



COMAC

MASTERBATCH
AND COMPOUNDING
LINES

CONTENTS

3	COMAC, KNOW-HOW AND CUTTING EDGE TECHNOLOGY
13	DEDICATED SOLUTIONS
16	TWIN SCREW EXTRUDER
18	PRODUCT RANGE
19	COMPONENTS AND ACCESSORIES
22	COMPOUNDING LINES
23	MASTERBATCH LINES



COMAC, KNOW-HOW AND CUTTING EDGE TECHNOLOGY



COMAC STARTS ITS ACTIVITY IN 1978 IN CER-RO MAGGIORE, NEARBY MILAN, IN A DISTRICT WHERE THE ITALIAN MECHANICAL INDUSTRY IS INTERNATIONALLY RENOWNED FOR THE HIGH QUALITY OF ITS PRODUCTS.

The company specializes in the design, engineering and production of twin screw extruders for the plastic industry. Partnerships with important customers favour the development of groundbreaking solutions, designed around the needs of a fast growing market. COMAC's approach, focused both on the quality of the raw materials and on the ability of designing and manufacturing its machines in an extremely flexible way, is winning in establishing the name of the company as an expert, reliable and innovative partner as in Italy as abroad.

The high modularity of COMAC twin screw extruders fully designed and manufactured in its premises near Milan is considered an additional and important benefit by all customers that choose COMAC's solutions.

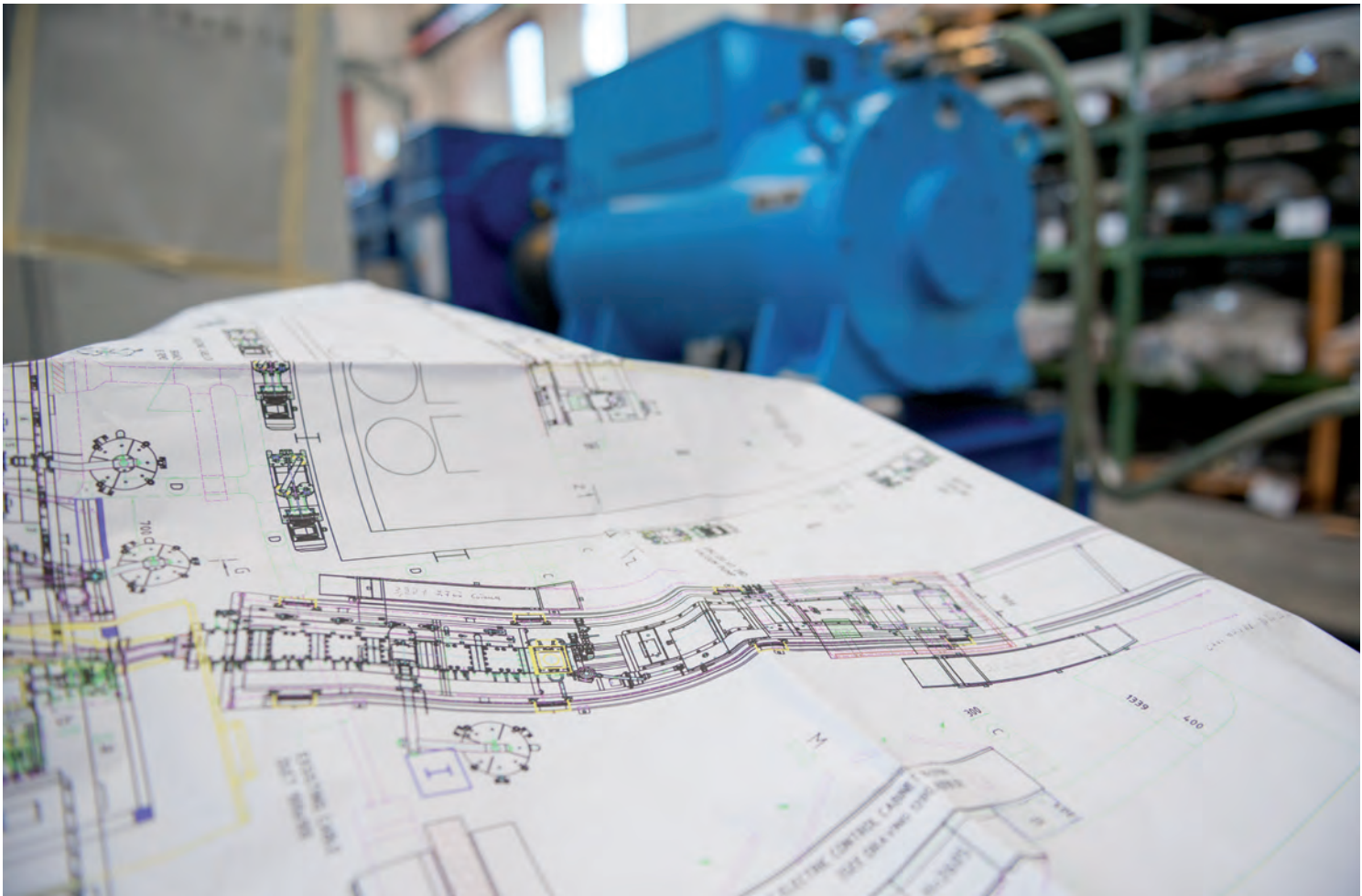
Continuous investments in R&D and cooperations with some of the most advanced departments of chemical, material and nanotechnologies engineering in Italy and with other research institutes abroad have made COMAC a reference point amongst the worldwide producers of twin screw extruders for the production of masterbatch and compound or integrated in special production lines.

