PSC

PSC S.p.A.
Engineering & Contracting

SPECIAL PROCESS PACKAGES & PROCESS ENGINEERING

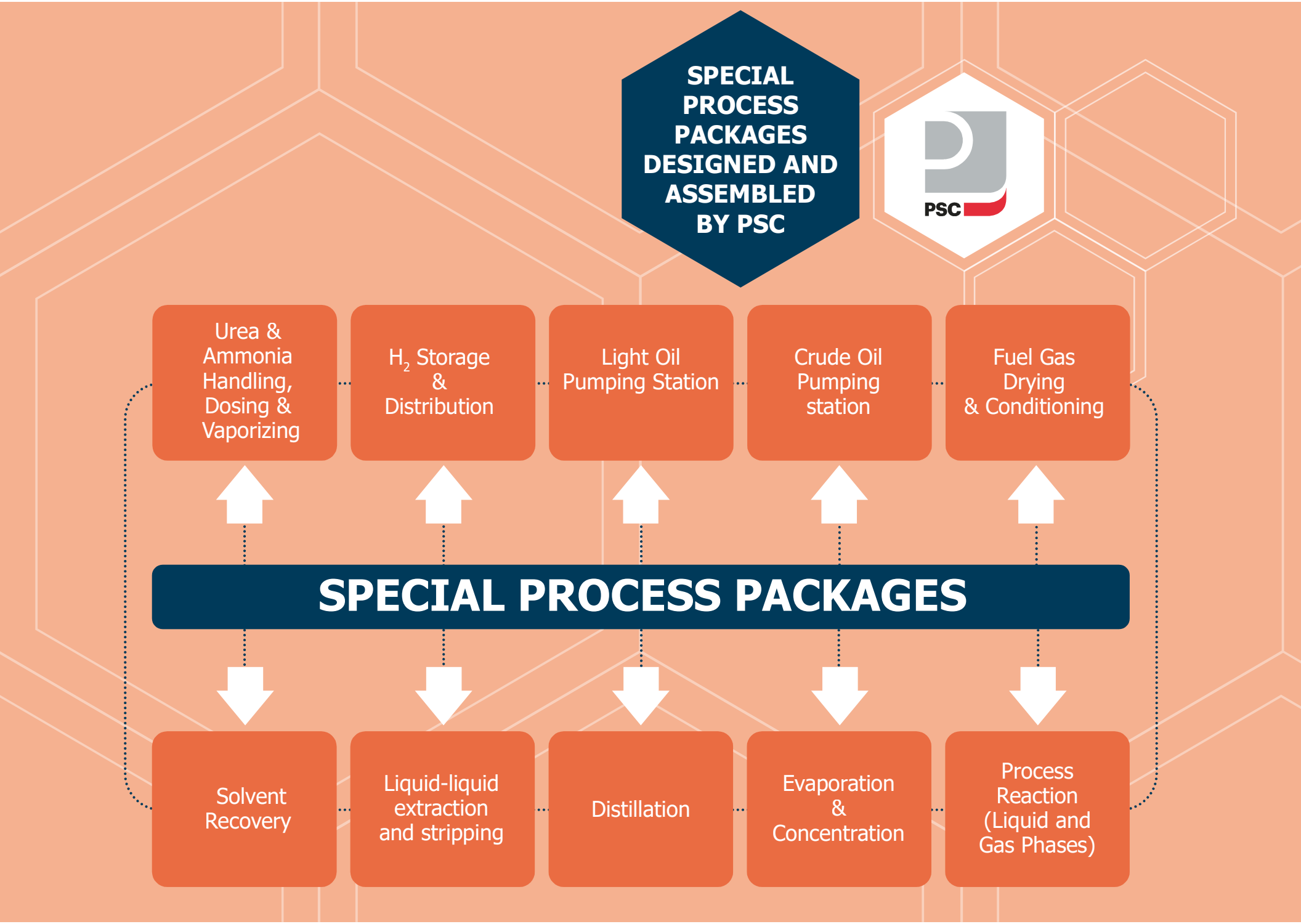
INTRO

PSC S.p.A. Engineering & Contracting (PSC) is a company operating in the Oil & Gas, Petrochemical, Power and Chemical Industry. PSC has a division devoted to Special Process Packages; its activity ranges from Engineering Services of any kind, to the construction of Skid mounted Systems or Packages, as well as complete Turn-key plants.

