



Carbon Black

Eurotecnica technology





- The Company, set up in 1962, is an international engineering contractor with a staff of more than 100 highly skilled employees. To date Eurotecnica has carried out successfully more than 130 projects, implemented all over the world to clients' full satisfaction
- Eurotecnica is known worldwide for its High Pressure Melamine Technology, which has reached today 424,000 t/y licensed capacity.
- Thanks to its skills Eurotecnica can offer a wide range of technologies in the field of chemicals petrochemicals and renewables.

KEY FIGURES



MELAMINE

Melamine is used to produce melamine/formaldehyde resins for flooring, laminates and thermosetting plastic, paints, glues, flame retardants and slow-release fertilizers.

Eurotecnica is the world leader in melamine technology and its High Pressure Melamine Technology is the process of choice for new installations because of its outstanding features in terms of product quality, plant operability and environmental friendliness.

Eurotecnica has licensed almost 40% of the world melamine capacity.

Eurotecnica High Pressure melamine Process features

Continuous production of top grade melamine

Proven time between normal turn arounds more than 600 days with plant operating 24hr/day without interruptions.

Catalyst free operation – no downtime, no production ramp-up for fluid bed tuning, no variation in quality, no costs for catalyst purchase and disposal.

Turn down ratio less than 50 %.

Ammonia and carbon dioxide rich off gases fully recycled at medium pressure to the upstream urea plant or to a dedicated urea unit.

No extra chemicals added to the process: just urea and ammonia.

Environmentally friendly – Zero liquid and solid discharge.

CHEMICALS

Eurotecnica, thanks to its well known commitment to reliability and process expertise, is a reliable and proven access door to a wide range of chemical technologies

Eurotecnica utilizes or develops in partnership proven and referenced technologies of international companies and research institutes active in the chemical and petrochemical fields.

Furthermore, Eurotecnica has deep experience in teaming up with Client in identifying technological opportunities and transforming them into full fledged process plants.

Some of the technologies in our portfolio

Carbon Black

Phtalic Anhydride

PENTA, TMP, NPG

Acetaldehyde

Paraformaldehyde

REFINERY

Refinery is where all our activities started and where our well known process expertise is coming from.

Eurotecnica performed a number of projects with UOP technologies, ranging from Continuous Catalyst Regeneration Reforming (CCR), to Benzene-Toluene-Xylene systems (BTX), to Hydrotreating and to N-paraffins extraction.

Furthermore, Eurotecnica has been one of the very first companies to build UOP's Linear Alkyl Benzene plants, thus paving the way to its current leadership in that field.

Highlights from our experience in refinery units

- CCR Platforming
- Gasoline, Kero and Diesel hydrotreating
- Aromatics complexes
- Linear Alkyl Benzene
- Normal Olefin Dimers
- Linear and branched alcohol fractionation
- Dodecylbenzene
- C8 aromatics isomerization
- n-paraffins extraction
- Benzene from pyrolysis gasoline
- Oxo-alcohols
- N-olefins

ET SOLAR

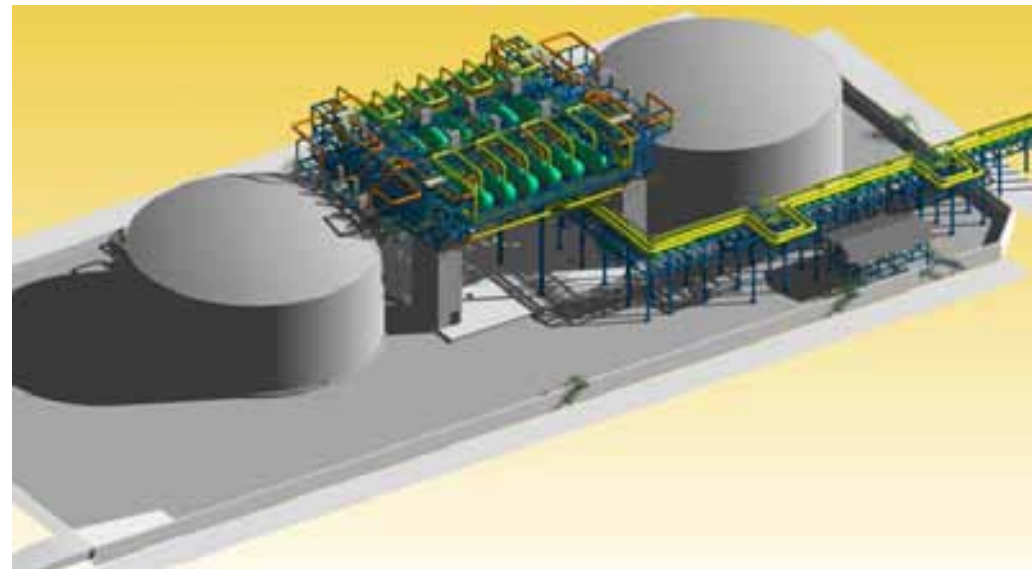
A Concentrating Solar Power plant gathers heat from the sun and utilizes it to produce green electric power. But what to do at night, when there is no sun, and how to match the output of the power station with the demand from the grid?

An Eurotecnica Thermal Energy Storage system can store the heat, in the form of a huge mass of high temperature salts kept in molten state, and release it to produce steam right when electric power is required.

Molten Salts Thermal Energy Storage Systems

Eurotecnica is one of the few companies in the world with technology and references for Molten Salts Thermal Energy Storage Systems for concentrating solar power plant.

The technology is derived from the molten salts expertise gathered by Eurotecnica with the High Pressure Melamine Technology.



