



CTI Thermal Certification Test Report

T154A-174-24I

Initial Qualification Test
On the Superflow Cooling Towers Pvt. Ltd. (SuperFlow)
SFCT Series, Model SFCT SQ-11
1-cell Induced-Draft, Counterflow Cooling Tower

For Superflow Cooling Towers Pvt. Ltd.
BT-06, Sears Tower, Flat No. 102, Omaxe Height, Sector-86,
Nahar Par, Faridabad-121002, India

Test Date: June 17, 2025
CTI Test Number: T154A-174-24I

Prepared by: Michael G. Womack, P.E.
CTI Thermal Certification Administrator
c/o CleanAir Engineering

Summary

McHale & Associates, Inc. (McHale) has been designated by the Cooling Technology Institute (CTI) to conduct thermal certification tests as set forth in the CTI STD-201(21) certification standard. A CTI Initial Qualification Test was performed for Superflow Cooling Towers Pvt. Ltd. (SuperFlow) on their SFCT Series, Model SFCT SQ-11, 1-cell Induced-Draft, Counterflow Cooling Tower. The test was conducted at the La-Med Health Care Facility in Sector-24, Faridabad, India. The purpose of the CTI Initial Qualification Test was to verify the thermal performance of the subject tower as required to obtain CTI Certification of the line of cooling towers. The work was performed by McHale as an independent contractor licensed by CTI for STD-201 testing services.

The Initial Qualification Test was conducted on June 17, 2025, in accordance with the CTI Standard for Performance Rating of Evaporative Heat Rejection Equipment, STD-201RS(21). The test data were acquired in accordance with the CTI Acceptance Test Code for Water-Cooling Towers, ATC-105(22). All thermal parameters were measured with precision platinum RTD temperature probes and recorded using a data acquisition system consisting of a multi-channel data logger interfaced with a laptop computer. The circulating water flow was measured using a hydraulic pitot tube with an air-over-water manometer. Fan motor power was measured with a clamp-on digital kilowatt meter. Following the test, the computer system was used to average the test data, assist with selection of time periods for analysis, and calculate the test results.

The test results were calculated for one time period selected during the Initial Qualification Test by using the manufacturer's expanded ratings table and the methods of analysis as specified in the CTI STD-201 certification standard. The data indicate that the SuperFlow Model SFCT SQ-11 cooling tower was operating at 150.0% of its published capacity during the test on June 17, 2025 which exceeds the 95% minimum allowed by the CTI STD-201.

Therefore, the Superflow Cooling Towers Pvt. Ltd., SFCT Series of cooling towers has fulfilled the test requirement to obtain thermal certification per CTI STD-201.

The CTI STD-201 Certification requires the successful completion of a CTI Annual Reverification Test on a different model each year to remain in effect in the subsequent year.

Prepared by:

Michael G. Womack, P.E.
CTI Thermal Certification Administrator

Test on SuperFlow Model SFCT SQ-11

June 17, 2025

Cooling Technology Institute

Test Calculations - SI Units (°C, m³/h & kPa)

File No. IP250118 Date 6/17/2025 Time Period 16:13:00-17:12:00
 Model No. SFCT-SQ-11 Location Sector-24, Faridabad TAN # T154A-174-251

Test Data

Hot Water, °C = <u>33.97</u>	Cold Water, °C = <u>29.92</u>	Wet Bulb, °C = <u>27.09</u>
Tower Flow, m ³ /h = <u>156.5</u>	Makeup Flow, m ³ /h = <u>N/A</u>	Makeup Temp. °C = <u>N/A</u>
Test Fan Power, kW = <u>7.55</u>	0 p Pressure, kPa = <u>N/A</u>	Barometer, kPa = <u>97.32</u>
Rated Fan Power, kW = <u>7.50</u>	Dry Bulb, °C = <u>31.68</u>	Humidity % = <u>70.61</u>

Calculated Values

Pump Correction = 0.000239 * kPa / Pump Efficiency (0.8 assumed)	PC = <u>0.00</u> °C
Evaporation = 0.00153 * Flow * Range	Evap = <u>N/A</u> m ³ /h
Makeup Corr. = (CWT + PC - MUT) * MUF / (Tower Flow - MUF)	MC = <u>N/A</u> °C
CCWT = CWT + PC + MC	CCWT = <u>29.92</u> °C
Range = HWT - CCWT	Range = <u>4.05</u> °C
Approach = CCWT - WBT	Approach = <u>2.83</u> °C

