EREMA®
PLASTIC RECYCLING SYSTEMS

consumption of utilities for production

V 6.7

project: P-20240199
product: INTAREMA® 1714 DuaFil® Compact
application 1: LDPE, LLDPE max. 1.550 kg/h

city water

temperature max. 25 °C

position in layout inlet	position in layout outlet	description	remark	consumption l/h	pressure bar
G	/	water injection into PCU (pre-conditioning unit)		18,0	2,5 - 4
N1	O1	BWB: Water consumption to reduce water exchange interval	①,②	84,0	2,5 - 4
N1	O1	BWB: Water consumption due to evaporation in pump	③, ④	20,0	2,5 - 4
N2	O2	pelletising system		45,0	2,5 - 4
			total	167,0	

remark

① To ensure that the water quality is retained for longer, the process water tank is equipped with an adjustable fresh water flushing. To attain a water exchange, the fresh water valve is opened between 0% and 33% (corresponds at 2 bar max. 27m³/day) of the operating time (time adjustable). If the value is set 0%, the fresh water flushing is switched off!

② The cleaning cycle of the closed circuit for operating water of vacuum pump is a manual operation (not automatic mode). The consumption per cleaning cycle is around 200 liters (53 gal). The interval depends on the contamination of the feeding material. Under normal usage, you need to clean the tank every 200 – 1000 operating hours.

③ The water tank (closed circuit for operating water of vacuum pumps) should be positioned in the same level than the vacuum pump (max. 500 mm higher). The backflow of the process water into the closed circuit for operating water of vacuum pump needs to be unpressurised.

④ Some of the extracted substances out of the degassing unit will dispose in the process water. Which kind of substances and the quantity of it depends on the contamination of the feeding material (requires empiric validation). Please contact you local administration to determine how to treat your waste water.

chilled water

temperature 10 - 25 °C

position in layout inlet	position in layout outlet	description	flow m³/h	cooling cap. kW	pressure bar
E	F	INTAREMA: gearbox & barrel cooling extruder	4,0	40,0	2,5 - 4
E	F	electric cabinet on main frame	0,6	0,4	2,5 - 4
S1, S2	T1, T2	external electric cabinet	2,0	9,0	2,5 - 4
L	M	WPS: pellet or strand cooling	30,0	242,0	2,5 - 4
		total	36,6	291,4	

remark

- To ensure chilled water circulation, there needs to be a sufficient pressure gradient between in and outlet.
- After finishing the installation and commissioning all chilled pipes have to be isolated, in order to prevent the condensation (condensation can damage electrical components).

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chilled water

temperature max. 12 °C

position in layout inlet	position in layout outlet	description	flow m³/h	cooling cap. kW	pressure bar
W	X	BWB: closed water circuit for vacuum pump(s)	2,6	9,4	2,5 - 4
		total	2,6	9,4	

remark

- To ensure chilled water circulation, there needs to be a sufficient pressure gradient between in and outlet.
- After finishing the installation and commissioning all chilled pipes have to be isolated, in order to prevent the condensation (condensation can damage electrical components).

compressed air

position in layout inlet	position in layout outlet	description	remark	consumption m³/h	pressure bar
C	/	conveyor belt (level sensor)		1,80	2,5 - 4
C	/	valve for vacuum pump(s)	②	0,00	2,5 - 4
C	/	melt pump sealing		2,10	4 - 6
C	/	pelletizing system	②	0,00	2,5 - 4
C	/	PSC: througput scale		0,01	7 - 8
C	/	piping: granulate pipe switch	①	0,00	7 - 8
C	/	BigBag station: granulate pipe switch	①	0,00	7 - 8
			total	3,91	

remark

- Machines ≥ 1006 are equipped with a central compressed air connection, required supply pressure: 8 bar
  The specified pressure range is set by means of pressure reducers provided by EREMA at the respective component

