



3V TECH EQUIPMENT AND PROCESS SYSTEMS

General Company Presentation

WE MAKE **PROGRESS** BY THE **PROCESS**.

In partnership with our customers **we design, build and operate customized plant solutions for process industries and multi-utility companies.**

We continuously innovate by **working with our customers** to develop solutions that achieve the **targeted results.**

Strong and synergistic relations are the starting point to reach truly successful solutions.

Progress is what we aim for every day.



Group Overview

Group Year Turnover: > 200 MIL €
Group Total Employee > 600 people



3V PARTECIPAZIONI

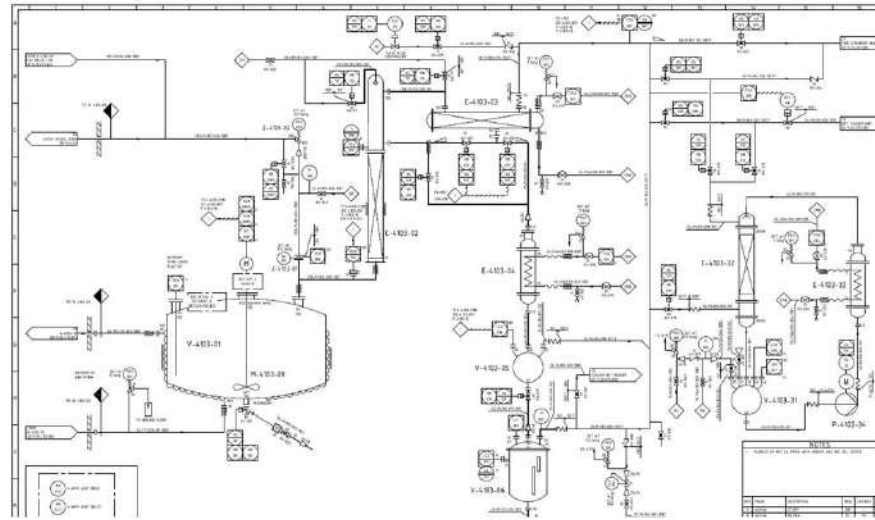


What is 3V Tech today



3V Tech: Engineering and Manufacturing Company





Extended range of engineering disciplines:

- Chemical processing
- Environmental processing
- Mechanical & Pressure equipment
- Materials know-how
- Control & Automation
- Electric & Instrumentation
- Structures & Piping
- 3D modelling





Dalmine (IT): Manufacturing of plants, evaporators, filters, vacuum dryers



Noventa (IT): Glass lined reactors, pressure vessels and heat exchangers



Cornate (IT): preparation of carbon steel pressure vessels



Assisi (IT): borosilicate glass process equipment



Andrews (US): Glass lined vessels and parts, After Market services





Management of largest privately owned industrial waste water and sludge treatment in Italy



Operating chemical plants with 3V Sigma for more than 50 years



Support during mechanical erection and plant commissioning at customer site



Training how to operate our plants, performances testing, troubleshooting



3V has realized a brand new **pilot building** at his main production site in Dalmine (BG)



Thanks to this new R&D center, 3V will be able to provide **tests** and **chemical analysis** using hiw own process equipment for following processes: reaction, solid-liquid separation, drying, thermal separation, environmental processes such as waster water and sludge treatment

