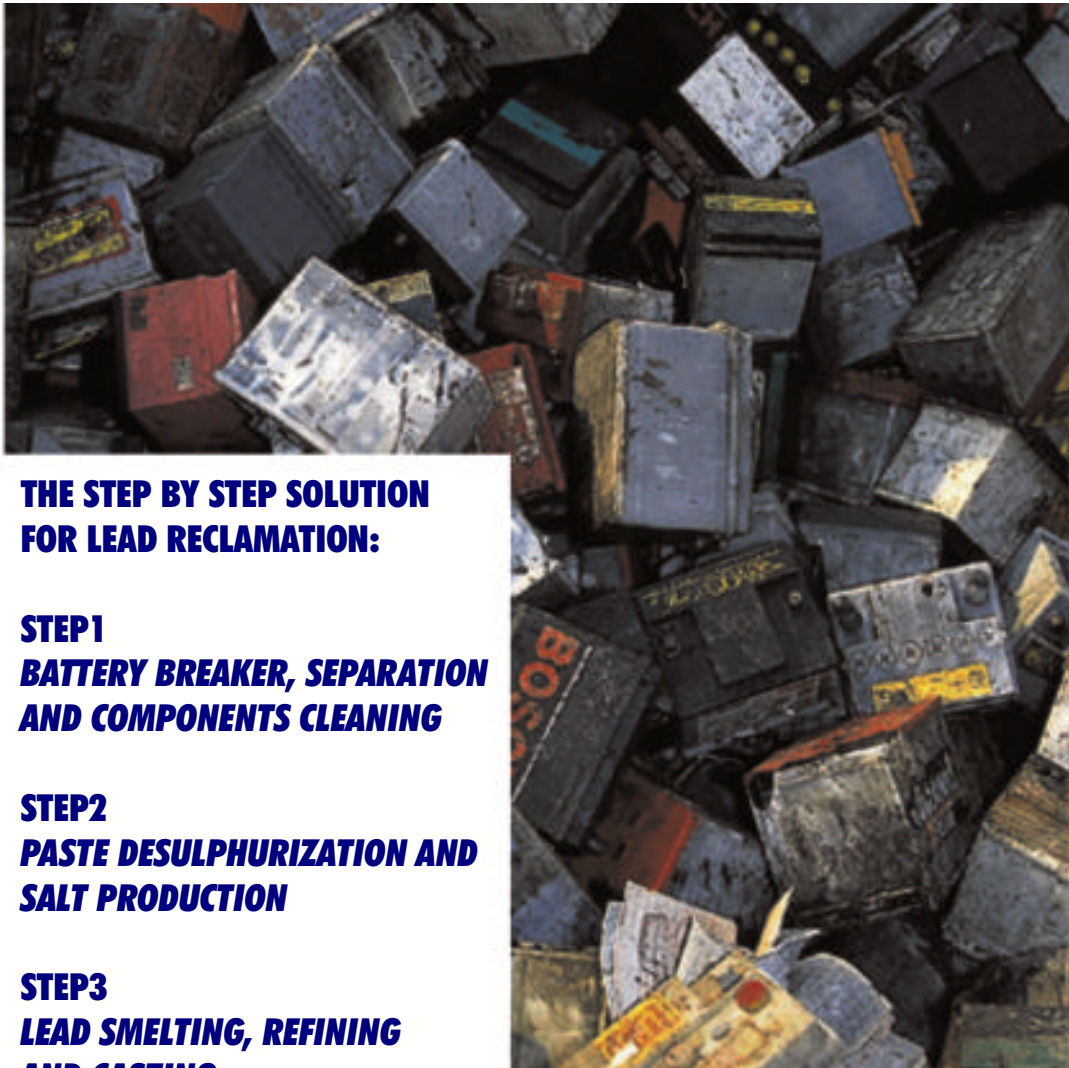


THE INTEGRATED CX SYSTEM

**FROM SCRAP ACID BATTERIES TO
SOFT LEAD AND LEAD ALLOYS**



**THE STEP BY STEP SOLUTION
FOR LEAD RECLAMATION:**

**STEP1
BATTERY BREAKER, SEPARATION
AND COMPONENTS CLEANING**

**STEP2
PASTE DESULPHURIZATION AND
SALT PRODUCTION**

**STEP3
LEAD SMELTING, REFINING
AND CASTING**

**THE UNIQUE
LEAD BATTERY RECLAMATION PROCESS
PERFECTLY SOUNDING FOR THE ENVIRONMENT
AND SAFE FOR THE WORKERS HEALTH**



Engitec Technologies

