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Chemicals Business Unit

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HISTORY

- Established 1960
- Initial focus on detergent and sulphonation business, market breakthrough introducing MultiTube Falling Film Sulphonation Reactor
- Enters the Chemicals Plants business, 1st inorganic chemical project awarded in 1999
- Becomes a MECS General Licensee for Sulphuric Acid in 1999
- Enters the Alkoxylation technology by acquisition of PressIndustria in 2009
- Becomes a Prayon General Licensee for Phopshoric Acid in 2009
- Enters the Soap business by acquisition of Mazzoni LB, in 2017
- Enters the Fluorine business by acquisition of Buss ChemTech in 2021)
- Slow release Methylene Urea fertilizer and Wet Potassium Sulphate technologies added in 2022
- Consolidated turnover in the range of EUR 150 mln, in rapid growth

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A WORLD LEADER

- Detergents, Surfactants – Absolute World Market Leader
- Soap – Absolute World Market Leader
- Sulphuric Acid – Main MECS Licensee worldwide
- Phosphoric Acid – Main Prayon Licensee worldwide
- Hydrogen Fluoride – Absolute World Market Leader
- Fertilizers and granulation - Major World Player

Fully -fledged technology-oriented contractor

Licensor for various chemical Technologies

Application-Oriented Research and Development Division

Encompassing all phases of a project cycle

i.e. concept to commissioning, after sales, continuous technical support

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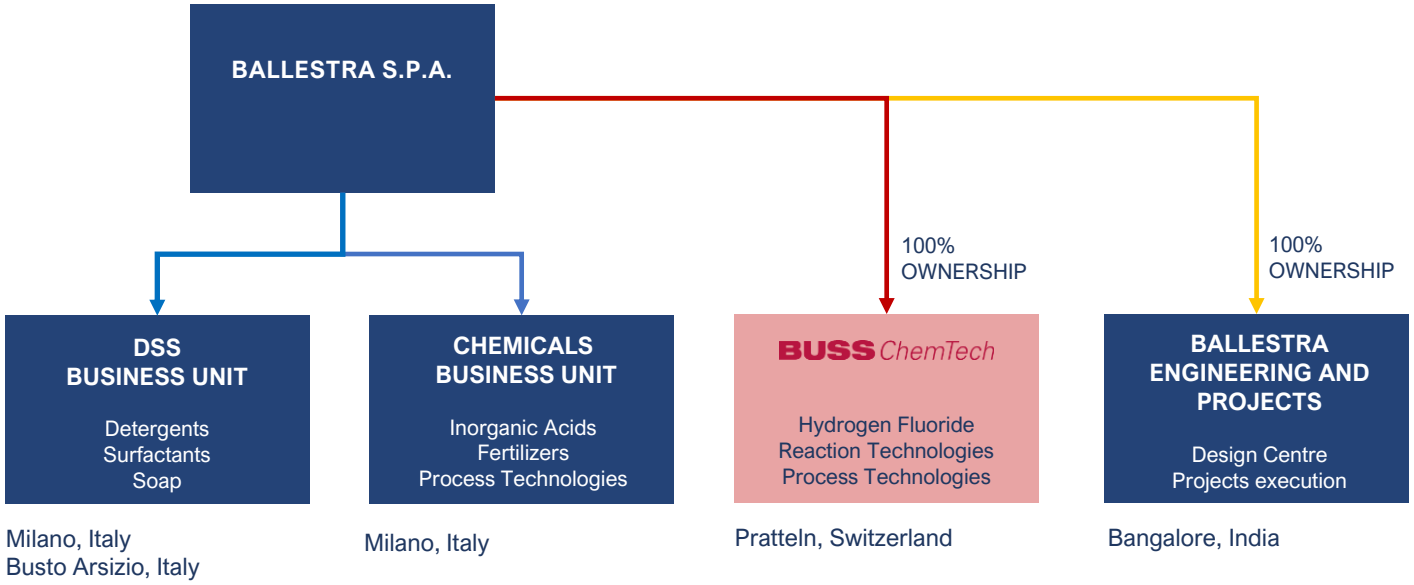
BALLESTRA GROUP'S STRUCTURE