COMAC INCREASINGLY AIMS AT WORKING SIDE BY SIDE WITH ITS CUSTOMERS TO DEVELOP AD HOC SOLUTIONS, ABLE TO MAKE THE DIFFERENCE BOTH QUALITY-WISE AND IN TECHNICAL TERMS.

Extruders designed to easily adapt to the real needs of the masterbatch and compounding industry, able to grant a constant functioning and a high level of production, thanks to the advanced modularity of their components. Thanks to a well-established know-how, a commercial network that covers all continents and a competent and timely technical service, COMAC takes care of every possible aspect, bringing forward its customers' needs.

ALL ALONG, COMAC HAS ACCEPTED EVEN THE MORE AMBITIOUS CHALLENGES, BEING CONFIDENT IN ITS TECHNICAL AND PLANNING COMPETENCES BUILT IN OVER FORTY YEARS OF ACTIVITY IN THE SPECIFIC INDUSTRIAL SECTOR OF EXTRUDERS AS WELL AS IN ITS CUSTOMER ORIENTED ATTITUDE.

COMAC's aim is to offer a proactive approach which would be able to bring forward the needs of an industry where innovation is a real and measurable competitive advantage. In spite of its slim structure, a high technical and technological profile enables COMAC to work effectively and timely.





QUALITY IS A VERY IMPORTANT CONCEPT FOR COMAC, WHICH HAS BUILT ITS CREDIBILITY AND THE RELIABILITY OF ITS TWIN SCREW EXTRUDERS ON A HIGH CARE FOR DETAILS.

First of all, quality means an accurate choice of raw materials, able to grant to all components their maximum lifetime and a functioning without any defect.