History and development of carbon black



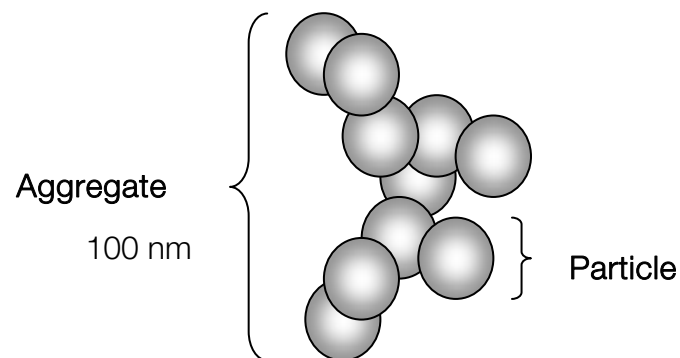
The use of carbon black as a pigment dates back to prehistoric times.

Until 1870 the only commercial process was the lampblack process.

In 1920 two new processes using natural gas as feedstock were introduced: the thermal black process and the gas furnace process, that is the forerunner of the actual oil furnace process.

The first commercial oil furnace process was put in operation in 1943 by the Phillips Petroleum Co. The oil furnace blacks displaced rapidly all other types used for rubber reinforcement and today account for practically all carbon black production.

Carbon Black is composed essentially of elemental carbon in the form of semispherical, colloidal particles coalesced into each other and forming mainly particle aggregates.



These are obtained by partial combustion and thermal decomposition of highly aromatic hydrocarbon oils under controlled conditions.

There are many types of Carbon Blacks that differ in the physical-chemical properties of the particles.

This wide variety of Carbon Black grades requires different reactor designs and different reaction conditions (temperature, residence time, turbulence and concentration of active ingredients).

Carbon Black is widely used in rubber products, particularly in vehicle tires, and in the plastics and ink industries. In rubber applications, according to ASTM standards, the carbon blacks are classified broadly into hard and soft grades. Hard grades are typically used in tire threads, whereas soft grades are needed for the balance of the tire.

Details of the product-wise applications of the various grades are given in the table below:

	Airbags	Conveyor belt	Ext. Product	Footwear	Hoses	Inks	Mech. Goods	Moulded prod	OTR tyre	Plastics	Pigments	Railway pad	Retread	Rubbersol	Tubes	Tyre carcass	Tyre tread	V-belt	Wire/cable
N220				X		X	X			X			X				X		
N326					X	X	X	X	X		X					X			
N330		X	X	X		X	X	X		X	X		X	X			X	X	X
N339							X				X		X				X		
N347							X			X	X						X		
N550	X		X		X	X	X		X	X					X	X		X	X
N650			X	X	X		X								X	X		X	X
N660		X	X	X	X		X	X					X		X	X		X	X
N774				X	X	X	X	X		X	X								X

H
A
R
D

S
O
F
T



Prices vary greatly according with grade and application

Percentage share of end applications – 2007 figures

Area	Tires	Non tire rubber	Plastics	Inks and paints	Other
World	72.0	20.0	5.2	1.7	1.1
North america	69.0	19.0	7.9	2.6	1.4
Central And South America	82.0	15.0	1.8	0.4	0.9
Western Europe	67.0	24.0	5.9	2.0	1.2
Central and Eastern Europe	66.0	25.0	5.9	2.0	1.2
Africa and Middle East	66.0	26.0	5.2	1.8	1.0
Japan	74.0	19.0	4.5	1.3	1.3
China	76.0	19.0	3.0	1.1	1.0
Other Asia/Oceania	75.0	19.0	3.8	1.1	1.1

Source: SRI

The feedstock for a carbon black plant is called Conversion Oil. Typical feedstocks are decant oil from fluid catalytic cracking of gas oils, ethylene tar or ethylene cracker residue from steam cracking of naphtha/gas oil and coal tar oils, such as creosote and anthracene oil.

Feedstocks are characterized by the following properties:

1. AROMATICITY
2. SULFUR CONTENT
3. ASH
4. PENTANE INSOLUBLES
5. ALKALI METALS

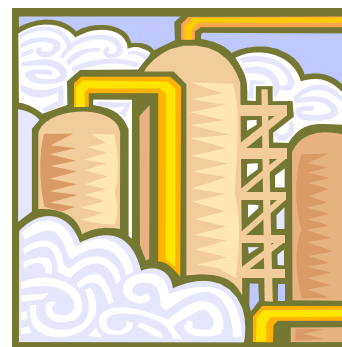


Refinery

FCC Decant Oil



Steam Cracker Residue

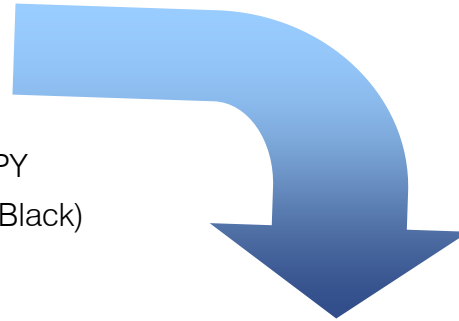


Steam Cracker

Petkim Petrokimia

Phillips Technology

- Soft Black Reaction Line 15000 MTPY
Three Reactors
- Hard Black Reaction Line 15000 MTPY
Four Reactors
- Carbon Black Separation Line 15000 MTPY
(common to Hard Black and Soft Black)