400 EMPLOYEES

4 OPERATING OFFICES

Milano, Italy
Busto Arsizio, Italy
Pratteln, Switzerland
Bangalore, India

4 LABS AND INDUSTRIAL PILOT INSTALLATIONS

Milano, Italy
Grassobbio, Italy
Busto Arsizio, Italy
Pratteln, Switzerland

WORLDWIDE SALES NETWORK AND PROJECT EXPERIENCE

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R&D – SCIENCE MEETS ENGINEERING

Ballestra strongly believes R&D is the mainspring and differentiating element

- Dedicated team of scientists and engineers
- Continuous information exchange between execution and R&D
- Fully equipped chemical laboratories
- Bench scale pilot tests
- Industrial pilot scale plants, DCS controlled for seamless data acquisition and process monitoring (in Milan, Grassobbio, Busto Arsizio, Pratteln)
- Modularized industrial pilot concept, for quick assembly of different process routes
- Cooperation with universities in Europe, Asia, and USA
- Dedicated personnel to run industrial pilots 24h/day 7days/week

Continuous optimization of existing processes and technologies

Technology industiralization with pilot plants

New processes and technologies development

New applications for existing technologies

Customized R&D services for clients

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SKILLFUL PROJECT EXECUTION

- Flexibility in modes of execution based on Client's requirement
- In-house Basic and Detail Engineering capabilities
- Skiiled process design and automation engineers
- Comprehensive Engineering Package
- Experienced Project Managers
- Well trained Procurement team
- Specific knowledge of potential suppliers for critical components
- Cooperation models with selected experienced subcontractors worldwide
- In-house Logistic expert, including for ODC (Over Dimensional Cargoes)
- In-house dedicated team for Erection Supervision & Commissioning / Start-Up Management
- After Sales support

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PROVEN RELIABILITY

- Rich Experience in the industry
- Unique & strong R&D and Innovation
- Product Processing Expertise
- Sustained Development
- Experienced Project Execution
- Efficient Customer Service
- Global Presence

Repeated orders from clients are the testimony of our capabilities

Over 75 years of technology and reliability

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UNIQUE CLIENT PORTFOLIO

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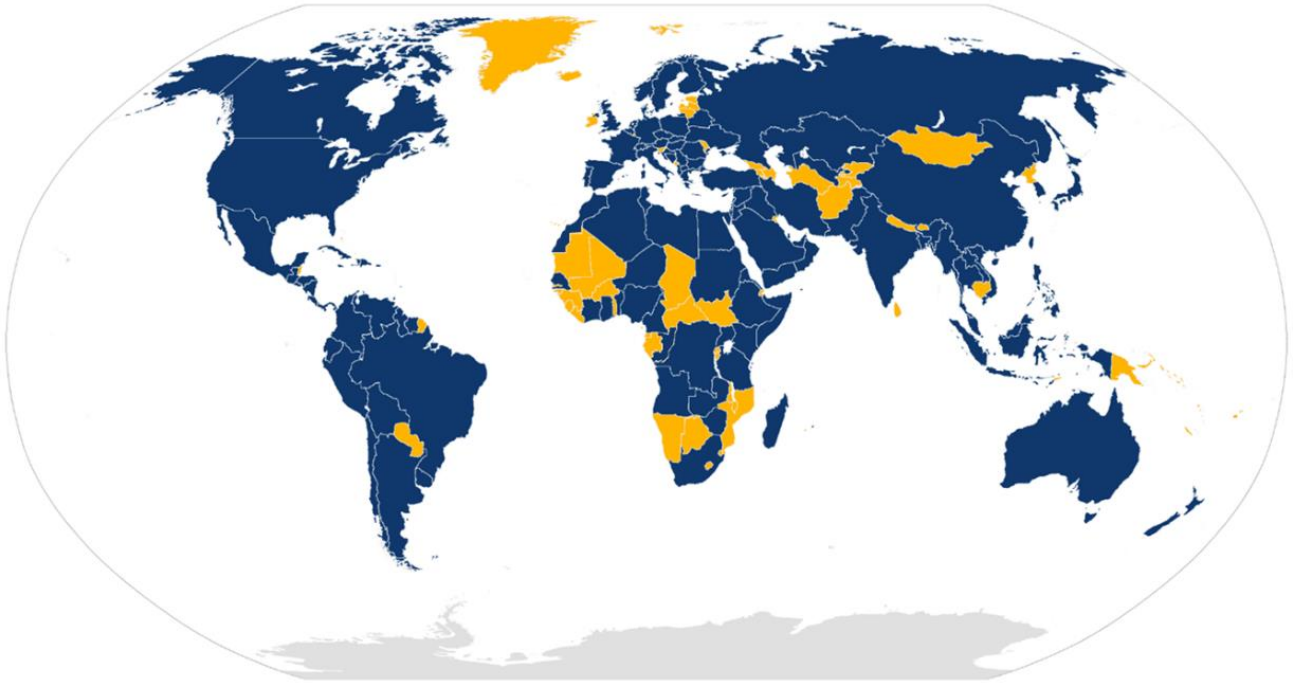
GLOBAL REACH



