

LIST OF REQUIREMENTS AND RECOMMENDATIONS

MODELS		MIRAI Cold 10 (MC 10 O/W)	
		MIRAI Cold 15 (MC 15 O/A)	
		MIRAI Cold 22 (MC 22 O/W)	
POWER SUPPLY		~3 PE+N, 400 V, 50 Hz	
POWER SUPPLY CABLE	MC 10, MC 15	Not smaller than 5 x 10 mm ²	
	MC 22	Not smaller than 5 x 16 mm ²	
MAXIMUM ALLOWED VOLTAGE DROP		5 V	
MAXIMUM CURRENT	MC 10, MC 15	63 A	
	MC 22	80 A	
MACHINE ROOM AMBIENT TEMPERATURE		From +5 °C to +35 °C (different temp. after approval)	
WATER COOLED MIRAI COLD OPEN CYCLE (O/W)			
COOLING WATER TEMPERATURE		From +6 °C to +30 °C (lower temp. possible)	
COOLING WATER PRESSURE		Recommended 3 barg (maximum 4 barg)	
COOLING WATER MASS FLOW	MC 10	MIN – MAX	1 200 kg/h – 4 000 kg/h
		Recommended	2 000 kg/h
	MC 22	MIN – MAX	2 000 kg/h – 8 000 kg/h
		Recommended	3 000 kg/h
COOLING WATER PRESSURE DROP		80 kPa	
ADDITIONAL EQUIPMENT NEEDED FOR OPERATION (not offered by Mirai Intex)		Dry cooler / chiller (depending on water temperature used)	
		Circulation pump	
		Expansion tank	
IMPORTANT NOTES		Corrosion inhibitors are required*	
		Water purity must be controlled (see following section)	
HYDRAULIC RESISTANCE OF ALL EQUIPMENT INTEGRATED BETWEEN	RM OUTLET AND COLD ROOM	300 Pa	
	COLD ROOM AND RM INLET	50 Pa	
AIR COOLED MIRAI COLD OPEN CYCLE (O/A)			
COOLING AIR TEMPERATURE		From -25 °C to +40 °C	
COOLING AIR MASS FLOW	MC 15	MIN	1800 m ³ /h
ADDITIONAL EQUIPMENT NEEDED FOR OPERATION		Air Box (with fan, filter silencer, pressure sensors, air duct)	
END-COOLER PRESSURE LOSS**		900 Pa	
NOMINAL AIR FLOW**		2 200 m ³ /h	
RECOMMENDED FAN WITH OPERATING POINT AT LEAST**		2 200 m ³ /h @ 1300 Pa	
HYDRAULIC RESISTANCE OF ALL EQUIPMENT INTEGRATED BETWEEN RM CONNECTING PIPING AND COOLING CHAMBER		Maximum 2 000 Pa	
SNOW CATCHER (HED - HUMIDITY EXTRACTION DEVICE)			
WIDTH (= minimal cold chamber width)	MC 10	820 mm*** / 1635 mm****	
	MC 15	1600 mm*** / 2033 mm****	
	MC 22	1600 mm	
DEPTH (to be considered with small cold room)	MC 10	223 mm	
	MC 15, MC 22	245 mm	
HED COVERED WITH ADDITIONAL WALL		Minimal distance between HED and cover wall 50 mm****	
MIRAI COLD CONNECTION WITH HED DESIGN WALL THICKNESS		200 mm (smaller compensated by plates, larger to be discussed)	
ICE REMOVAL (DRAIN SIGN ON THE DRAWINGS)		Drain or vessel to collect melted ice below conveyor motor	
ICE MELTING		Heating cable to melt ice faster (delivered with machine)	

