



CTI

CERTIFIED

STD-201 CERTIFICATION PURPOSE

“This standard sets forth a program whereby the Cooling Technology Institute will certify that all models of a line of water cooling towers offered for sale by a specific manufacturer will perform thermally in accordance with the manufacturer's published ratings. . . .”



STD-201 CERTIFICATION SCOPE

- **Entering wet bulb temperature**
12.8°C to 32.2°C (55°F to 90°F)
- **Cooling range > 2.2°C (4°F)**
- **Cooling approach > 2.8°C (5°F)**
- **Process fluid temperature < 51.7°C (125°F)**
- **Barometric pressure**
91.4 to 105.0 kPa (27" to 31" Hg)



STD-201 CERTIFICATION LIMITATIONS

- **Unique Product Line Name & Model Numbers**
- **Applies to Only Product Lines & Models Submitted**
- **Installed With Ample Unobstructed Air Supply**
- **Multi-cell Systems Allowed if Airflow is Unaffected
Or Configuration Impact is Included in Ratings**
- **Optional Accessories Allowed if Airflow is Unaffected
Or Their Impact is Included in Ratings**
- **Non-certified Configurations or Locations
Should Consider ATC-105 Acceptance Test**

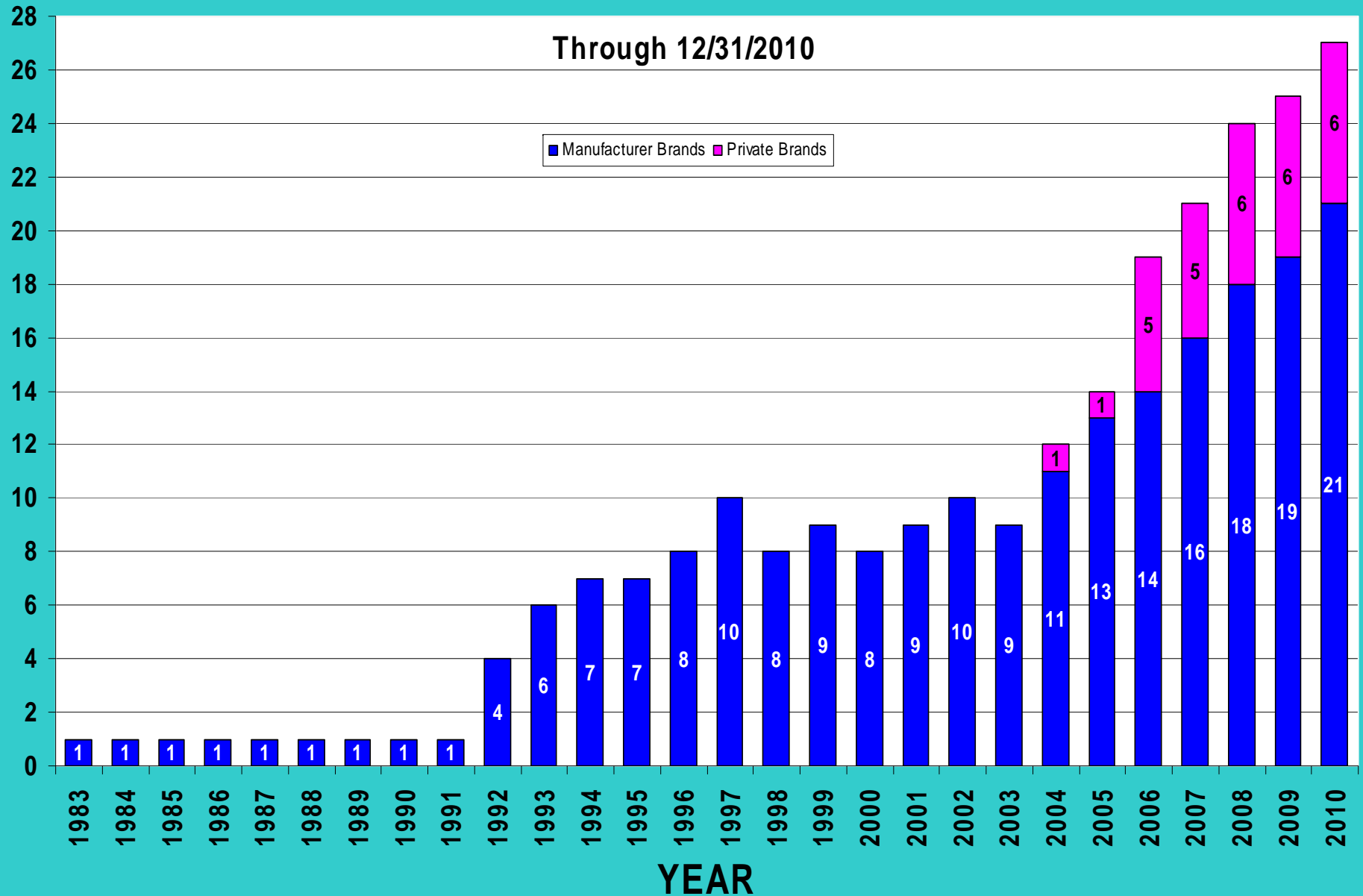


STD-201 CERTIFICATION HISTORY

- **1962 First Edition Published**
 - Required Extensive Matrix of Tests to Qualify, No Follow Up Tests
- **1981 Minor Revisions**
- **1986 Substantial Revisions – Enlarged Test Matrix to Qualify**
- **1991 Major Revisions**
 - Emphasis on Technical Review with Initial Qualification Test(s)