Bigger reactors

Higher efficiency

Improved energy recovery

Sherkat Carbon Simorgh

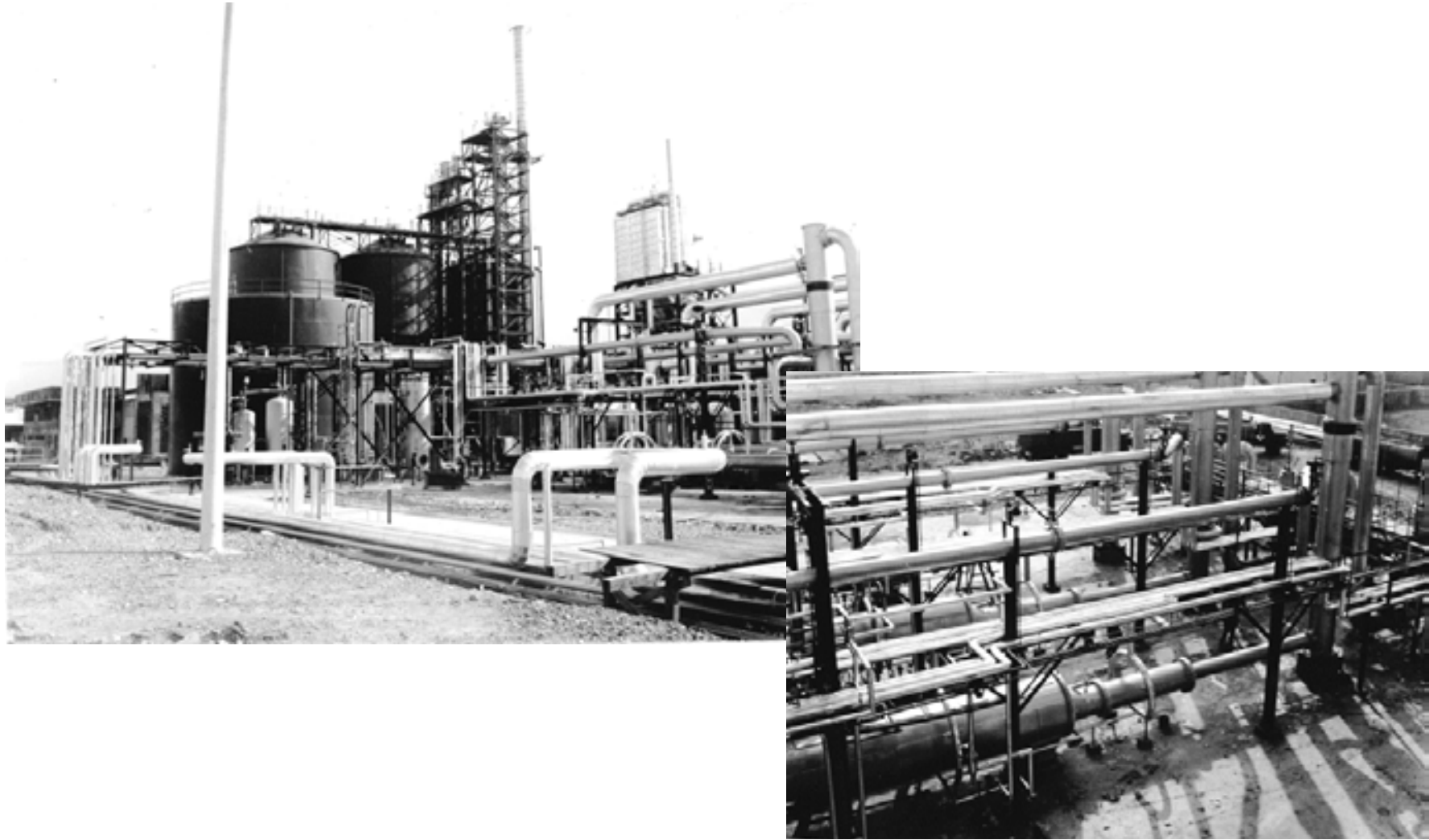
EUROTECNICA/PVTI Technology

- Soft Black Reaction Line 42000 MTPY
Three Reactors
- Hard Black Reaction Line 42000 MTPY
three Reactors
- Carbon Black Separation Line 42000 MTPY
(common to Hard Black and Soft Black)

Confidential Client

EUROTECNICA/PVTI Technology

- Hard Black Reaction Line
- High added value product,
- Top of the market specs
- Installation within world class complex



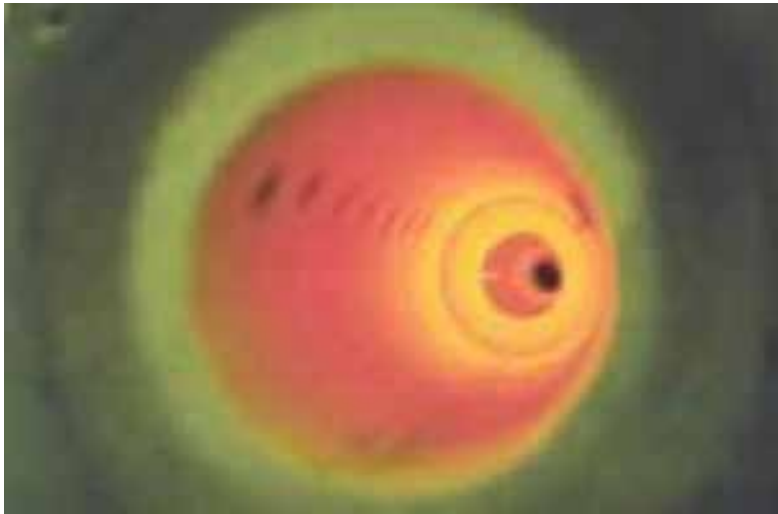
The Carbon Simorgh project is a clear demonstration of the contribute that Eurotecnica can give to any carbon black plant in terms of project and process reliability.

The plant can produce all Carbon Black grades as per ASTM Standards or Specialty Grades as per customer requirements.