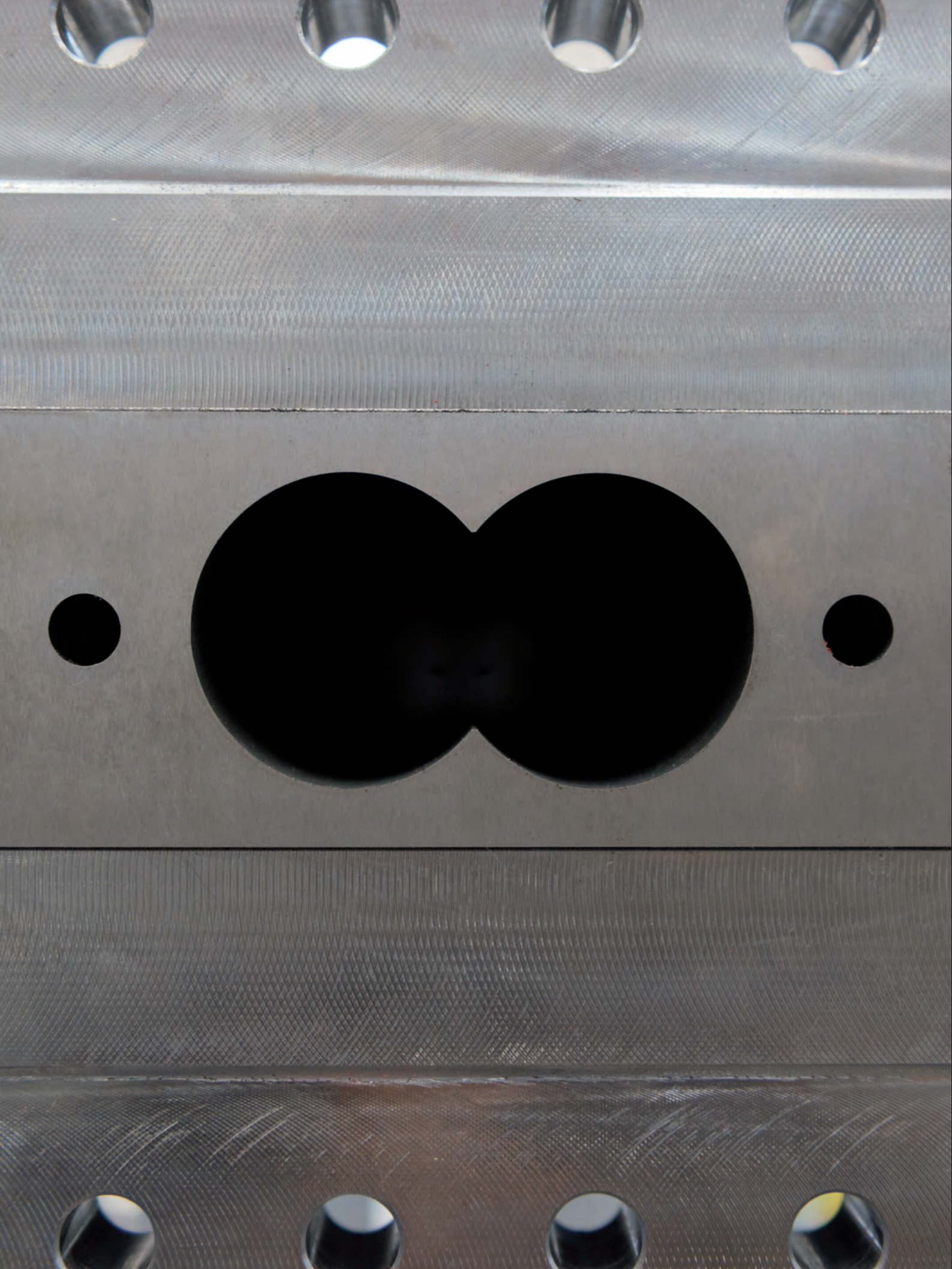
All mechanical parts are designed and manufactured in house; this allows COMAC to quality check every single piece ruling out the risk of malfunctioning that could cause production problems or machine stoppage.

COMAC's quality is also evident in the know-how that allows it to accomplish even 'impossible' tasks (in a unique way amongst competitors in the worldwide market) and to grant a level of customization of its products that is probably typical of an atelier more than of a mechanical workshop.

“MADE IN ITALY” IS NOT A MERE DECLARATION ABOUT PRODUCTION PLACE OF ITS MACHINES BUT, RATHER THAN THAT, THE SYNTHESIS OF AN OPEN ATTITUDE THAT TAKES CARE WITH PRIDE OF CUSTOMERS EXPECTATIONS, OF A COMMITMENT AND A KNOWLEDGE CARRIED-ON WITH PASSION, OF AN ABILITY TO LISTEN AND RESPOND THAT THE ENTIRE WORLD ACKNOWLEDGES US.

To COMAC, “Made in Italy” means attention to details; because consciousness of details makes the difference when speaking about competitiveness of one's customers and quality of their productions. In advanced technologies, quality of design plays a major role, but level and quality of assistance as well as capacity of timely intervention are also extremely important. COMAC can guarantee both a remote assistance service able to solve most of functioning problems and immediate direct assistance when actually needed, in order to dramatically reduce downtime of equipment.





DEDICATED
SOLUTIONS



EXTRUDERS AND COMPLETE LINES ARE MAINLY USED FOR:

- . production of SPC (Single Pigment Color) masterbatches starting from base polymers and inorganic/organic pigments;
- . production of tailor-made color masterbatches either in one-step from pigments or starting from monopigmented pre-dispersed granules (SPC masterbatches);
- . production of additive masterbatches;
- . production of white or black masterbatches;
- . production of compounded pellets for a wide variety of applications (including polymers with mineral fillers, polymer alloys, polymers with glass fibres and polymers with long glass fibres for automotive applications like D-LFT or other uses, elastomeric thermoplastic polyurethane by continuous polymerization, hot-melts);
- . recycling of waste materials into pellets addressed to various end uses;
- . in integration with downstream equipment for various applications (e.g.: one-step continuous production of staple fibres, thermoformable sheets, pipes, profiles with compounding in-line; often in combination with recycling of waste materials like bottle flakes by reliable solutions for PET dryerless extrusion; artificial grass).

