



3V TECH USA is a leading provider of advanced
Process Solutions & Process Equipment



Process Solutions



Process Equipment

BRANDS

COGEIM - MABO - GLASSCOAT - CONSITO

WWW.3VTECHUSA.COM

The Company

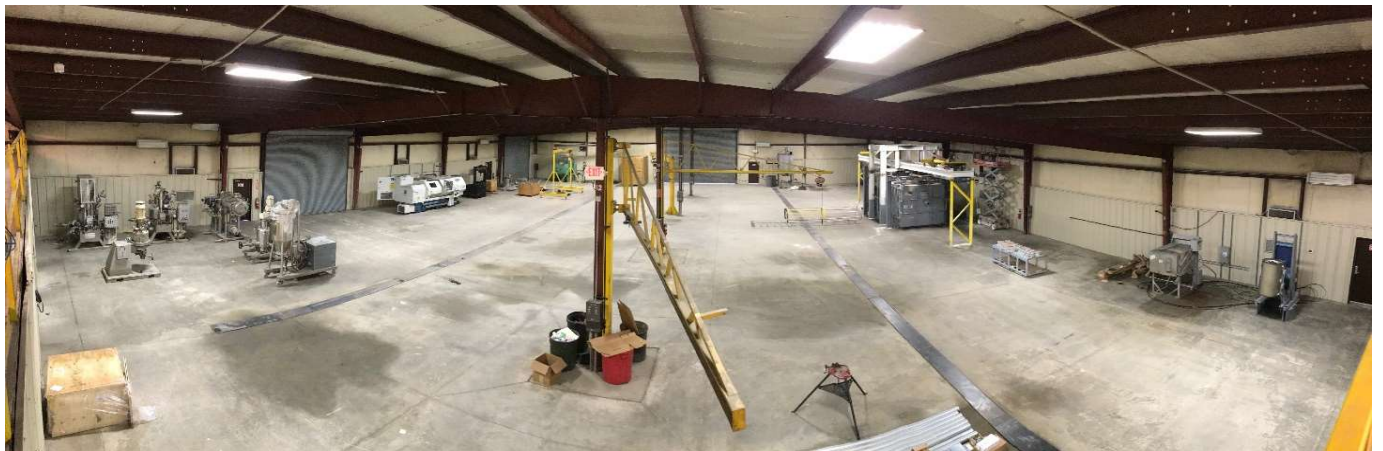
3V TECH USA Inc is a wholly-owned subsidiary of 3V TECH Equipment & Process Systems SpA in Italy, and is a fully integrated supplier of technology, equipment, solutions and systems for the chemical, pharmaceutical and environmental industry. One year ago we incorporated 3V TECH USA Inc and we completed our new 3V TECH USA facility in Andrews, SC near our Georgetown, SC headquarters, with **full glasslining and refurbishing capabilities**.



3V TECH USA Inc, Andrews, SC

Our mission in **3V TECH USA Inc** is to become a first class service and customer oriented American company leveraging the technological knowhow and expertise of the **3V Group** and offering:

- **COGEIM®** equipment and refurbishment of any brand of filter dryers, paddle dryers, conical dryers
- **MABO®** equipment and refurbishment of thin film, wiped film or short path evaporators
- **GLASSCOAT®** Glass-lined vessels as well as reglazing of vessels
 - Manufacture of new glass-lined or reglass parts and components such as:
 - Protection rings, manway covers, agitators, hubs, shafts, baffles, dip pipes, valves, seal faces, gaskets, PTFE sleeves, etc..
 - Compatible & interchangeable parts with other known brands.
 - Factory replacement parts for **CERAMIC COATINGS** glass-lined equipment. 3V Tech owns the **IP** for this brand.
- **CONSITO®** Providing technology, engineering solutions, plants and process optimization in the Chlor-Alkali and its derivatives (CaCl₂, FeCl₃, Ca-Hypo, Na-Hypo, PAC)



3V TECH USA Inc, Andrews, SC

3V TECH USA Inc will continue to support new equipment fabricated in our dedicated 3V TECH facilities located in Dalmine and in Noventa di Piave, Italy which maintain the dedicated tooling, machining and craftsmen required to fabricate process equipment to the highest quality standard

Equipment Manufacturing

Equipment manufacturing

Proprietary process equipment is manufactured in modern manufacturing facilities.



Manufacturing Facility Dalmine – Italy

3V Tech’s manufacturing plant in Dalmine with approximately 130,000 sqft covered surface is dedicated to the fabrication of stainless steel and higher alloy process equipment.



Manufacturing Facility Noventa -Italy

3V Tech’s manufacturing plant in Noventa di Piave with approximately 40,000 sqft covered surface is specialized in glasslined equipment.

Quality assurance: ISO 9001, latest edition

Qualifications: ASME (U-stamp), PED, SQL, DIN EN ISO 3834-2 (glass-lining), ATEX 94/9/CE, SELO

Design codes: ASME, EN 13445, ISPEL, AD 2000, CODAP, SVT

Materials include: 304 L, 316 L SS, Duplex SS, Superduplex SS, Hastelloy, Nickel based Alloys, Nickel, Titanium, Carbon Steel, Glasslined, etc.