① consumption per switch: 1 liter at 6 bar (0,26 gal at 87 psi)
② consumption per machine start or stop: 1 liter at 6 bar (0,26 gal at 87 psi)

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electric data

position in layout				remark
	<< POWER GRID 1 >>			
	main supply:	400	V (AC)	
	frequency:	50	Hz (+/-2%)	
	control voltage:	24	V (DC)	①
	rated current:	1277	A (+/-10%)	
	rated power (full load):	788	kW (+/-10%)	②
	starting current:	3437	A for 30 sec	③
B	max. backup fuse:	1600	A gG	④
	prospective short-circuit current at the point of supply:	25	kA	

remark

- According to EN 61800-3 the plant is designed for operation in the 2nd environment (industry) in category C3

① The control voltage is generated from the electric equipment included in the scope of supply
② value is not suitable for calculation of kWh/kg
③ Normally only a short peak. The run-up takes approx. 7-10 sec. (motor protection class 20), 30 sec. are necessary for choice of a selective backup fuse
④ The backup fuse has to be supplied by customer and defined in accordance to the local regulations and on the basis of the rated current & plant starting current.

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other connection point for utilities or emissions

position in layout		Network cable for internet connection	Upload-	Download-	speed
NET		Smart Communicator	≥ 20	≥ 20	Mbit/s
position in layout		drain	remark		per stop
inlet	outlet				l
/	O1	BWB: water overlet	⑥		
/	P	GS: water overlet	⑥		
/	R	centrifugue: pellet residual moisture	⑥		
		Condensat heat exchanger of e-cabinets	⑧		
position in layout		aspiration (air / dust / vapour)	remark		air volume
inlet	outlet				m³/h
/	/	SAS 2500: exhaust air			2500
/	Z	TROX Exhaust Unit: exhaust air	①,⑤		10000
/	H1, H2	BWB: exhaust air of vacuum pump(s)	①,⑤,⑦		120
/	/	recommended suction hood(s) ②	②		

remark

① If there is no suction system included in EREMA´s scope of supply, a suitable suction system has to be supplied by customer.
② Even when it's not mandatory, we recommended to use a suitable suction system in the surrounding of the melt filter as well as the down stream equipment to collect emissions of melting plastic and steam.
⑤ wet aspiration required
⑥ Consumption varies depending on process conditions. I.e. water quality, evaporation,…
⑦ Due to high humidity some kind of water drainage is recommended.
⑧ condensate drain / collection box necessary
• It is assumed that the exhaust air as well as the wastewater is contaminated with a high probability by hydrocarbons and microplastics.

All mentioned consumption and emission data are based on maximum throughput.
The specified coolant flow refers to the maximum permissible temperature of the coolant.
The consumption and emission data may vary dependent on operation conditions. Possible influencing values i.e. are: input material properties (humidity, contamination,..) througput, filtration, process parameters,…
Cooling curcuits can be closed completely, so an installation of a bypass is recommended.
EREMA expects that on customer side, the media supply piping's are equipped with shutoff-valves to ensure a safe separation of the line from the media supply net.

Specification of utilities

For the connections and operation, the below data shall be considered, depending on the machines execution and executed options:

1. City water:

Total hardness	7 - 14°dH ①
Conductivity	100 - 800 µS/cm
Alkalinity (pH-value)	7 - 8,5
Chlorides	≤ 150 mg/l
Sulfates	< 180 mg/l
Nitrates	< 20 mg/l
Ammonium Nitrogen	< 20 mg/l
Phosphates	< 10 mg/l
Iron	< 0,2 mg/l
Carbonate hardness	< 20°dH ①
Suspended and settle able solids	≤ 10 mg/l
Grain size	≤ 20 µ
Oxygen concentration in cold water	< 0,1 g/m³
Oxygen concentration in warm water	< 0,02 g/m³