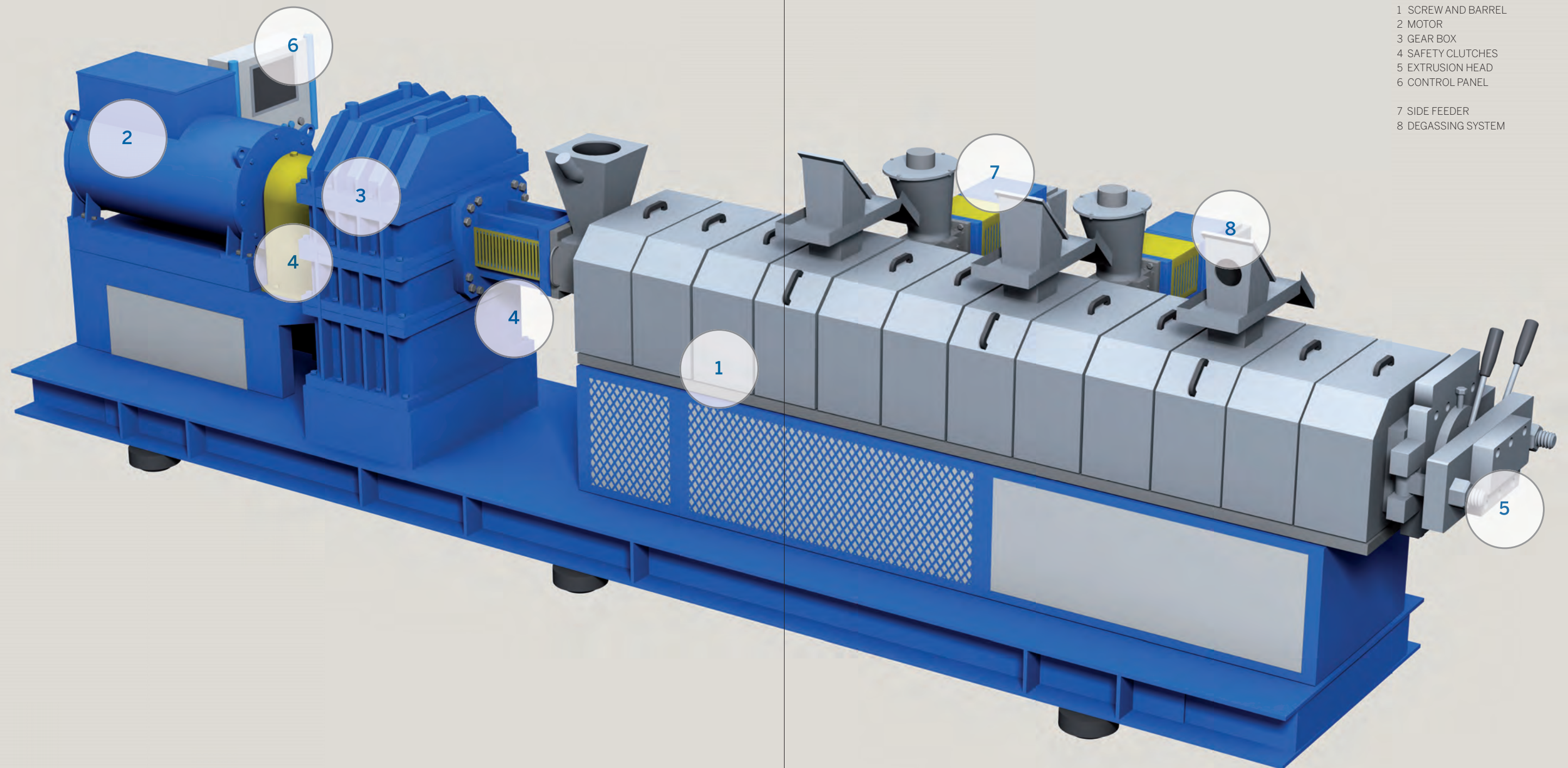
EVERY PLANT IS CAREFULLY DESIGNED ACCORDING TO CUSTOMER'S SPECIFIC REQUIREMENTS.

The whole design and manufacturing process makes use of up-to-date CAD/CAM technologies and is first supported by the highly valuable experience of COMAC's technical staff (designers + process engineers) and of skilled workshop personnel.