Turn-key plants

Offering:

- Know-how
- Basic and detailed engineering
- Project management & Project execution
- Procurement
- Expediting
- Fabrication of key equipment
- Assembling of skid or installation on site
- Installation supervision
- FAT, SAT
- DQ, IQ, OQ, PQ validation according to URS and GMP requirements
- Commissioning, start-up, training
- Remote technical assistance

Aftermarket

Offering:

- Installation supervision, Commissioning, start-up & validation
- Customer training
- After sales assistance
- Quality spare parts delivery & field service
- Equipment assessment & refurbishments
- Retrofits & upgrades to improve performance
- Re-glassing
- Equipment re-certification

Cogeim

Filters, Filter-Dryers & Vacuum Dryers



For the last 40 years Cogeim has been a leading worldwide supplier of solid-liquid separation and vacuum drying equipment to the pharmaceutical, fine chemical and chemical industries.

Cogeim's workshop specializes in manufacturing process equipment, engineered systems and large process skids using high quality construction materials such as stainless steels and special nickel based alloys. Cogeim has held an ISO 9001 certificate since 1994 and is regularly inspected by authorized agencies.



FILTRODRY FEP/SD 012

Design and manufacturing (starting from the raw material such as plates, flanges and forgings) takes place in house, together with all quality control activities. This vertically integrated organization enables Cogeim to guarantee the highest standard available in the market for this equipment.

Cogeim represents a unique combination of expertise in process engineering and equipment manufacturing and has been the first to introduce to the market several innovations which are now a market standard.

Some examples:



FILTER-DRYER
MODEL FILTRODRY FEP/XD

Provided with a special four arm agitator that significantly increases the heated surface area in contact with the product and drastically reduces the drying time.



3 O-RING FILTER MEDIA

No screws in contact with the product allows smaller heel volumes, and minimizes dead spaces, optimizing the CIP wash for pharmaceutical GMP productions.

Cogeim



XTRACT-1 FULL DISCHARGE SYSTEM

Based on pneumatic conveying technology, XTRACT-1 performs complete dry solids discharge from flat-bottomed equipment, including the residual heel left under the agitator.



XAM-1

XAM-1, introduces a new generation of sidewall mounted valves, combining on-line measurement of residual solvents with solid product sampling.



MICROWAVE DRYING

Microwave drying is an alternative or auxiliary technology to conventional heating; used to optimize drying and to improve the final characteristics of the solid product.

Special designs are available for Sterile and HAPI pharmaceutical applications where cleaning, complete drainage, sterilization and containment are an integral part of the equipment design, manufacturing and testing.

Cogeim has vast experience in developing process automation systems ensuring:

- ▼ Operator safety
- ▼ Reliable machine control
- ▼ Integrated process control for the equipment and peripheral support

Cogeim can provide very simple solutions to highly complex systems, integrating plant production control, monitoring systems, data recording, history mapping and "recipe" management for different products.



FILTRODRY FEP/SD 200 - 2 sqm Filter-Dryer with heel push and heel discharge isolator.

Cogeim

Filters, Filter-Dryers & Vacuum Dryers

SOLID - LIQUID SEPARATION

Nutsche Filter-Dryers are deep bed, solid-liquid separation systems that use a filter screen to promote the development of the filter cake. Use of nitrogen above the cake and vacuum underneath the filter mesh improves the filtration process.

Supply of heating fluid to the jacket in combination with vacuum inside the vessel, generates the appropriate conditions for solvent evaporation and; thus, for wet cake drying.

Applications

- Active Pharmaceutical Ingredients (API and HAPI)
- Agrochemical products
- Extraction processes
- Purification processes
- Convection drying



FILTRO - FPP 100
AGITATED NUTSCHE FILTER



TOTUM - RFE 15
ALL-IN-ONE REACTOR - FILTER - DRYER

Cogeim Filter & Filter-Dryer models:

- ▼ FILTRO FPP Nutsche Filter
- ▼ FILTRODRY FEP/SD Nutsche Two arm Filter-Dryer
- ▼ FILTRODRY FEP/TD Nutsche Three arm Filter-Dryer
- ▼ FILTRODRY FEP/XD Nutsche Four arm Filter-Dryer
- ▼ TOTUM RFE "All - in - one" Reactor-Filter-Dryer

Cogeim also offers filtration equipment developed for thinner filter cakes with lower solids concentration where deep bed filtration may be less effective

- ▼ CLARIFIL FAP Semi - Continuous Leaf Filter
- ▼ ROTAPRESS FRP Continuous Rotary Pressure Filter



ROTAPRESS FRP 04
CONTINUOUS ROTARY PRESSURE FILTER

Cogeim

VACUUM DRYING

Vacuum drying is the most efficient drying method for most pharmaceutical and chemical products. Drying occurs using the appropriate combination of vacuum and temperature that generates evaporation of the solvent contained in the cake that is being dried. Agitation ensures the homogenous mixing of the end product, improves the heat exchange factor and, as a final result, reduces drying time.