CHARACTERISTICS OF THE CX SYSTEM PROCESS

The ENGITEC INTEGRATED CX SYSTEM for LEAD RECYCLING is nowadays the most innovative and proven process available on the world to produce lead alloys and raw lead from SLI and industrial scrap batteries full of acid.

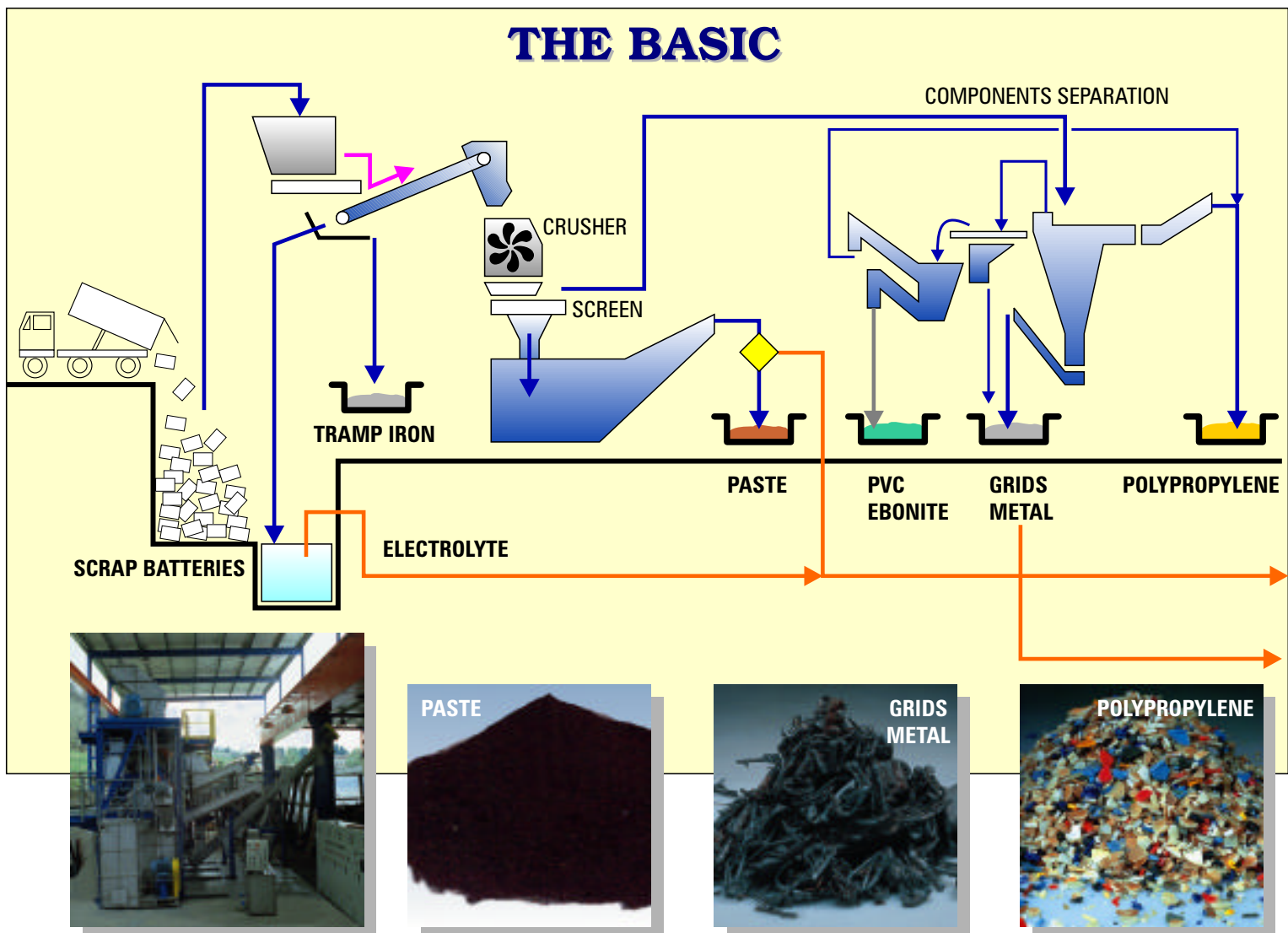
The CX SYSTEM is everywhere recognized as the "STATE OF THE ART" in lead recycling and the sole process guaranteed for the clean treatment for the Industrial type batteries too.