- Starting from 1960, Ballestra designed, delivered, and started up hundreds of process plants globally.
- EP projects are preferred because of risk control, a worldwide network of construction partners allows to complement with high level construction services.
- Whatever the country is, Ballestra has the experience to deliver.

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DETERGENTS, SURFACTANTS, AND SOAP

mazzoni

Ballestra, with its DSS Business Unit, is the undisputed world leader in process plants for detergents, surfactants and soap.

Detergents	Powder (Spray Drying Tower, NTD) and Liquid (batch/continuous)
Surfactants	Anionics (Sulphonation/Sulphation, Vacuum Neutralization, Drying), Non ionics (Ethoxylation / Propoxylation, Alkanolamides), Amphoterics and Cationics (Betaines, Esterquats, Aminoxides)
Soap	Soap plants, finishing lines and derivatives

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CHEMICALS

Ballestra, with its Chemicals Business Unit, is one of the main world players in inorganic chemistry, fertilizers and several market niches.

Inorganic acids:	**S**ulphuric acid, phosphoric acid, hydrogen fluoride and derivatives, nitric acid, SO_2, SO_3, Oleum
Fertilisers:	AN, AS, ASN, CN, CAN, UAN, UAS, SSP, TSP, MAP, DAP, potassium nitrate, granulation, slow release fertilizers, prilling and other finishing technologies
Detergent Industry:	Linear Alkyl Benzene (LAB), Sodium Sulphate, Sodium Silicate, Zeolites