✓ **Process development and testing**

- Process simulation
- Bench scale testing
- Pilot plants testing

✓ **Physical-chemical analysis**

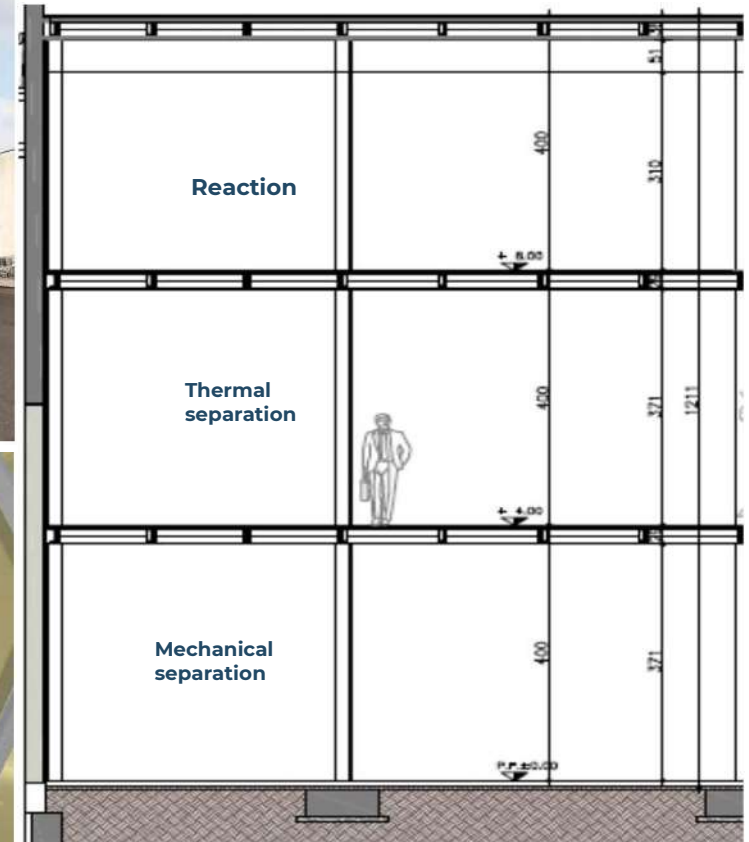
in-house analytical laboratory equipped to process different kinds of samples:

- Water
- Wastewater
- Sludge
- Chemicals from different industries

✓ **Testing and analytical services**

- Process solution identification (process development/design)
- Process feasibility investigation
- Process scale up
- Process verification
- Equipment selection and sizing

NEW AREA FOR LABORATORY AND PILOT TESTS



3V Tech process equipment will be available for testing and in case of need rental

Complete reaction group

- 250 lts AE type glass lined jacketed reactor