Predicted Test Flow Rate At Test Thermal Conditions Via Selection Program Version <u>Marcel IDCF</u>	103.13 m³/h
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Adjusted Test Flow = Test Flow * [Fan Power (design) / Fan Power (test)] ^(1/3)
Adjusted Test Flow (@ design fan power) = 156.15 m³/h

Barometric Factor {kPa} = 1 + (0.0023 (BPstd - BPTst))
Barometric Factor = 1.009212

Adjusted Corrected Test Flow (with BP correction) = Adjusted Test Flow / Barometric Factor
Adjusted Corrected Test Flow (@ design barometer) = 154.72 m³/h

Percent Capability = Adjusted Corrected Test Flow / Predicted Test Flow * 100
*** Percent Capability = 150.02 %**

201

IDCF Software Output (Marcel IDCF Input Data File)

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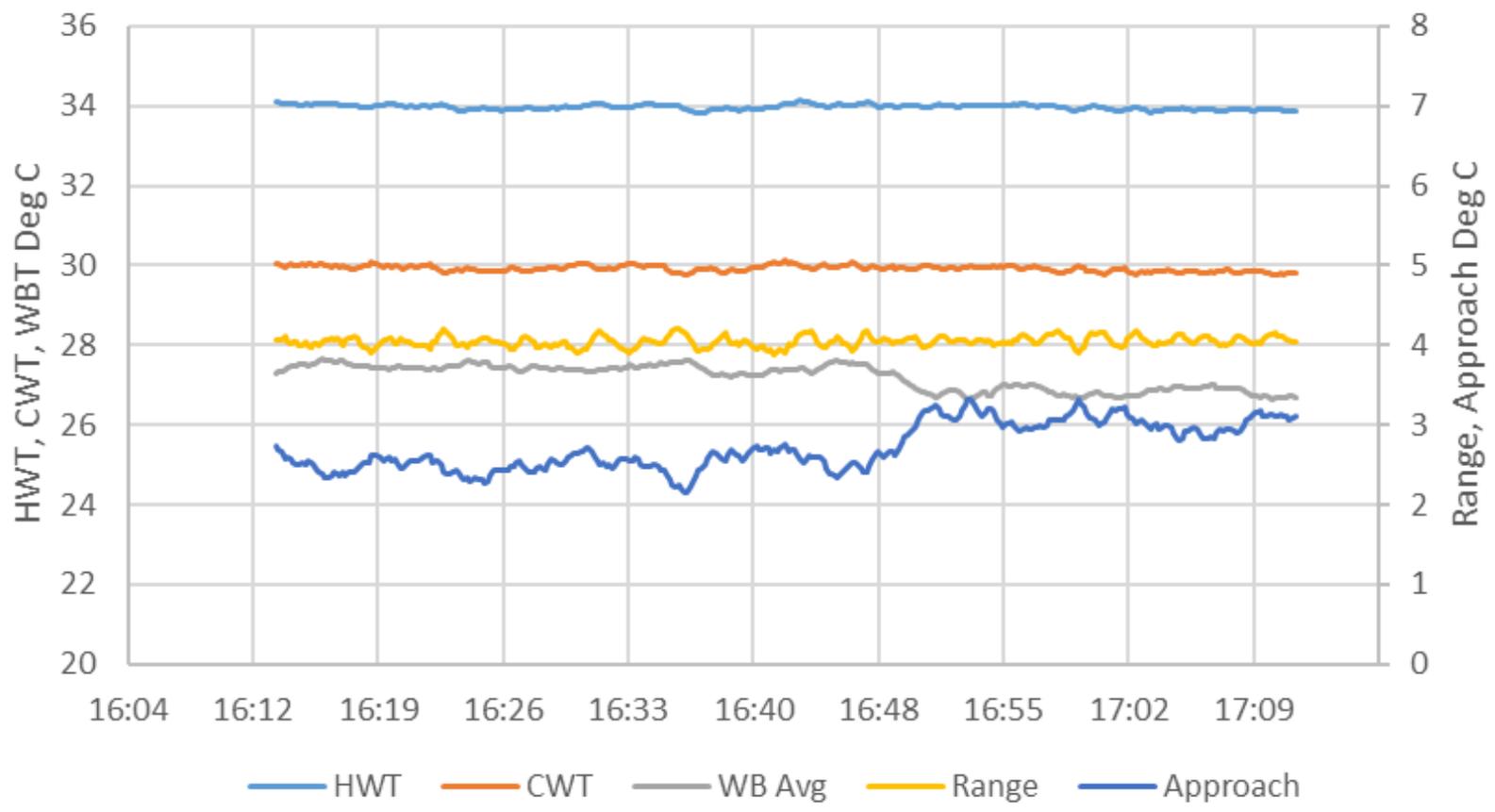
C:\IDCF\IDCF.EXE
***** T H E R M A L   D A T A .   * * * * *
Site altitude.....m          0   Barometric press...millibar  1013.3
Ambient wet bulb temp.....C   27.09 Air relative humidity.....%   70.0
Ambient dry bulb temp.....C   31.79 Water salinity.....ppm      5000