Cogeim offers a wide range of vacuum dryers, all provided with an agitator and each using conduction as the heat transfer method. An optional heated agitator is available to improve drying performance.

Applications

- Drying filtered cakes from centrifuges, nutsche filters, belt and discfilters, or filter presses that are wet with water and/or solvent
- Drying cakes with high solid content
- Bulk chemical and/or pharmaceutical production
- Food grade applications
- Steam sterilization
- Flame retardants
- Essences, fragrances, aromas, flavors
- Waste and sludge treatment
- Pyrolysis
- Thermal desorption
- Biofuels

Cogeim Dryer models

- ▼ STERIDRY ES Paddle Dryer
- ▼ STERIDRY EP Paddle Dryer
- ▼ CHEMIDRY EC Paddle Dryer
- ▼ MULTIDRY EV Pan Dryer
- ▼ MIXODRY EMV Vertical Conical Dryer
- ▼ MIXODRY EMV/DE Vertical Helical Agitator Conical Dryer



STERIDRY EP 6000
PHARMA DESIGN 6000 L PADDLE DRYER



STERIDRY ES
HORIZONTAL VACUUM PADDLE DRYER



MIXODRY EMV
VERTICAL CONICAL DRYER

Mabo

Thermal Separation solutions & Turn-Key plants



Since our beginning in 1961, Mabo has provided about a thousand systems with a variety of applications. Our ability to provide engineered solutions to customers with thermal process separation problems, has made us a recognized partner in evaporation, highly-viscosity products processing, crystallization, distillation & rectification, solvent recovery and drying technologies.

Our thermal separation techniques are applied in industries such as base and fine chemicals, specialty chemicals, oleochemicals, petrochemicals, plastics, fibers, polymers, agrochemicals, biotech, pharmaceuticals, food & food Ingredients, as well as for environmental and energy solutions.

Mabo designs and supplies single equipment up to complete tailor-made thermal separation solutions. Thanks to our integrated engineering and manufacturing capabilities, we can deliver from pilot tests to full scale skid mounted industrial plants. Fabrication according to the most well-known codes & standards, from stainless steel to exotic materials.



INSTALLATION OF DOUBLE STAGE SKID-MOUNTED EVAPORATOR FOR AGROCHEMICAL CONCENTRATION



DOUBLE STAGE TFE-HHV SYSTEM FOR TDI REMOVAL FROM POLYURETHANE PRE-POLYMER

Depending on the application, we install a wide variety and combination of thermal separation equipment

- ▼ Thin/Wiped film evaporators/reboilers/dryers
- ▼ Short path evaporators
- ▼ Falling film evaporators/reboilers
- ▼ Forced circulation evaporators/reboilers
- ▼ Forced circulation evaporative and cooling crystallizers
- ▼ Tray/Packing columns

According to the requirements, Mabo designs the optimal energetic arrangement of the thermal separation plant, in order to minimize capital and operating costs.

Some of the options we apply

- ▼ Multiple effect arrangement (ME)
- ▼ Thermal vapor recompression (TVR)
- ▼ Mechanical vapor recompression (MVR)
- ▼ Use of waste heat (e.g. waste steam, hot water, etc.)
- ▼ Combination of several techniques

Mabo

Thin Film Evaporators

Mabo thin film evaporator consists of a cylindrical, heated, vertical or horizontal vessel and a high-speed contacting or non-contacting rotor that maintains a film of product against the wall in highly turbulent conditions, a distributor mounted in front of the inlet of the product and a dynamic droplet separator.

Our agitated thin film evaporator is the best solution where the product is difficult to handle due to the temperature sensitivity, high viscosity, high boiling point or fouling tendency, suitable for distillation, concentration, dimerization, degassing, drying, reaction and their combination, even for GMP applications.

It can be operated under vacuum, down to 1 mbar abs, at atmospheric condition or under pressure.



TFE
VERTICAL THIN FILM EVAPORATORS

The agitating system is essential. Mabo offers proven wiper systems for low to high viscosity liquids or slurries:

▼ Type L & HV: non-contacting lobed rigid rotor with fixed and well-defined clearance from the heated wall, for wide range of viscosities.

▼ Type HHV: non-contacting rotor with toothed paddles, for positive transport of viscous and very viscous material which do not flow easily by gravity.

▼ Type P & P-HV: hinged blades sliding in contact with the heated surface, for streams with high solids and fouling products, up to crystallization and drying. Special execution for high solids and high viscosity applications (type PHV), combining movable blades and fixed toothed blades.



TFE
THIN FILM EVAPORATOR

Short path evaporators

Mabo short-path evaporator is a wiped film evaporator with a built-in condenser in the evaporation chamber, mounted coaxially to the rotor, which results in a very short distance between the heating and condensing surfaces.

Our short path evaporator is the best solution for molecular distillation and purification of extremely heat-sensitive substances and products with very high boiling point, under extreme vacuum conditions (down to 0,001 mbar abs), thanks to the inside condenser.