Other than the ASTM grades, the plant has the flexibility to produce Specialty Grades suitable for selected applications such as:



The plant features high energy efficiency reactors for better quality of Carbon Black and higher production rating:

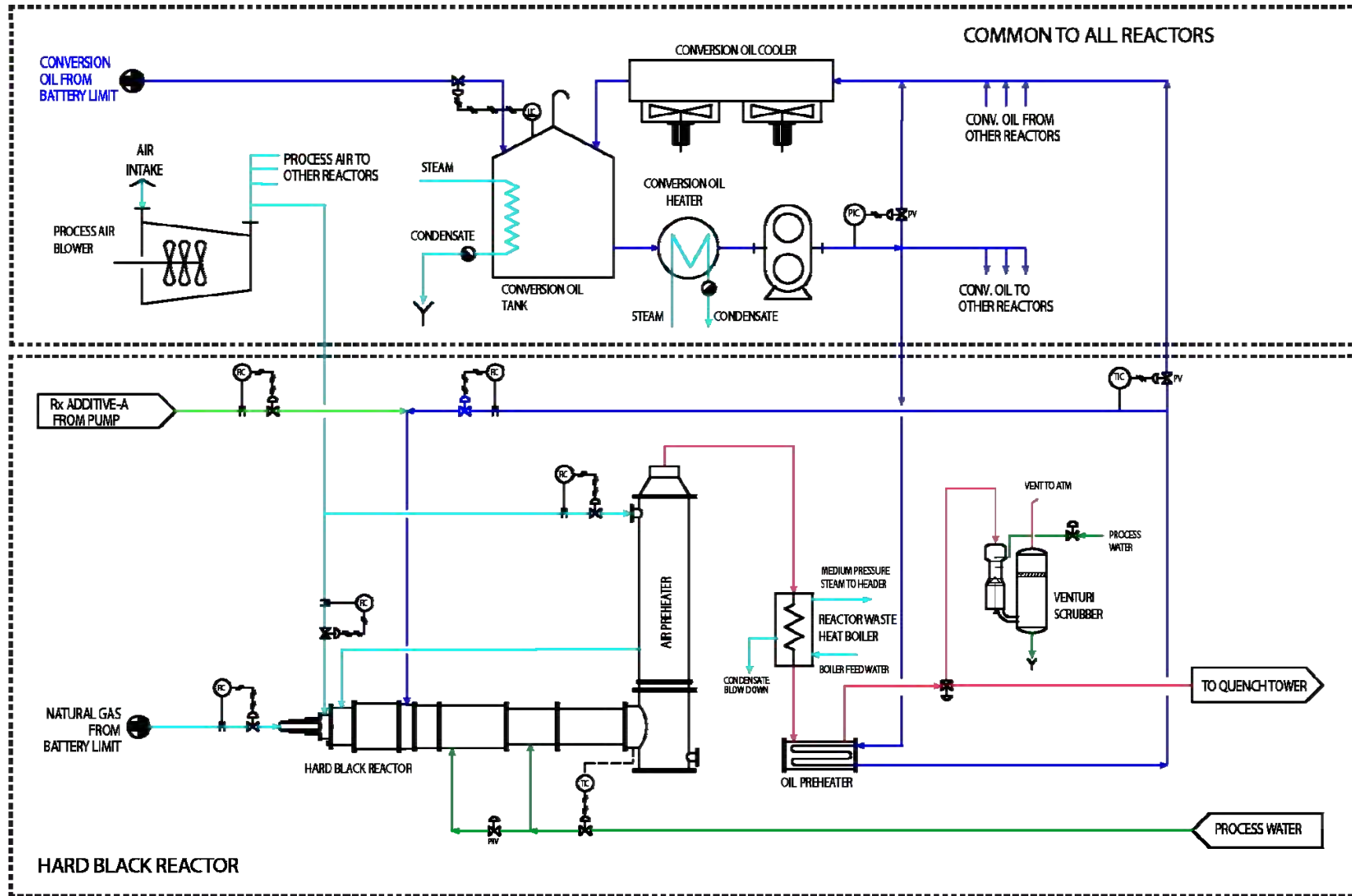