COMAC'S PRODUCT RANGE INCLUDES:

1. A complete range of corotating twin screw extruders available in HT series (High Torque – 11 Nm/cm³) or XT series (eXtra Torque – 15 Nm/cm³) and in High-Volume version or Standard version. COMAC industrial scale corotating twin screw extruders range from the compact EBC40 for small productions to the extruders for medium size EBC50 and EBC60, up to the bigger extruders for large scale productions like EBC70, EBC90, EBC120 and the new EBC135.
2. The laboratory corotating twin screw extruder EBC25 suitable for production simulations and for process parameter setup or small size samples; a Jolly Mixer closed discontinuous mixer with high shear rate available in standard version and in version with jacketed mixing chamber (heated and cooled) suitable to achieve excellent pigment dispersions in a variety of resin carriers and for homogenizing different resins to obtain polymeric alloys; the very popular Filter Test line for testing the quality of dispersion into polymeric alloys.
3. Special plants for PET waste reprocessing, long glass fiber reinforced sheet extrusion (D-LFT), continuous polymerization of thermoplastic polyurethane (TPU), the production of synthetic grass and of Hot Melt.

TWIN SCREW EXTRUDER



- 1 SCREW AND BARREL
- 2 MOTOR
- 3 GEAR BOX
- 4 SAFETY CLUTCHES
- 5 EXTRUSION HEAD
- 6 CONTROL PANEL

- 7 SIDE FEEDER
- 8 DEGASSING SYSTEM

PRODUCT RANGE

STANDARD VERSION (R _c AROUND 1.5) HIGH-VOLUME VERSION (R _c AROUND 1.65) SERIES HT (11 Nm/cm³) AND SERIES XT (15 Nm/cm³)									
COMAC MODEL		EBC 25	EBC 40	EBC 50	EBC 60	EBC 70	EBC 90	EBC 120	EBC 135
Nominal diameter Std/ High-Vol. (mm)		26/27	42/43	53/55	62/64	70/72	92/94	120/123	135
Screw number of lobes		2	2	2	2	2	2	2	2
Screw center-to-center (mm)		22	35	44,6	52	58	76	100	110
Screw speed (rpm) other values on request		600 900 1200	600 900 1200	600 900 1200	600 900 1200	600 900 1200	600 900 1200	300 600	350
Torque on each screw (Nm)	HT (High Torque)	117	472	976	1547	2146	4829	11000	14600
	XT (Extra Torque)	160	643	1331	2109	2927	6585	15000	19900
L/D ratio		28÷52	28÷52	28÷52	28÷52	28÷52	28÷52	28÷52	28÷52

COMPONENTS AND ACCESSORIES


SCREWS AND BARREL

Screws and barrels are “the core” of COMAC extruders. A fully modular design of screws and barrels allows fast assembling and geometry adjustment for every material to be processed.

BARREL


Barrels are built-up by 4D long modules specifically designed for their functions: main feeding, mixing, side feeding, degassing.


COMAC’s new concept barrels are built in three pieces: an inner part is made with high wear resistance steel in between upper and lower bodies that contain thermoregulation devices. The new concept results in a better thermoregulation and in faster and easier maintenance.





SCREWS

Screw are highly modular; different modules are available with several profiles, like kneaders and mixers, that can be assembled on screw splined shafts. Their carefully defined design avoids material stagnation, grants a self-cleaning action and is specifically studied to obtain the best possible process results.

SHAFT


SCREW SHAFTS

SCREW SECTORS KNEADERS

SPECIAL FUNCTIONS

MOTOR

COMAC equips its twin screw extruders with the best available motors. Customers can choose amongst AC or DC, air or water cooled motors.



GEAR BOX

The transmission is manufactured with steel alloys that undergo a thermal treatment and subsequent stabilization. All gears are made with special steel; tooth surfaces are properly hardened and ground all over so that gearboxes are designed for over 50000 hours of continuous operation at full load.



SAFETY CLUTCHES

COMAC extruders are fitted with the best safety systems.

SAFETY CLUTCH

To safeguard the gear box COMAC assembles between the motor and the speed reduction gear box torque limiting safety clutch (with instant separation and motor power cut-off in case of overload) of the best brands available on the market.



SAFETY JOINTS

The safety joints between the gear box and the shafts are manufactured by COMAC and suitably sized to sustain the maximum coupling receivable by a single shaft. In case of overload, they brake to protect the screws.