SPE
SHORT PATH
EVAPORATOR

Mabo

Falling film evaporators

Mabo tubular falling film evaporator is a vertical evaporator consisting of a proper designed liquid distribution section at the top, a shell & tube calandria in the middle and a centrifugal or gravity vapour-liquid separator at the bottom.

Our falling film evaporator is the right solution to concentrate streams containing a small amount of suspended solids, low-medium viscous fluids and heat sensitive products.

It is particularly suited for energy saving multiple-effect (ME) evaporation, thermal vapor recompression (TVR) or mechanical vapor recompression (MVR) arrangement due the very small operating temperature difference between heating medium and process side ("driving force").



SINGLE EFFECT MVR FALLING FILM EVAPORATOR
FOR WASTEWATER CONCENTRATION



FALLING FILM LIQUID DISTRIBUTOR



LARGE FALLING FILM EVAPORATOR

Forced circulation evaporators

Mabo tubular forced circulation evaporator consists of a shell & tube heat exchanger, a flash separator, a circulation pump and circulation ducts.

Our forced circulation evaporator is the right solution to concentrate streams containing large amounts of suspended solids, medium-highly viscous fluids and products with high tendency to fouling.

It is particularly suited as high concentration step in multiple-effect (ME) evaporation, thermal vapor recompression (TVR) or mechanical vapor recompression (MVR) arrangement because the forced circulation evaporator can handle more concentration values and/or higher solid content than a falling film evaporators.

Mabo

Forced circulation crystallizers

Mabo tubular forced circulation crystallizer consists of a shell & tube heat exchanger, a flash separator/crystallizer vessel, a circulation pump and circulation ducts. Our forced circulation crystallizer is similar to the forced circulation evaporator, where special separator designs are used to separate crystals from the recirculated crystal slurry.

It is an evaporative crystallizer mainly used with products having flat or inverted solubility relative to the temperature. It is also used with compounds crystallized from solutions with scaling components, often for recovery/purification or elimination of products from liquid effluents (e.g. Zero Liquid Discharge system, ZLD).

Our forced circulation crystallizer is particularly suited as final step in multiple-effect (ME) evaporation, thermal vapor recompression (TVR) or mechanical vapor recompression (MVR) arrangement because it can handle high solids content.

Separation of crystals from slurry is done by belt filters or centrifuges.

Thin film dryers

Mabo thin film dryers are thin film evaporators with a special rotor system.

Our thin film dryer is particularly suitable for continuous drying of thermal sensitive products and whenever heat transfer performance needs improvement.

This dryer can also be used in combination with a horizontal dryer.



VERTICAL THIN FILM DRYER
AS FINAL STEP OF ZLD PLANT



OMEGA-3 FATTY ACID
DISTILLATION SYSTEM

Distillation columns

Mabo distillation & rectification systems, operating under vacuum, at atmospheric condition, or under pressure, optimally use the following column types, depending on the application:

- ▼ Tray columns: sieve tray, bubble cup tray, valve tray, tunnel tray
- ▼ Packing columns: random packing, structured packing

Depending on the application, distillation columns are equipped with thin/wiped film, falling film or forced circulation reboilers.

Glasscoat

Equipment, plants and components in Glass-lined steel



A state of the art glass lining facility was established in 2008 in Noventa di Piave near Venice, Italy.

The new glasslining plant in Georgetown, SC will allow us to better serve our American customers with faster deliveries on new equipment and on spare parts.

The staff at 3V Tech is a mix of engineers and technical specialists that have significant experience in the glass-lining industry. 3V Tech glass lining facility is equipped with customized software controlled electric furnaces. For every new vessel a specific firing program is developed and stored in our central data base. These customized firing programs allow us to exactly reproduce the same firing cycle for repeat jobs and optimize our vessel production to achieve optimum repeatability and prime glass quality. The plant also maintains a well-equipped lab that supports current production and develops new, advanced glass types.

Our primary glass is G2208 has a number of superior characteristics. In addition to its excellent corrosion resistance to acidic process environments, it is distinguished by higher thermal shock resistance and smoother surface finish than other glasses. The G2208 glass is available in: dark blue, light blue and white. The corrosion resistance for all three colors is the same.



Since 2008, Glasscoat has developed two new glass formulations suited for several different applications :

Phi Glass is a new formula that improves the limited heat transfer properties of the glass commonly used in the chemical industry and improves heat transfer rates across the glass interface. The glass was developed by the study of the behavior of ceramic particles in hot and cold conditions. Phi Glass is a hybrid glass that includes a percentage of ceramic particles which impart enhanced heat transfer capacity to the glass. This glass is available in light blue color and is the first of its type that has been introduced in the glass lining industry.

SIGMA Glass is not the first of its type but it is innovative in the sense that it advances the concept of electrically conductive glass. This glass offers an enhanced electric conductivity through all layers of its lining, from the ground coat up to its last layer, thus making an electrical connection between the process fluid and the substrate. Since the introduction of SIGMA glass to the market it has become the glass preferred by the major manufacturers in central Europe and in Asia.

