

ASME Performance Test Codes

ASME Performance Test Codes: A Wide Range of Applications

For over 100 years, ASME has been providing industry with a comprehensive collection of the best technical documents to conduct tests of power plant equipment and systems. ASME now offers 48 Performance Test Codes (PTCs), covering four main categories of equipment and systems – Power Production, Combustion and Heat Transfer, Fluid Handling, and Emissions. There are also “general” documents that cover Analytical Techniques, Measurement of Process Parameters and Associated Phenomena and Guiding Information.

ASME PTCs: Ensuring Accuracy, Precision, and Reliability. Instilling Confidence.

Performance test codes provide a “level playing field” for both manufacturers and users of the equipment or systems. Both parties to the test can reference the particular test code, confident with the knowledge that it represents the highest level of accuracy based on current engineering knowledge, taking into account test costs and the value of information obtained from testing. Precision and reliability of test results must also underlie all considerations in the development of an ASME PTC, consistent with economic considerations as judged appropriate by each technical committee under the jurisdiction of the ASME Board on Standardization and Testing.

ASME PTCs on Power Production

PTC 6, Steam Turbines
 PTC 6.2, Steam Turbines in Combined Cycles
 PTC 17, Reciprocating Internal Combustion Engines
 PTC 18, Hydraulic Turbines and Pump Turbines
 PTC 22, Gas Turbines
 PTC 29, Speed-Governing Systems for Hydraulic Turbine Generator Units
 PTC 42, Wind Turbines
 PTC 46, Overall Plant Performance
 PTC 47, Integrated Gasification Combined Cycle
 PTC 50, Fuel Cell Power Systems Performance
 PTC 55, Aircraft Engines
 PTC PM, Performance Monitoring Guidelines for Steam Power Plants

ASME PTCs on Combustion and Heat Transfer

PTC 4, Fired Steam Generators
 PTC 4.2, Coal Pulverizers
 PTC 4.3, Air Heaters
 PTC 4.4, Gas Turbine Heat Recovery Steam Generators
 PTC 12.1, Closed Feedwater Heaters
 PTC 12.2, Steam Surface Condensers
 PTC 12.4, Moisture Separator Reheaters
 PTC 12.5, Single Phase Heat Exchangers
 PTC 19.10, Flue and Exhaust Gas Analyses
 PTC 23, Atmospheric Water Cooling Equipment
 PTC 30, Air-Cooled Heat Exchangers
 PTC 30.1, Air Cooled Steam Condensers
 PTC 34, Waste Combustors with Energy Recovery
 PTC 51, Gas Turbine Compressor Inlet Air Conditioning Equipment

ASME PTCs on Fluid Handling

PTC 8.2, Centrifugal Pumps
 PTC 10, Compressors and Exhausters
 PTC 11, Fans
 PTC 12.3, Deaerators
 PTC 19.11, Steam and Water Sampling, Conditioning, and Analysis in the Power Cycle
 PTC 19.23, Model Testing
 PTC 25, Pressure Relief Devices
 PTC 31, Ion Exchange Equipment
 PTC 39, Steam Traps



ASME PTCs on Emissions

PTC 21, Particulate Matter Collection Equipment
 PTC 28, Determining the Properties of Fine Particulate Matter
 PTC 40, Flue Gas Desulfurization Units

ASME General Documents on Analytical Techniques

PTC 19.1, Test Uncertainty
 PTC 61, Validation and Verification of Computational Fluid Dynamics and Heat Transfer

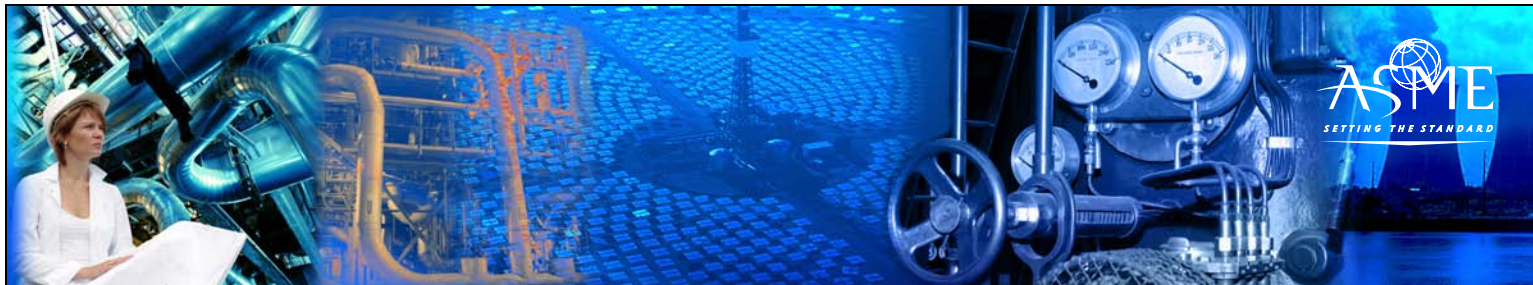
ASME General Documents on Measurement of Process Parameters and Associated Phenomena

