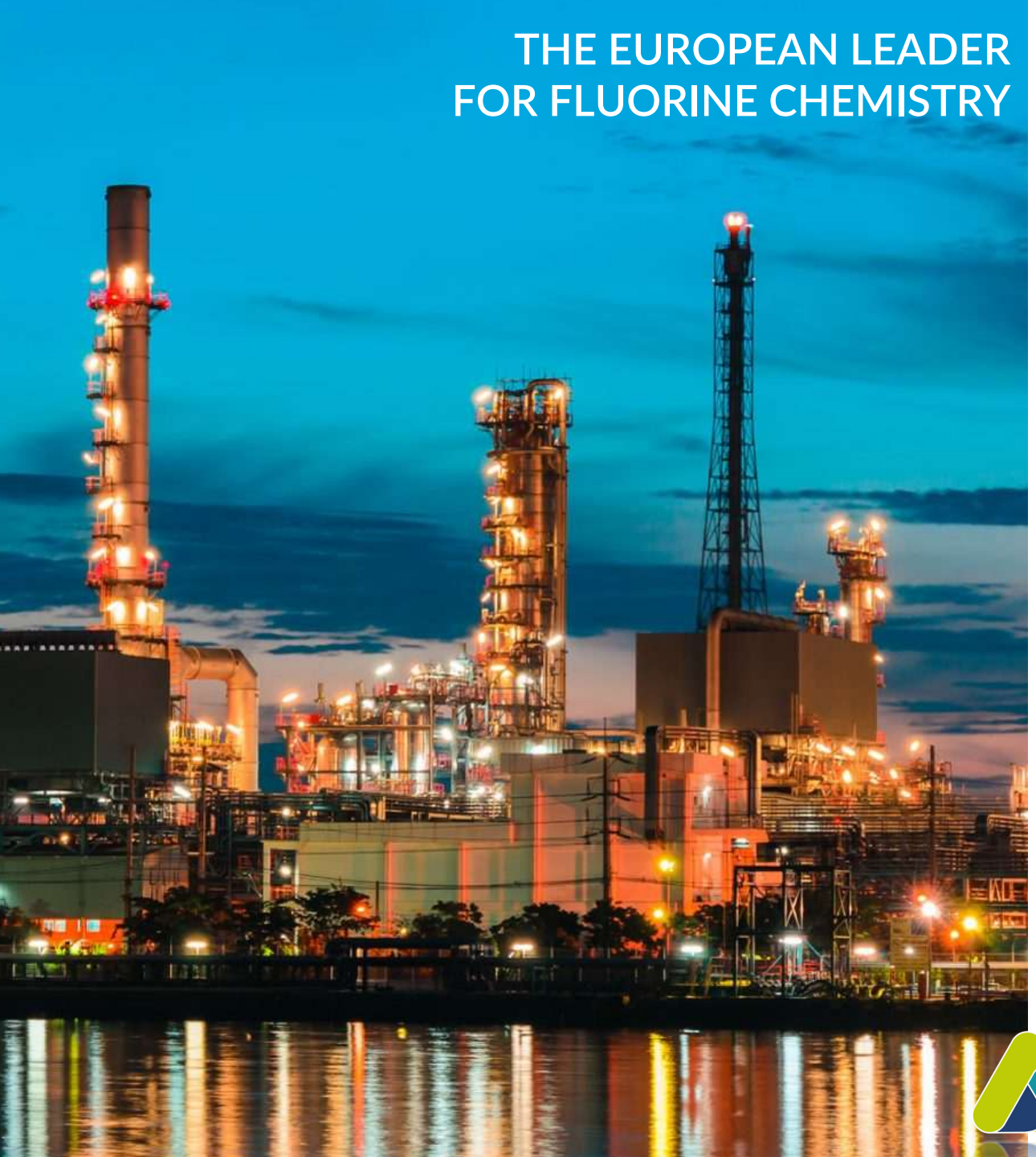
ALKEEMIA

Graphite purification and future opportunities

Lorenzo Orsini - R&D Director



WHO WE ARE

ALKEEMIA is one of the largest European producers of hydrogen fluoride (HF)

PRODUCTS

- Anhydrous HF (AHF)
- Aqueaous HF (aqHF)
- Anhydrite
- Gypsum
- Fluorosilicic acid (FSA)

SEGMENTS

fluoropolymers, refrigerants, agrochemicals, electronics, metallurgy, construction and glass.

€ **70M€ turnover**

> 120 FTE

100% **Italian market share (AHF)**

>25% **EU market share (AHF)**



PORTO MARGHERA



WHERE WE ARE

Located in Marghera Harbour (Venice)

LOGISTICS

- Placed inside a sea port
- Internal railway line
- Close access to the Highway
- Wide space for expansion

SEGMENTS

fluoropolymers, refrigerants, agrochemicals, electronics, metallurgy, construction and glass.