Glasscoat

Glasscoat uses a unique application technology that creates a glass with a smoother surface and finer bubble structure resulting in lower air content. The lining consists of several layers applied and fired at temperatures in excess of 800 °C. The unique dust/liquid application technology allows Glasscoat to achieve the final thickness with fewer layers and trapping less air into the glass matrix. The result is a glass with a micro bubble structure and better dielectric properties. As proof we test all vessels to at least a Glasscoat standard of 30.000V – 10.000V to 15.000V higher than the voltage used by other manufacturers in the mar-



GLASSCOAT CUSTOM REACTORS

Glasscoat's product portfolio covers the full range of chemical synthesis from reaction to distillation to separation and drying.

The production of glass lined process equipment is Glasscoat's speciality as it is part of 3V Tech and can therefore rely on the more than 40 years of experience in producing process equipment for the Chemical Synthesis and the Pharmaceutical industries. The cGMP design, clean room suitable and high containment equipment that has been a hallmark of Cogeim designs is also available as reaction equipment from Glasscoat.



GLASSLINED ASME REACTORS LEAVING OUR PLANT IN SC



COMPLETE GLASSLINED REACTOR SYSTEMS

Glasscoat

Glasscoat produces glass-lined pressure vessels according to the DIN, BN and ASME standards vessels, such as jacketed and agitated reactors, storage tanks, receivers, columns, pipes, and vessel accessories are all part of our standard product line.

As one of the world's leading specialists in glass-lining, Glasscoat also manufactures high pressure vessels such as hydrogenators as well as very specialized glass-lined equipment such as thin film evaporators, condensers, falling film evaporators, double cone dryers and blenders, nutsche filters, separation columns, vapor lines, jacketed piping, phase separators and very complex geometries like large helices. With our expertise in glassing, Glasscoat is willing and able to glass-line geometries that other companies will not even attempt.



3V PHARMA REACTOR



BICONICAL DRYER-BLENDER

Glasscoat reactors can be equipped with conventional one-piece agitators or our 3V Press-Lock Agitation System mixing technology. 3V Press-Lock agitators are specially designed for better mass transfer, heat transfer and gas dispersion. We can design mixers for very specific applications and optimize mixing solutions for multipurpose chemical synthesis, covering a wide spectrum of process conditions.



PL TYPE ASME REACTOR



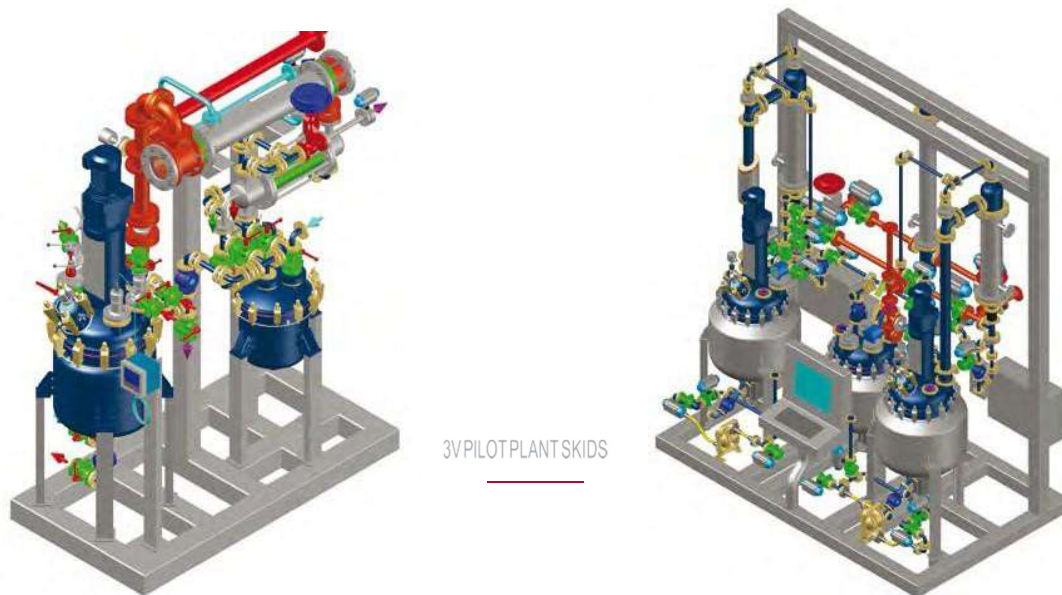
3V PRESS-LOCK

Glasscoat

3V Tech Process Solutions division supports the Glasscoat, Cogeim and Mabo engineers in the design and selection of the optimal solution for each customer's specific requirements.

Instead of just offering individual pieces of equipment, the 3V Tech Process Solutions approach is to leverage our full spectrum of capabilities to offer complete packaged solutions for process equipment for reaction, evaporation, thermal separation, solid-liquid separation and rectification.