2. Chilled water:

pressure difference inlet - outlet	> 1,6 bar
Carbonate hardness	>3 <8 °dH ①
Free carbon dioxide	8 - 15 mg/l
Accomplying carbonic acid	8 - 15 mg/l
Agressive carbonic acid	0 mg/l
Sulphides	free
Oxygen	< 10 mg/l
Conductivity	< 2200 µS/cm
Alkalinity (pH-value)	7 - 8,5
Chlorid-Ions	< 50 mg/l
Sulfate-Ions	< 250 mg/l
Nitrates and Nitrites	< 10 mg/l
COD	< 7 mg/l
Ammonia	< 5 mg/l
Iron	< 0,2 mg/l
Manganese	< 0,2 mg/l
Residue on evaporation	< 500 mg/l
Potassium permanganate consumption	< 25 mg/l
suspended matter	< 3 mg/l
	> 3 mg/l -> water filter required

3. Compressed air:

Dew point temperature	7 °C ②

Quality: oil free, dust free, condensate free, pre-filtered

4. Nitrogen (N2):

temperature	ambient
pressure fluctation	+/- 0,5 bar
atm. dew point	-40 °C
purity	≥99,5%

5. Electrical energy:

The electrical equipment of our plants corresponds with the recommendations of IEC (International Electric's Commission) and with VDE regulations.

6. further utilities specification:

For purchased components such as twin screws, motors and frequency converters, this specification is a guideline. In principle, the requirements of the manufacturer apply to these units and are transmitted in the appendix to this specification or separately.

① … 1°dH = 1.787 French hardness = 1.25 Engl. hardness
② … Class 5 according DIN ISO 8573-1

All indications refer to sea level and normal atmospheric conditions. Any deviations there from may influence the quality of the pellets (cleanness) and the maintenance intervals (calcifying and eventual corrosion) as well as the life time of electrical components (voltage fluctuation).

Exclusions from supply

The customer shall provide the following:

1. Utilities and energy:

1.1 All energy supply lines as well as their safety equipment (filter, valves, etc.) concerning electric energy, compressed air, steam and cooling water from the central mains provided by the customer to the connecting points of the individual plant components; furthermore, disposal lines for the aforementioned media.

1.2 All equipment required to guarantee and / or cover the necessary constant energy supply.

2. Foundations:

2.1 All foundations for plant and plant components; leveling, aligning and fastening of plant components, if necessary; guide rails, etc. at bay floor level.

2.2 All covers and supports for pipelines; platforms, ladders, railings, stairs, if required.

- The plant components supplied in accordance with this contract are shipped without access platforms. It is the purchaser's responsibility to have access platforms fabricated locally according to the on-site situation and in compliance with the CE standard in addition to any local standards where applicable.
- It is therefore agreed in this contract that, according to the CE standard, EREMA doesn´t supply a complete plant; only the components of a plant.
- EREMA hereby confirms, however, that all plant components supplied under this contract fulfill all requirements of the CE standard. The purchaser is solely responsible for completion of the plant to conform to the CE standard by providing the necessary CE-compliant access platforms.
- If requested, EREMA could make plans available for fabricating access platforms to conform to the CE standard, or could also supply the necessary access platforms complete, for an extra charge.
- In such a case, detailed and binding information relating to the on-site situation of the location where the plant components are to be installed, need to be provided in sufficient time.

2.3 All necessary above ground and underground electric cables and ducts, as well as their covers, rails and fixtures.

2.4 All equipment for air conditioning, ventilation, fumes and dust extraction, room-heating and lighting as well as all measures to be taken for noise level reduction according to the local valid regulations.

3. Erection and start-up:

3.1 All costs incurred in connection with erection and start-up.

3.2 All erection tools, hoists, ropes. Preservation of all deliveries stored on site against climatic and mechanical influences. Insurance and / or guarding of plant components and spare parts stored on site against theft, willful destruction and other influences (force majeure).

4. Local safety provisions:

4.1 All safety equipment in accordance with the local regulations, such as grounding, lightening protection, protective grates, covers, fire protection, etc.