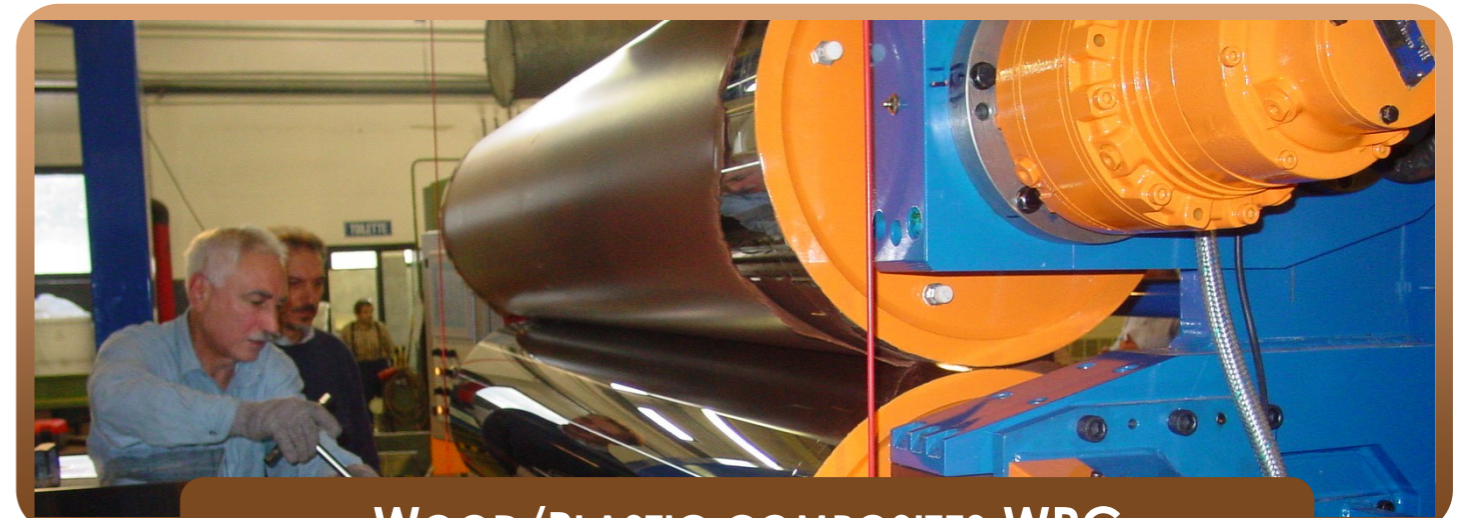
SPECIAL DIRECT EXTRUSION /COMPOUNDING FOR IN LINE LAMINATED PRODUCTS

- **Sound-deadening substrate** for car interior carpet/mat
- **Waterproofing membranes** made of TPE-TPO-Soft PVC, reinforced with plastic nets and laminated with non-woven, fabric
- PET / EVA foil laminated with textile nets / non-woven for **footwear industry**



TWIN-SCREW CO-ROTATING EXTRUDERS FOR THE DIRECT EXTRUSION OF FILLED/REINFORCED PIPES

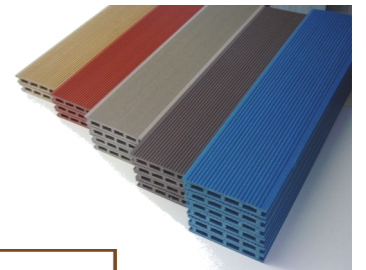
- PP/HDPE **pipes core layer** with high mineral filler content for sound-deadening performances in sewage column application
- **Middle layer** in PP reinforced with fiberglass for hot water pipelines and conduits
- **Single-layer pipes** made of filled PP for generic low-cost pipes



WOOD/PLASTIC COMPOSITES WPC

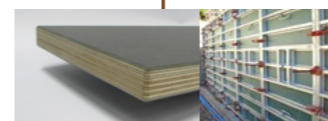
ICMA DIRECT EXTRUSION SYSTEMS PRODUCE IN ONE STEP PROCESS WPC PROFILES AND SHEETS WITH EXCLUSIVE ADVANTAGES:

- No need of material pre-mixing/agglomeration or ready-made granules
- Wood with a higher residual moisture content can be used (No need of fibers dryer)
- Formulations adjustable in-line with loss in weight metering units
- Significant energy (one step process + split feed technology)
- Higher mechanical characteristic due to better fibers/plastic mixing
- Limited material degradation due to a single plasticization/extrusion process and shorter fibers residence time
- Reduced maintenance cost due to the limited screws and barrel wearing thanks to the split feed technology
- Reduced maintenance cost due to modular construction of screws and barrel
- Less operational space needed (space renting savings)
- Simplified production/logistic management
- Substantial reduction in production costs (energy, labor, logistics, management, maintenance...)
- Maintain a proprietary know how with in-house manufacturing process



PIONEERS IN WOOD/PLASTIC COMPOSITES:

FIRST IN THE WORLD TO EXTRUDE WOOD PLASTIC COMPOSITES



DIRECT EXTRUSION SYSTEMS FOR WOOD/PLASTIC COMPOSITE SHEETS OR OTHER NATURAL FIBERS



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