- Glass lined vapor line
- Silicon Carbide condenser
- Condensates storage tank



3V Tech process equipment will be available for testing and in case of need rental

Nutsche filter dryer

- HC22 as material of construction
- 0,2 m2 as filtrating surface area
- product discharge:
 - With side manual discharge valve
 - With isolator and manual plug



3V Tech process equipment will be available for testing and in case of need rental

Vacuum paddle dryer

- HC22 as material of construction
- 200 lts capacity



Vacuum conical dryer

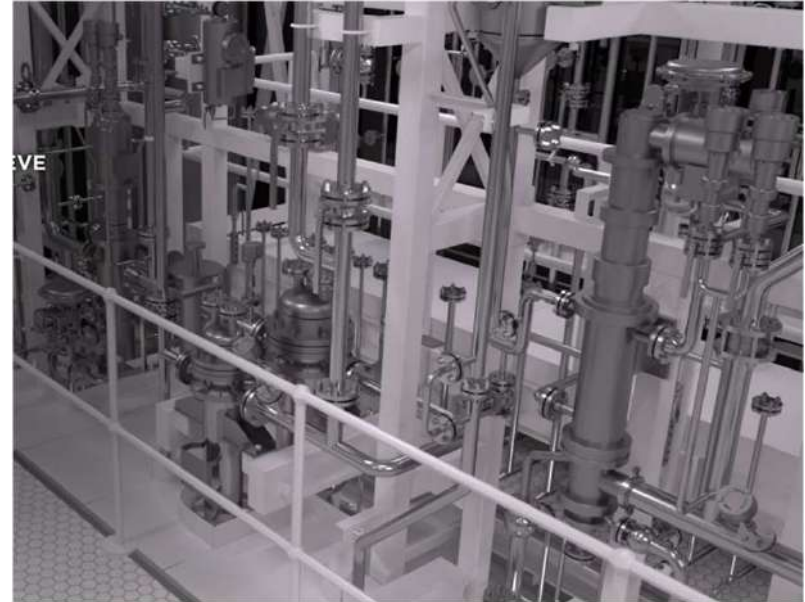
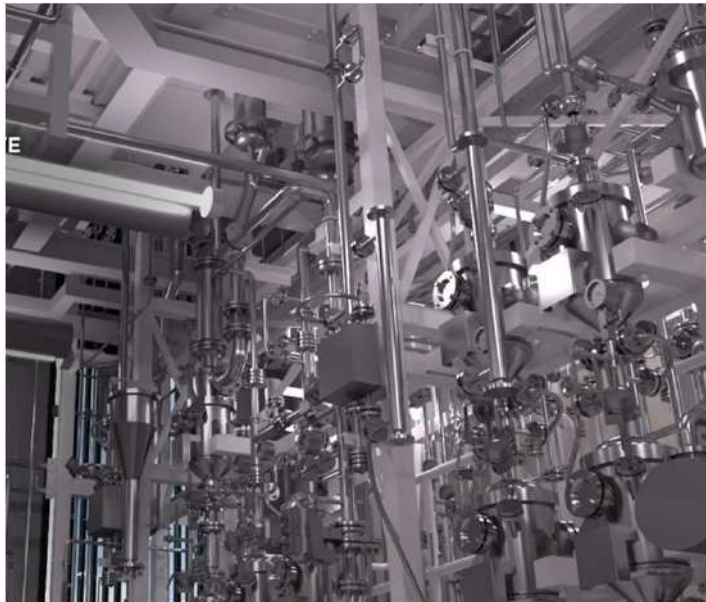
- HC22 as material of construction
- 50 lts capacity
- With screw or helix agitator



