

Cooling Water (Reference Items)

Test Item	Cooling Water System			Cold Water System		Hot Water System				Tendency Indicator	
	Recirculating		Once-Through			Low-Medium Temp.		High-Medium Temp.			
	Circulating Water	Makeup Water	Once-Through Water	Circulating Water ($\leq 20^{\circ}\text{C}$)	Makeup Water	Circulating Water ($20-60^{\circ}\text{C}$)	Makeup Water	Circulating Water ($60-90^{\circ}\text{C}$)	Makeup Water	Corrosion Tendency	Scale Formation Tendency
Iron (mg/L as Fe)	Not more than 1.0	Not more than 0.3	Not more than 1.0	Not more than 1.0	Not more than 0.3	Not more than 1.0	Not more than 0.3	Not more than 1.0	Not more than 0.3	○	○
Copper (mg/L as Cu)	Not more than 0.3	Not more than 0.1	Not more than 1.0	Not more than 1.0	Not more than 0.1	Not more than 1.0	Not more than 0.1	Not more than 1.0	Not more than 0.1	○	
Sulfide (mg/L as S^{2-})	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	○	
Ammonium Nitrogen (mg/L as $\text{NH}_4\text{-N}$)	Not more than 1.0	Not more than 0.1	Not more than 1.0	Not more than 1.0	Not more than 0.1	Not more than 0.3	Not more than 0.1	Not more than 0.1	Not more than 0.1	○	
Residual Chlorine Concentration (mg/L as Cl)	Not more than 0.3	Not more than 0.3	Not more than 0.3	Not more than 0.3	Not more than 0.3	Not more than 0.25	Not more than 0.3	Not more than 0.1	Not more than 0.3	○	
Free Carbon Dioxide (mg/L as CO_2)	Not more than 4.0	Not more than 4.0	Not more than 4.0	Not more than 4.0	Not more than 4.0	Not more than 0.4	Not more than 4.0	Not more than 0.4	Not more than 4.0	○	
Ryznar Stability Index (RSI)	6.0-7.0	—	—	—	—	—	—	—	—	○	○

- ① Item names, terminology definitions, and units are based on JIS K 0101.
- ② The ○ marks indicate items related to corrosion or scale formation tendency.
- ③ At elevated temperatures (40°C or above), corrosion generally becomes significant. In particular, when steel materials come into direct contact with water without any protective coating, it is recommended to implement effective corrosion control measures such as the addition of corrosion inhibitors and deaeration treatment.
- ④ For cooling water systems using enclosed cooling towers, the closed-circuit circulating water and its makeup water follow the once-through water system standards; the spray water and its makeup water follow the recirculating cooling water system standards.
- ⑤ The source water to be supplied is limited to municipal water (tap water), industrial water, and groundwater; purified water, reclaimed water, and softened water are excluded.
- ⑥ The Ryznar Stability Index is an index proposed to indicate the tendency of water toward corrosion and scale formation. Stability Index (RSI): Below 6 = scale formation tendency; 6 or above and below 7 = stable range; 7 or above = corrosion tendency.