PSC provides engineering solution customized for any specific plant background and Customer requirement. Thanks to its international asset, PSC complies with any International Standard in any related discipline:

ATEX | API | ASME | TEMA | EAC/ TR-CU | BS | NORSOK | NEMA |

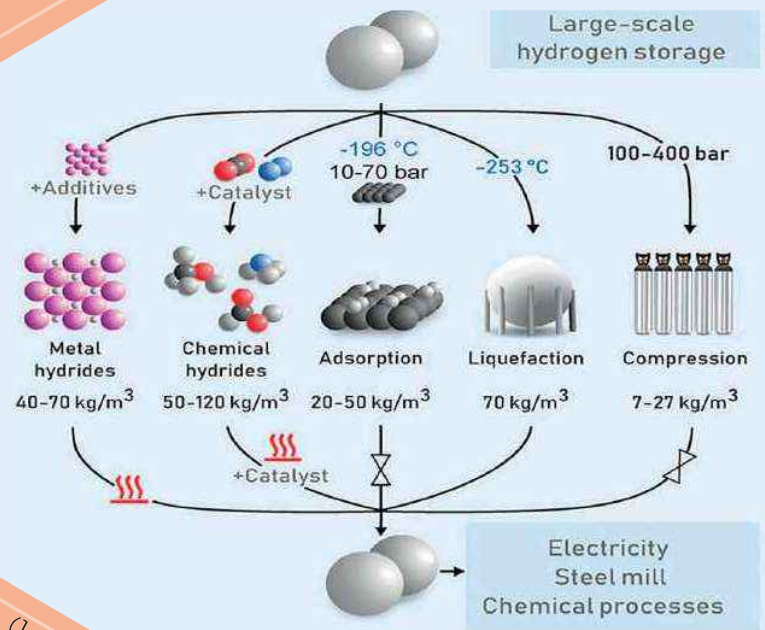
and others


SPECIAL PROCESS PACKAGES DESIGNED AND ASSEMBLED BY PSC
PSC
Urea & Ammonia Handling, Dosing & Vaporizing
H_2 Storage & Distribution
Light Oil Pumping Station
Crude Oil Pumping station
Fuel Gas Drying & Conditioning
SPECIAL PROCESS PACKAGES
Solvent Recovery
Liquid-liquid extraction and stripping
Distillation
Evaporation & Concentration
Process Reaction (Liquid and Gas Phases)

PSC supplies handling unit, for storing, vaporization and dosing of ammonia and/or urea solution, customized as per Client's specification and needs, including:

- Storage tank with all required accessories
- Unloading pumps skid with local panel, safety valves and instruments for the proper protection
- Ammonia Flow Control Unit
- Ammonia distribution manifolds with block balancing valves, pressure instruments
- Ammonia injection grid with individual lance isolation
- Local control panel with PLC or DCS configuration

H2 STORAGE & DISTRIBUTION



(J. Andersson, S. Grönkvist - International Journal of Hydrogen Energy, V. 47)

PSC designs and provides projects of Hydrogen storage and distribution system in different industrial fields.

Hydrogen has been identified as a clean "green" fuel.

In comparison to fossil fuel use, hydrogen source has the following advantages:

- Zero CO2 emissions from the combustion process, water as final product
- Obtained from renewable energy sources.
- Higher gravimetric energy content
    - Wider flammability limits

LIGHT OIL PUMPING STATION

PSC provides customized fuel oil pump stations to fill local storage tanks via commercial trucks and then deliver the stored liquid fuel to the combustion system loop, even on a skid or in a 40 feet mobile container.
It consists of the following skid mounted pumps (both centrifugal and volumetric type):

- Light Fuel Oil Unloading Pumps
- Light Fuel Oil Pumps for District Heating
- Light Fuel Oil Pumps for Waste Combustion

Pumping station can be realized on skid or inside container, suitable for outdoor installation, either near fuel storage tank or commercial truck unloading platform.