The most reputed secondary lead producers of the world have installed an ENGITEC CX system and the Environmental Protection Agencies of USA, Canada, Germany, Austria, France, Switzerland, Italy, UK, Spain, Poland, Slovenia, Saudi Arabia approved the installation of the CX facility.

Nowadays the Engitec's CX System are processing more than 1.200.000 ton per year of battery.

THE QUALITY OF THE PRODUCTS

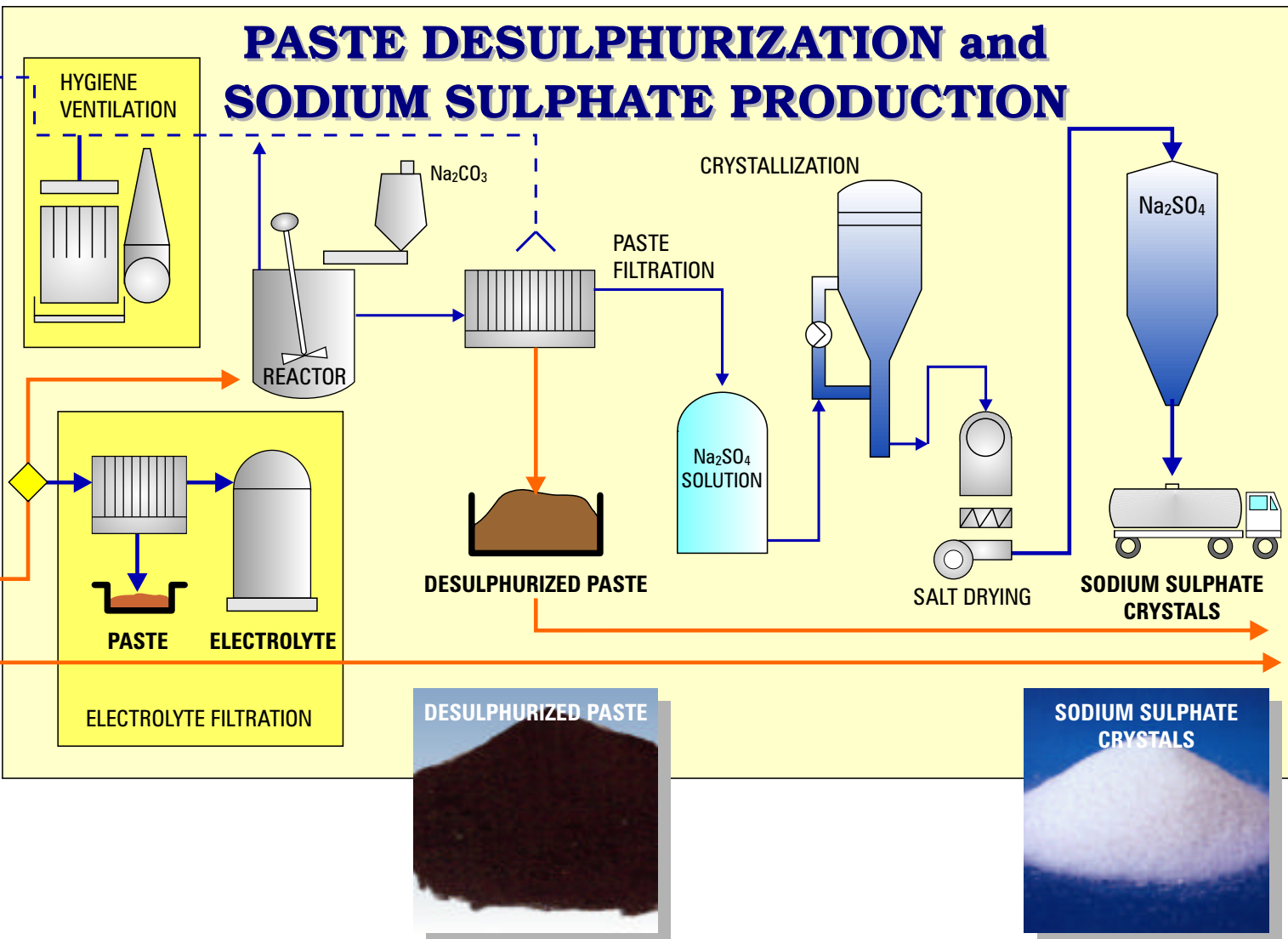
- The CX system guarantees the optimum separation of the battery components and quality of the products, such as:
- High quality grade polypropylene because of its low lead content: less than 1000 ppm.
- The cleaner Ebonite & Separators to dump or recycled as by fuel.
- High quality grade Na₂SO₄ crystals (Pb<2 ppm), to be sold off, i.e., to detergent manufacturers.
- High quality grade Grids and Poles (metallic content higher than 96%) to be melt in the refinery or through the unique on-line CX rotary melter, with a great saving of reagents and fuel.
- Production of raw soft lead having low content of Sb (less than 0,4) due to good separation of the breaker.
- Refined soft lead (purity 99,99%) and lead alloys (Pb/Sb - Pb/Ca etc.) whose characteristics meet easily the battery manufacturers specification.