FAST OPENING EXTRUSION HEADS

Strand extrusion die heads are typically used on color/additive masterbatch and on compounding lines for some applications (e.g. glass fiber compounds). The special design of COMAC's extrusion heads with fast opening system allows quick and easy product change. A type with front movable plate hinged to the fixed plate and locked by 2 bolts only is proposed for flexible production on small-medium scale (e.g. color MB). Production idle time is reduced to a very minimum whenever the head is to be opened for cleaning / screen replacement. Other types of extrusion heads for bigger capacity, also integrate with screen-changers, are available too. Twin screw extruders can also be equipped with flanges to be integrated with any other downstream equipment.



CONTROL PANEL

All process parameters of an extrusion line are displayed on an operator's control panel that can be fitted either on the extruder or on its control cabinet. The user interface is intuitive so that operators and production supervisors as well as maintenance engineers can access all important data directly on the touch screen panel. Twin screw extruders can also be equipped with remote assistance packages.



SIDE FEEDERS

COMAC corotating twin screw extruders can be equipped with corotating twin screws side feeders that allow to insert fibres or mineral fillers directly into the melt. According to different needs, side feeders can be manufactured with modular or whole-piece screws and can be equipped with a cooling system.



DEGASSING SYSTEM

Extruders can be equipped with an under vacuum degassing system connected with relevant barrel module/s. The degassing system can be standard with a water ring pump or in configuration tailored on special needs.



SCREEN CHANGERS

COMAC screen changers allow the melt filtration without production stops. COMAC manufactures screen changers having an optimized design in which the extrusion head is integrated in the screen changer itself to reduce melt volume to a very minimum in order to avoid degradation. Screen changers by specialized manufacturers are proposed in applications requiring other capabilities such as, for instance, self-cleaning.



PELLETIZING SYSTEMS

COMAC manufactures its own strand pelletizers in various sizes used mainly in the masterbatch production field. An optimized design and innovative solutions help operators during start-up and routine operations. Especially when throughput exceeds certain values or special features are required, COMAC proposes strand pelletizers made by the best reputed manufacturers. COMAC's machines can also be provided with underwater pelletizers and water-ring pelletizers (mostly, in the compounding field and/or when in presence of high capacity lines; choice among solutions being related to raw materials / products).



COMPOUNDING LINES

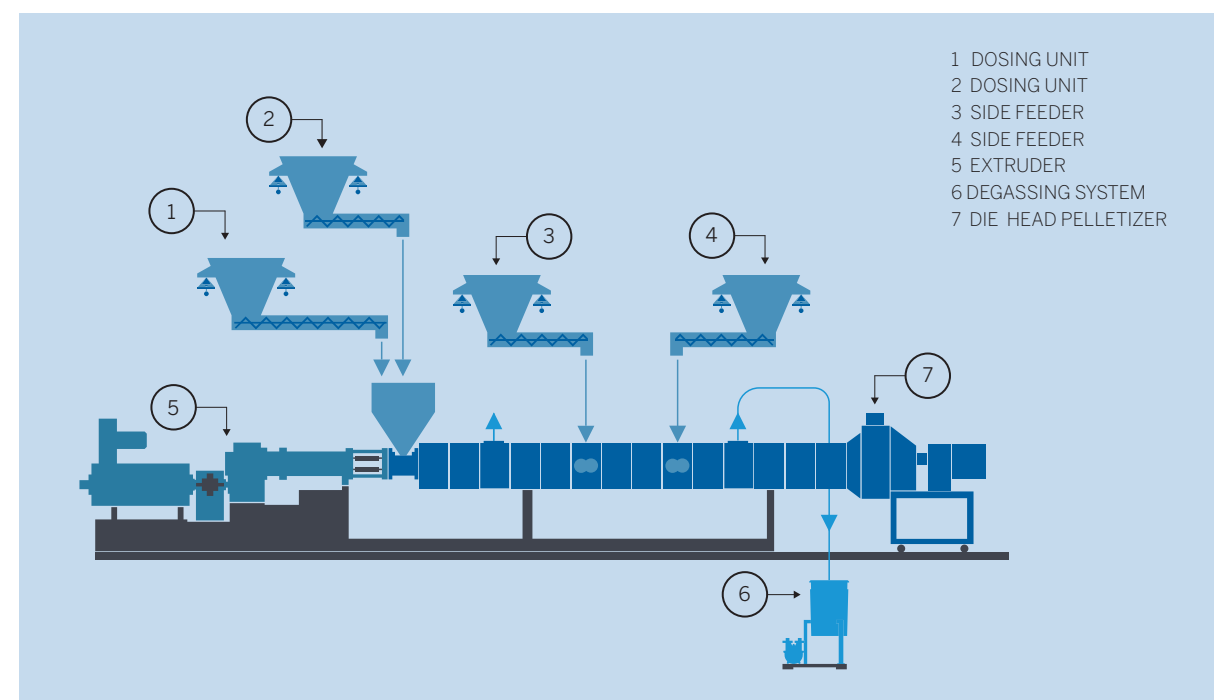
Highly flexible compounding lines allow the production of commodities, engineering and speciality compounds. Matching the latest market trends, COMAC proposes extruders able to produce a wide range of high added value compounds even in small-medium size lots.