COLD CHAMBER		
AIR MASS FLOW TO CALCULATE AIR DUCTS CROSS SECTION (Values are nominal mass flow increased by 20%)	MC 10	660 kg/h
	MC 15	1 300 kg/h
	MC 22	1 560 kg/h
SAFETY VALVE BETWEEN CHAMBER SECTIONS		Resistance 100 Pa, size Ø 200 mm
SAFETY VALVE FROM CHAMBER TO OUTSIDE		Resistance 100 Pa, size Ø 200 mm
RECOMMENDED SAFETY VALVE LOCATION		In line with HED conveyor drain
CHAMBER DOOR		Ensure tightness to withstand pressure increase 1 kPa
CUTTING HOLES (SEE DRAWINGS COLD CHAMBER PREPARATION)		Specified holes must be cut in order to connect MC and HED

* If copper pipes are used gaskets between the joints and additives in the coolant are necessary
 Recommended and tested additive is Delo XLI Corrosion Inhibitor in 6 % concentration

** Data needed for fan section. Fan selection also depends on the air duct design, air duct length, filters, grills and valves used

*** The smallest internal dimension to fit respective Snow Catcher

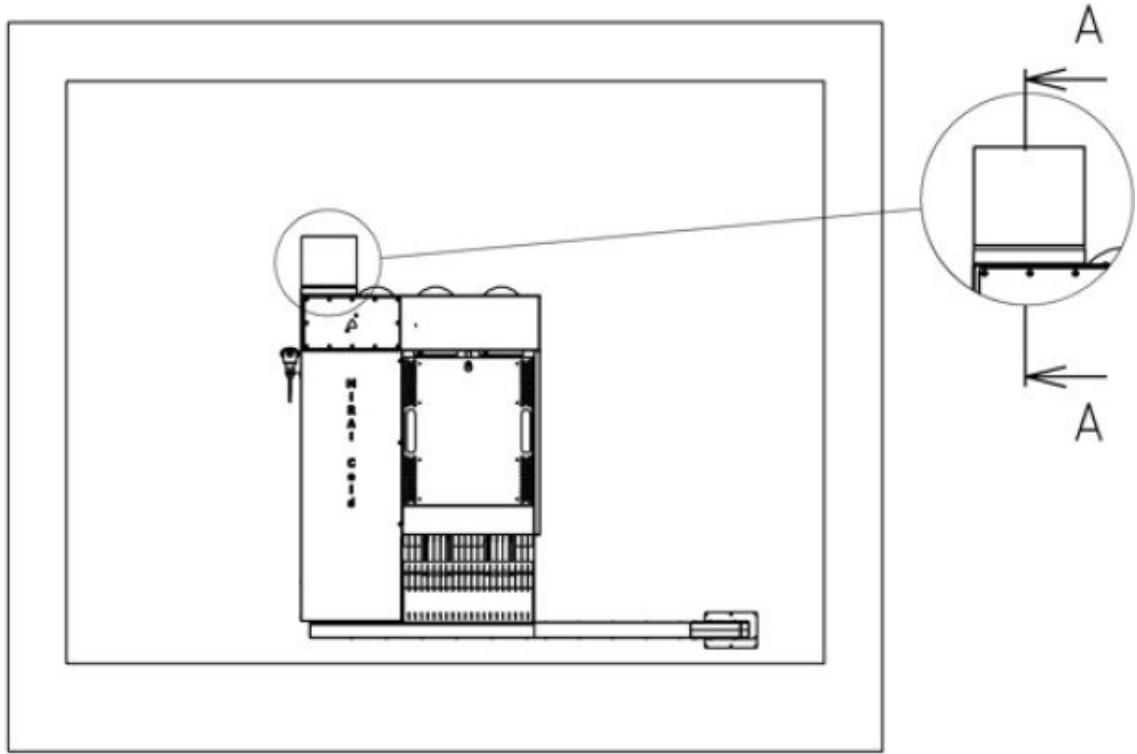
**** It is not mandatory to fit transporter inside the chamber as illustrated below in addition optionally transporter can be excluded