BUSINESS CONSOLIDATION



~30,000 MT/y

HF

HYDROGEN FLUORIDE

- AHF
- HF 40%
- FLUOROSILIC ACID

CALCIUM SULPHATE ($CaSO_4$)

- ANHYDRITE
- GYPSUM PELLET

LiPF6 > NaPF6

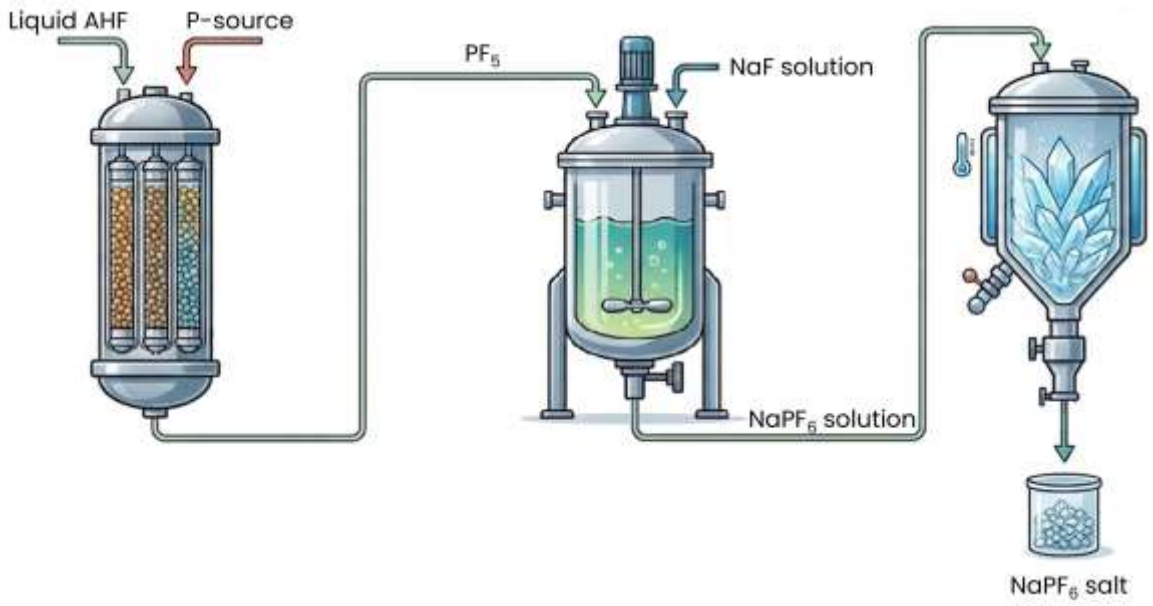


LiF

FSA based process

PF5

Generator



NaPF6

ABOUT GRAPHITE...



«… a soft, dark grey form of carbon, used in the middle of pencils, as a lubricant in machines, and in some nuclear reactors»

(Definition of graphite from the Cambridge Advanced Learner's Dictionary & Thesaurus © Cambridge University Press)

APPLICATIONS :



MARKET COMPETITION



China market coverage > 90%

Alkeemia Scope in BAM Supply Chain (today)

RAW MATERIAL



NATURAL GRAPHITE

- Mining
- Crushing
- Flotation

GRAPHITE CONCENTRATE
(≈95 wt%)

BAM PROCESS

SPHERONIZATION



Micronization

Spheronization

SG
(≈95 wt%)

PURIFICATION



PURIFICATION

SPG
(99.95 wt%)

