

SPECIFICATION OF RAW MATERIALS AND UTILITIES

1. Demineralised water

Parameter	Unit	Value
pH		6.5÷7.5
Silicon as SiO ₂	mg/L	max 0.02
Iron as Fe	mg/l	max 0.01
Conductivity	µS/cm	max 1

2. Hydrogen gas

Parameter	Unit	Value
Hydrogen H ₂	% vol.	min 99.9
Oxygen O ₂	% vol.	max 0.1
Water H ₂ O	-	saturation
Temperature	°C	of the ambient
Pressure	kPa (g)	approx. 2.5

3. Chlorine gas after cooler E141 (primary stream)

Parameter	Unit	Value
Chlorine Cl ₂	% vol.	min 96
Oxygen O ₂	% vol.	max 2.8
Inerts	% vol.	max 1.0
Water H ₂ O	% vol.	max 1.5
Temperature	°C	min 37
Pressure	kPa	approx. 20

4. Chlorine gas after cooler E1602 (secondary stream)

Parameter	Unit	Value min	Value max
Chlorine Cl ₂	% vol.	31	68
Oxygen O ₂	% vol.	16	62
H ₂	% vol.	0.01	3
CO ₂	% vol.	0.1	10
N ₂	% vol.	0,13	14
H ₂ O		0.0	
		Value	
Temperature	°C	approx	
Pressure	kPa	min 200	max 320

5. Cooling water

Parameter		Unit	Value
Supply pressure		MPa (g)	Min. 0.3
			Max. 0.58
Return pressure		MPa (g)	Min. 0.1
			Max. 0.25
Supply temperature / Return temperature		°C	Min 19 / Min 29
			Norm 25 / Norm 35
			Max 27 / Max 37
pH			7.8÷8.4
Calcium hardness		mval/L	1÷20
M-basicity		mval/L	1÷6
Silica		mg/L	max 120
Iron Fe		mg/L	max 2.5
Suspension		mg/L	max 15
Conductivity		μS/cm	max 3,500

6. Low-pressure nitrogen

Parameter	Unit	Value
Pressure	MPa (g)	Min 0.5
		Norm 0.6
		Max 0.68
Temperature	°C	Min -20
		Norm 25÷38
		Max 50
Composition:		
Nitrogen	mol %	Min 99.1
Oxygen	mol %	max 0.1
Dew point in weather conditions	°C	-70

7. Instrument air

Parameter	Unit	Value
Pressure	MPa (g)	min 0.5
		norm 0.6
		max 0.73
Temperature	°C	Min of the ambient
		norm 38
		max 40
Dew point 0 bar g	°C	-40

Parameter	Unit	Value
		Oil-free, dry, dust-free

8. Technical air

Parameter	Unit	Value
Pressure	MPa (g)	min 0.5
		norm 0.6
		max 0.7
Temperature	°C	Min of the ambient
		norm 38
		max 40
Dew point 0 bar (g)	°C	-30
		Oil-free, dry, dust-free

9. Electric energy

Parameter	Value	Notes
Voltage	10KV ±10%	Supply of rectifiers and transformers
Transformers	10/0.69kV or 10/0.4kV motor	
	690V ± 10%	
	230/400V ± 10%	
Frequency	50Hz	
	10 kV	
Emergency power supply	Power generator, Diesel	Emergency power is available 10 s after a power failure
	500V	
Transformer type	> 300kVA	Oil-filled transformer
	300kVA	Dry transformer

10. Electric energy

Parameter		Value	Notes
Engine	Power range	< 315 kW	Insulated
	Voltage	690 V	
	Phase	3 phases	
Engine	Power range	> 315 kW	Insulated
	Voltage	10 kV	
	Phase	3 phases	
Lighting	Voltage	400/230V	Insulated

Parameter		Value	Notes
	Phase	3/1 phase	
Instrumentation DCS	Voltage	230 V	with UPS
	Phase	1 phase	
Instrumentation	Voltage	24 V DC	with DCS
	Phase	1 phase	

11. Eyewash water

Parameter	Unit	Value
pH	-	7.0 ÷ 8.0
tw _{og} (as CaCO ₃)	mg/dm ³	< 450
Fe	mg/dm ³	< 0.10
Mn	mg/dm ³	< 0.05
Cl-	mg/dm ³	30 ÷ 50
N-NH ₄	mg/dm ³	0.15 ÷ 0.40
SO ₄ -2	mg/dm ³	60 ÷ 80
Obscurity	NTU	< 1
Pressure	MPa	0.3 ÷ 0.35 ¹
Temperature	°C	~10 ÷ 15 ²

1– measurement of the pressure in the drinking water pumping station

2– temperature at the outlet of the drinking water pumping station