3V Tech Process Solutions creates complete, skid mounted systems with full PLC, instrumentation, valves, fittings and other components in conjunction with the best combination of equipment from the Glasscoat, Cogeim and Mabo product lines in most construction materials. In this way 3V Tech can create a customized solution tailored to the individual needs of each customer.



Complete Reactor System

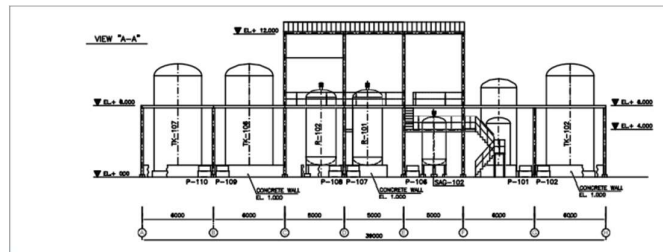
Consito

From Process Know-How to Turn-Key Plants



Since 1972 Consito has been providing technology, engineering solutions and process optimization to lead you in the market of Chlor-Alkali, its derivatives & water treatment chemicals.

- ▼ Chlor-Alkali
- ▼ Sodium Hypochlorite
- ▼ Ferric Chloride
- ▼ Poly-Aluminium-Chloride (PAC)
- ▼ Calcium Hypochlorite
- ▼ Sodium Silicate
- ▼ Hydrogen Peroxide
- ▼ Calcium Chloride



2013 - SO - PAC 9HB PLANT - LAYOUT

Milestones

1975 - Italy	know-how, design and construction, turn-key plant for PAC 18% production from alumina and hydrochloric acid (PAC 18% first industrial plant after invention and pilot plant from Snamprogetti)
1981 - Ecuador	know-how, design, supply of an integrated complex for production of Water Treatment Chemicals: salt electrolysis, chlorine, sodium hypo, calcium hypo, PolyAluminiumChloride
1984 - USA	Patent N.4.517.166 : two stage chlorination of lime for production of calcium hypo (70%) without consumption of caustic
1988 - Gulf Area	know-how, design and supply for a factory of salt electrolysis, liquid chlorine, sodium hypo, flaked caustic
1995 - Italy	design and supply of skid plant for hydrogen production from water electrolysis
2002 - Italy	design of a plant for salt electrolysis, carbon oxide production, phosgenation
2003 - Egypt	design of integrated complex for production of sodium silicate, PolyAluminiumChloride, ferric chloride, calcium chloride, soda ash from caustic
2006 - KSA	design and procurement for complete factory for 2.5 & 3.3 sodium silicate and precipitated silica from silica sand
2011 - Tunisia	know-how, design and construction, turn-key plant for sodium hypo from salt whit production of caustic chlorine
2013 - Argentina	know-how and design for production plant of PAC 9 High Basicity from PAC 18% and alum
2014 - KSA	know-how and design for production plant of calcium chloride 75% & 95% granules from limestone and hydrochloric acid and production plant of ferric chloride 40% solution from iron oxide and hydrochloric acid

Consito

CHLOR-ALKALI

CONSITO small scale chlor-alkali units, 1 to 15 MTPD chlorine capacity, in order to provide for a reliable, provides highly efficient device to produce chlorine on site, 32% caustic soda/caustic potash and hydrogen.

Our small scale plants, named CHLOR-PACK®, are pre-assembled, modular skid-mounted electrolysis units, based on bipolar membrane cells. They can be equipped with transformer-rectifier, brine preparation, brine purification, depleted brine dechlorination, caustic concentration up to 50% or to flakes.

Chlorine gas can be dried and compressed to be fed directly by pipeline to the consumers or liquefied under pressure and stored.

Alternatively, chlorine and caustic soda can be directly converted to sodium hypochlorite ("bleach") in a further step of our plants or to hydrochloric acid.

SODIUM HYPOCHLORITE

Sodium hypochlorite, commonly known as bleach, is produced by direct reaction of chlorine gas with caustic soda solution from chlor-alkali process, to be used for water treatment, for bleaching agent in textile industry and for household products.

CONSITO developed know-how and technologies for small sodium hypochlorite units, 3.5 to 30 m³/day sodium hypochlorite solution capacity, up to approx. 160 g/l concentration and approx. 150 g/l available chlorine, in order to provide for a reliable, highly efficient device to produce "on site".

Our small plants, named HYPO-PACK, are pre-assembled, modular skid-mounted reaction units. Usually, this package is supplied together with the CHLOR-PACK® unit, in order to produce sodium hypochlorite starting from sodium chloride as raw material.

Bleach can be fed directly by pipeline to the consumers or bottled.

FERRIC CHLORIDE

Ferric Chloride or Iron (III) Chloride is used as a flocculant in sewage treatment and drinking water production. It is usually produced and marketed as a concentrated solution with a minimum concentration of 40% w/w.