 - Added Annual Reverification Test Requirement to Continue
- **1996 Minor Revisions + Closed Circuit Towers**
- **2002 Minor Revisions + Raised Upper WBT**
- **2004 Minor Revisions + Reduced Lower WBT**
- **2009 Revised Format + Evaporative Condensers**
- **2009+ Continuous Review by P&T Task Group**



CTI STD-201 CERTIFICATION PROGRAM NUMBER OF PARTICIPATING MANUFACTURERS



CURRENT STD-201

21 PARTICIPATING OEM MANUFACTURERS

- **Advance GRP (Advance) Cooling Towers, Pvt., Ltd. - 1 Line**
- **Aggreko Cooling Tower Services - 1 Line**
- **American Cooling Tower Corporation - 1 Line**
- **Baltimore Aircoil Company - 9 Lines**
- **Delta Cooling Towers - 1 Line**
- **Evapco, Inc. - 7 Lines**
- **Fabrica Mexicana de Torres, SA (Reymosa) - 4 Lines**
- **KIMCO (Kyung In Machinery Company) - 3 Lines**
- **King Sun Industry Company, Lrd. - 2 Lines**
- **Liang Chi Industry Company, Ltd. - 4 Lines**
- **Mesan Cooling Tower, Ltd. - 4 Lines**
- **Nihon Spindle Manufacturing Company, Ltd. - 1 Line**
- **Polacel, b. v. - 2 Lines**
- **Ryowo (Holding) Company Ltd. - 4 Lines**
- **Sinro Air-Conditioning (Fogang) Co. Ltd. - 1 Line**
- **SPX (Marley) Cooling Technologies - 7 Lines**
- **Ta Shin F. R. P. Company Ltd. - 1 Line**
- **The Cooling Tower Company, Inc. - 1 Line**
- **Tower Tech, Inc. - 1 Lines**
- **Waltco Systems, Inc. - 1 Line**
- **Zhejiang Jinling Refrigeration Engineering Co. - 2 Lines**