THE ENVIRONMENTAL PROTECTION AND LABOR HEALTH

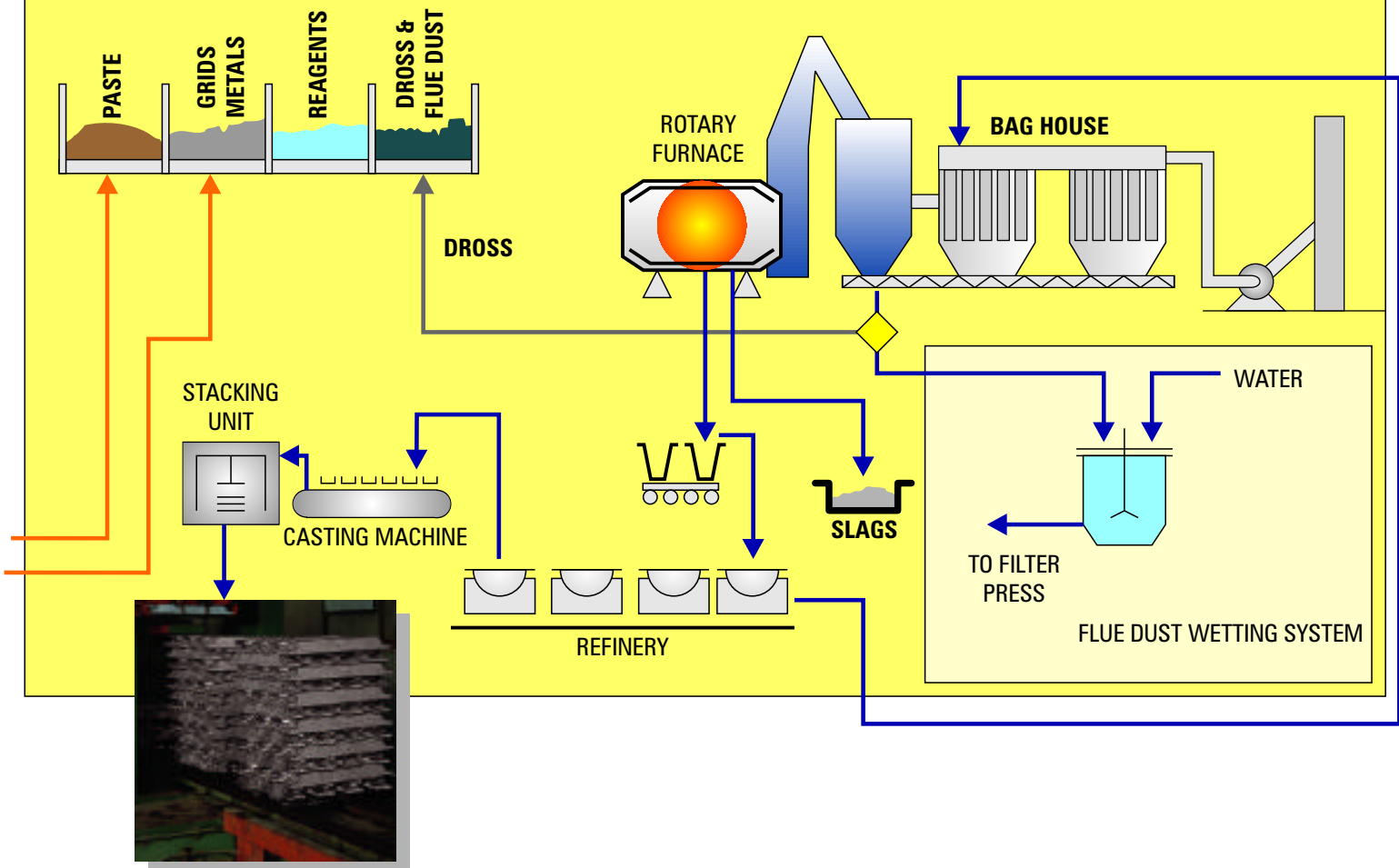
- Compliance with the most advanced regulations for environmental and labor protection:
- No liquid effluents released from the plant; the CX system transforms the acid waste in a high quality saleable product.
- Very low development of SOx in the flue dust due to the CX desulphurization process.
- Total Dust Capturing System to reduce the Pb level contamination well below 0,05 mg/m3 in the working place: it is one of the most appreciated characteristics of Engitec process providing to keep under control the pollution sources of the plant.
- Flue dust recycling: the flue dust captured from bag houses are fed back periodically to the CX system for the metal recovery.
- Solid wastes reduction down to the lowest quantity in comparison with the traditional systems.



