ICMA SAN GIORGIO

Advanced Compounding and Extrusion Systems

DIRECT EXTRUSION

IN LINE COMPOUNDING
DIRECT EXTRUSION SYSTEM

www.icmasg.it

IN LINE COMPOUNDING

There Are 3 Reasons For Which It's Important To Think And Reconvert To The Direct Extrusion Technology:

TECHNOLOGICAL:

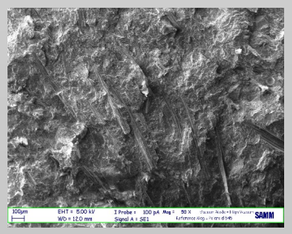
At each extrusion cycle the polymers lose their characteristics by degrading themselves. At each extrusion cycle the most heat-sensitive fillers are degraded. At each extrusion cycle the fibers lose their characteristics by shortening themselves. A product made by direct extrusion has always high performance characteristics.

ECONOMIC:

We are increasingly globalised and we must become more and more competitive and the most direct way is the cost reduction. Great efforts are being taken to run after the best price for the raw materials and we don't realize that the solution is already in our hand: every single cent saved and multiplied to the units bring at the end of the year to unexpected gain.

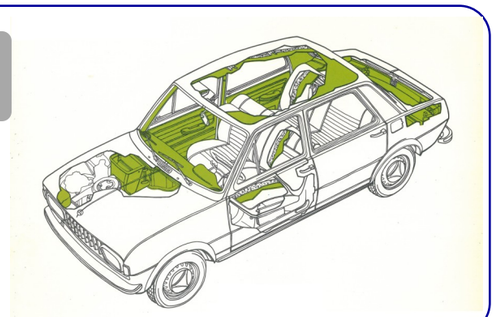
STRATEGIC:

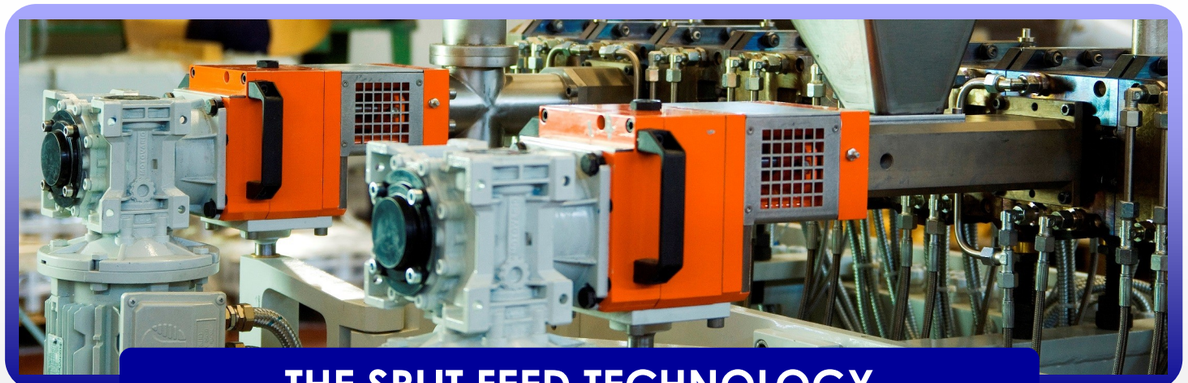
Differentiate to become more competitive: you know the final properties you want to get for your finished product. Only you can run a fine-tuning process to achieve them. Formulations will no longer be shared with the compound supplier (and consequent sharing with other customers of theirs)



Direct Extrusion Is In Our DNA:

Few years later the reconversion of the company into the world of the plastic material transformation, ICMA has developed and patented the first Extrusion Direct System for the composite materials: it was the year **1974**

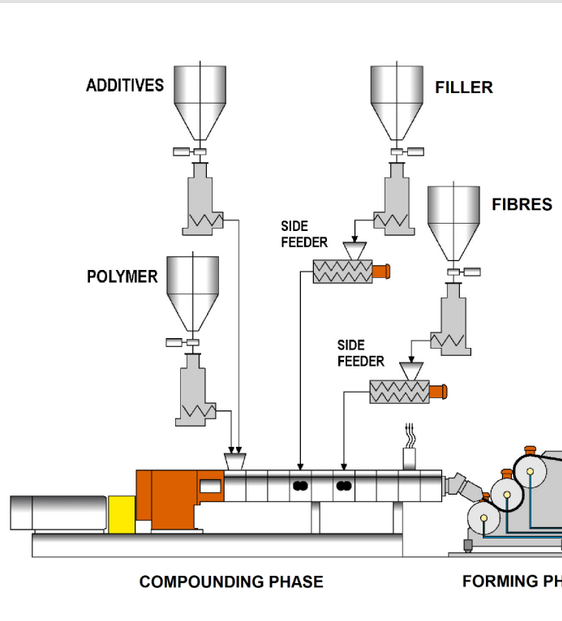




THE SPLIT FEED TECHNOLOGY

ICMA Co-Rotating Twin Screw Extruder Gives The Unique Solution Of Split Feed Technology Of Fillers/Fibres

The separation of the plasticization phase of polymer matrix from the introduction and mixing of fillers/fibres is the basic concept of the co-rotating technology.



