Recommended Test Parameter Limits as Related to Design

Parameter	CTI Code	ASME Code
Circulating Water Flow Rate	± 10%	± 10%
Heat Load	not specified	± 20%
Range	± 20%	± 20%
Fan Driver Output Power	± 10%	± 15%
Wet Bulb Temperature	± 8.5°C (15°F)	+ 3°C (5°F) -9°C (15°F)
Dry Bulb Temperature (natural draft)	± 14°C (25°F)	not specified
Wind Velocity (maximum)	4.5 m/s (10 mph) with one minute gusts not to exceed 7.0 m/s (15 mph)	15 km/h (10mph) with one minute gust not to exceed 25 km/h (15 mph)
Barometric Pressure	± 3.5 kPa (1.0 in Hq)	not specified
Oil, tar or fatty substances	10 ppm	10 ppm
Total Dissolved Solids (maximum)	the greater of 5,000 ppm or 1.1 times design concentration	10% above design
Lapse Rate (natural draft)	a minimum drop in dry bulb temperature of 0.65°C/100m elevation (3.5°F/1000 ft)	a maximum increase in dry bulb temperature of 1°C (2°F) from top to bottom of tower

Notes

1. The limitation on oil, tar, fatty substances, and total dissolved solids is not routinely checked during the test process. This limitation is checked and comes into the process if a tower should fail and any party suspects these agents are present and contribute to the shortfall. Usually it is the manufacturer that requests the investigation.

2. Measuring the lapse rate is a complicated matter at most test sites. Both codes offer methods to estimate the lapse rate compliance. The degree to which it is pursued is usually determined by mutual agreement of methodology and normally only significant if the tower appears to be deficient. If a natural draft tower is specified for an ASME test, Marley would take exception to the outdated ASME lapse rate restriction, and refer to the more current CTI ATC-105 requirements.

3. One or more identical cells of a multi-cell tower may be shut down during the test, if necessary, to conform with above limitations. This test is then considered representative of the whole tower. Both codes allow this.

4. It is not always possible for all parameters to be within the above recommended limitations. A test *is considered valid if all parties agree* that one or more parameters may be outside these limits.

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