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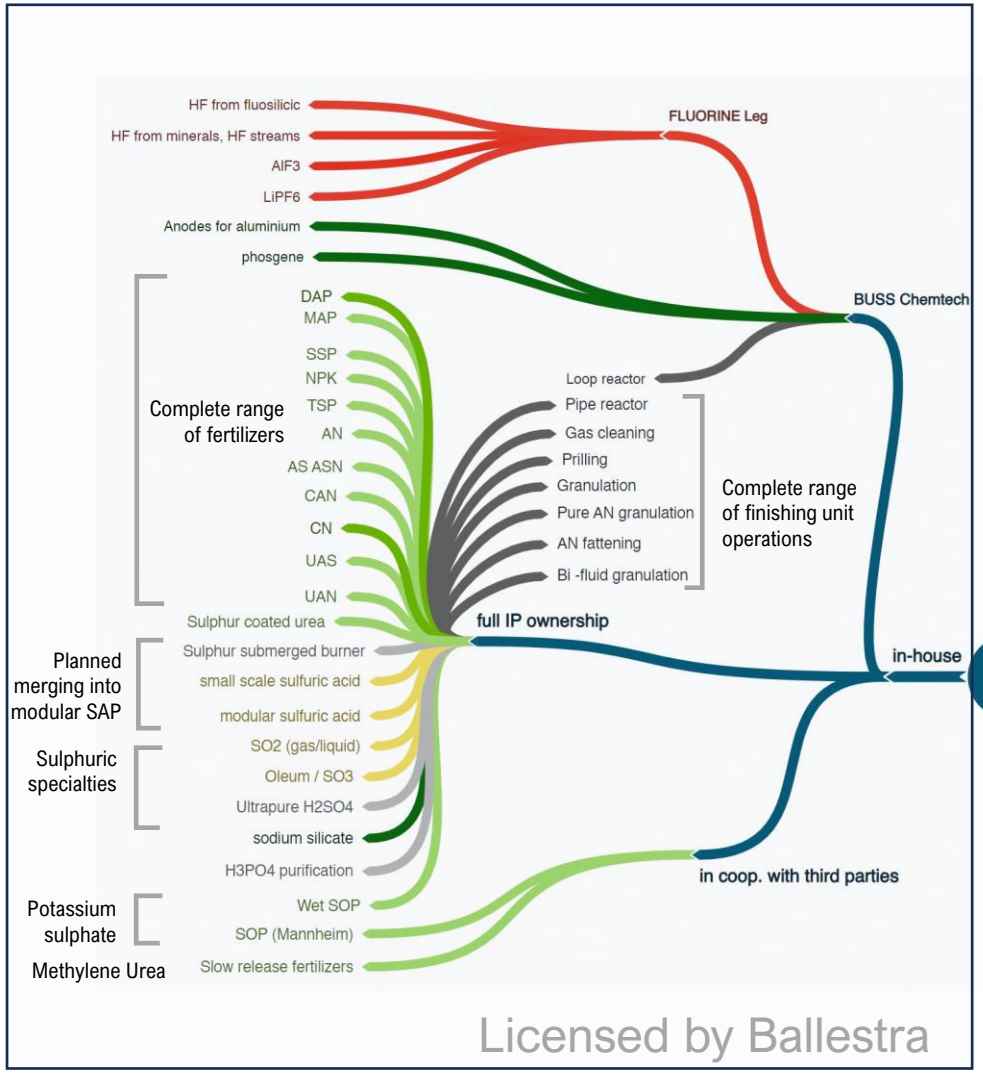
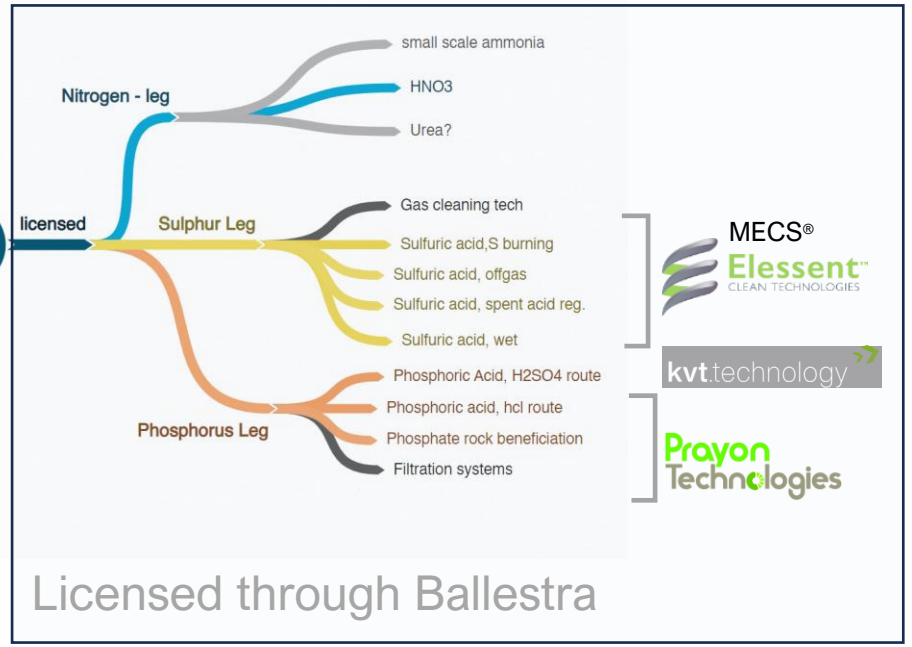
CHEMICALS TECHNOLOGY PORTFOLIO