Transfer energy at the exact point without misspending it to heat the filler

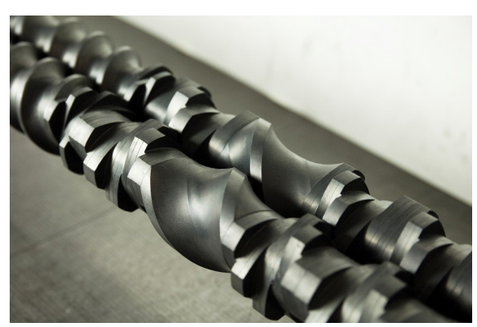
Shorten the fibres **residence** time minimising the fibres break-up

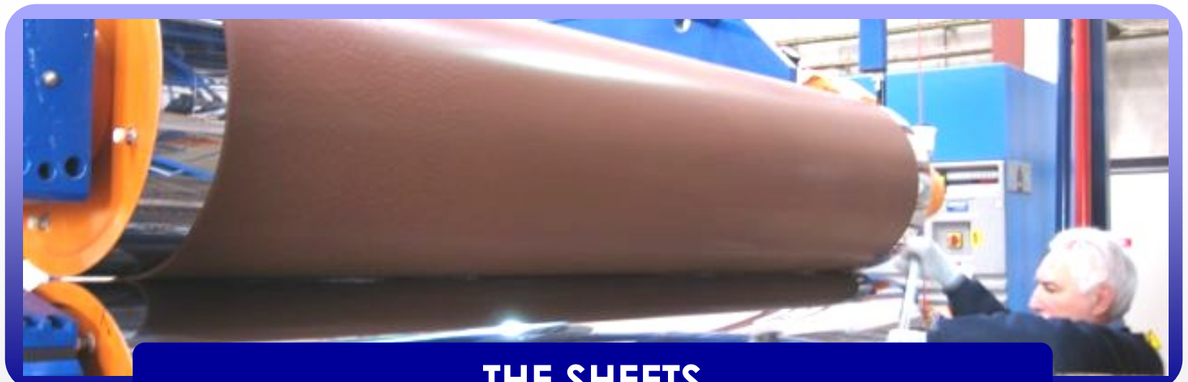
Take the advantage of co-rotating high efficiency degassing system to avoid the **polymer pre-drying** process

Minimise the wearing action of fillers/fibres on extruder metal parts

These are the basic concepts from which arise numbers of advantages specific of this technology.

Modular construction of screw and barrel
Allow a drastic reduction in maintenance cost.



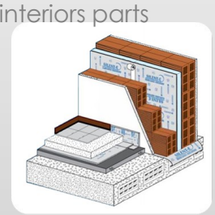


THE SHEETS

NOWADAYS, ON THE MARKET YOU CAN ALREADY FIND DIFFERENT EXTRUDED SHEETS PRODUCED BY U-USING THE DIRECT EXTRUSION TECHNOLOGY

For automotive:
HEAVY LAYER sheet based on PO + $CaCO_3$ + $BaSO_4$ for noise reduction
WOOD-STOCK ™ sheet based on PO + Natural filler for interiors parts

For constructions: PO + $BaSO_4$ for sound dampening



Technical Sheets: PO + metallic fillers for Electro-magnetic shield, Magnetisable sheet

NOWADAYS, ON THE MARKET YOU CAN FIND ALREADY DIFFERENT EXTRUDED SHEETS WITH PRE-COMPOUNDED MATERIALS WHICH COULD TAKE ADVANTAGE FROM THE DIRECT EXTRUSION TECHNOLOGY

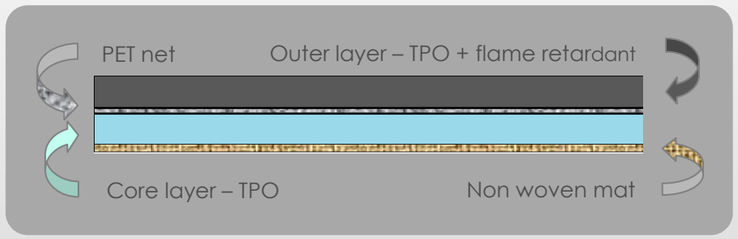
Technical Sheets: Glass fibres reinforced sheets
PO + mineral fillers sheets
PC-ABS alloy sheets

