

ET Black™

Carbon Black Technology



Eurotechnica 



Eurotecnica, part of the Proman family of companies, is the world leader in licensing and designing advanced methods and processes for the production of melamine and carbon black, and energy storage solutions for the chemical, petrochemical, and energy sectors. With a global reach spanning landmark projects in China and across the EMEA region, Eurotecnica sets the standard for sustainable and efficient production processes.

Established in 1962 and headquartered in Milan, Italy, Eurotecnica is known for its industry-leading technologies.



ET Black™ Carbon Black Technology

Developed over years of operational experience in commercial plants, the modified furnace black process prioritises product quality, consistency, and operational flexibility. A single reactor can seamlessly produce each ASTM grade—one reactor for hard grades and one for soft grades—ensuring efficiency and adaptability. The highly exothermic nature of the ET Black™ process enables the surplus heat to be harnessed for steam production or electricity generation, delivering improved economic performance and sustainable operations.

ET Black™ Technology has been successfully implemented at several licensee facilities, particularly in the Middle East, demonstrating its versatility and reliability. It is ideal for integration within upstream operations such as refineries, ethylene complexes, or coal tar facilities, as well as downstream processes like tyre manufacturing.

With its focus on flexibility, efficiency, and sustainability, ET Black™ Technology is the ideal solution for modern carbon black production.

Cut your CO2 emissions by 50% with ET Black™

Compliant and innovative
Meets stringent environmental regulations, keeping your business future-ready

Unparalleled flexibility
Produce all ASTM grades and specialty grades seamlessly in a single plant

Sustainable
Uses thermal decomposition of aromatic oils for cleaner production

140,000
Tonnes/year carbon black plant successfully implemented

100%
Efficiency in fine particle collection

50%
Reduction in CO₂ emissions

Carbon Black

Carbon black is a versatile material integral to various applications, including tyres, plastics, coatings, inks, and batteries. With a global market size of more than 15 million tonnes per year, it continues to experience strong demand, driven by its critical role across diverse and expanding industries. Over the past three decades, global demand has shown a steady upward trend, highlighting its indispensability in both traditional and emerging applications.

Carbon black production is often integrated with upstream facilities such as refineries, ethylene complexes, or coal tar operations, offering strategic advantages in cost efficiency and resource utilisation. Its high value as a specialty chemical enhances the overall profitability of these complexes, particularly when surplus energy

generated during production is utilised for internal utilities. This combination of broad industrial applications, economic value, and integration potential solidifies carbon black’s position as a key driver of growth and profitability in the chemical and materials industries.

Eurotecnica’s ET Black™ Technology is an advanced solution for producing all carbon black grades defined by the ASTM standards.



ASTM Standards

Carbon black classification encompasses a number of series and grades, in accordance with the ASTM standard.

N110, N220, N330 series are defined as hard black grades, N550, N660, N770 series, as soft grades.

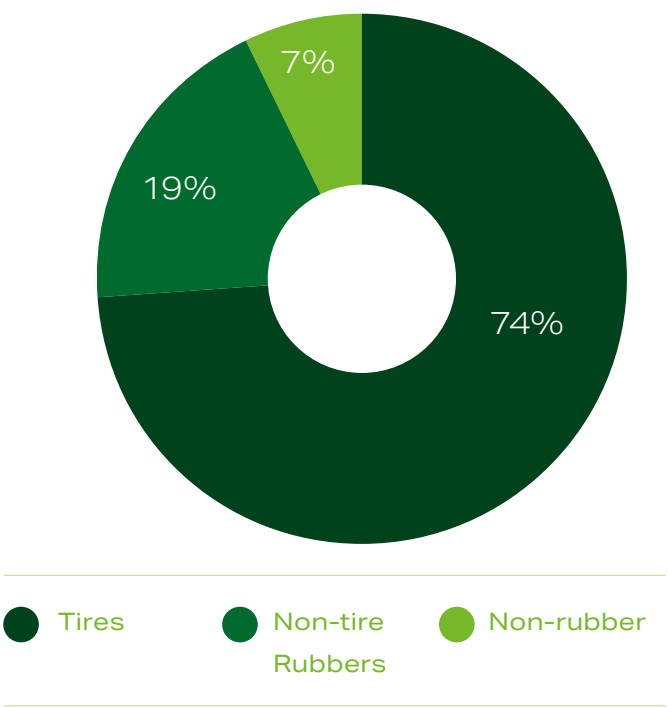
Particle size, aggregate size, morphology, surface area, bulk properties are the most important parameters that identify the specific grade of the final product and therefore its range of applications.