- Sulfuric acid technologies
- Phosphoric acid technologies
- Fertilizer technologies
- Nitrogen technologies
- Other technologies
- Unit operations
- Hydrogen fluoride technologies
- Coming up



Ballestra Chemicals BU technology portfolio



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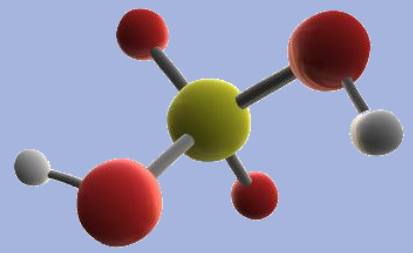
SULPHURIC ACID

SULFURIC ACID TECHNOLOGIES A WORLD LEADER



MECS Elessent CLEAN TECHNOLOGIES

KVT PROCESS TECHNOLOGY

- World-class licensed technology from MECS/Elessent Clean Technologies: all configurations available (sulphur burning, off/gas plants, wet route, HRS enhanced recovery system, spent acid recovery, etc.)
- Well-referenced licensed technology from KVT Process Technology for Oxysulf™ solutions (based on wet catalysis), with a solid technical background
- N. 55 projects awarded and successfully delivered, other 2 units currently ongoing
- High competence in process engineering with specific direct experience from the several projects we executed
- High competence in critical detail design, such as:
  - Process equipment detail design
  - Piping/Ducting design, piping and ducting stress-analysis
- Procurement experience with vendors on world wide basis and direct feedback from the projects we executed
- Skilled and experienced team of erection supervisors and commissioning engineers
- Experience in the integration of phosphoric acid plants in larger fertilizer projects

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TAILOR-MADE SOLUTION FOR SPECIFIC NEEDS

- Procurement experience with most industry vendors
- Experience with HRS systems design, delivery and construction
- Experience in the integration of sulphuric acid plant in larger fertilizer projects
- In house know how for SAP units up to 200 MTPD, both single absorption (simple configuration, quick start up, flexible operation, capable to achieve low emissions by tail gas scrubbing, steam production) and double absorption. Small capacities fitted for niche specialties production (e.g. SO_2 or SO_3 for electronic grade H_2SO_4)
- In house know how for pure (98-99%) SO_3 and liquid SO_2 production
- Tail gas scrubbing systems for SO_2, SO_3, H_2S emission reduction by soda, lime, peroxide scrubbing (e.g. SO_2 down to 10 ÷ 30 ppm depending by removal agent and initial concentration)

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SULPHURIC ACID - PERFECT EXECUTION

Status:	In operation since 2020
Products:	Sulphuric Acid + Liquid SO_2 Production
Technology:	MECS (USA)
Plant size:	H_2SO_4 2'200 TPD (including 200 TPD for Liquid SO_2 as 100% SO_2)
Plant Configuration:	DCDA + Liquid SO_2 (Cryogenic)
Contract type:	EP+TA