***** Snow Catcher must be accessible when covered by additional wall

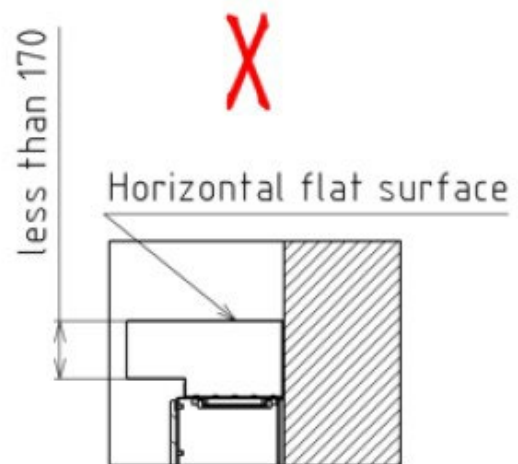
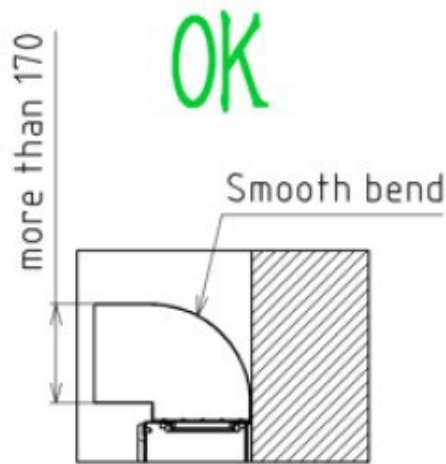
WATER QUALITY REQUIREMENTS

WATER CONTENT	CONCENTRATION [mg/l] or [ppm] or [-]	VALUE
Alkalinity (HCO ₃ ⁻)	70 - 300	
Sulfate (SO ₄ ²⁻)	< 70	
HCO ₃ ⁻ / SO ₄ ²⁻	> 1	ratio
Electrical conductivity	10 - 500 µS/cm	
pH	7.5 - 8.5	
Ammonium (NH ₄ ⁺)	< 2	
Chlorides (Cl ⁻)	< 25	
Free chlorine (Cl ₂)	< 0.5	
Oxygen	< 0.02	
Hydrogen sulfide (H ₂ S)	< 0.05	
Free (aggressive) carbon dioxide (CO ₂)	< 5	
Total hardness (°dH)	7.0 - 8.5	
Nitrate (NO ₃ ⁻)	< 100	
Iron (Fe)	< 0.2	
Aluminum (Al)	< 0.2	
Manganese (Mn)	< 0.1	
Particles	< 40 µm < 1 mg/l	
Oil and grease	< 1	