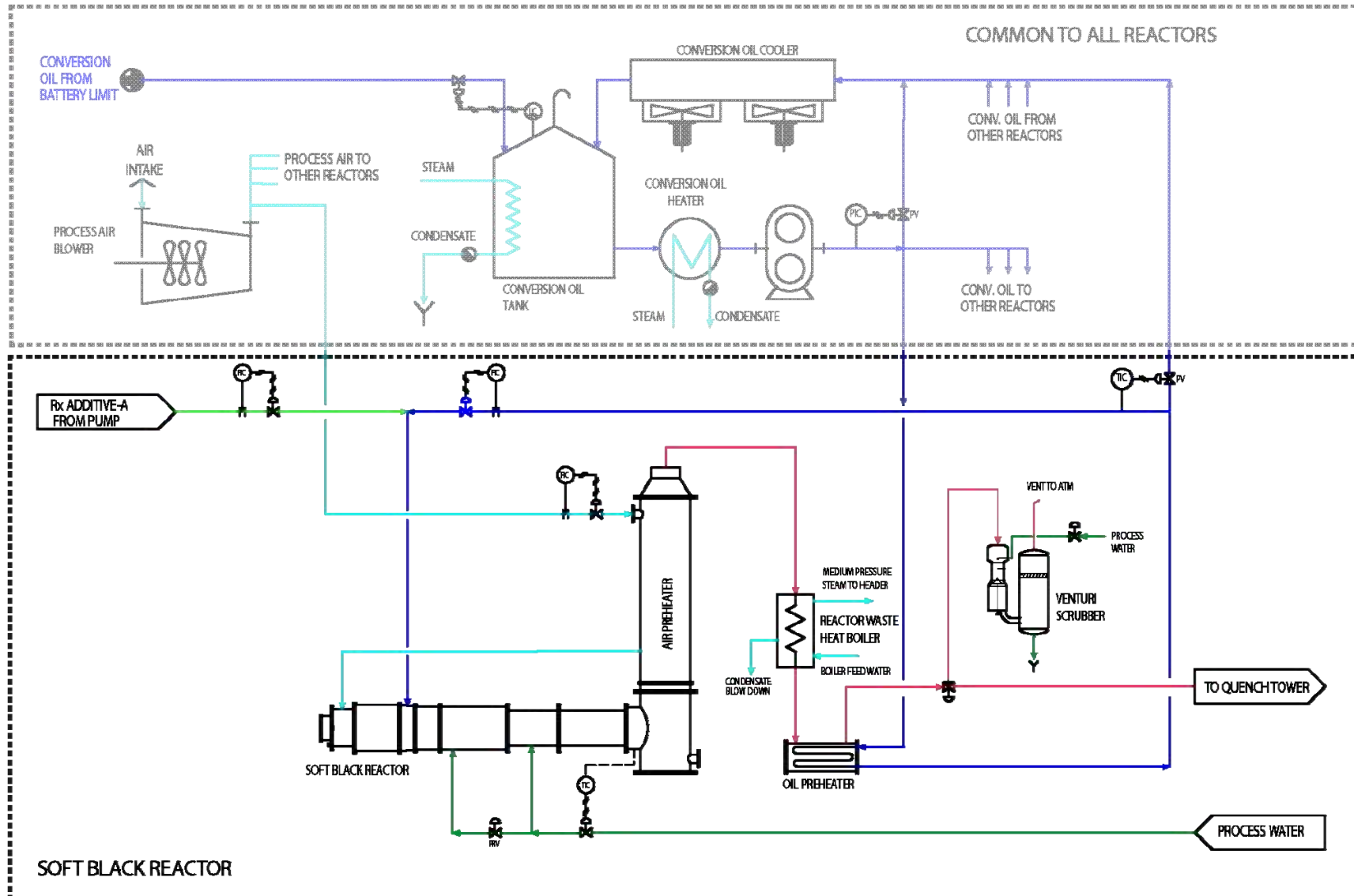
The plant incorporates high temperature air pre-heaters, which provide maximum energy recovery from reactors effluents.

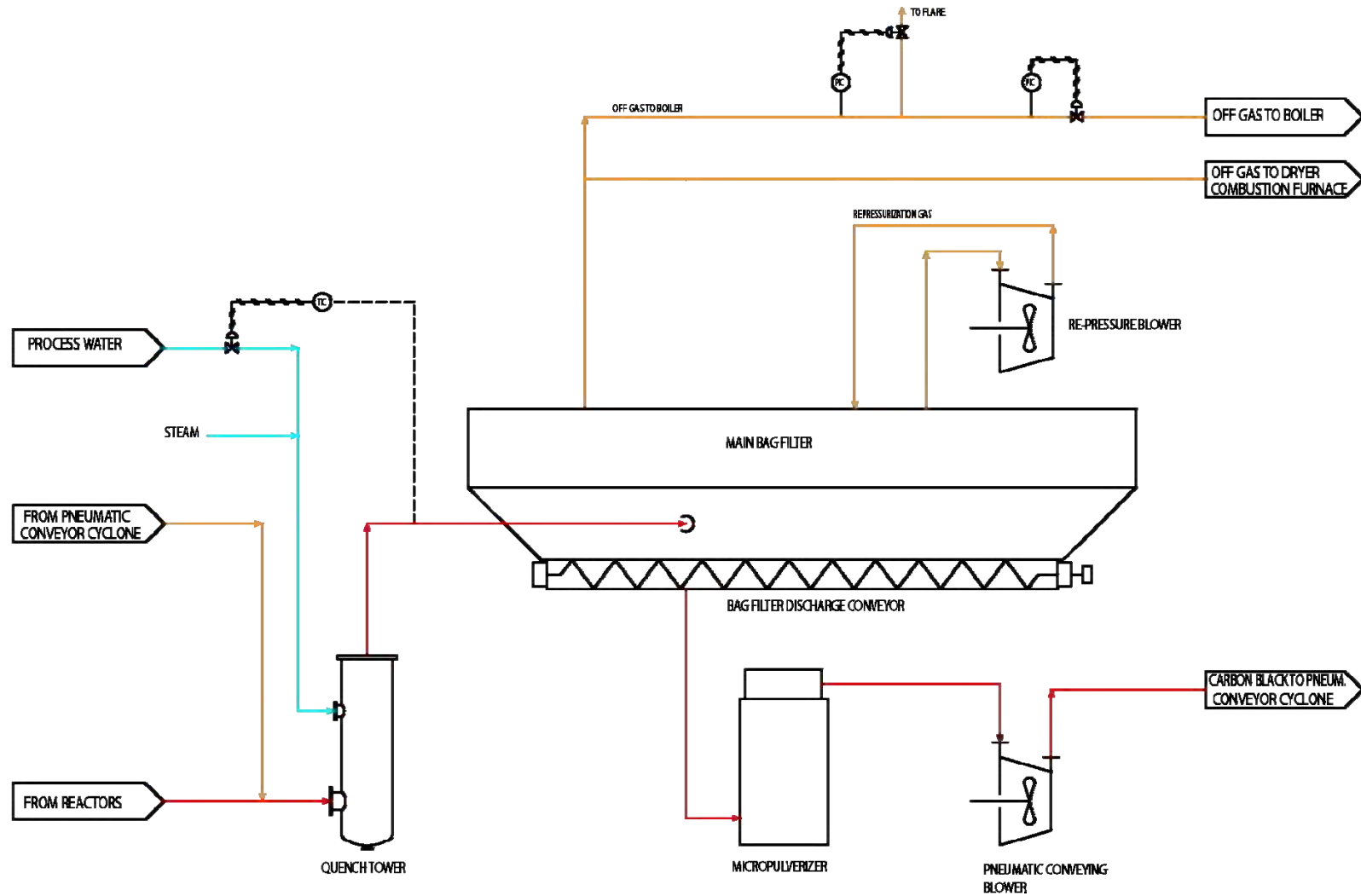
The product from this plant is a world standard quality product in compliance with the most stringent market specifications.