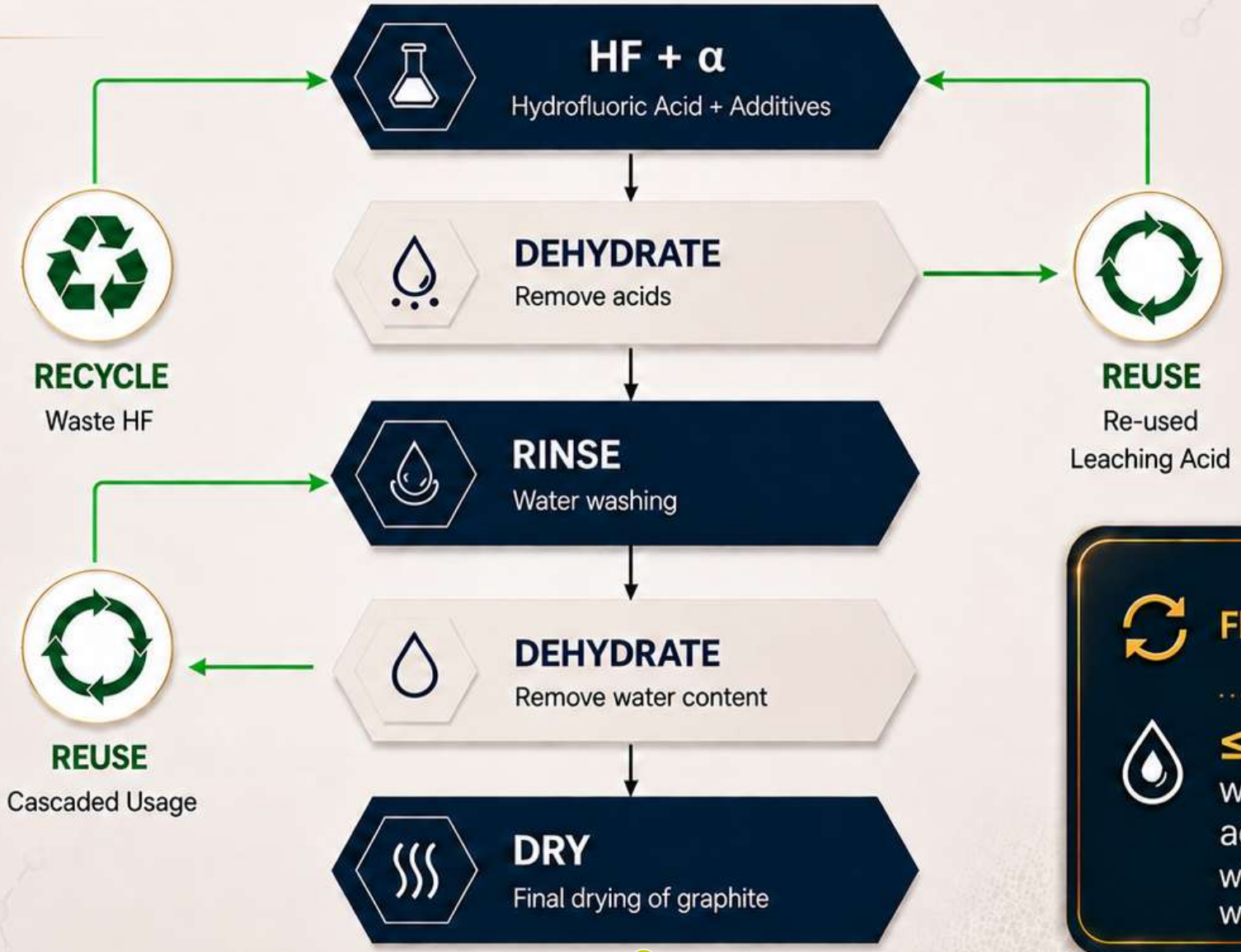
COATING



COATING

CSPG

PROCESS FLOW



Flexible process

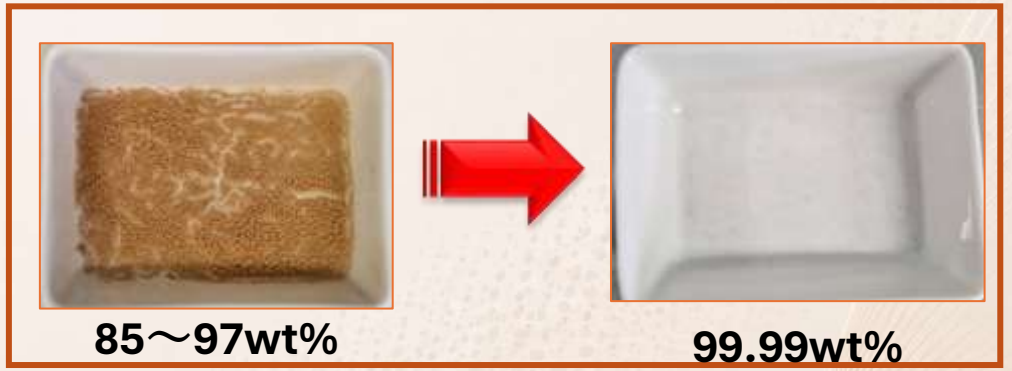
≤50% water and acid consumption with reduced wastewater