CRUDE OIL PUMPING STATION

Pumping stations are located at regular intervals along the pipeline to boost the delivered pressure to move the liquid through the pipeline and various geodesic elevation, until to final destination.

PSC personnel is skilled in designing any size of oil pumping station.

Typically, a pumping station includes:

- Multiple booster centrifugal pumps arranged in parallel with block valves, suction basket filter, check valves at each pump, field instrument, so that any pump can operate independently of the rest, feeding the next pumps;
- High pressure, multistage centrifugal pumps, operating in parallel and complete with accessories as per booster feed pump.

FUEL GAS DRYING & CONDITIONING

PSC designs fuel gas conditioning systems, as fuel gas skids, fuel gas systems or fuel gas filtration and heating packages to remove high efficiently any liquids, solids and aerosols particles.

Fuel gas conditioning systems are used for treatment of raw production gas. They are designed to deliver clean and treated gas to feed properly gas-driven equipment such as turbines and generators.

SOLVENT RECOVERY

Solvent recovery is a special design package to limit the environment impact by industrial chemical production facilities:

- Sustainable method to resolve the issue of the vapour solvent released to atmosphere
- Saving in cost for the fresh solvent consumption
- Removing pollutant, toxic odours released in the atmosphere

PSC designs and supplies any solvent recovery unit to meet each customer's requirement.

Other processing as air, steam stripping and thermal distillation are applied as final alternative solvent treatment and recovery.

LIQUID-LIQUID EXTRACTION & STRIPPING

a) Liquid-Liquid Extraction Process

PSC is expert in Liquid-liquid Extraction (LLE) also known as solvent extraction and partitioning method to separate constituents (solutes) of homogeneous liquid solutions.
This separation process is used:

- After a chemical reaction as part of the work-up, often including an acidic work-up;
- If all other process separation as stripping, thermal distillation, evaporation and membrane are not feasible and convenient.

If the aim of the process is to achieve a pure extract, the LLE as a downstream process is most often only the initial step. Further purification, such as distillation, crystallization or second extraction might be needed.

b) Stripping Process

The stripping process is a physical separation process where one or more components are removed from a liquid stream by a vapor or gas stream.

DISTILLATION

Distillation is used to separate mixtures of liquids by exploiting differences in the boiling points of the different components.

PSC designs and provides distillation systems for:

- Gases production;
- Crude oil refining into main hydrocarbon fractions as naphtha, kerosene, gasoline, etc.;
- Solvent recycling and purification;
- Biodiesel and biofuel production;
- Oil vegetable refining and carboxylic acids production