THE CO-ROTATING TWIN-SCREW EXTRUDERS CAN BE USED ALSO FOR GENERIC POLYMERS WHEN IS REQUIRED A VERY HIGH CAPACITY (not reachable with the single-screw extruders of reasonable size)

PET-PC-ABS lines where the efficiency of the degassing can be of great advantage
Lines for **BOPP - BOPET**
Line for **Cast Stretch film** and **CPP**

IN LINE CARPET BACKING EXTRUSION

MEMBRANES



The market is demanding more and more high-performance products and even with eco-friendly appeal.

Membranes based on polyolefin and thermoplastic rubbers have been developed.

ICMA provides complete extrusion lines that can realize membranes having really complex structures, with multiple co-extruded layers and lamination of various kinds on the surfaces as well as central reinforcements.

For special applications that require specific characteristics of resistance to flame, the direct extrusion becomes a must to get unique formulation costs and features .

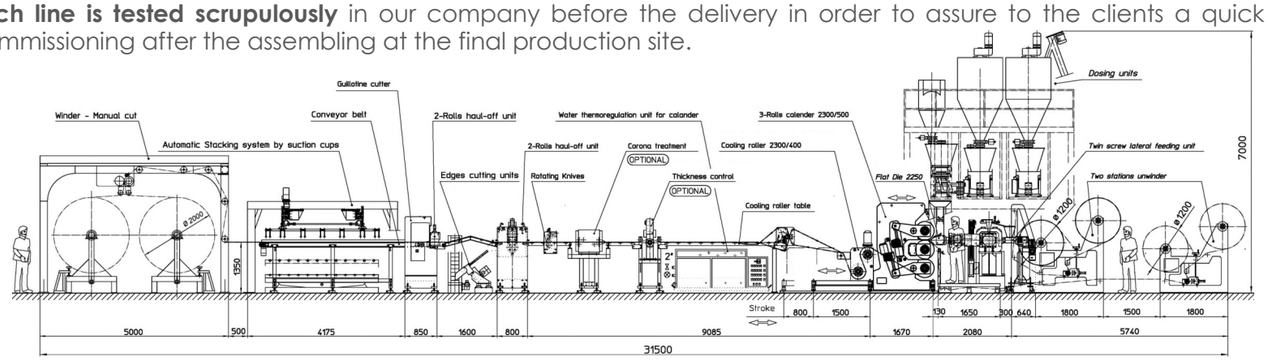
TURN KEY PROJECT

Over the years ICMA has specialized in the supply of **turn key projects for the direct extrusion**, from the handling & feeding of the raw materials to the down-streams and cooling devices.

All the engineering phases, from design to manufacturing, the assembly, the internal testing and final commissioning, can be customized according to the project specifications.

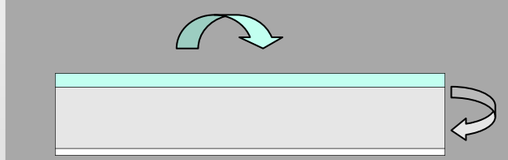
The ICMA turn-key solutions can also offer a series of services from **the personnel training before the delivery** and also at the end of the start-up in order to minimize the operative risks.

Each line is tested scrupulously in our company before the delivery in order to assure to the clients a quick commissioning after the assembling at the final production site.