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PHOSPHORIC ACID TECHNOLOGIES DOUBLING SUCCESS

PRAYON

PHOSPHORIC ACID

- World-class licensed technology from Prayon Technologies
- All configurations available (DH, HH, CPP, DA-HF)
- Access to Purified Phosphoric Acid technology with recently developed technical experience
- N. 9 projects awarded and successfully delivered since 2011, 2 currently ongoing
- High competence in process engineering with specific direct experience from the several projects we executed
- High competence in critical detail design, such as:
  - Process equipment detail design
  - Piping/Ducting design, piping and ducting stress-analysis
- Procurement experience with vendors on world wide basis and direct feedback from the projects we executed
- Skilled and experienced team of erection supervisors and commissioning engineers
- Experience in the integration of phosphoric acid plants in larger fertilizer projects

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PHOSPHORIC ACID - WORLD CLASS

Status:	In operation since 2019
Products:	Merchant Grade Phosphoric Acid (PA MG) Purified Phosphoric Acid (PPA)
Technology:	Prayon for PA MG DBI integration of sections from different technology partners for PPA
Plant size:	PA MG 2 x 600 TPD + PPA 2 x 150 TPD
Plant Configuration:	PA MG: DH Mark4 PPA: Phosphoric Acid TG
Contract type:	LSTK in Consortium with Local Partner (Petrojet)

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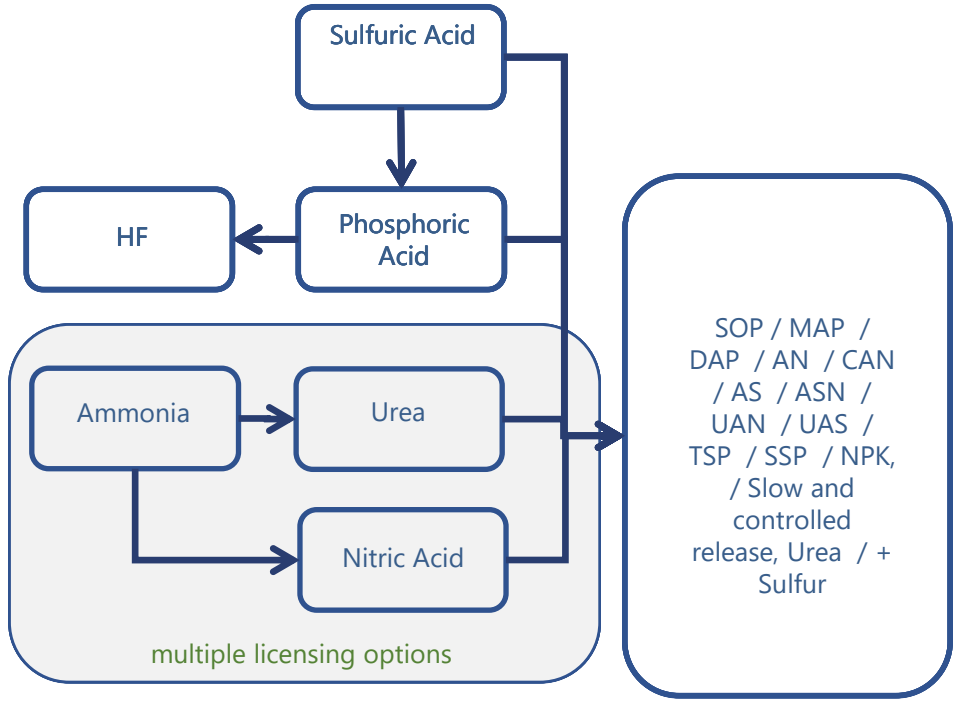
FERTILIZER TECHNOLOGIES