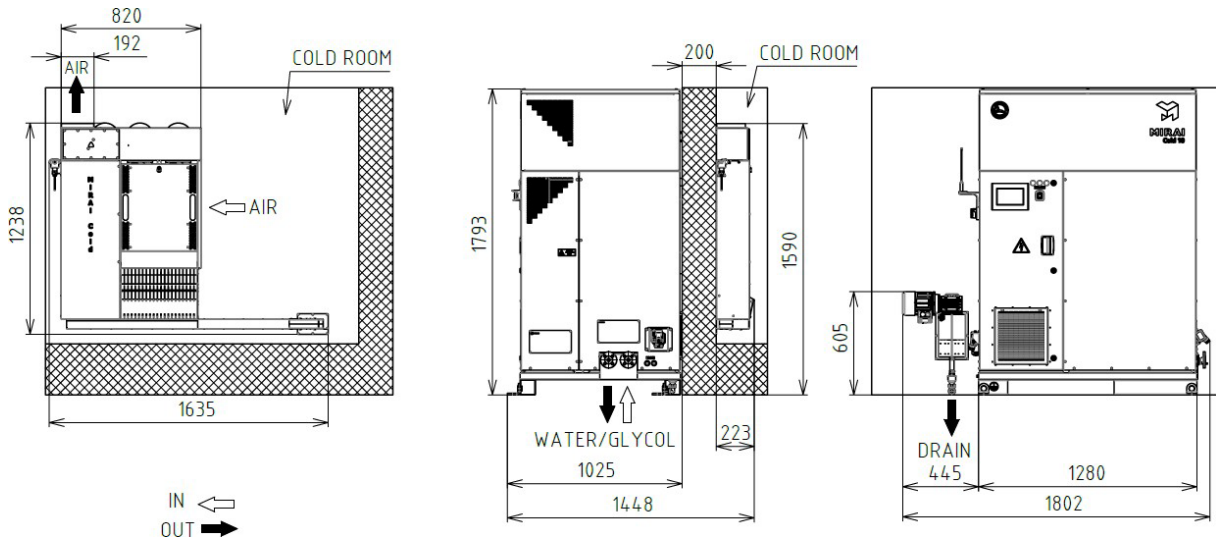
MIRAI COLD 10 O/W AIR DUCT DETAILS



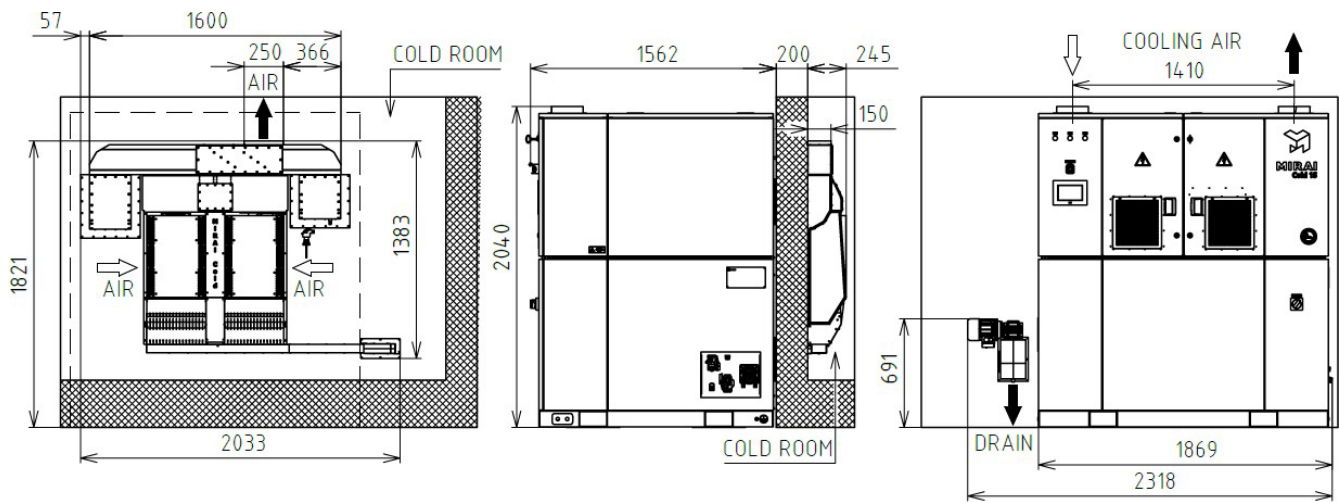