THE OPERATING COST SAVING

- The CX System provides for the most efficient smelting system because of the integrated process and because the furnaces are fed with the unique desulphurized paste giving an impressive reduction of production cost.
- Low requirement of iron (ten times lower than the traditional way).
- Energy (fuel gas) substantial saving.
- Effective reduction of slags, even three times lower.
- Proven reliability of the equipment (Engitec own design).

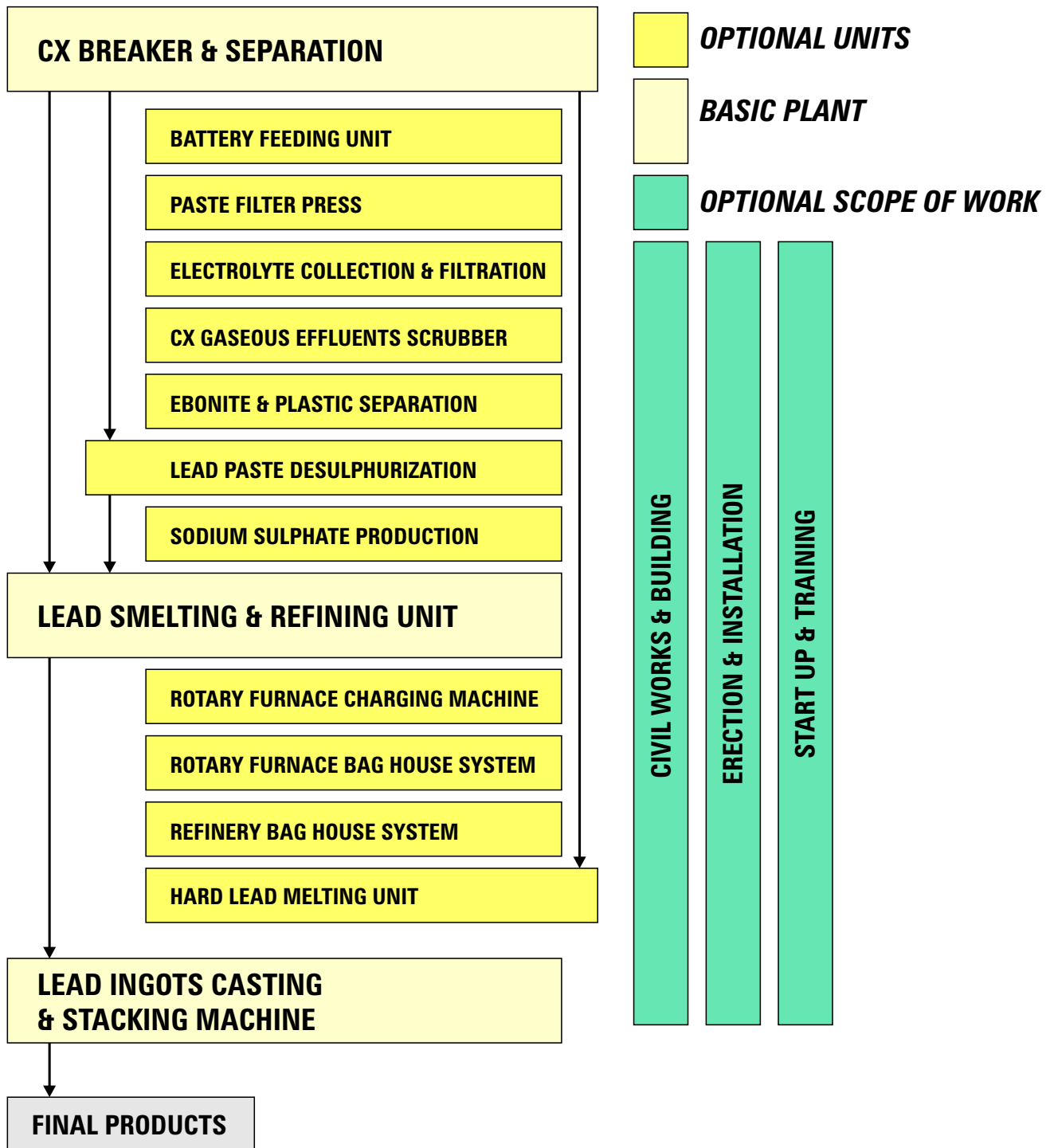
SMELTING-REFINING and GAS FILTRATION UNIT



**TABLE OF THE MAIN TECHNICAL FEATURES
OF THE INTEGRATED CX SYSTEMS
WHEN THE PASTE DESULPHURIZATION UNIT IS IN OPERATION**

FEED	PRODUCTS			WASTES			
NOTE 1 SCRAP USED ACID LEAD BATTERIES	SOFT LEAD & LEAD ALLOYS	POLYPROPYLENE	NOTE 2 DRY SODIUM SULPHATE SALT	PVC, EBONITE	SLAG		
ton/year	ton/year	ton/year	ton/year	ton/year	ton/year		
10.000	6.000	500	1.000	500	650		
20.000	12.000	1.000	2.000	1.000	1.300		
30.000	18.000	1.500	3.000	1.500	1.950		
40.000	24.000	2.000	4.000	2.000	2.600		
60.000	36.000	3.000	5.000	3.000	3.900		
90.000	54.000	4.500	9.000	4.500	5.850		
120.000	72.000	6.000	12.000	6.000	7.800		
150.000	90.000	7.500	15.000	7.500	9.750		
300.000	180.000	15.000	30.000	15.000	19.500		
ENVIRONMENTAL IMPACT				Pb		LESS THAN 1 mg/m ³	
Gaseuos effluent				SOx		LESS THAN 100 mg/m ³	
<p>NOTES</p> <p>1) Intermediate sizes are available on request</p> <p>2) The quantity of Sodium Sulphate is proportional to the content of sulphur in the scrap battery</p> <p>3) Soda ash consumption calculated considering 3% sulphur content in the full batteries</p>							

THE INTEGRATED CX SYSTEM IS COMPOSED OF THE FOLLOWING UNITS:



ENGITEC TECHNOLOGIES makes available to its Clients the advantages of its long and varied experience in design, build and operate several complete Plants worldwide and offers to the **SECONDARY LEAD INDUSTRY** a large spread of services:

- Technology advising
- Feasibility study and project financing assistance
- Environmental impacts study
- Basic design and detailed design
- Design and supply or design and build of Complete Production Units
- Design and build of Complete Recycling Facilities (Turn-Key Projects)
- Spare parts assistance and management
- Training course and on-line technical assistance