

General Guide for How to Choose a PLASTEK Water Chillers

1. How to calculate required Cooling Capacity:

C = required cooling capacity (kcal/hr)

D = throughput of raw material (kg/hr) x specific heat of raw material

T3 = melt temperature of raw material (°C)

T4 = temperature of ejected moulding component (°C)

$$C = D \times (T3 - T4) \div 0.8 \text{ (safety factor)}$$

[Example] D = 100 kg/hr, T3 = 200 °C(ABS), T4 = 50 °C

Required cooling capacity

$$= 100 \times 0.34 \text{ (ABS)} \times (200 - 50) \div 0.8$$

$$= 6400 \text{ kcal/hr}$$

2. How to calculate required Pump Capacity:

E = required pump capacity (litre/minute)

F = approx. medium volume in the cooling chamber of mould (litre)

G = approx. medium volume in the connection hoses between mould and heater (litre)

$$E = (F + G) \times (10 \sim 20)$$

3. Differences between Air-cooled and Water-cooled Chiller:

For achieving best cooling efficiency the air-cooled chiller is recommended to use at an ambient temperature under 30°C, therefore for application at ambient temperature of 30°C and up we normally recommend the water-cooled chiller. If you insist to use air-cooled chiller for application at ambient temperature of 30°C and up you should choose to use the next larger model based on the required cooling capacity.

4. General Experience:

To obtain refrigerating tonnage according to moulding machine tonnage simply divide machine tonnage by 80, for example 5RT (1RT = 3,024 Kcal/hr = 12,000 BTU/hr) will be required for a 400 ton machine; or to obtain the same according to injection weight simply divide injection weight (ounce) by 6, for example 5RT will required for a machine with 30 ounce injection weight.

Note: Normally only mould is required to be cooled by the water chillers, hydraulic oil and injection barrel shall be cooled by the cooling tower only, because of different temperature required.

5. How to choose required Cooling Tower

Required cooling capacity of the cooling tower shall be 1.5 times of the chiller's providing it is used for cooling of chiller only, 2.5 times shall be required if it is used for also hydraulic oil and even injection barrel.

Remark: Above calculation formulas are for reference as a guideline only and should however pay high respect to the field application experiences.