DESIGNING YOUR SUCCESS

45 YEARS OF EXPERIENCE

CHEMICAL AND FERTILIZER INDUSTRIES

FULL SPECTRUM OF SERVICES

ALL DESIGN DISCIPLINES

PROJECT EXECUTION

ENGINEERING SERVICES
PROZAP – DESIGNING YOUR SUCCESS

PROZAP is a major multi-discipline engineering company serving the chemical industry in Poland and abroad for 45 years.

The company started in 1970 as the Design and Engineering Department of Zaklady Azotowe “Puławy”, employing engineers and technicians involved in designing and erection of the industrial complex in Puławy. In 1988 the Design and Engineering Department was transformed into a separate business entity, PROZAP Sp. z o.o. Today PROZAP is part of Grupa Azoty, the largest chemical group in Poland and one of the largest such entities in Europe.

The basic scope of the company’s activities is related to designing new and revamping the existing chemical plants, general and municipal construction, managing procurement and acting as an EPC Contractor. PROZAP services cover a complete investment life cycle: from a concept, through designs and engineering, to supplies and plant erection, extending even further to management and supervision over start-up and as-built documentation, according to individual requirements of each client.

High quality of services rendered by PROZAP is assured by Quality Management System according to ISO 9001 implemented in 1998 and still valid as well as ISO 14 001 and 18 001.

The company employs more than 100 professionals with average experience of over 10 years.

QUALITY AND COMPETENCE

In order to confirm the company’s position as an established service provider PROZAP undergoes verification procedures carried out by independent bodies in the course of numerous competitions and promotional programmes.

- ISO 9001, ISO 14 001 and 18 001 Certificate
- Certificate of Technical Competence issued by the Polish Chamber of Construction Designing (since 1995)
- Regional Business Leader 2015 certificate
- Title of the Best Design Company of 2013
- Fair Play 2013 Platinum Statuette
- Award of excellence for high technical safety standards granted by Office of Technical Inspection (UDT)
- Modernization of the Year 2011 Award for the Modernization and capacity increase of the Urea Plant in Z.A. Pulawy, Poland acc. to Basic Design by Urea Casale
- Modernization of the Year 2012 Prize for the Flue-gas Desulphurization Plant in the Power Plant of Grupa Azoty Zaklady Azotowe Puławy S.A.

PROZAP is located in Puławy, in the Eastern part of Poland, 120 km southeast of Warsaw.
- Polyethylene bag plant, Zakłady Azotowe Puławy
- Ammonia Plant improvements, Zakłady Azotowe Puławy
- Chemicals storage, Zakłady Azotowe Puławy
- Revamping of Ammonium Nitrate coating unit, Zakłady Azotowe Puławy
- Extension of urea storage and bagging station, Zakłady Azotowe Puławy
- Liquid SO₂ packaging station, Zakłady Azotowe Puławy
- System for urea solution transport to UAN production plant, Zakłady Azotowe Puławy
- Scrubbing system for ammonium nitrate prilling towers (coop. with Rhodia Chemie, France), Zakłady Azotowe Puławy
- Scrubbing system for urea prilling tower (coop. with BECO Engineering Ltd., USA), Zakłady Azotowe Puławy
- Degassing of process condensate, ANWIL S.A.
- Scrubbing system for urea prilling tower, Chemie Linz (Austria)
- Bulk fertilizer storage and UAN terminal, Bałtycka Baza Masowa
- Urea plant 1700 MTPD (coop. with Tecnimont, Italy), Zakłady Azotowe Puławy
- Caprolactam plant revamping, Zakłady Azotowe Puławy
- Off-gas scrubbing system, GZNF Fosfory
- Commercial Center Taganka, Moscow, Russia
Ammonia unloading and storage, Zakłady Chemiczne LUBON
AdBlue plant, Zakłady Azotowe Puławy
Revamping of urea plant, (acc. to Basic Design by Urea Casale, Switzerland), Zakłady Azotowe Puławy
Melamine plants II and III 30 000 MTPY each (coop. with Eurotecnica, Italy), Zakłady Azotowe Puławy
25 000 t CAN storage, AWIL S.A.
30 000 MTPY Sulphonation plant, PCC Rokita S.A.
TDI complex capacity increased to 75 000 MTPY in ZACHEM S.A.
Increase of capacity of a polyether plant by 30 000 MTPY, PCC Rokita S.A.
Polyol plant, Wratislavia BIO
Scrubbing system for urea prilling tower, SABIC (Saudi Arabia)
Supercritical CO₂ extraction plant, INS Puławy
Commissioning of 500 liquid fuel tanks, PKN ORLEN S.A.
130 000 MTPY, Methanol plant (coop. with Khimteknologiya, Ukraine), Zakłady Chemiczne ACHEMA (Lithuania)
Revamping of the production train: oxygen plant – ammonia – urea, Zakłady Azotowe Puławy S.A.
Plant for loading, storage and feeding of 3 process lines with ammonia, Stalprodukt S.A.
Construction of Research Center for Supercritical Extraction with use of liquid CO₂, INS Puławy
Liquid ammonia storage, Grupa Azoty Zakłady Azotowe Puławy S.A.
Solid fertilizer, production plant with handling, storage and logistics centre, Grupa Azoty Zakłady Azotowe Puławy S.A.
Flue-gas, Desulphurization Plant (technology by MET, USA), Grupa Azoty Zakłady Azotowe Puławy S.A.
Butadiene tanks with pumping station and emptying system, Synthos Dwory Sp. z o.o. Sp. jawna
Fertilizer Research Centre, INS Puławy
Flue-gas, Desulphurization Plant (technology by MET, USA), Grupa Azoty Zakłady Chemiczne Police S.A.
Air Liquide, 2x1770 MTPY oxygen plant
EPC Project, UAN Storage with loading and unloading facilities, Agrochem Puławy
ALL DESIGN DISCIPLINES

PROZAP’s engineering services encompass all stages of a project. Whether we deal with a completely new, turn-key project, revamping or extension of an existing plant or a New Second Hand Plant type of the job, we are able to cater for all the specific needs of a client. The documentation can be prepared in accordance with the Polish (PN), European (EN) and American standards, including Technical Inspection Office (UDT) code, AD-Merkblätter or ASME/ANSI; as required by the client.

