

QUESTIONNAIRE

CITRIC ACID PLANT

GENERAL DATA

Client (end user)	
Address, telephone, email	
Project code/name	
Site location	
Responsible project manager	
Form completed by (name, company)	
Date	

1. PROJECT DATA

Provisional time schedule	
Contract award	
Plant start-up	
Implementation of a new plant	<input type="checkbox"/> Yes <input type="checkbox"/> No
Expansion of an existing plant	<input type="checkbox"/> Yes <input type="checkbox"/> No
Budget available	<input type="checkbox"/> No, development of new business case <input type="checkbox"/> Approval pending feasibility study <input type="checkbox"/> Approval pending financing <input type="checkbox"/> Financing approved

2. BASIC DATA FOR PRODUCTION

Production capacity in metric tons per year (minimum 20,000 mtpa)	
Operating time in days per year in continuous process (24 hours per day, 7 days per week)	
Raw material (e. g. beet molasses, cane molasses, hydrolysates, raw sugar) Please provide chemical analysis, if available.	
Required type of citric acid to be produced	<input type="checkbox"/> Monohydrate <input type="checkbox"/> Anhydrous <input type="checkbox"/> Liquid
Product quality requirements For others than listed please provide standard or specification.	<input type="checkbox"/> British Pharmacopoeia <input type="checkbox"/> EU Pharmacopoeia <input type="checkbox"/> FCC <input type="checkbox"/> USP
Desired downstream technology	<input type="checkbox"/> Lime sulfuric acid process (LSA process) <input type="checkbox"/> Chromatographic purification

3. UTILITIES

Process water supply

Secured supply quantity during the whole working time of the factory, m ³ /h	
Quality Please enclose the water analysis, for which the plant shall be designed or make adequate notes at the attached standard analysis.	
Temperature, °C max/min	

Cooling water supply

Secured supply quantity during the whole working time of the factory, m ³ /h	
Temperature, °C max/min	

Power supply

Available voltage up to the main distributing frame in the plant, V / ± V	
Available frequency, Hz / ± Hz	
Connected load, MW	
Typical downtime due to power outages (short time, a few hours, days) and how frequently	

Steam supply

Available steam quantity, t/h	
Steam pressure, bar	
Steam temperature, °C	
Distance to existing steam boiler, m	

4. BUILDING SITE

<p>Available area for erection of the plant Please adjoin map to this questionnaire.</p> <p>Altitude of the site above sea-level, m</p> <p>Seismic factor</p>	
<p>Climatic conditions on site</p> <p>Outdoor temperature, °C min/max</p> <p>Relative humidity, % min/max</p> <p>Wet bulb temperature, °C min/max</p> <p>Special conditions (floodwater, rainfall, wind velocity, snow loads)</p>	

Storage Capacities Available/required capacities for Raw material, mt or weeks Citric acid, mt or weeks	
Logistics Kind of supply to and dispatch from plant	<input type="checkbox"/> Rail <input type="checkbox"/> Road
Buildings Please provide plans of existing buildings, if available.	

5. SCOPE OF SUPPLIES AND SERVICES REQUESTED

License, engineering and know-how	
Equipment (FCA, CIP)	
Supervision services (erection, start-up)	
Training	

6. BASIC DATA FOR FEASIBILITY CALCULATIONS (to be filled in only if required by customer)

Expected plant's production share of citric acid for domestic market, mt / year	
Expected price (domestic) ex factory, mt	
Expected plant's production share of citric acid for export markets, mt / year	
Expected price (export) ex factory, mt	

Raw Material: costs per unit

Kind of raw material, mt	
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Chemicals, technical quality: costs and unit

Lime, 60 - 70% CaO	
Sulfuric acid, 94 - 96% H ₂ SO ₄	
Hydrochloric acid, min. 31% HCl	
Caustic soda solution, min. 50% NaOH	
Ammonium nitrate, min. 98% NH ₄ NO ₃	
Magnesium sulphate, min. 98,5% MgSO ₄	
Zincum sulphate, min. 98,5% ZnSO ₄	
Potassium ferrocyanide, min. 98% K ₄ Fe(CN) ₆ ·3H ₂ O	
Potassium dihydrogen phosphate, min. 98% KH ₂ PO ₄	

Utilities: costs per unit

Electricity supply, kWh	
Steam (saturated), mt	
Fuel, kJ	

Salaries and wages: costs per man-month

Plant manager	
Biotechnologist / chemical engineer	
Engineer	
Foreman	
Skilled personnel	
Unskilled personnel	