PTC 19.2, Pressure Measurement
 PTC 19.3, Temperature Measurement
 PTC 19.5, Flow Measurement
 PTC 19.6, Electrical Power Measurement
 PTC 19.7, Measurement of Shaft Power
 PTC 19.22, Digital Systems Techniques
 PTC 36, Measurement of Industrial Sound

ASME General Documents on Guiding Information

PTC 1, General Instructions
 PTC 2, Definitions and Values

To learn more about ASME Performance Test Codes, visit www.asme.org/ptcs. Or contact Steve Weinman, Director, Standardization & Testing, ASME, Three Park Avenue, New York, NY 10016; 212.591.7002; weinmans@asme.org



Industry Speaks About ASME Performance Test Codes

“PTC 4, on Fired Steam Generators, is the ultimate comprehensive document for defining, calculating and testing for the efficiency of Fired Steam Generators by the Energy Balance Method as well as other significant performance parameters. A major feature of the Code is that it includes the methodology for correcting test conditions to guarantee/reference conditions based upon actual unit performance. The Code is written in a tutorial manner which enhances use as an instructive medium as well as providing the methodology for developing a computer code by the user. The Code includes the methodology for determining the uncertainty of both the test and corrected results.”

Thomas C. Heil
Retired
Babcock & Wilcox

“PTC 6, on Steam Turbines, is the international standard for steam turbine acceptance testing. It was created and recently revised by a consensus group of vendors, owners, and users. It provides a standard, consistent, method for determining existing, retrofitted and new steam turbine performance within the minimum practical uncertainty. It covers large fossil and nuclear fueled utility grade steam turbine/generators.”

W. Cary Campbell
Principal Engineer
Southern Company Services

“PTC 4.4, on Heat Recovery Steam Generators, provides a detailed rigorous calculation approach for testing of HRSG’s. The test approach involves the determination of the gas turbine exhaust flow by two different means and combining the result. This would apply to multi-pressure HRSG’s including units with auxiliary duct burners. It includes guidance on instrumentation including measuring temperature of a large exhaust flow stream a method for determining the HRSG test uncertainty.”

Joseph E. Schroeder
Vice President Engineering
Nooter Eriksen

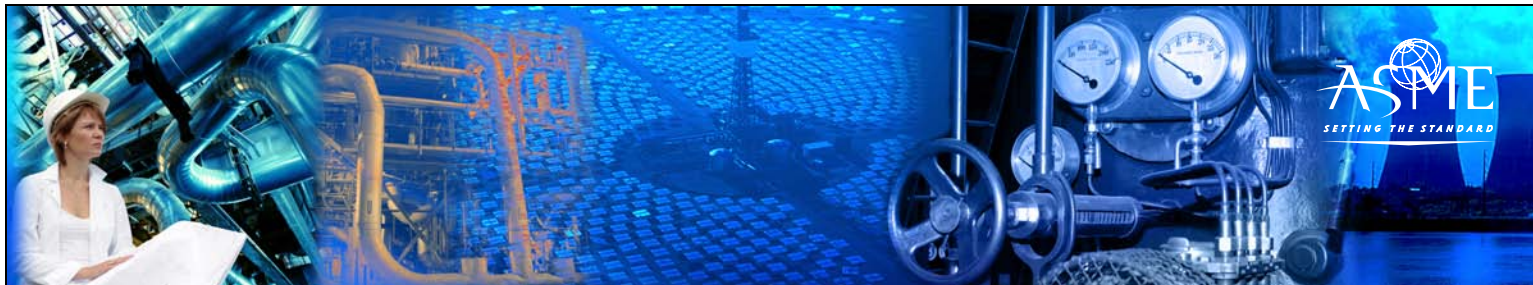
“PTC 11, on Fans, provides a reliable method for true testing of fans in the as-installed condition – without any questionable adjustments to performance.”

Philip M. Gerhart, PhD
Dean
College of Engineering & Computer Sciences
University of Evansville

“PTC 19.1, Test Uncertainty, provides guidelines to determine the quality of test data, objectively. These methods meet national and international standards for objective data quality assessment: measurement uncertainty.”

Ronald H. Dieck
President
Ron Dieck Associates, Inc.





ASME Codes and Standards – An Overview

ASME: “Setting the Standard” for 125 Years

ASME helped pioneer the development of modern industrial codes, beginning with its first published standard in 1884 on pressure-testing for boilers. It seeks to balance interests among its 4,000 technical experts drawn from industry, government and academia, while achieving consensus in the finished output. The process remains open and transparent throughout, yielding codes that withstand scrutiny across markets and jurisdictions.

These development efforts are rigorous and up-to-date, and reflect best practices of industry. Hence, they have earned the confidence of regulators around the world and the principles of ASME's standards development process are consistent with those of the World Trade Organization TBT Agreement. ASME's more than 500 codes are now adopted into law, all or in part, within more than 100 nations. These codes and standards are invaluable resources for industry and governments that help to establish safety and productivity enhancements in areas ranging from operation and maintenance of nuclear power plants to design of fasteners and plumbing fittings.