Some examples of production include:

- . mineral filled compounds with up to 80% filler contents
- . glass fibres, glass beads, mixed fillers
- . flame retardants
- . impact modifier compounds
- . plastic recycling
- . elastomers

MAIN CHARACTERISTICS:

- . strand extrusion solutions
- . under water or water ring pelletizer solutions
- . compounding solutions integrate in extrusion lines (profiles, sheets, etc.)



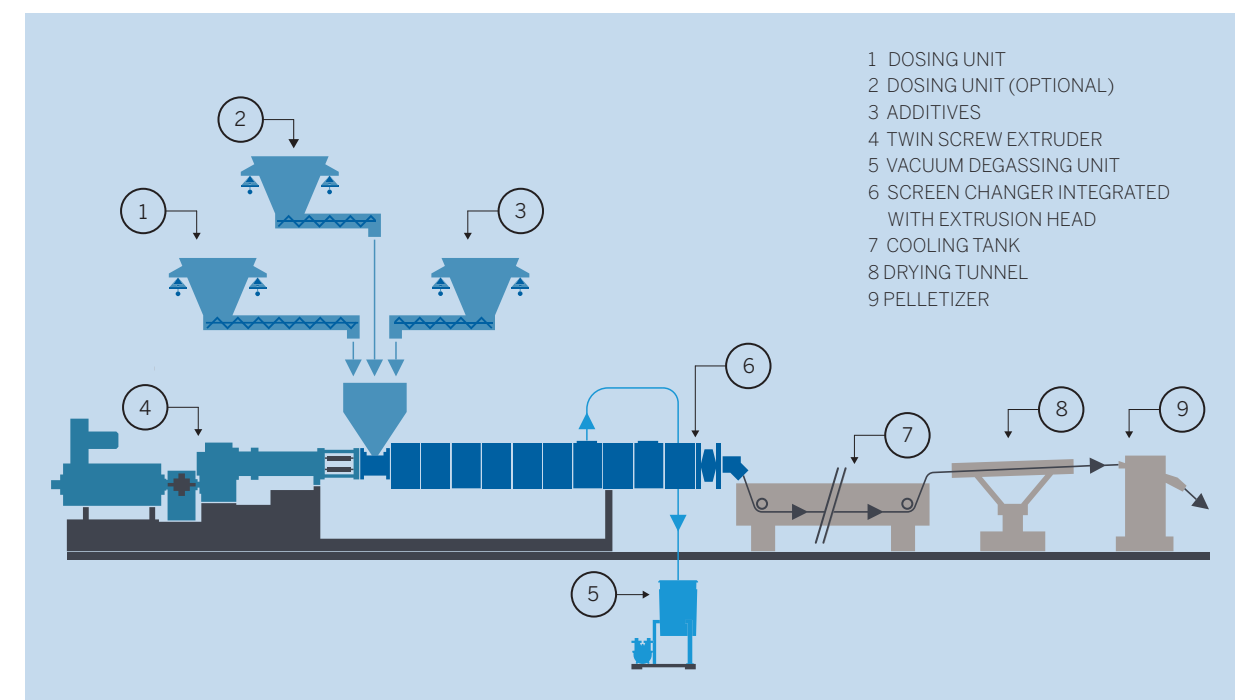
MASTERBATCH LINES

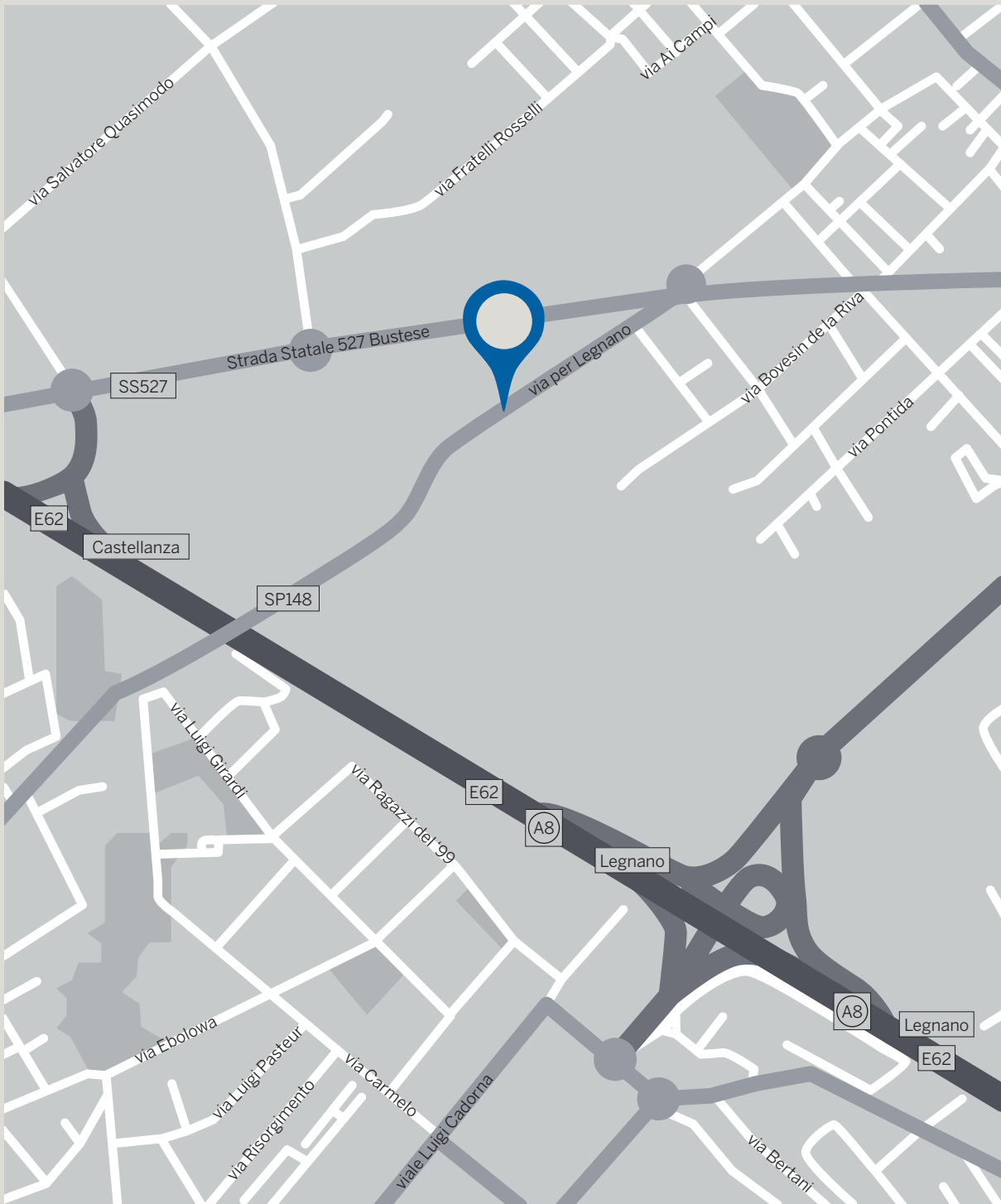
Optimized for the strict quality requirements of masterbatch producers, these lines are fitted with the most advanced solutions coming from 30 years of real experience in this field. High shear-rate and performing screw geometry enable to achieve high pigment concentration in polymer carriers with optimal dispersion.

High-Volume version extruders (with compenetratio ratio 1.65) conjugates excellent quality with output performances. A self-cleaning profile minimizes machine stops. Screen changers and extrusion heads are designed for quick opening and fast colour change.

MAIN CHARACTERISTICS:

- . dosing system
- . cooling tank
- . drying tunnel
- . pelletizer





COMAC srl
via per Legnano, 57 20023 Cerro Maggiore (MI) Italy
t +39 0331.577387 f +39 0331.464605
www.comacplast.com info@comacplast.it

LATITUDE	45° 36' 36"	NORTH
LONGITUDE	8° 56' 33"	EAST