3V Tech process equipment will be available for testing

Evaporators

- thin film evaporators
- short path evaporators
- falling film evaporators



Laboratory



Other features

- available meeting rooms to host customers during tests and trials
- state of the art of control & automation: field signals can be detected, measured and analyzed even from a remote basis
- all process equipment are interconnected together with the possibility to simulate a complete process

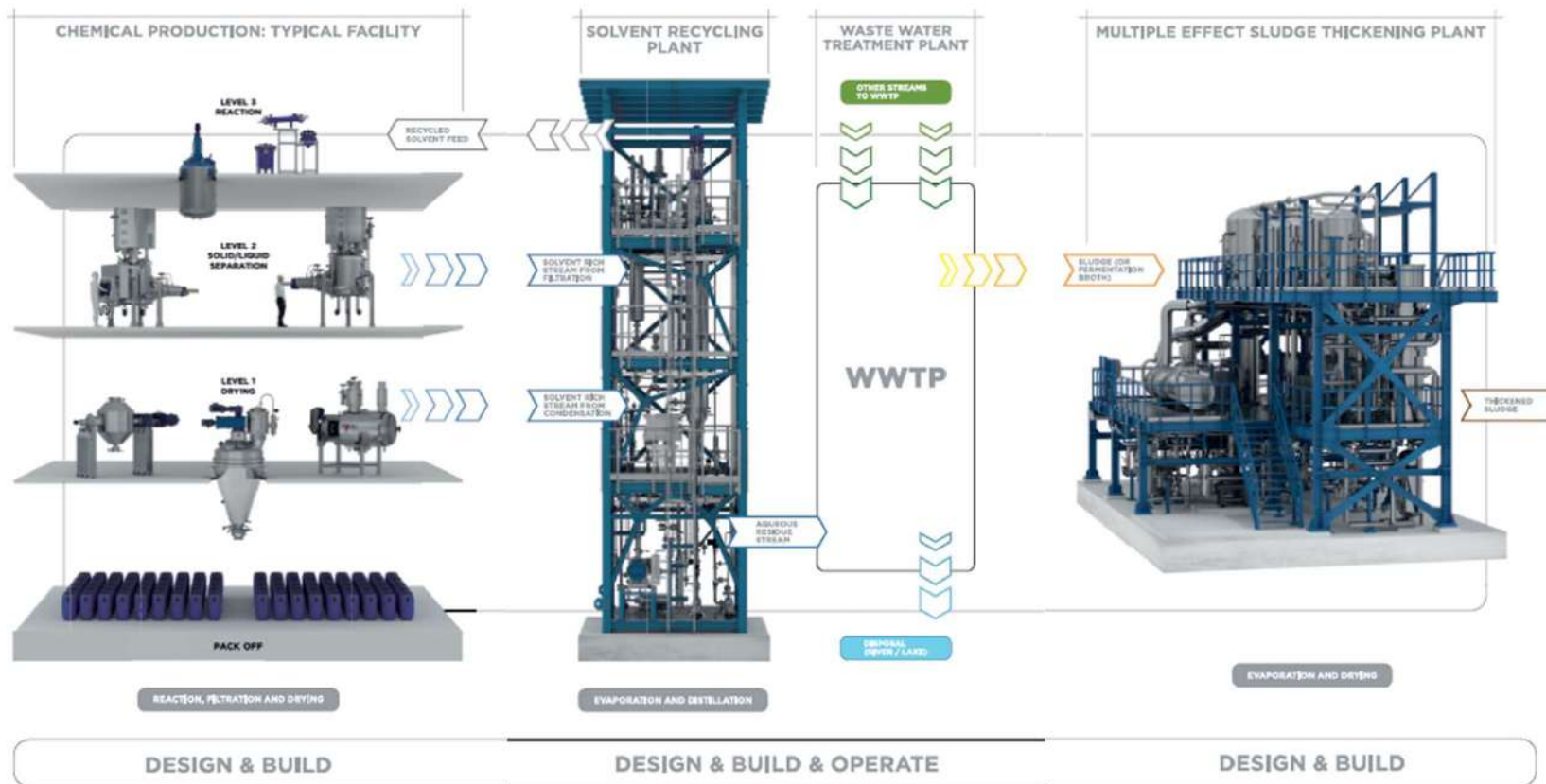


PROGRESS BY PROCESS

Processes	Equipment	Plants	Industries
Filtration Reaction Drying	Filter-Dryers Vacuum Dryers Glass Lined Equipment Glass Equipment	Reaction Plants Filtration & Drying Systems	API - Pharmaceutical Agrochemicals Flavours & Fragrances Mining & Metals Refining Chemicals specialties
Concentration Purification	Vertical Thin film Evaporators Horizontal Thin film Evaporators Short Path Evaporator Falling film Evaporator	Caustic soda concentration Essential oils extraction & Refining Glycerine recovery Oleochemicals purification Polymers concentration & devolatilization	API - Pharmaceutical Agrochemicals Flavours & Fragrances Chemicals specialties Food & Beverage Nutraceutical Polymers Base inorganics Oleochemicals
Environmental Waste water treatment Sludge treatment Waste recovery		Wet Oxidation – TOP Technology Chemical Oxidation Deep neutralization Natural and forced circulation evaporation Wet Oxidation – DUAL TOP Technology Spent solvents recovery Used lube oils re-refining	Oil & Gas Multiutilities API – Pharmaceutical