Water flow.....unknown
Cold water temperature.....C   29.92 Range.....C          4.05
KaU/L mult. factor(upper)--   1.00 Pr.drop mult.fact.(upper)--   1.00
Merkel correction factor..--   1.00 Recirculation allowance...C   0.00

***** R E S U L T S .   * * * * *
Actual water flow.....m3/hr  103.13 Heat load...million kcal/hr    0.4
Water density.....kg/m3     997.90 Water specific heat.....      0.992
Uapor press. x factor.....--  0.996 Ka salt x factor.....--      0.996
Water loading.....T/hr.m2    11.03 Actual fan power.....Kw       7.12
Gas/Liquid G/L.....--       0.968 Liquid/Gas L/G.....--       1.033
Exit wet bulb (CTI).....C     30.62 Exit wet bulb exact HB...C    30.79
Absolute humidity inlet...--0.020944 Absolute humidity exit...--0.028039
Evaporation.....%           0.68   Min. recommended plenum ..m   0.63

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T154A-174-25I



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Fan Power Data Sheet - SI

Location	Sector-24, Faridabad	File No.	IP250118
Barometric Pressure	28.740	TAN #	T154A-174-25I
KW Instrument	Fluke 39	Date	6/17/2025
Tower Model	SFCT-SQ-11	Time	4:25 PM

Fan ID	Volt (1)	Volt (2)	Amp (1)	Amp (2)	kW (1)	kW (2)	kW In Total	Motor Eff.	kW Out
Fan	398	396	17.9	19.1	3.8	5.6	9.40	0.830	7.80
Averages		397.0	18.50		Average:		9.40	Sum:	7.80

Motor Nameplate Data

Frame:	Voltage:	Manufacturer:
RPM:	Amps:	Nominal Efficiency: 0.830
kW:	SF:	Power Factor:

Line Loss Calculation

Data:

Wire Length (meter)	40	Wire Size (mm ²)	2.5
Average Ampere	18.50	Motor Eff.	0.830

Results:

kW In - Total (avg.)	9.40	kW Out - Total (av	7.80
kW In (loss)	0.30	kW Out (loss)	0.25
kW In (net)	9.10	kW Out (net)	7.55

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Water Flow Data Sheet

FILE NO. IP250118
 TAN# T154A-174-25I

DATE: 06/17/25

PITOT STYLE:	Elliptical	PIPE IDENTITY:	
SERIAL NUMBER:	18006	NOMINAL PIPE DIAMETER (mm):	152.4
DATE CALIBRATED:	February-2024	AVERAGE PIPE AREA (m ²):	0.01824
PITOT COEFFICIENT:	0.7611	PITOT FLUID TYPE:	Water
		FLUID TEMPERATURE (°C):	34.0

	TAP: 0 TIME: 15:30 DIAMETER (mm): 152 2/5	TAP: 0 TIME: 16:15 DIAMETER (mm): 152 2/5
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STATION NUMBER	RELATIVE LOCATION	LOCATION (mm)	DEFLECTION d (mm)	LOCATION (mm)	DEFLECTION d (mm)
1	0.0257	3.9	407.9	3.9	407.9
2	0.0817	12.4	435.0	12.4	435.0
3	0.1464	22.3	503.0	22.3	503.0
4	0.2261	34.5	516.6	34.5	516.6
5	0.3419	52.1	543.8	52.1	543.8
CP	0.5000	76.2	571.0	76.2	571.0
6	0.6581	100.3	546.5	100.3	546.5
7	0.7739	117.9	530.2	117.9	530.2
8	0.8536	130.1	524.8	130.1	524.8
9	0.9183	140.0	511.2	140.0	511.2
10	0.9743	148.5	486.7	148.5	486.7

	Diam 1 $\sum \sqrt{d}$	223.51	Diam 2 $\sum \sqrt{d}$	223.51
	Diam 1 Avg \sqrt{d}	22.351	Diam 2 Avg \sqrt{d}	22.351
	Pipe Average \sqrt{d}	22.3512		

FLOW, m³/hr = 156.5
FLOW, lpm = 2,607.6

SI-Flow