OUR ACHIEVEMENTS



SPG: 99.99wt%

FLAKE: 99.99wt%

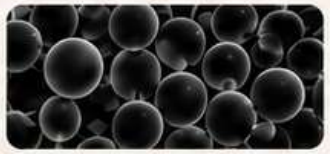


C: 99.95wt%

PILOT LINE CONCEPT LAYOUT 100–200 MT/Y

85~97 wt%

Spheroidal graphite



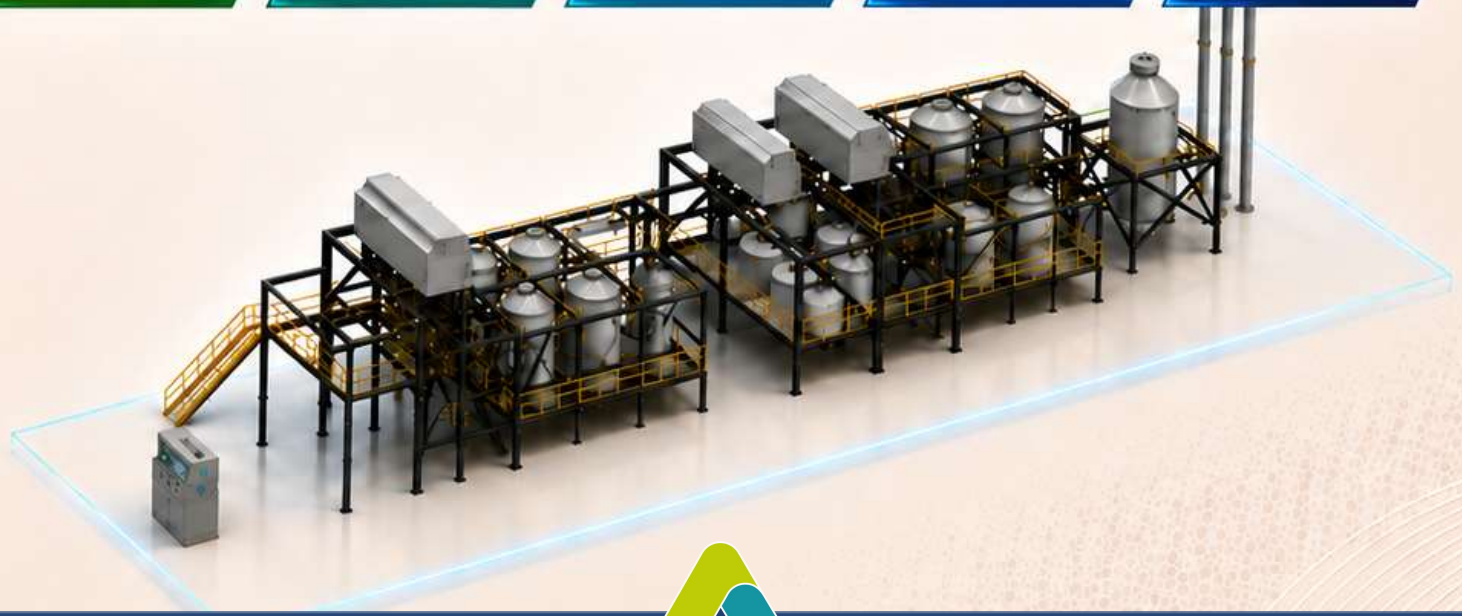
Flake graphite



Acid treatment → Filtration (acid) → Water wash → Filtration (water) → Drying process

Graphite ≥99.95 wt%





GRAPHITE COMMERCIAL LINE CONCEPT

10,000–20,000 MT/Y



CAPACITY
10,000 – 20,000 MT/Y

PURITY
≥ 99.95wt%

RESOURCE EFFICIENCY
Reuse and recycle

ENVIRONMENTAL IMPACT
Minimized waste

ABOUT PURIFICATION...

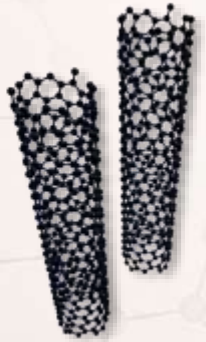


Black Mass



Synthetic graphite





Nano Carbons



By-products

WHAT ELSE...?

01



SiO_2 + Metals

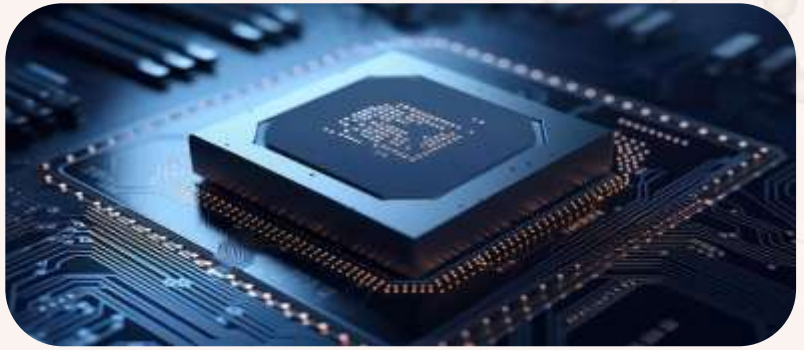


SiO_2

+



Metals



02



Glass + Resins



Glass

+



Resins



03



Resin + Metals



Resin

+



Metals



THANK YOU



Lorenzo Orsini
R&D Director

ALKEEMIA