CURRENT STD-201

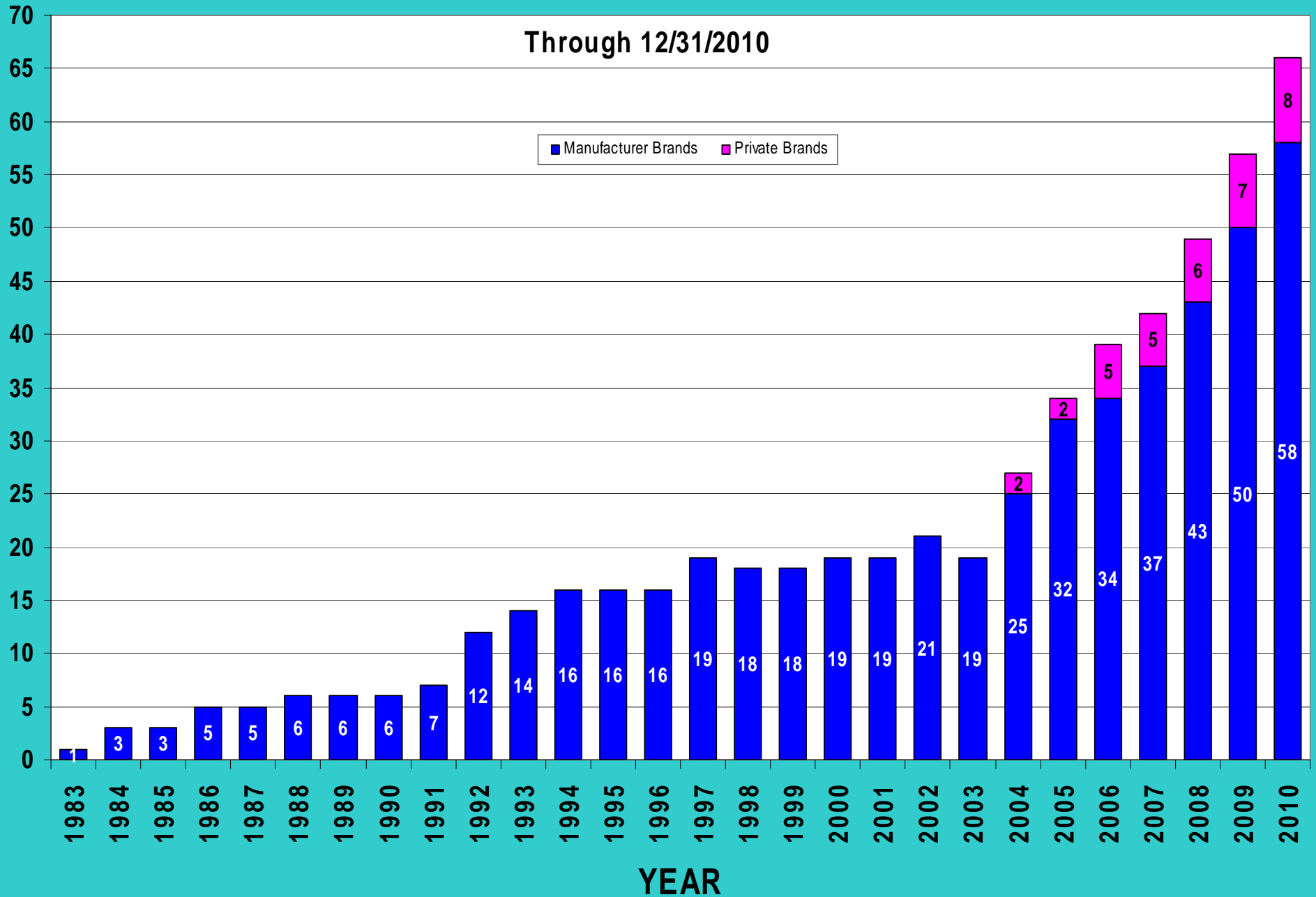
6 PARTICIPATING PRIVATE BRANDS

- **AMCOT Cooling Tower Corporation - 1 Line**
- **AONE E&C Corporation, Ltd. - 1 Line**
- **HVAC/R International, Inc. - 2 Lines**
- **Protec Cooling Towers, Inc. - 2 Lines**
- **RSD Cooling Towers, Inc. - 1 Line**
- **The Trane Company - 1 Line**



NUMBER OF CTI CERTIFIED LINES

Through 12/31/2010



CTI STD-201 CERTIFIED TOWER CONFIGURATIONS AVAILABLE

8 Lines - Forced-draft, Counter-flow

6 lines - single side air inlet, top discharge

2 line - bottom air inlet, top discharge

16 Lines - Induced-draft, Counter-flow

16 lines - One to four side air inlet, top discharge

2 Lines - Forced-draft, Cross-flow (+ 1 Line Private Brand)

2 lines – single side air inlet, opposite side discharge (+ 1 Private Brand)

20 Lines - Induced-draft, Cross-flow (+ 6 Lines Private Brands)

1 line - single side air inlet, opposite side discharge

2 lines - single side air inlet, top discharge

16 lines - double side air inlet, top discharge (+ 6 Private Brands)