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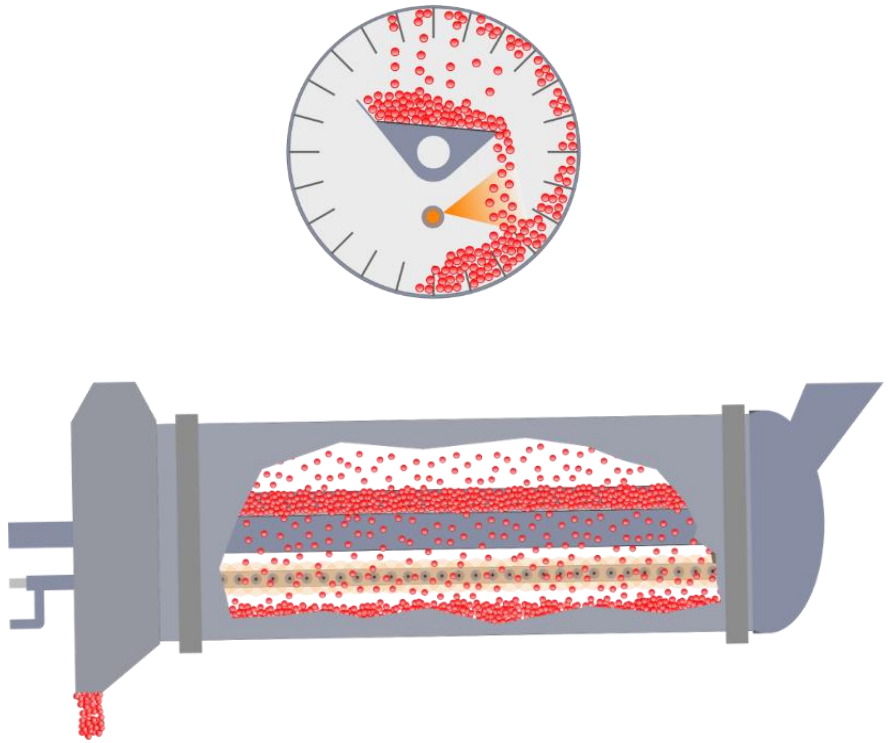
FERTILIZER TECHNOLOGIES - FINISHING



- Multiple granulation technologies in house (drum, pan, fluid bed, hybrid bi-fluid)
- Pure Ammonium Nitrate granulation
- Prilling
- Pastillation
- Multi-purpose units (one plant, more products)
- High customizability and flexibility
- Pilot scale testing

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ENVIRONMENT AND PEOPLE

Waste to chemicals (e.g. FSA from PAP unit to HF)

Waste to fertilizers (e.g. nutrient recovery to NPK production)

Pollutant abatement (Filtration, chemical scrubbing, WESP)

Pollutant recovery and re-use

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BUSS CHEMTEC

Reaction Technology

Gas liquid reaction technology
Hydrogenation
Ethoxylation
Phosgene
Custom applications

Fluorine

Hydrofluoric acid from fluorite
Hydrofluoric acid from fluosilicic acid
Aluminum fluoride
Lithium Hexa Fluoro Phosphate (LiPF6)

Aluminum industry

Anode paste

BUSS ChemTech

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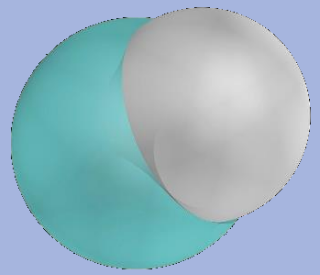
HYDROFLUORIC ACID TECHNOLOGIES UNDISPUTED LEADERSHIP