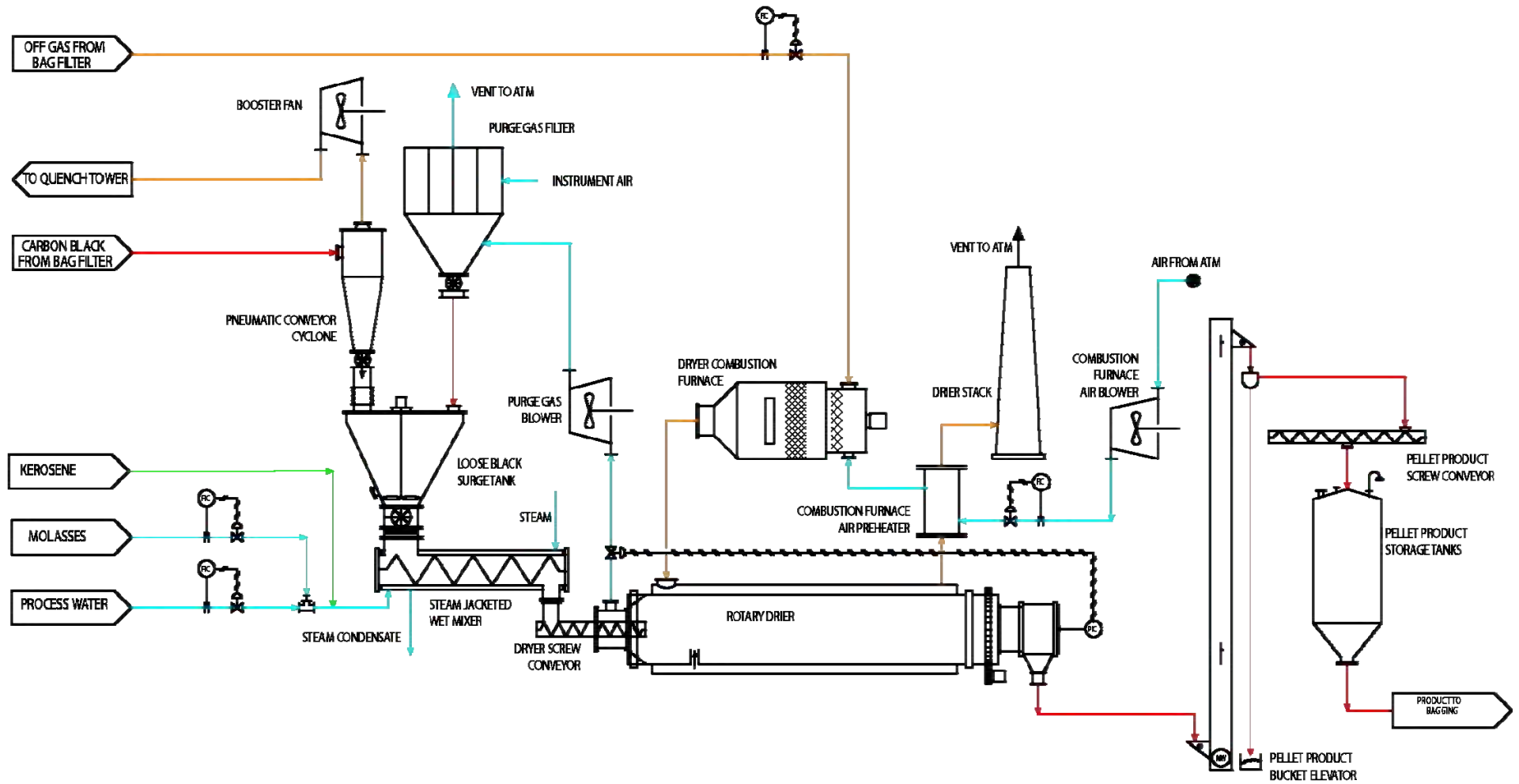
The complete manufacturing process consists of the following main sections:

- 1. Reaction – hard black**
- 2. Reaction – soft black**
- 3. Quenching and separation**
- 4. Pelletizing and drying**
- 5. Tail gas boiler**