PRE-INVESTMENT

- Feasibility Study
- Location studies
- Investment planning, licensing
- Contract negotiation on behalf of the client
- Technology transfer
- Cost optimalization
- Evaluation of technical condition
- Authority Engineering, including:
  - Preparation of the required technical documentation
  - Submission of documents evaluation and approvals
  - Submission of applications for Building Permits,
  Permits for Use and Integrated Permits on behalf of the Client
- Environmental impact reports
- Technical attachments to contract

DESIGN

- Cost estimates and control
- Chemical processes modeling and simulation
- Complete designs for industrial plants, civil and municipal projects, including:
  - Plot-plan
  - Basic design
  - Civil Engineering
  - Detail Engineering
- Documentation in all disciplines
  - Process and environmental protection
  - Civil
  - Land development
  - Steel structures
  - Piping
  - Vessels and machinery
  - Instrumentation
  - Electrical
  - HVAC
- Documentation checking and approval
CONSTRUCTION

- EPC Contractor
- PMC Contractor
- Project management at the execution stage, including:
  - Supervision over project execution
  - Intermediate and final approvals
- Cost and schedule control
- Subcontractor management
- Management of procurement, including proposal screening and negotiations with vendors
- As-built documentation

START-UP

- Operating and process manuals
- Personnel training
- Engineering supervision
- Mechanical and process start-up

COMPREHENSIVE

SPECIALTY ENGINEERING AT EACH STAGE OF THE INVESTMENT LIFE CYCLE
PROZAP specializes in designs and engineering services related to chemical industry. Our vast, over forty-five-years-long experience includes plants based on natural gas and accompanying utilities. We also specialize in caprolactam, melamine, TDI plants and other installations related to organic chemicals.

**CHEMICALS**
- Ammonia
- Sulphuric and nitric acid
- Ammonium nitrate
- Urea
- Mixed liquid fertilizers (UAN)
- AdBlue
- Technical gases
- Methanol
- Caprolactam
- Melamine
- Toluene diisocyanate (TDI)
- Polyol compounds
- Bioethanol

**ENVIRONMENT PROTECTION**
- Prilling tower / granulator exit air dedusting
- $\text{SO}_2 / \text{NO}_x$ removal from off-gases
- Waste sedimentation and utilization units
FOCUS ON ENVIRONMENT PROTECTION

Emission abatement systems

CLEANING UNIT
Natural environment protection and energy saving – address all of the issues with one solution – the CLEANING UNIT by PROZAP

- Only 800 Pa pressure drop – lowest in the industry
- Approximately 3 times lower energy consumption (compared to sieve trays scrubbers) - significantly reduced operation costs
- High removal efficiency: over 90% of dusts and over 90% of ammonia
- Product retrieval for commercial purposes or recycling to system
- Possible application for $SO_3$, $SO$ and $H_2SO_4$ as vapour and mist removal from sulphuric acid plant and power station off-gases
- Future-proof - compliance of the plant with restrictive environmental regulations today and beyond
- No limitations as to the capacity of the plant and the amount of off-gases to be treated
- Fits well both new and old plants

AS-WFGD
A novel and commercially viable process for flue gas desulfurization by Marsulex Environmental Technologies, USA. An interesting alternative to conventional sulphur removal for sites using feedstock of 2% or higher sulphur content and access to ammonia.

- Ammonia as reagent
- > 98% $SO_2$ removal efficiency
- Product - commercial grade ammonium sulphate
- High (99+%) system reliability
- Commercially proven in full scale for over 10 years
- No waste sludge
- Minimal / no waste water
**EPC: Engineering Procurement Construction**

An EPC contract (a.k.a. LSTK – lump sum turnkey) is commonly preferred formula of cooperation on complex projects when the owner does not require direct control over the execution of the project, on the contrary, the company just needs the plant to be erected so it performs the expected functions, the construction to be on time and within the budget. It is the EPC contractor’s job to make sure the engineering is sound, the right equipment is purchased, the construction is well organized to meet the deadlines, safe and cost-effective, the subcontractors perform as expected and finally the guarantee test is passed and the plant commissioned.

PROZAP offers, i.a. the following services within an EPC contract framework:

- Selection of suitable technology
- General concept studies
- Authority engineering required to obtain Building Permit
- Civil Design
- Basic Engineering
- Detail Engineering in all design disciplines
- Construction (Construction subcontractor)
- Supervision
- Procurement of all necessary equipment
- Commissioning
- Manuals and personnel training
- As Built Documentation

**EPCM: Engineering Procurement and Construction Management**

Within EPCM contract framework, PROZAP’s role is to represent the owner in liaison with authorities, subcontractors and suppliers and oversee the execution of the project in its every aspect. Our main goal is to ensure successful completion of the project.

PROZAP’s usual scope of work as an EPCM contractor includes:

- Preparing comprehensive engineering or managing the preparation of the documentation by engineering subcontractors
- Managing the procurement of equipment, including preparation of inquiries, coordination with the suppliers and tendering
- Selection of the EPC / construction contractor and supervision over erection of the plant
- Participation in tests and commissioning on behalf of the owner
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