136 years of History

60 years of Fluorine Expertise

Two Routes (FSA & Fluorspar) for HF Production

AHF from FSA

HBD AlF3

AHF from CaF2

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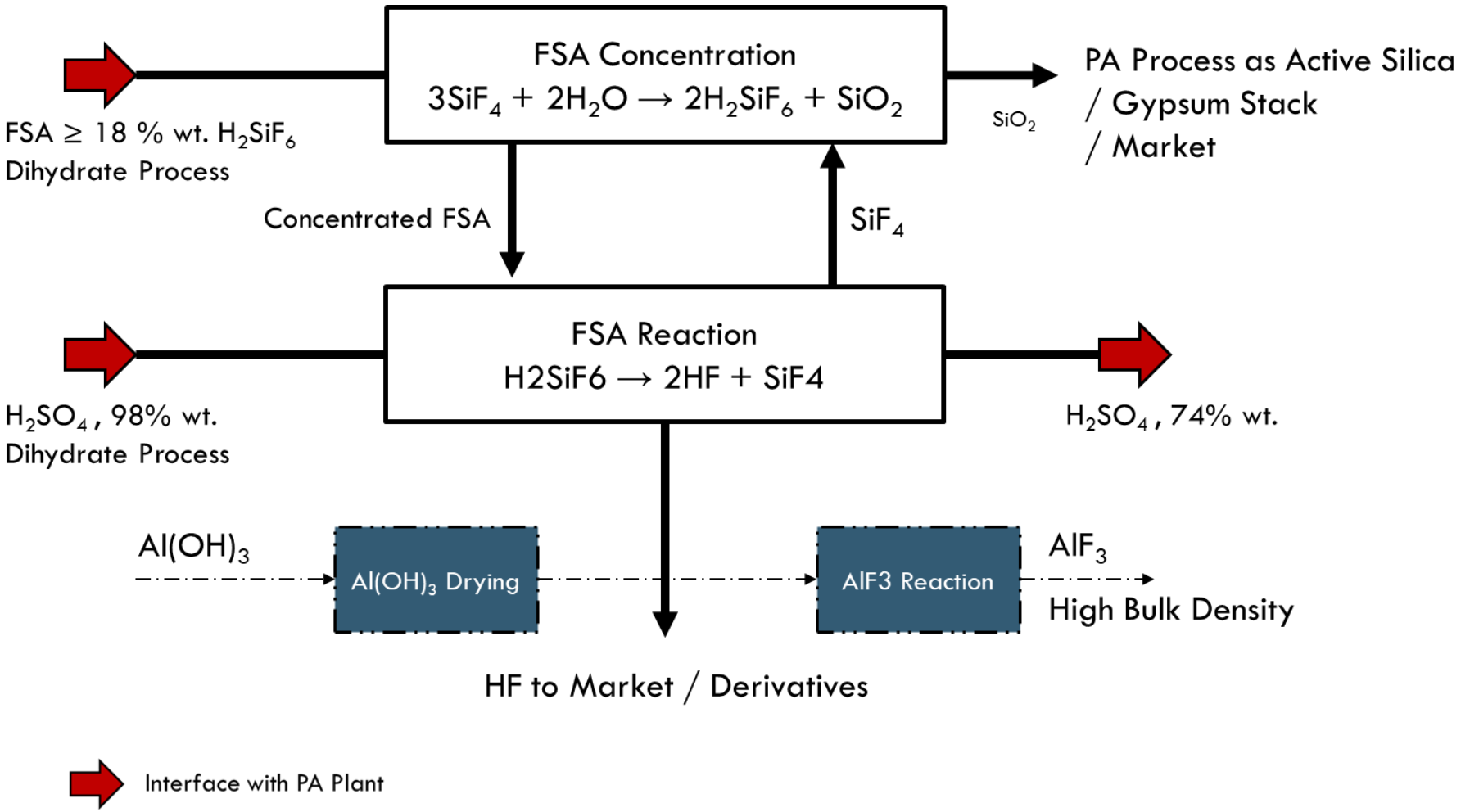
BUSS CHEMTEC – VALUE FROM WASTE FSA



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BALLESTRA ENGINEERING AND PROJECTS LTD

- Incorporated in Aug 2022, a fully owned Ballestra subsidiary
- Detail Engineering
  - Piping and Layout
  - Electrical and Instrumentation Engineering
  - Machinery and Packages
- Automation Engineering and Automation Field Support
- Procurement Services
- Project Management
- Planning and Scheduling
- Sales
- Start-Up and Commissioning
- Tight of cooperation models with Ballestra Headquarters
- Constant growth part of Ballestra plans

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