Carbon Black Feedstock

Carbon black is produced using heavy residues from refinery conversion units as feedstock. The composition, characteristics, and properties of feedstocks vary and must be carefully assessed during process design to achieve the desired product quality.

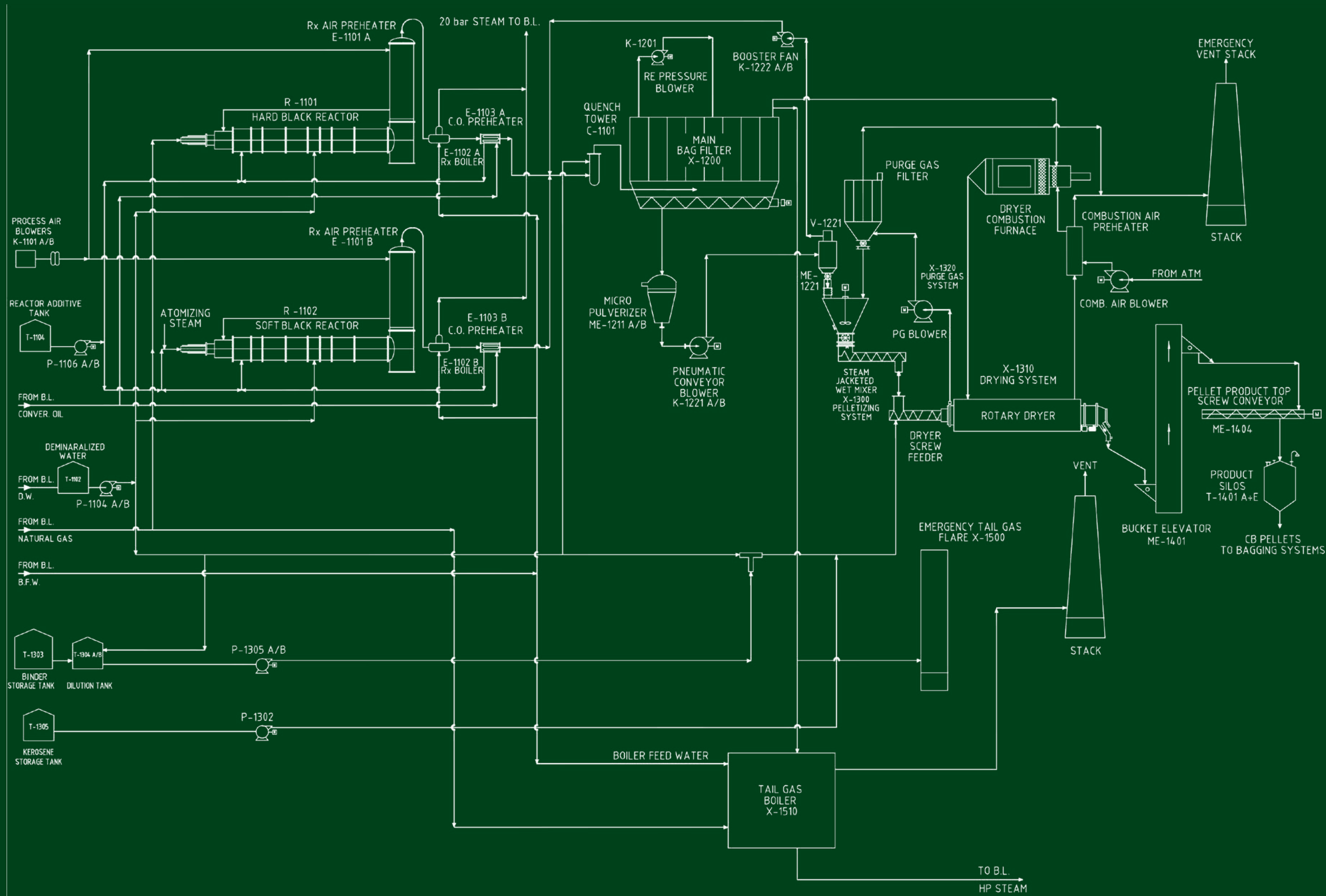
The U.S. Bureau of Mines Correlation Index (BMCI) measures feedstock aromaticity and is useful for yield characterisation. It must be adjusted for sulphur, oxygen, and nitrogen content, as these elements negatively impact carbon black yields.

Sulphur content generally increases BMCI but does not enhance yield. While most carbon black grades tolerate sulphur, it should be limited to 2–3% by weight to prevent corrosive gas formation that damages downstream equipment. High-end grades like N115 and N220, used in UV water supply pipes, require 0.1–0.2% sulphur to meet “smell and taste” standards.