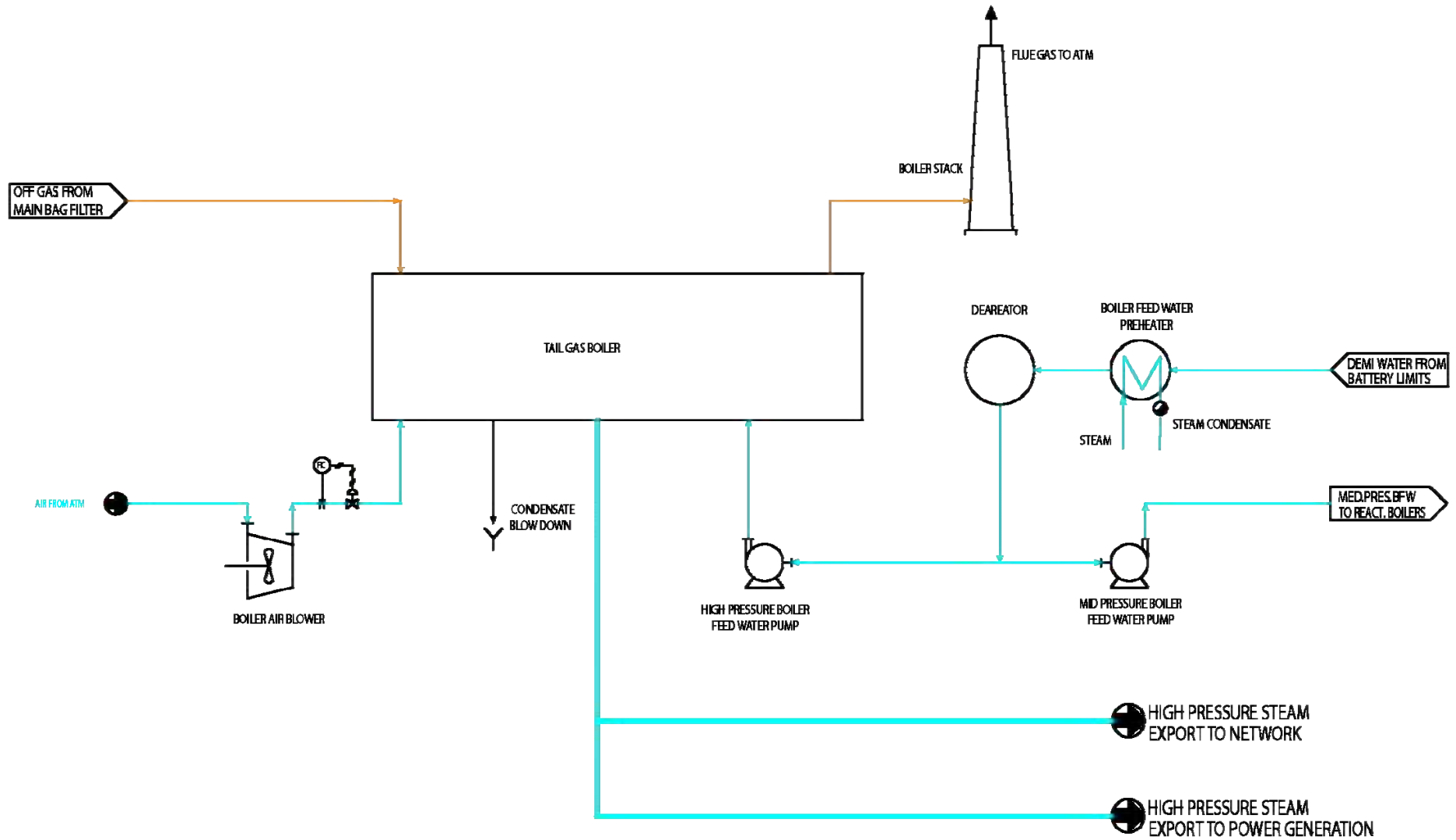


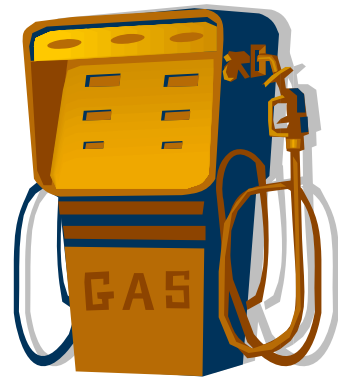




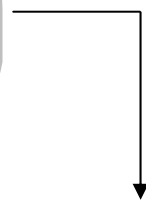


Tail gas boiler

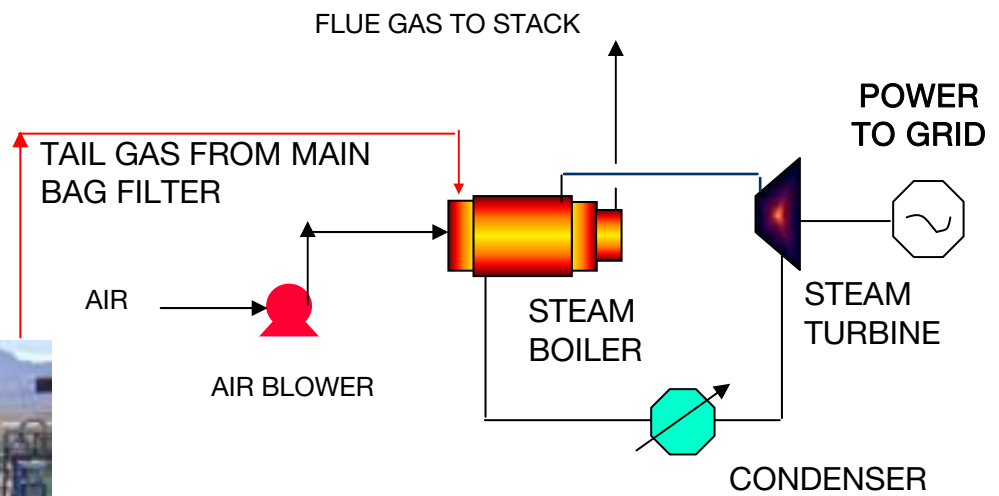


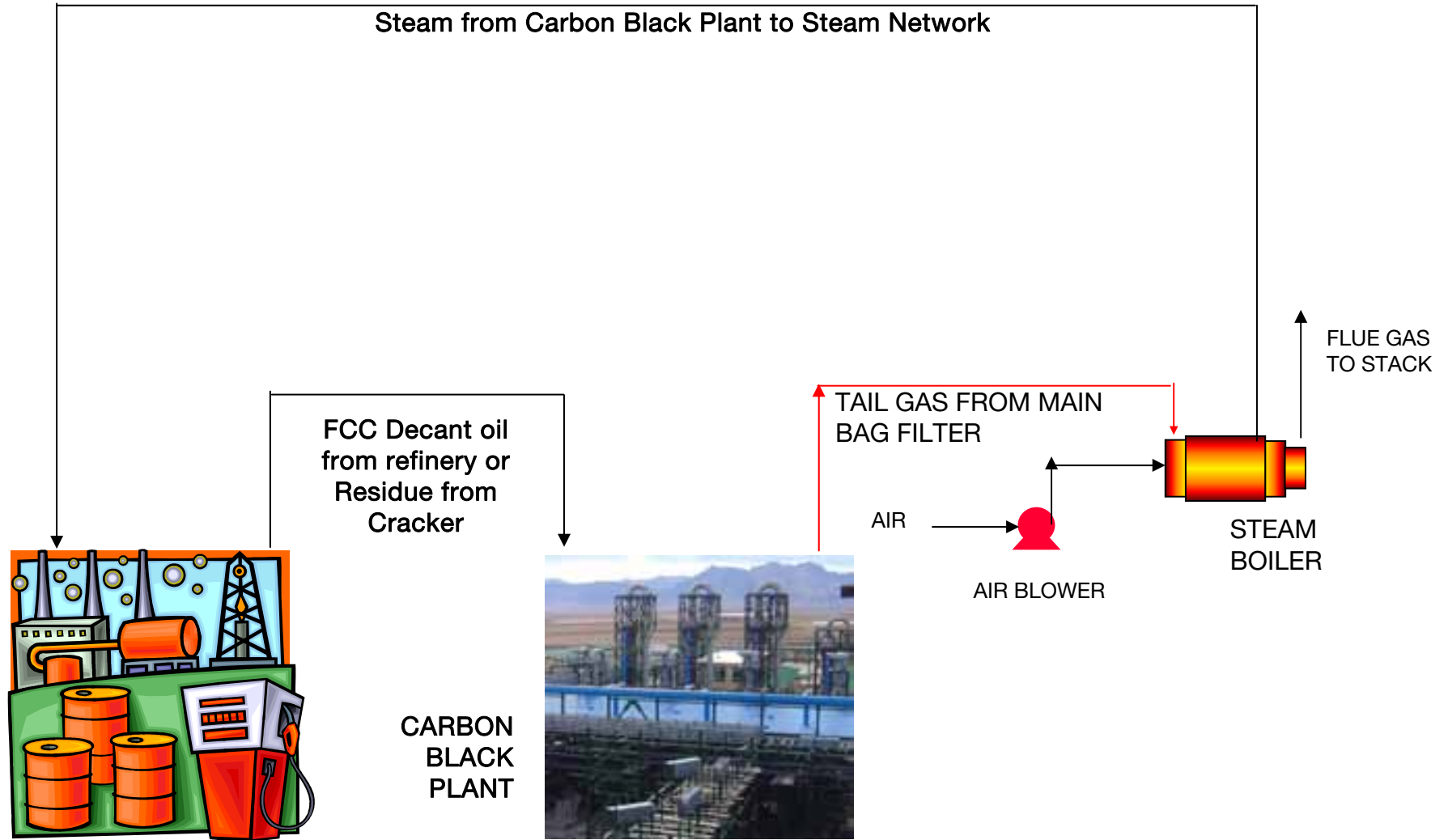


FEEDSTOCK FROM THE MARKET



CARBON BLACK PLANT





EXCELLENT PRODUCT QUALITY



Thanks to significant improvements in Carbon Black process know-how, the plant is able to guarantee:

- Improved quality of the product;
- Capability to produce all grades as per ASTM specifications and also customer specific requirements;
- Low off-spec product generation.

INNOVATIVE PROCESS EQUIPMENT

Hard Black and Soft Black reactors (Jumbo reactors) with high production rates;

New generation of bag filters that provide an increase of filtration efficiency and a reduction of the required filtration area;

Dryer technology with a furnace burning 100% tail gases produced in the process instead of fuel gas;

Introduction of a in-line Micropulveriser that crushes any hard carbonaceous particles and reduces the quantity of off-spec product;

Simplification of the molasses solution preparation system, by direct injection of water into the molasses pumped line;

Very simple scheme of solid separation and handling arrangement, reducing the number of rotating equipment.

IMPROVED ENVIRONMENT PROTECTION EQUIPMENT

Dedusting system and off-spec product re-run system, assuring negligible emissions of Carbon Black powder in the environment;

Tail gas treatment, by means of a dedicated tail gas flare, avoiding the undesired discharge of partially unburned gases in the atmosphere.

HIGH ECO-COMPATIBILITY

Zero water wastage: even the waste water that comes from the floors washing and the equipment cleaning can be totally recycled and reused;

Zero energy wastage : energy recovery from tail gases as low cost fuel in specially designed dryer combustor furnace and for steam/power generation;

No Carbon Black discharged to the atmosphere. This outstanding performance is achieved by means of design and installation of high efficiency bag filters.

LOW OPERATING COSTS AND MONETARY SAVINGS

High level of process automation and control, reducing man power requirement to only three operators per shift for the complete production line;

Substantial monetary savings due to

improved yield

higher steam/power generation

Reduced breakdowns due to application of total quality management systems;

Periodical shutdown for general maintenance every two years.

Jumbo Reactors



Process Air Blower



Main Bag Filter



Steam Jacketed Wet Mixer



Drier





Thank you.

2007 3 4