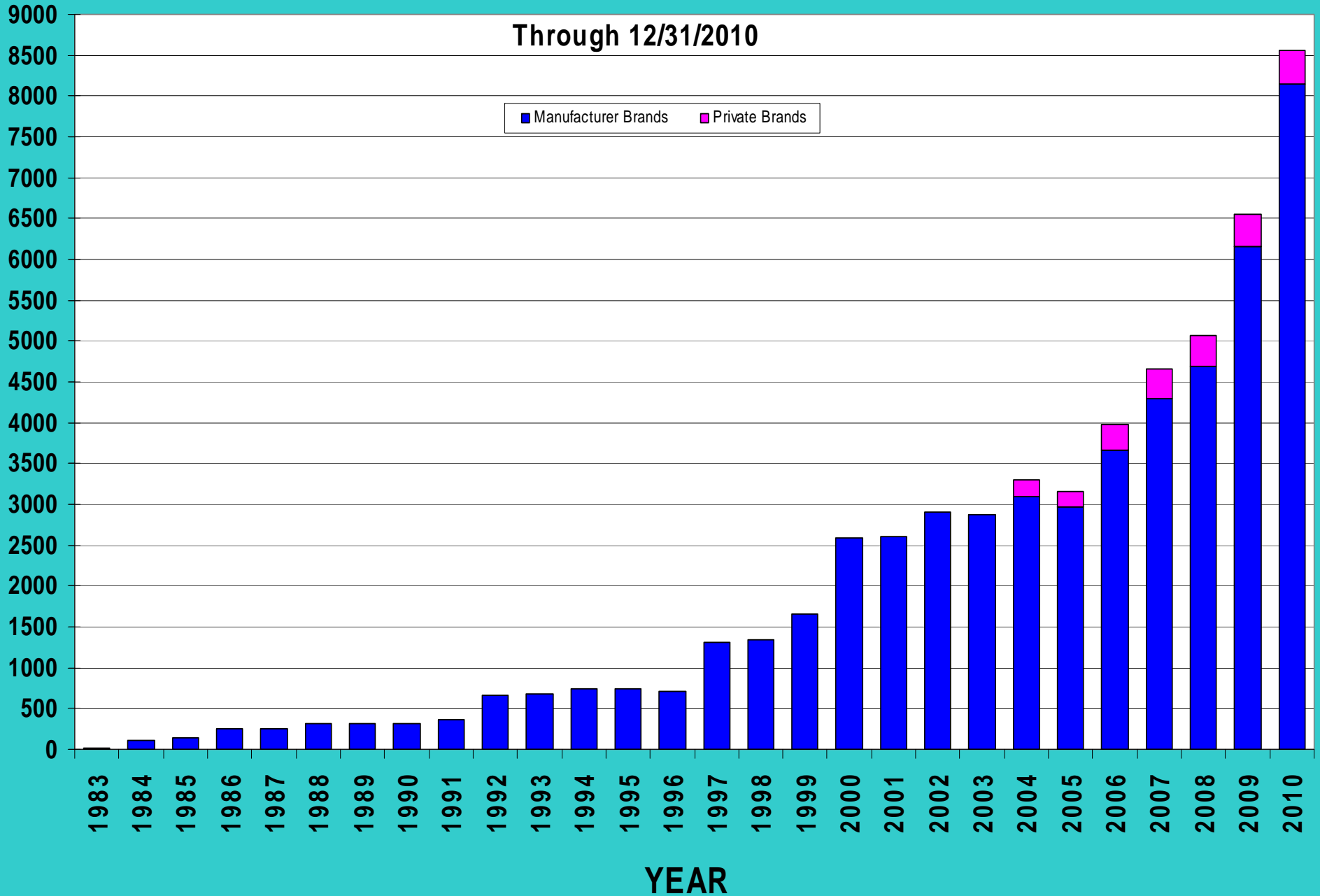
1 line - quadruple side air inlet, top discharge