EVAPORATION & CONCENTRATION

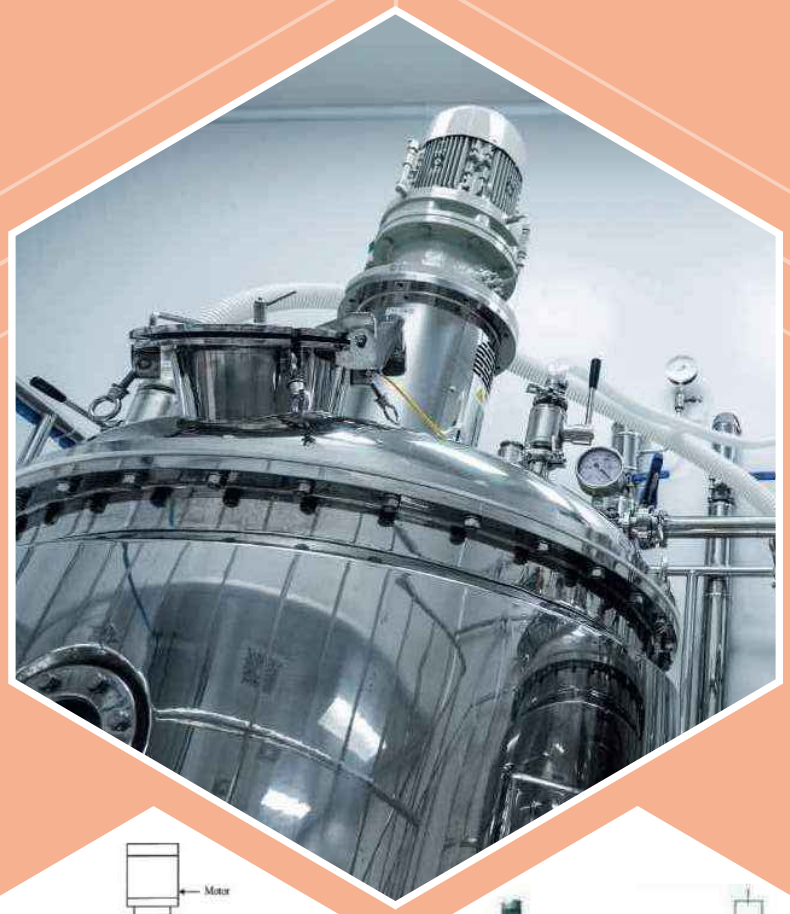
During solvent removal, energy is applied as heat when the liquid is vaporized to gas, which is removed to leave a concentrated or solvent-free (dry) product. Many systems are referred to generically as "evaporators."

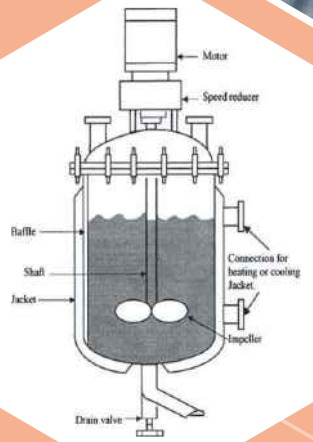
Zero Liquid Discharge is the new frontier of Green Technology, with the following technical benefits:

- Reducing all emissions of liquid pollutant effluents or wastewater streams
- Minimizing the environment impact
- Recycling of the recovered water
- Saving fresh water consumption

PSC provides every thermal evaporation and concentration process as a customized solution and tailored to the client specification and requirement (case by case)

PROCESS REACTIONS (LIQUID & GAS PHASES)





PSC has strong knowledge in chemical process reactions that occur in a single phase (gaseous, liquid) homogeneous.

The most important of homogeneous chemical reactions are between:

- Gases;
- Liquids or substances dissolved in liquids;
- Gas and liquid

The chemical reactions in homogeneous phase are simpler than heterogeneous type and occur in continuous flow stirred tank reactor (CSTR), usually equipped with heating jacket coils.

The catalyst is packed solid form into the reactor to promote the chemical oxidation and removal of the toxic substances with the oxygen oxidant, very green and high efficient process and technology.

ACTIVITY

The utter professionalism of its personnel enables PSC to provide any category of engineering service:

| Feasibility studies and cost evaluation | Basic and detailed engineering | Procurement and construction of special process packages or plants | Pilot plants | Project Management |

PSC S.p.A. Engineering & Contracting

is an engineering partner to EPC Contractors and End Users all over the world.

To follow, some of our Customers:

desmet ballestra

EUROCHEM MINERAL AND CHEMICAL COMPANY

Baker Hughes

FLOWVISION

VODOVOD-OSIJEK d.o.o. OSIJEK

Natrica

eni

DE NORA

SOLVAY

CECO ENVIRONMENTAL

EMERSON

wood.

HOLCIM

SCOP

ZEPPELIN WE CREATE SOLUTIONS

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& PROCESS ENGINEERING

PSC S.p.A. Engineering & Contracting

Via S. Antonio da Padova, 6/A
20813 Bovisio Masciago (MB) - Italy
Ph. +39 0362 571113 - Fax +39 0362 571115
Workshop: C.so Europa, 12 - Cesano Maderno (MB) - Italy - Ph. +39 0362 550457
psc@pscengineering.com - sales@pscengineering.com - www.pscengineering.com