CONSITO developed know-how and technologies for ferric chloride 40% w/w solution production plants, both for waste water treatment and drinking water grades, starting from different feedstock:

- ▼ Iron scraps and chlorine gas, by ferric chloride recycling
- ▼ Soft iron and chlorine gas, by ferric chloride recycling
- ▼ Ferric oxide and hydrochloric acid
- ▼ Mixed oxides, hydrochloric acid and chlorine gas
- ▼ Pickling liquors and chlorine gas, with final concentration

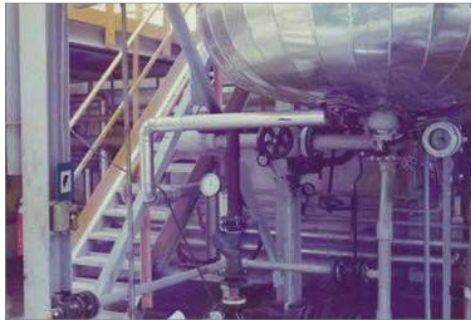


FERRIC CHLORIDE PLANT EGYPT

Consito

POLY-ALUMINIUM-CHLORIDE (PAC)

PAC is a flocculant of new concept, the specific properties of which derive from the action of its basic active constituent, namely Poly Aluminium Chloride, a polynuclear complex of polymerised hydro-aluminium ions. It is based on highly charged aluminium which results in lower dosage and therefore reduces sludge volume and pH adjustment demand. It also improves solids and/or phosphorous removal over conventional coagulants.



FIRST PAC PLANT



CONSITO developed know-how and technologies for production plants of the following grades of PAC:

- ▼ PAC 18%: mid-basicity liquid PAC, containing $17,5 \pm 0,5\%$ alumina, specific for waste waters and neutral sizing in paper making. It is used as primary coagulant aid for any clarifying/flocculation process relating to the treatment of surface or underground water and urban or industrial effluents.
- ▼ PAC 30%: mid-basicity powder form, containing $30 \pm 0,5\%$ alumina.
- ▼ PAC 9% HB: high-basicity liquid PAC, containing $9 \pm 0,5\%$ alumina, specific for potable waters.

Our high-performance PAC 9% HB (High Basicity, 60-68%) is a formulation for treatment of drinking water, obtained by reaction of PAC 18% with aluminium sulphate, a basifier and a sequestering agent.

This sequestering agent considerably improves the characteristics of the polymer, increasing the coagulation and flocculation velocity, even in case of low turbidity and low temperature. Moreover, the sequestering agent increases the storage stability of the final product.

PAC 9HB produced with our technology hydrolyzes completely in treated water, forming large flakes which easily sediment, reducing the backwashing of sand filters and decanters.

Our PAC 9HB releases less than 100 ppb aluminium ions with a dosage of 20 ppm in treated water, whereas standard PAC 9-10% HB leaves approx. 200 ppb aluminium ions.

CALCIUM HYPOCHLORITE

Calcium Hypochlorite is an inorganic compound, marketed as granules or tablets, used for water treatment and as bleaching agent due the very high content of available chlorine, 65-70%, greater than sodium hypochlorite.

Calcium hypochlorite production process basically consists of hydrated lime reaction with gaseous chlorine.

OVERCHLOR® is our Calcium Hypochlorite production plant according to the patented process developed by CONSITO, which minimizes the caustic soda consumption.

Consito

SODIUM SILICATE

Sodium silicate is the generic name for a series of compounds derived from soluble sodium silicate glasses. They are water solutions of sodium oxide (Na_2O) and silicon dioxide (SiO_2) combined in various ratios, which results in solutions with differing properties that have many diversified industrial applications.

Standard commercial grades of liquid sodium silicates range in weight ratio of SiO_2 to Na_2O from 1.6 to 3.3. Sodium silicate with weight ratio $\text{SiO}_2/\text{Na}_2\text{O}$ R=1.6-2.5 is the base product of the silicate family. It can be marketed as dried powder or as a concentrated solution and a solid content of about 40÷50%Bé. It is also the feedstock for producing other types of silicates.

Consito developed technologies for production plants of liquid and powder sodium silicates, as well as metasilicates in granular anhydrous and pentahydrate forms.



DRY SILICA HOPPER

HYDROGEN PEROXIDE

Hydrogen peroxide is a weakly acidic, colourless liquid, miscible with water in all proportions. It is the simplest peroxide and is commercially available in aqueous solution over a wide concentration range for preparation of other peroxides and as an oxidising agent mainly in pulp and paper bleaching.

Our manufacturing process involves the catalysis of the reaction of hydrogen with atmospheric oxygen to give hydrogen peroxide. 2-Ethylanthraquinone is used as hydrogen carrier.

Consito developed know-how and technologies for production plants of hydrogen peroxide 35÷70%wt.

CALCIUM CHLORIDE

Calcium Chloride is an inorganic compound, marketed as 36% solution, 75-78% flakes or 94-97% granules, used for roads de-icing, dust control, brine refrigeration, dehumidification, setting time reduction in concrete, petroleum oil extraction and food processing.

CONSITO developed technologies for Calcium Chloride production units as 36% solution, 75-78% flakes or 94-97% granules, basing on reaction between limestone and hydrochloric acid.