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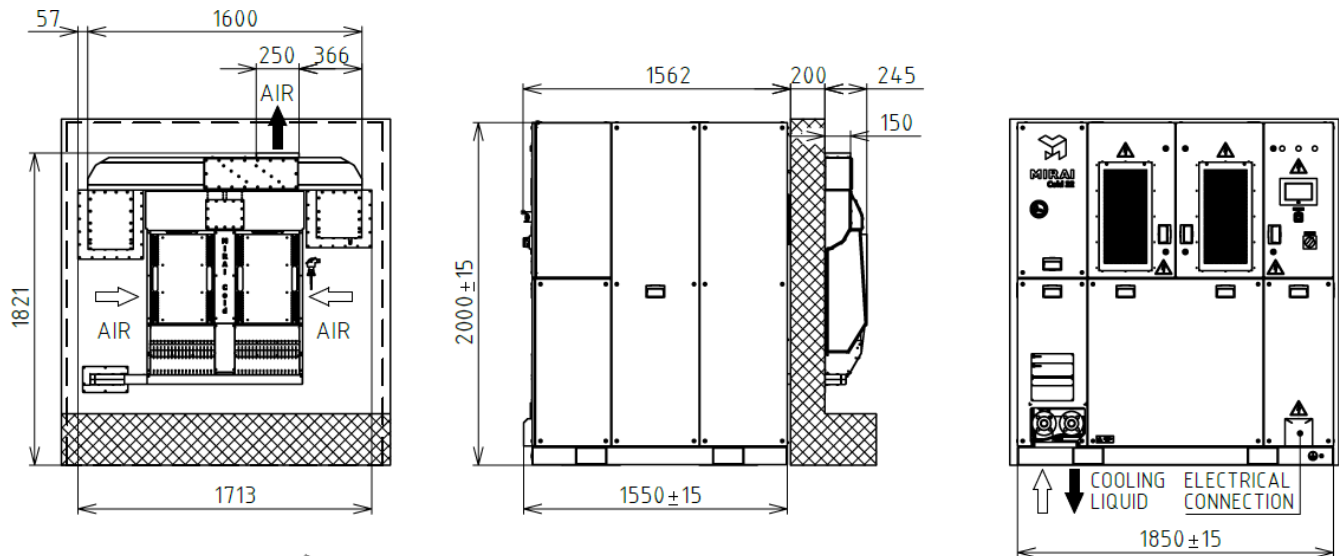
MIRAI COLD 10 O/W SNOW CATCHER



