Expression of Interest

KORUMA KLOR ALKALİ SAN. VE TİC. A.Ş.

Country	TURKIYE
Name of the organization	Koruma Klor Alkali San. ve Tic. A.Ş. (PIC number 907303275)
Department	**Research and Development Center**
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Koruma Klor Alkali San. ve Tic. A.Ş. (Koruma) established and reorganized in 1994 as agrochemicals and chemicals producer, has been a pioneer in Turkish chemical industry, driven by its commitment to innovation and sustainable growth. Between 2000 – 2006 chlor-alkali facility has been converted to modern membrane technology. In 2015, Koruma founded its R&D Center, which focuses on developing innovative chemicals not produced in Turkiye. The R&D center has successfully completed many projects that reflect Koruma's innovation-driven approach, supporting local production while enhancing global competitiveness. With a strong emphasis on sustainability and green investments, Koruma R&D center continues to contribute to the advancement of the chemical industry and creates added value by local and international projects.

AREAS OF EXPERTISE

Electrolysis Processes

- ✓ Zero-gap membrane electrolysis with low energy consumption

Chemicals Production Process Development

- ✓ Synthesis, development and scale-up of production processes for key chemicals and CCU technologies

Agricultural Chemicals

- ✓ Formulation and process development of fungicides, insecticides, and herbicides for plant protection.

Bio-Based and Sustainable Chemical Technologies

- ✓ Development of bio-based solvents as sustainable alternatives to petroleum-derived chemicals.

- ✓ Lignocellulosic biomass valorization for the synthesis of epoxy resins and polymer-based materials.

Process Simulation, Modeling, and Optimization

- ✓ Implementation of model-based optimization techniques for industrial processes.

Analytical Characterization Techniques

- ✓ Advanced chemical characterization of raw materials and final products using HPLC, GC-MS, FTIR and NMR.
- ✓ Quality control and material performance evaluation for industrial and agricultural applications.

Strategic partnerships with universities, research institutions, and industry leaders through R&D collaborations to accelerate innovation

- ✓ The Scientific and Technological Research Council of Türkiye (**TUBITAK**), Türkiye Agricultural Research and Policies General Directorate (**TAGEM**) and **EU Horizon Program** supported projects.

Sustainable Energy and CO_2 emission reduction

- ✓ Carbon capture and utilization research: chemicals from CO_2
- ✓ Trigeneration plants
- ✓ Solar power plants: total installed capacity of 70 MWp/54 MWe. Koruma Klor Alkali is the company that has made the largest investment in solar power plants within the chemical industry in Turkiye. 55,000 tons/year of carbon dioxide emissions have been prevented.

AREAS OF INTREST

- ✓ Carbon capture and utilization
- ✓ Green and resilient flexible production processes
- ✓ Biomass and bio-based chemicals
- ✓ Electrolysis and electrochemical technologies
- ✓ Process modelling and optimization
- ✓ Contribution as “industrial partner” for pilot or higher scale applications
- ✓ Integrated use of renewable (solar) energy in industrial sites

FUNDED PROJECTS

- ✓ Development of Food Additive grade Solid Calcium Chloride as E509 (funded by TUBİTAK)
- ✓ Development of Synthetic Zeolite 4A for Detergent Production (funded by TUBİTAK)
- ✓ Development of Copper Oxychloride Production Process (funded by TUBİTAK)
- ✓ Development of Manganese Sulfate Production Technology from Low Grade Manganese Ores (funded by TUBİTAK)
- ✓ Development of Monochloroacetic Acid Production Process (funded by TUBİTAK)

- ✓ Synthesis of High Value-Added Bio-sourced Epichlorohydrin from Glycerin (funded by TÜBİTAK)
- ✓ Synthesizing Calcium Hypochlorite Using Domestic Resources and Improving the Production Process (funded by TUBİTAK)
- ✓ Bio-sourced Solvent Production and Process Development as an Alternative to Petroleum-Sourced Solvents (funded by TUBİTAK)
- ✓ Isolation of Lignin from Waste Hazelnut Shells, Enzymatic Depolymerization and Synthesis of Bio-based Polymers (funded by TUBİTAK)
- ✓ Synthesis, Production and Formulation Studies of Herbicide Active Ingredient Benfluralin (Funded by TAGEM)
- ✓ USABLE Packaging: Unlocking the Potential of Sustainable Biodegradable Packaging (**Funded by EU Horizon program**).
- ✓ Energy Storage Through Carbon Dioxide Conversion to Methanol (Funded by TUBİTAK)
- ✓ Electricity Generation from Waste Heat with Innovative Refrigerant Mixture (Funded by TUBİTAK)
- ✓ Value Added Product Development from Lignocellulosic Biomass (Funded by TUBİTAK)

INFRASTRUCTURE

Laboratory Facilities

- ✓ A wide range of laboratory equipments
- ✓ Fume hoods and ventilation systems
- ✓ Karl Fischer titrators, potentiometric titrator, rotary evaporator, vacuum oven, ash oven (muffle furnace), moisture analyzer, densitometers, pH meters, analytical balances, and circulators

Instrumental Analysis Devices

- ✓ GC-MS (Gas Chromatography-Mass Spectrometry)
- ✓ GC-FID (Gas Chromatography-Flame Ionization Detector)
- ✓ NMR (Proton and Carbon-13 Nuclear Magnetic Resonance)
- ✓ FTIR (Fourier-Transform Infrared Spectroscopy)
- ✓ HPLC (High-Performance Liquid Chromatography)
- ✓ AAS (Atomic Absorption Spectroscopy)

Pilot Facilities

- ✓ Equipment for pilot-scale tests
- ✓ A wide range of unit operation equipment with different sizes
- ✓ Pneumatic and spray pilot-scale dryers

- ✓ Glass distillation setup
- ✓ Fume hoods
- ✓ Reactors made of various materials: glass, glass-lined, composite, and stainless stee

R&D Center

Pilot Systems and Lab. Facilities

Electrolysis Plant

Solar Power Plants

Solar Power Plants: Gaziantep-Islahiye 35,5 MWe; Mersin-Mut 6,7 MWe; Uşak- Eşme 3,9 MWe and Rooftop solar systems at Koruma's facilities