12 Lines - Closed-circuit, Fluid-cooler (+ 1 Line Private Brand)



NUMBER OF CTI CERTIFIED MODELS

Through 12/31/2010



CURRENT STD-201 TOWER SELECTIONS AVAILABLE

- **Diverse Variety of Construction Materials**

**Galvanized Steel, Stainless Steel, Fiberglass,
Polyethylene, PVC**

- **Wide Choice of Nominal Cell Capacities**

~ 1 l/s (16 gpm) to ~ 350 l/s (5,500 gpm)



STD-201 CERTIFICATION PROCESS

- **Application Submission**
- **Technical Review**
- **Initial Qualification Test**
- **Approval Letter With Validation Number**
- **Annual Reverification Tests for Follow Up**



Application Submission

- **General Description of Line**
 - Catalogs
 - Preliminary Specification Sheets
 - Outline Drawings
- **Published Ratings**
 - Rating Tables
 - Graphical Selection Nomograph
 - Computer Selection Software
- **Physical “Data of Record” for Each Model**
 - Data Sheet in STD-201 Appendix A
 - Equivalent Tables
 - Equivalent Spreadsheets



Technical Review

- **Comparison of Models for Consistency**
 - Geometric Similarity
 - Physical Attributes
- **Review of Published Ratings for Reasonableness**
 - Performance versus Operating Conditions
 - Performance versus Physical Attributes Like Fan Laws
- **Selection of Model(s) for Initial Qualification Test(s)**
 - Representative of Line
 - Suitable for Comparison with Other Models
 - Model Availability



Initial Qualification Test

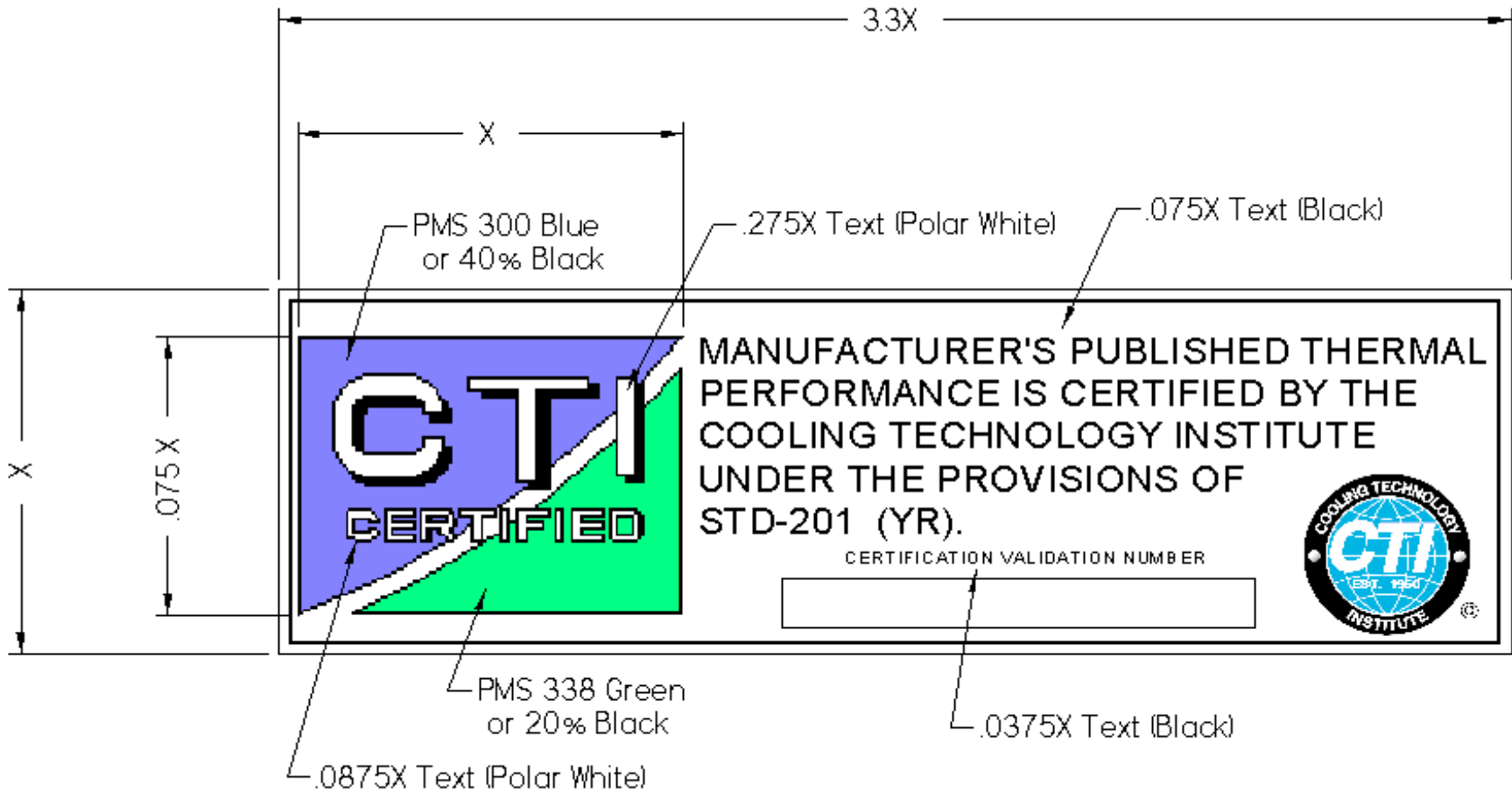
- **Thermal Performance Test per CTI ATC-105 Test Code**
 - Preparation per CTI FSP-156 Pretest Bulletin
 - Equipment Operation per CTI ATC-105 Test Code
 - Test Instrumentation per CTI ATC-105 Test Code
- **Capability Calculated Using Published Ratings**
 - Compares Measured Performance with Predicted Performance
 - 95% Minimum Capability Required to Pass Test
- **Verification of Physical “Data of Record”**
 - Inspection of Tower
 - Dimensional Comparison