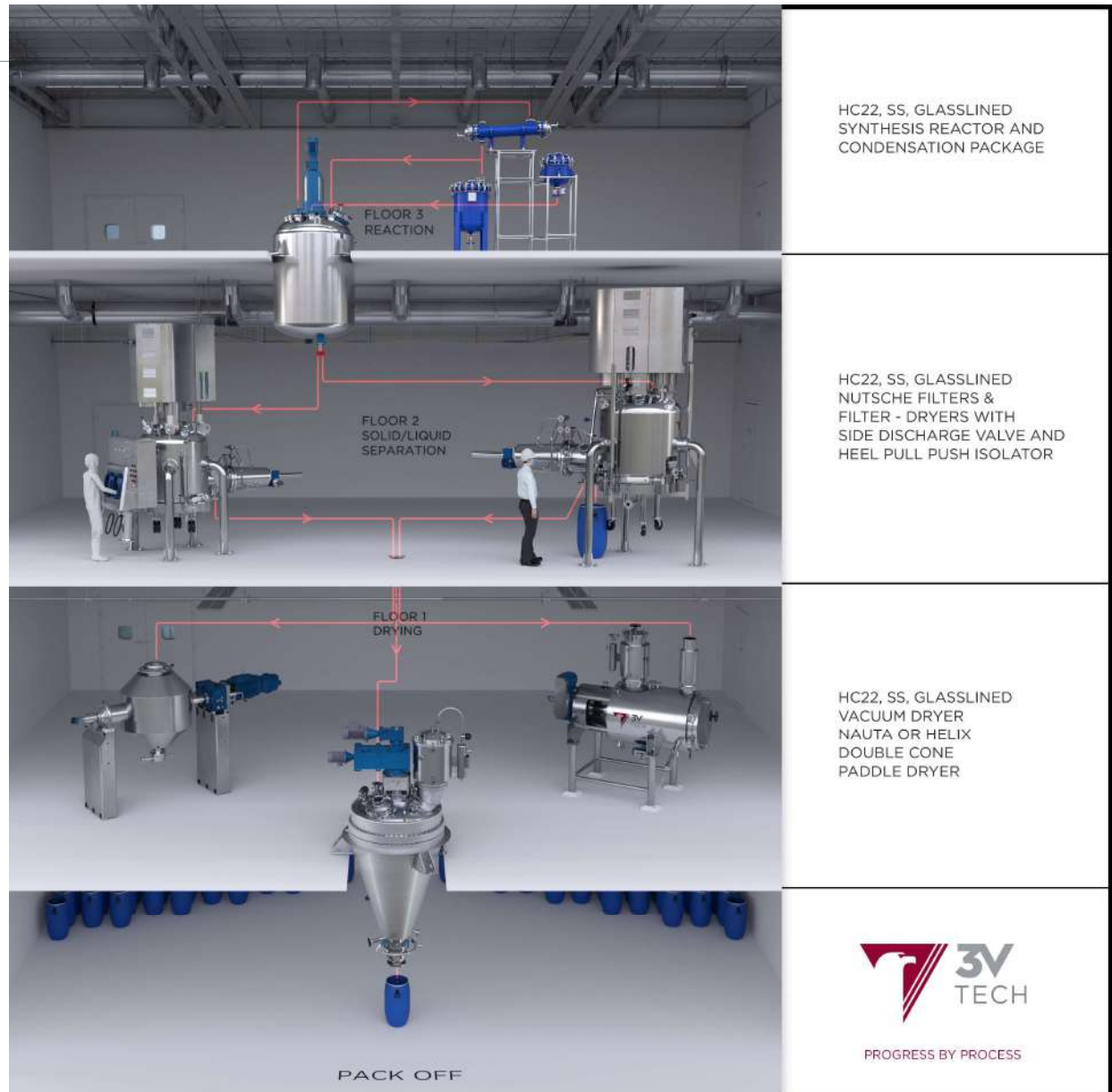


The integrated approach, based on our core technologies, supporting our customers in one or several of their process and waste management challenges



PROGRESS BY PROCESS

Important portfolio to provide huge range of process advanced equipment



THIN FILM EVAPORATOR

Thermal Separation Technology: applications for thin film & short path evaporation and distillation

POLYMERS

Separation of **solvents, monomers and other volatile** contaminants

AGROCHEMICALS & CROP PROTECTION

Solvents can be recovered products concentrated.

OLEOCHEMICALS

Fatty acids and Glycerine can be concentrated and purified downstream of a fractionation step.

SPECIALTY CHEMICALS

Multiple **concentration and purification** steps can be run to improve product quality

FOOD ADDITIVES & NUTRACEUTICALS

Thermal separation to obtain a **dried product** shows the versatility of thin film evaporation technologies.

INDUSTRIAL: CONCENTRATION AND PURIFICATION

PHARMACEUTICAL

Intermediates **Concentration and purification** as well as **solvent recovery**

METALS REFINING

Precious metals recovery from **waste streams** or **exhaust catalysts**

ENVIRONMENTAL: WASTE TREATMENT & RECYCLING

SOLVENT RECOVERY

Thermal separation technologies are widely employed for **recovery** and **recycling**.

FLAVOURS & FRAGRANCES

Flavours & Fragrances can be concentrated and purified while maintaining all their properties.

GREEN CHEMISTRY & BIOREFINERIES

Concentration and purification of **highly temperature sensitive products**

USED OIL RE-REFINING

Thermal separation technologies are widely employed for **recovery** and **recycling**.

THIN FILM EVAPORATOR

Turn Key Package for:

Thin Film evaporation plant
Short path evaporation plants
Falling film evaporation plants
Forced circulation evaporation plants
Forced circulation crystallization plants / ZLD
Distillation / rectification plants
Combined plants





We base on a **wide experience in the field**

PROCESSES
PRODUCTION

3V SOLUTIONS
PLANTS

CUSTOMER
INDUSTRY

FILTRATION

Industry: PHARMA
Location: IRELAND
Application: HP-API'S FILTRATION AND
DRYING PLANT





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PROCESSES
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CUSTOMER
INDUSTRY

REACTION

Industry: PRECIOUS METALS
Location: NORTH AMERICA
Application: PRECIOUS METALS REFINING