ET Black™ Carbon Black Technology

ET Black™ is a modified furnace black process developed through years of commercial operation, focusing on product quality and consistency, efficient pelletising and drying, and optimised steam and electricity generation.



Carbon black is produced in the reactor through the high-temperature thermal decomposition of hydrocarbon oil within microseconds, tailored to each grade. The reactor is the core of the process, converting feedstock into carbon black with specific characteristics.

Feedstock storage and pumping

The feedstock is unloaded into fixed roof storage tanks where it is kept at 60–90°C.

Before entering the reactors, the feedstock is filtered through fine mesh strainers to remove impurities and preheated to 200–250°C for improved atomisation.

Reaction

The reaction chamber, lined with high-temperature refractory, operates at 0.5 barg and around 1900°C for hard blacks or 1400°C for soft blacks. In the hard black reactor, auxiliary fuel combustion raises the temperature to enable thermal cracking. The produced carbon black travels at high velocity to the reactor's quenching section, where water sprays cool it to 800–1000°C at specific points.

The reactor gases, an aerosol of carbon particles in hot combustible gases and steam, first pass through an air preheater, heating reaction air.

They then move to a reactor boiler for steam production and a conversion oil preheater. Before reaching the main bag filter for separation, the gases are cooled to 280–300°C in a quench tower.

Carbon black separation and homogenisation

The carbon black is separated from the gaseous stream (a mixture of CO, CO₂, CH₄, C₂H₂, N₂, H₂, air, and water vapour) in the main bag filter.

Smoke at 280–300°C from the reactor enters the filter, where the bags trap carbon particles. The cleaned gas exits through the gas header, and the filter bags are cleaned at pre-set intervals.

The collected carbon black powder is discharged from the hopper and sent to micro pulverisers. Most off-gases are routed to the tail gas boiler for complete combustion and steam generation. A smaller portion is diverted to the drying section and fired in the dryer combustion furnace to provide the necessary heat for drying.



Pelletising

The collected carbon black is sent to a pelletiser, where it is mixed with water and additive to form strong wet pellets. The purpose of the pelletiser is to shape the carbon black mixture into durable, spherical pellets.

Drying

Wet pellets are fed into the rotary dryer via a screw feeder to maintain their integrity. The dryer shell is heated by burning a portion of off-gases from the main bag filter. Dry pellets with less than 1% moisture exit the dryer and are transferred to storage silos.

Purge gas filtration

At the end of the dryer flue gases, vaporised water, and powdered carbon black are removed by a purge gas blower. The gases are directed to a pulse-jet bag filter, which collects carbon black particles and releases clean gas into the atmosphere.

The collected carbon black is fed from the hopper to the surge tank via a rotary valve, ensuring no loss during dryer operation.

Handling, storage and packing

Dried pellets from the dryer are lifted by a bucket elevator to the top of storage silos, where a screw conveyor distributes them by grade. Off-spec product is sent to an off-spec silo for further processing. Carbon black is typically shipped in bulk via tank trucks, railcars, or big bags.

Energy Recovery

Unused tail gas is burned in a boiler to produce steam, with about 2% used in the ET Black™ process. The surplus is exported to local users or used to generate electricity.





Range of Expertise

Process Modelling & Simulations

Process Operations
Planning & Supply Chain
Energy Management
Integrity & Reliability

Projects Front-End

Conceptual Studies
Feasibility Studies

Licensing

License, Know-how, Trademarks Grants
Classroom/On-site Training
Assistance to Start-up
Networking & Products Sale Assistance
Technology Update

Engineering

Process Design Package (PDP)
Basic Engineering Design (BED)
Front-End Engineering Design (FEED)
Detailed Engineering (DED)

Project Execution

Project Management
Purchasing, Expediting, Inspection,
Testing
Assistance to Construction, Erection,
Commissioning
Assistance to Plant Operation

After Sales

After-Sales Service
Spare Parts Management

Sustainable solutions for a greener future

Eurotecnica's technologies are designed with sustainability in mind, helping our customers meet their environmental goals while setting new standards for cleaner industrial processes, from melamine and carbon black production to renewable energy storage.

The ET Black™ Technology exemplifies this commitment by offering high-performance, low-emission solutions for carbon black manufacturing, including the capture of nearly all fine particles, significantly reducing emissions and environmental impact.

Eurotecnica



Part of the Proman Family

www.eurotecnica.it/et-black/