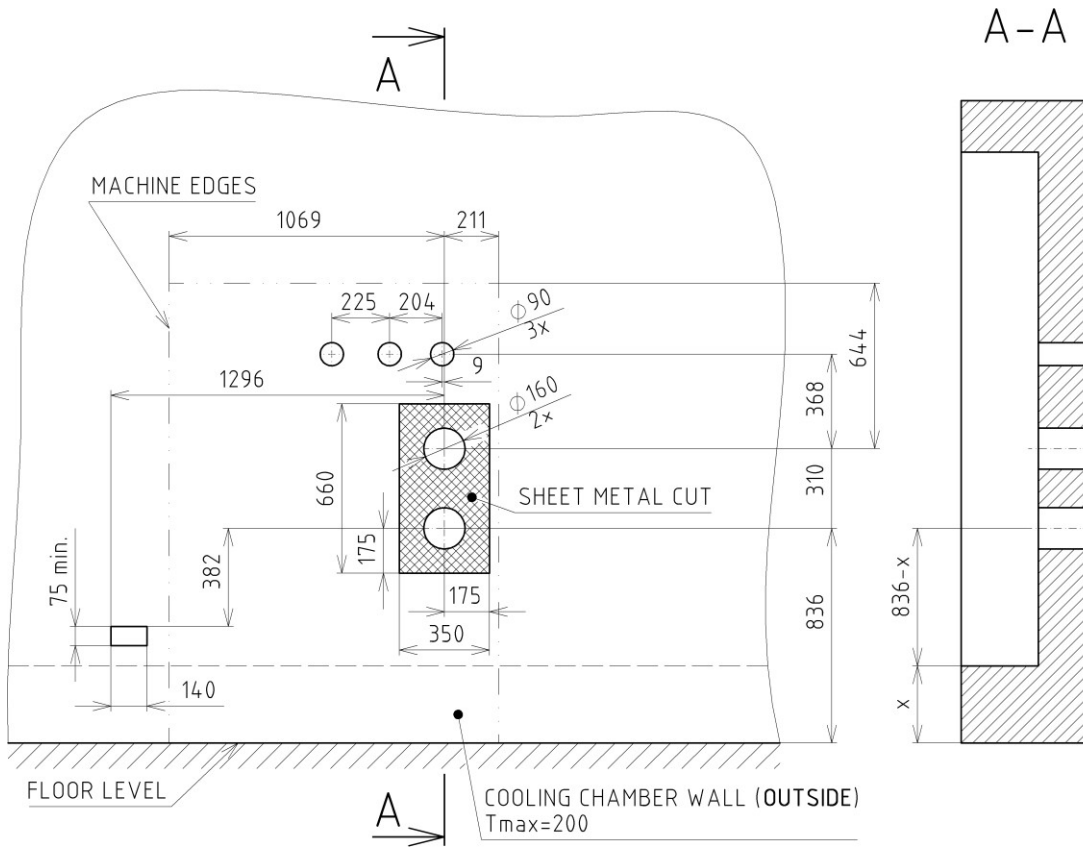
MIRAI COLD 15 O/A SNOW CATCHER



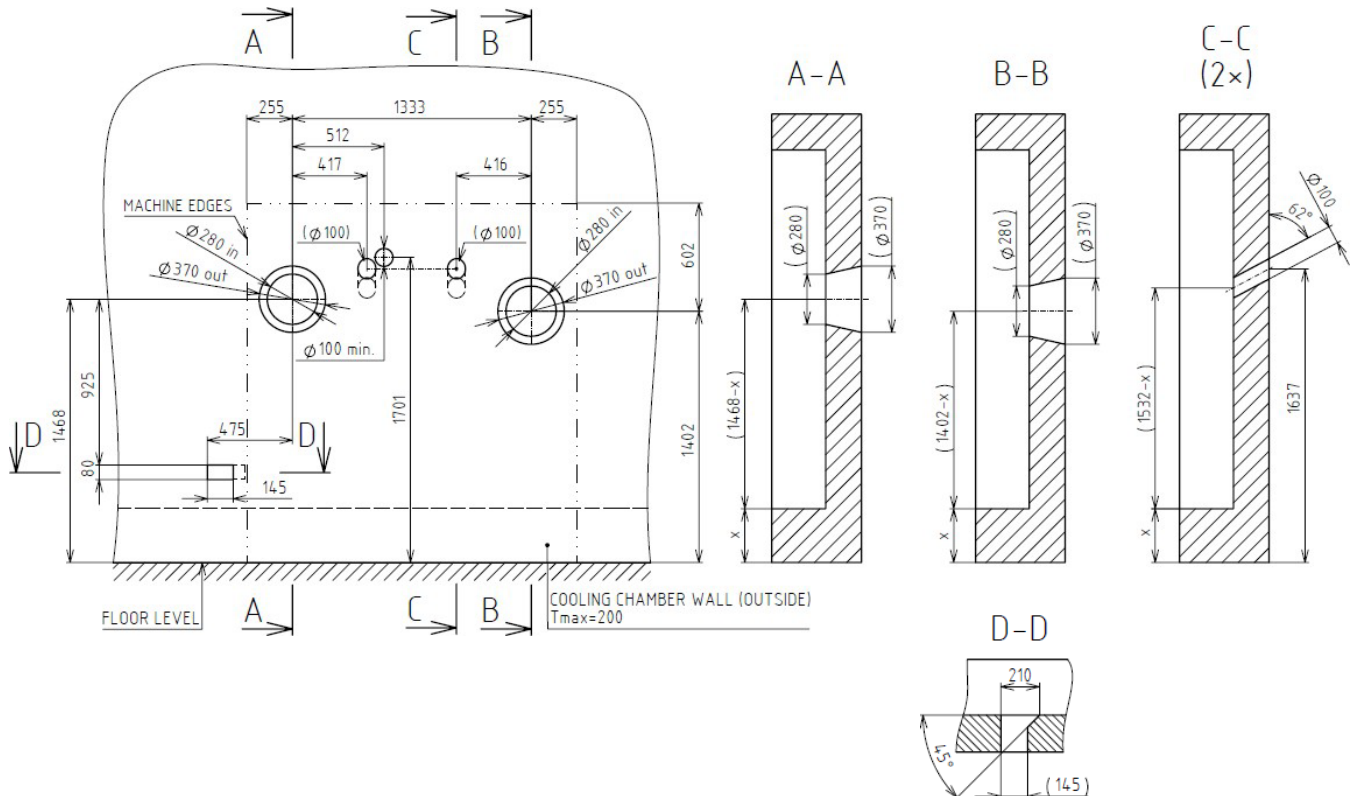
MIRAI COLD 22 O/W SNOW CATCHER



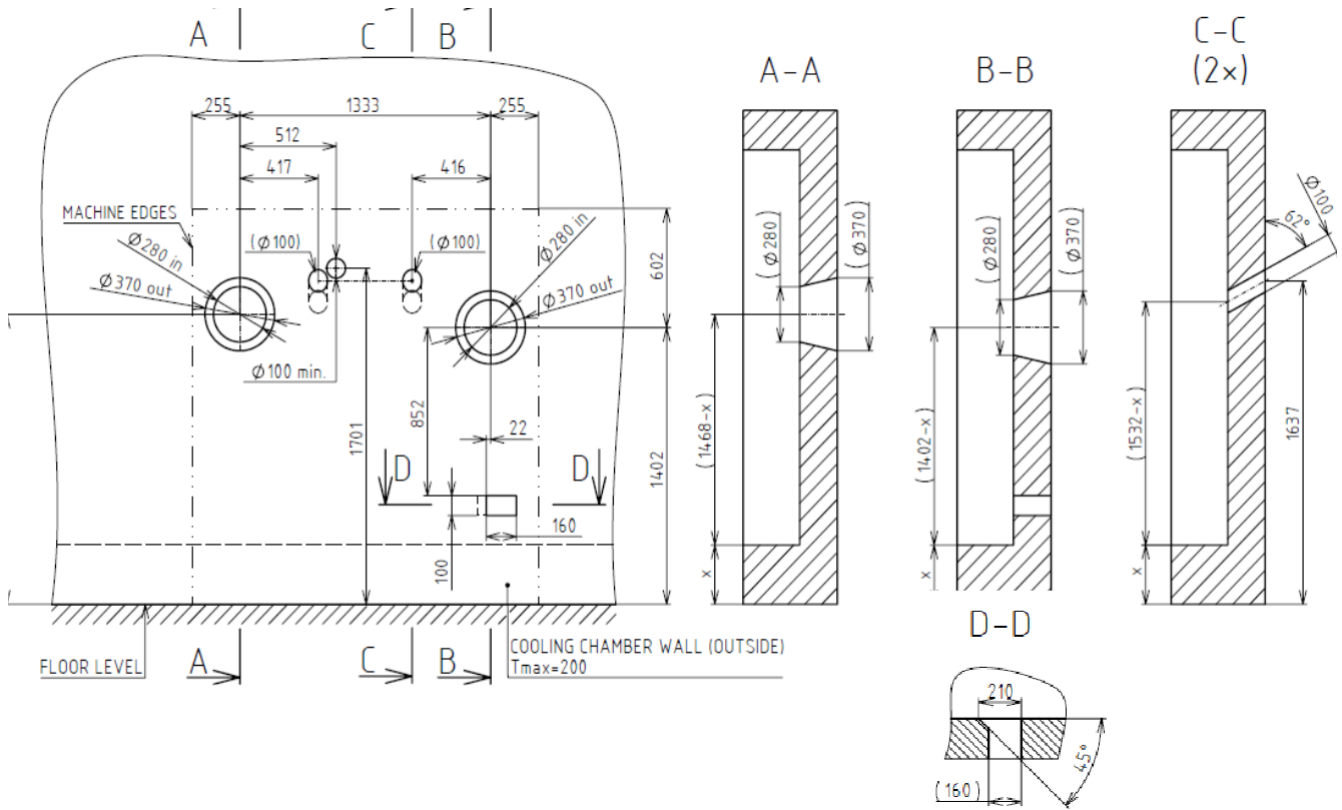
MIRAI COLD 10 O/W COLD CHAMBER PREPARATION



MIRAI COLD 15 O/A COLD CHAMBER PREPARATION



MIRAI COLD 22 O/W COLD CHAMBER PREPARATION



MIRAI COLD 10 SERVICE SPACE

MIRAI COLD 15 O/A, MIRAI COLD 22 O/W SERVICE SPACE