PROGRESS BY PROCESS

We base on a **wide experience in the field**

PROCESSES
PRODUCTION

3V SOLUTIONS
PLANTS



Industry: POLYMERS
Location: KOREA
Application: PURIFICATION

CUSTOMER
INDUSTRY

THERMAL SEPARATION



PROGRESS BY PROCESS

We base on a **wide experience in the field**

PROCESSES
PRODUCTION

3V SOLUTIONS
PLANTS



Industry: NUTRITION
Location: FRANCE
Application: SYRUP CONCENTRATION

CUSTOMER
INDUSTRY

THERMAL SEPARATION



PROGRESS BY PROCESS

We base on a **wide experience in the field**

PROCESSES
PRODUCTION

3V SOLUTIONS
PLANTS



CUSTOMER
INDUSTRY

THERMAL SEPARATION

Industry: Flavours & Fragrances
Location: ITALY
Application: CITRUS OIL REFINING



PROGRESS BY PROCESS

We base on a **wide experience in the field**

PROCESSES
PRODUCTION

3V SOLUTIONS
PLANTS



Industry: AGROCHEMICALS
Location: UK
Application: AGROCHEMICAL PURIFICATION

CUSTOMER
INDUSTRY

THERMAL SEPARATION



PROGRESS BY PROCESS

We base on a **wide experience in the field**

PROCESSES
PRODUCTION

**3V SOLUTIONS
PLANTS**

**WASTE TREATMENT
& RECYCLING**

**THERMAL
SEPARATION**

Industry: SOLVENT RECOVERY
Location: ITALY
Application: SOLVENT RECOVERY



PROGRESS BY PROCESS

We base on a **wide experience in the field**

PROCESSES
PRODUCTION

3V SOLUTIONS
PLANTS



*WASTE TREATMENT
& RECYCLING*

*THERMAL
SEPARATION*

Industry: OIL RECOVERY
Location: ITALY
Application: LUBE OIL REFINING



We base on a **wide experience in the field**

PROCESSES
ENVIRONMENTAL

3V SOLUTIONS
PLANTS

CUSTOMER
INDUSTRY

WET OXIDATION

Industry: OIL & GAS

Location: OMAN

Application: SPENT CAUSTIC WATER



We base on a **wide experience in the field**

PROCESSES
ENVIRONMENTAL

3V SOLUTIONS
PLANTS



CUSTOMER
INDUSTRY

THERMAL
SEPARATION

Industry: OIL & GAS

LOCATION: SAUDI

Application: SALTY WASTEWATER (ZLD)



We base on a **wide experience in the field**

PROCESSES
ENVIRONMENTAL

3V SOLUTIONS
PLANTS

**WASTE
TREATMENT
& RECYCLING**

WET OXIDATION

Industry: Liquid Waste Treatment
Location: ITALY
Application: WASTE WATER (PHARMA,
CHEMICALS, COSMETICS, SPENT CAUSTIC...)



We base on a **wide experience in the field**

PROCESSES
ENVIRONMENTAL

3V SOLUTIONS
PLANTS



***WASTE TREATMENT
& RECYCLING***

CONCENTRATION

Industry: Pharma
Location: SWITZERLAND
Application: Salty waste water Treatment
Multiple effects concentration ZLD





OUR CUSTOMERS – END USERS

PHARMA



AGROSCIENCE



CHEMICAL



FOOD & FRAGRANCES, NUTRACEUTICAL



PRECIOUS METALS



OIL & GAS



OUR CUSTOMERS – ENGINEERING FIRMS

PHARMA

JACOBS

PM
GROUP

exyte

lendlease

CHEMICAL

DPS Better
Engineered
Solutions

FLUOR

T.EN TECHNIP
ENERGIES

CB

OIL & GAS

SAMSUNG SAMSUNG
ENGINEERING

DAELIM

Petrofac **P**

Worley
energy | chemicals | resources

HYUNDAI
ENGINEERING & CONSTRUCTION

LOTTE E&C

WABAG

A team of **skilled technicians**, providing **after-sale services**, is also at support of our customers after plant or equipment start up

REFURBISHMENT & UPGRADE



Refurbishment of used units, performances improvement or re-certification of equipment and components:

- Filter to Filter Dryer
- Filter Dryer to Vacuum Dryer
- Vessel to agitator sealing system
- CIP System, dust filter metal cartridge, agitator, filter screen, discharge hatch, metal bellows, automation...

PREVENTIVE MAINTENANCE



Maintenance program, together with on-site inspection and control services are the key to:

- Increase equipment service life
- Reduce operating costs
- Enhance profitability

REPAIR SERVICES & SPARE PARTS



Worldwide customer support through:

- Field service technicians in Italy, USA
- Partner Companies in UK, Singapore and China
- Workshops in Italy and USA