For the production of 94-97% granules, CONSITO, in partnership with a well known European manufacturer, developed a special fluid bed dryer with internal heat recovery, which can be fed directly with the 36% solution coming from the neutralisation, avoiding the concentration step.

Pilot Plants

Make your CAPEX investments more reliable

3V Group has always maintained a strong focus on R&D and in-house engineering development in the chemical, environmental and process equipment fields, allowing some of their technologies to gain international recognition.

3V Tech USA Inc benefits from 3V Group's R&D centers located in Italy & in the USA.



MOZZO, BG-ITALY

Complete Multi-purpose 4 floors test center, with the necessary utilities and suitable to handle hazardous products.



GRASSOBBIO, BG-ITALY

Mainly dedicated to environmental research and to lab scale testing.



GEORGETOWN, SC -USA

Lab and pilot testing at 3V TECH USA Inc.

3V TECH USA Inc owns a fleet of pilot units which are used to optimize processes on behalf of our customers in the fields of:

- ▼ Batch filtration & drying
- ▼ Evaporation, crystallization, distillation, drying
- ▼ Highly-viscosity products

We offer you the following services

- Lab scale testing for equipment selection
- Pilot plant trials for scale-up to industrial units
- Design of optimal operating conditions
- Highly qualified testing personnel
- In-house test facilities and mobile rental units
- Physical-chemical analysis of product samples
- Detailed testing reports
- Large sample quantity for customer's further R&D activities
- Multi-step test plants can be set-up



Pilot Plants

Pilot Units

Most of our pilot units are manufactured in Alloy C 22 as material in contact with the product. This guarantees a compatibility with most products used in the chemical and pharmaceutical industries.

The following pilot units are available for testing:

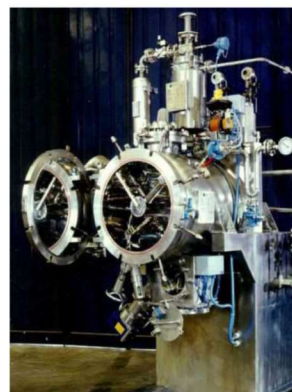
- ▼ Lab filters, filter-dryers and vacuum dryers
- ▼ Lab glass evaporators
- ▼ Lab thin film/short path evaporators
- ▼ Filter-dryers and various other filtration equipment Vacuum dryers of various kinds
- ▼ Short path evaporators

If testing at customer site is preferable to our pilot plant, we have available mobile pilot units, designed for an easy transport and installation.

Furthermore our specialized personnel is available to validate the installation, provide training and assist during the installation.



PILOT SHORT PATH EVAPORATOR SPE



Aftermarket

Our Field Service Engineers are ready to assist you

3V TECH USA Inc avails of a team of qualified and experienced field service technicians. Our field service technicians are equipped with parts, tools and the necessary safety equipment requested by our internal policies, by law (OSHA) and by our customers.

All technicians are fully trained to be able to comply with both local and international safety law requirements. Our team can carry out service and repair on our own equipment as well as on competitor's equipment.

SAT, Commissioning & Start up

After the equipment has been delivered our service team is ready to supervise the installation, carry out the Site Acceptance Test (SAT), start up the equipment and, if required, validate its performance.

Customer Training

To make sure the equipment runs appropriately and to provide day by day maintenance we are available to train customers with a mix of practical and theoretical training sessions.



After Sales Assistance

At 3V Tech we know that equipment reliability during its entire life cycle is of the utmost importance. Therefore we provide all our clients with a list of critical parts that our customers should keep in their storage, in order to perform a quick replacement in case of breakdown, minimizing unnecessary production downtime. If parts are not available at customer site, 3V Tech spare parts department will respond quickly to your queries.

Preventive Maintenance

Proper equipment operation and maintenance ensures optimal equipment performance and reduces the risk of downtime. This leads to longer equipment service life, lower costs of ownership and greater profitability. We start with a general assessment of the installed equipment and then offer different levels of service based on the need.

Equipment Assessment & Refurbishments

With spark test, thickness mapping and mechanical inspection we can provide an assessment of the equipment status and propose refurbishments to maintain your glass-lined equipment performing at best.



Retrofits & Upgrades to Improve Performance

Together with our technical department we can offer retrofits and upgrades to help customers improve equipment performance. This activity can be carried out on site or at one of our specialized manufacturing facilities

Re-Glassing

3V TECH USA Inc offers full reglazing capabilities for parts and for vessels. In addition to the reglazing, vessels can be upgraded with state of the art drive systems, agitators and baffles.

Reglazed vessels from 3V TECH are subject to same quality controls as applied to new equipment.

Spare Parts & Field Service

During the equipment life, to ensure continuous process performance, our Back Office Team is available to provide a complete list of spares and our Field Service Team is available to carry out intervention for preventive maintenance to reduce the risk of unplanned shut down. Our Field Service Team is available for interventions and repairs of mechanical components and special repairs on glass lined reactors with Tantalum, PTFE or Hastelloy plugs, patches or sleeves.





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