Approval Letter with Validation Number

- **Approval Letter Issued After Final Review**
 - Payment of Initial Administrative Fees and Test Expenses
- **Certification Validation Number Assigned**
 - Affixed to Each Tower Sold
 - Displayed in Catalogs and Other Literature





Approval Letter with Validation Number

- **Approval Letter Issued After Final Review**
 - Payment of Administrative Fees and Test Expenses
- **Certification Validation Number Assigned**
 - Affixed to Each Tower Sold
 - Displayed in Catalogs and Other Literature
- **Manufacturers, Line Names and Product Summaries**
Published in CTI Journal
- **Manufacturers, Line Names, Model Numbers and Internet**
Links Listed On CTI Web Site



Annual Reverification Tests for Follow Up

- **Different Model Selected Each Year**
- **Test and Evaluation Identical to Initial Qualification Test**
- **Payment of Annual Administrative Fees and Test Expenses**
- **Test Failure Requires Additional Testing and Investigation**
- **Resolution of Complaints by Testing and Investigation**



Certification Program Committee

- **Chairman – CTI Certification Administrator (non-voting)**
 - **Participating Manufacturers (1 vote per manufacturer)**
 - **CTI Board Liaison (non-voting)**
-
- **Advises Certification Administrator on Implementation**
 - **Establishes Annual Operating Budget & Fees**
 - **Recommends Changes to STD-201**



P & T Committee - Certification Task Group

- **Balanced Committee per ANSI Guidelines**
 - Producers (Manufacturers) <50%, General Interest, Owner/Operator
- **Reviews CTI STD-201 Every 5 Years or When Requested**
- **Revises CTI STD-201 As Needed**
- **Implements Expansion of STD-201 to New Areas**
 - Closed Circuit Cooling Towers (Added 1996)
 - Evaporative Condensers (Added 2009)



STD-201 Current Developments

- **Two New Lines Added Since 01/01/2011**

 - King Sun Industry Company, Ltd.

 - KC Line of Closed Circuit Cooling Towers

 - Wuxi Fangzhou Water Cooling Equipment Co. Ltd.

 - FLHB Line of Closed Circuit Cooling Towers

- **Two Other New Lines Nearing Completion**

- **Several Inquiries and Preliminary Reviews**

- **Cooperative Agreement with Eurovent for
Dual CTI/ECC Certification Opportunities**



Additional Certification Information

- **CTI Web Site**

<http://www.cti.org/certification.shtml>

- **CTI Journal**

- **CTI Office in Houston, Texas USA**

- **CTI Certification Administrator**

C/O Cooling Tower Test Associates, Inc.





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