RIGID PACKAGING

Inner layer: virgin/food contact polymer

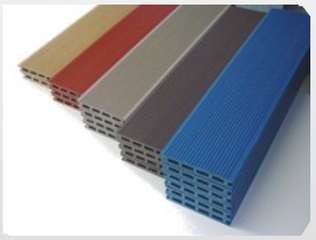


Core layer
Mix of virgin and recycled polymers + Mineral/Natural filler

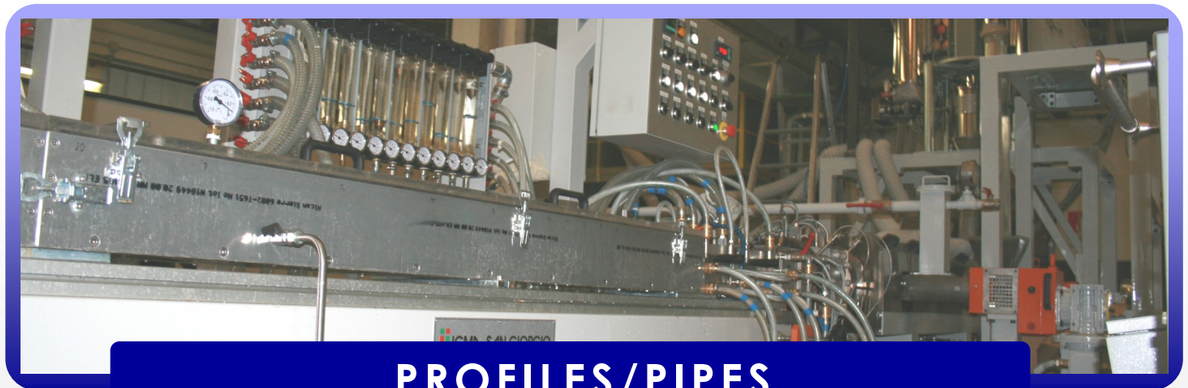
Outer layer: virgin polymer + colour & mineral filler

Even in the world of the rigid packaging the push towards the extreme competitiveness has led to the introduction of higher performance and more economical materials. The PP or PS compounds with the addition of the mineral fillers are now a daily reality. Bring the direct extrusion in this area is still a mission to accomplish, but who will have the advantage of using this new technology, will have made the successful choice.

PET DRY-LESS DIRECT EXTRUSION TECHNOLOGY

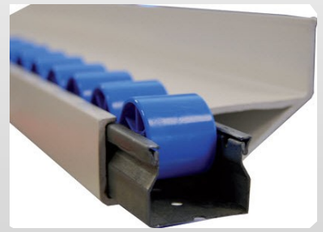


PROFILES/PIPES



COMPOSITE PROFILES

As demonstrated with the WPC profiles, the advantages of the direct extrusion are huge. The benefits of this innovative technology can also be realized for any profile made of a composite material: in particular on those profiles reinforced with fibres, where the individual process of extrusion allows to keep the fibres length giving a great advantage in terms of mechanical properties.

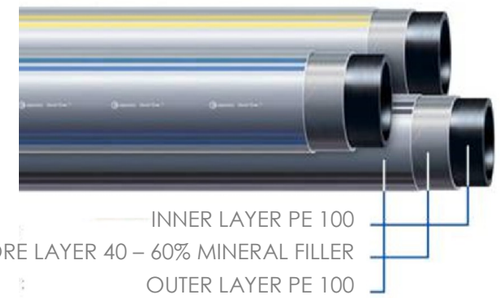


CO-ROTATING EXTRUDER FOR COMPOSITE PIPES

The composite pipes with minerals fillers are already widely used for special applications such as noise reduction in the use of internal piping as well as pipes with special resistance performance in the external sewage pipe.

Particular advantages are obtained for heat resistant pipes where the composite used involves the use of fibres.

A very present application is the use of recycled materials that take advantages from the direct extrusion for both the single extrusion passage, maintaining unaltered the mechanical characteristics of the polymer as well as the possibility of engineering the product with fillers, fibres and / or impact modifiers



SILENT PIPE

3 layers HDPE/PP noise dampening pipes

3 layers PP sewage pipes

CUSTOMER SUPPORT

Our goal is to keep customers operating at peak efficiency.

Our service team operates our HELP DESK 16 hours/day.

TRAINING SERVICE

Over our forty years experience in the compounding industry and a continuous R&D activity, we have developed a unique technical & process knowledge.

We condensed such knowledge in training seminars on co-rotating technology.

Our seminars extend beyond basic operations to processing knowledge that can make a difference in a competitive marketplace.

SPARE PARTS SERVICE

We offer a deep inventory of the most important extruder parts for rapid, "off the shelf" delivery.

We provide in-house support and manufacturing capability for screws elements, barrels sections and other important mechanical components such as gear boxes to help guarantee quality control.

R&D / LAB SUPPORT Our experienced laboratory personnel and versatile equipment help customers solve a variety of research and development challenges, including both pilot and pre-production testing.

Our lab facility includes a pilot line with a twin-screw co-rotating extruder MCM/25HT for running preliminary suitability and processing tests on a variety of materials and compounds on the dedicated sheet down stream allow to have an immediate result as far as surface aspect and other typical characteristics of an extruded product.

Second-phase pre-production testing is performed on our industrial extrusion lines. The lines are, equipped with a full-sized twin-screw co-rotating extruder MCM/60HT and MCM/42HP suitable for verification of specific production parameters on extruded flat sheets or foil with all systems to perform an inline laminated product. Dedicate down stream for profiles including co-extrusion option. All this for testing a combination of different new or recycled materials.

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