To learn more about ASME Codes and Standards' 125th Anniversary Celebration, visit: www.go.asme.org/cs125.



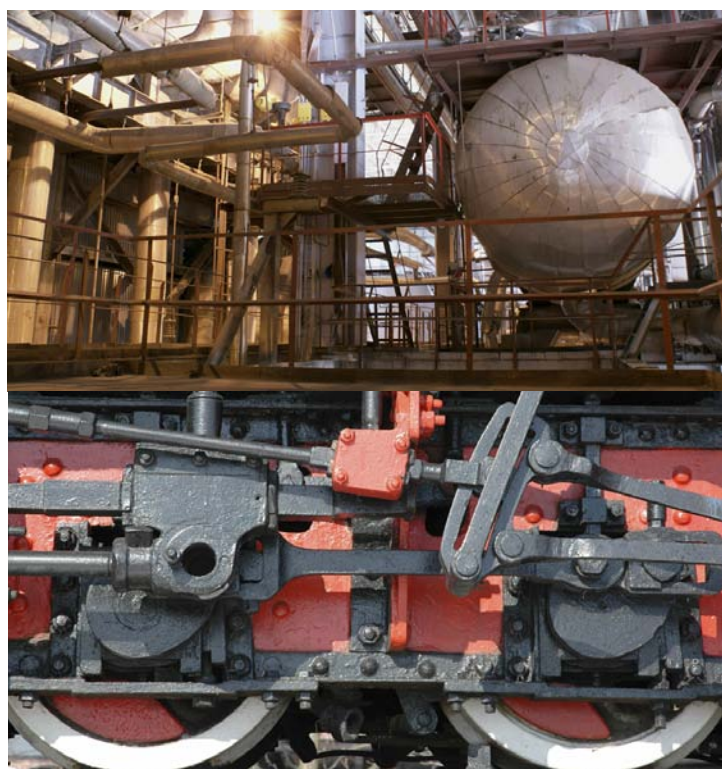
ASME Performance Test Codes (PTCs) provide uniform rules and procedures for the planning, preparation, execution, and reporting of performance test results. They provide protocols for establishing testing parameters and methods of measurement. They provide mathematical examples on computing the test results and statistical methods to determine the quality of the tests by calculating the test uncertainty.

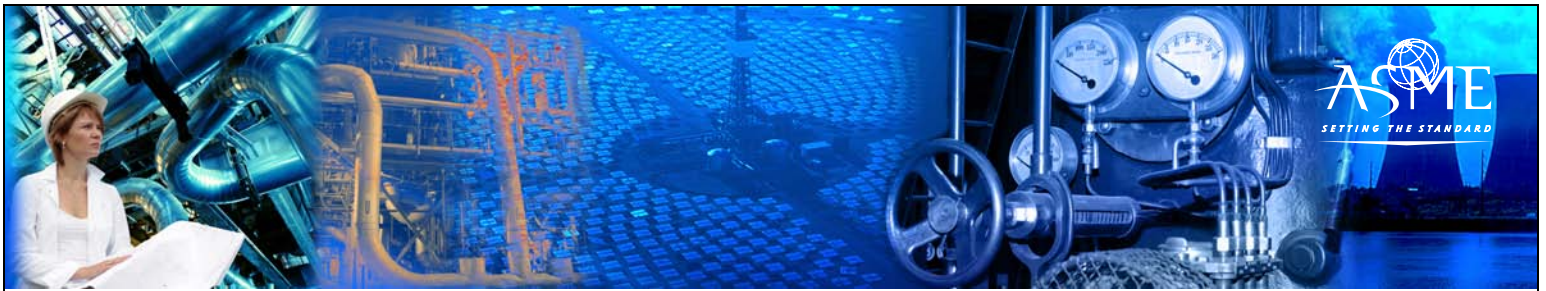
About ASME

Founded in 1880 as the American Society of Mechanical Engineers, ASME is a not-for-profit professional organization promoting the art, science and practice of mechanical and multidisciplinary engineering and allied sciences. With a membership of more than 127,000 mechanical engineers and allied professionals from around the world, ASME develops codes and standards that enhance public safety, and provides lifelong learning and technical exchange opportunities to benefit the global engineering and technology community.

Over 100 Years of ASME PTCs: Ensuring State-of-the-Art Quality for State-of-the-Art Technology

In 1884, the ASME published “Rules for Conducting Boiler Tests.” On April 13, 1909, the Power Test Committee was chartered by the Council of ASME to “revise the present testing codes of the Society relating to boilers, pumping engines, locomotives, steam engines, internal combustion engines ...etc.” In 1915, the “Rules for Conducting Performance Test of Power Plant Apparatus” was published. Over the years numerous test codes and supplements have been published. Some have been revised and others withdrawn as new technological advances have necessitated the issuance of state-of-the-art test codes. Today, some three dozen test codes are available for testing power plant equipment, such as fired steam generators, steam turbines and gas turbines as well as testing fuel cells and combined cycle gasification plants. It is Society policy to review each standard every five years to determine whether a revision is necessary.





Participating on ASME Codes and Standards Committees

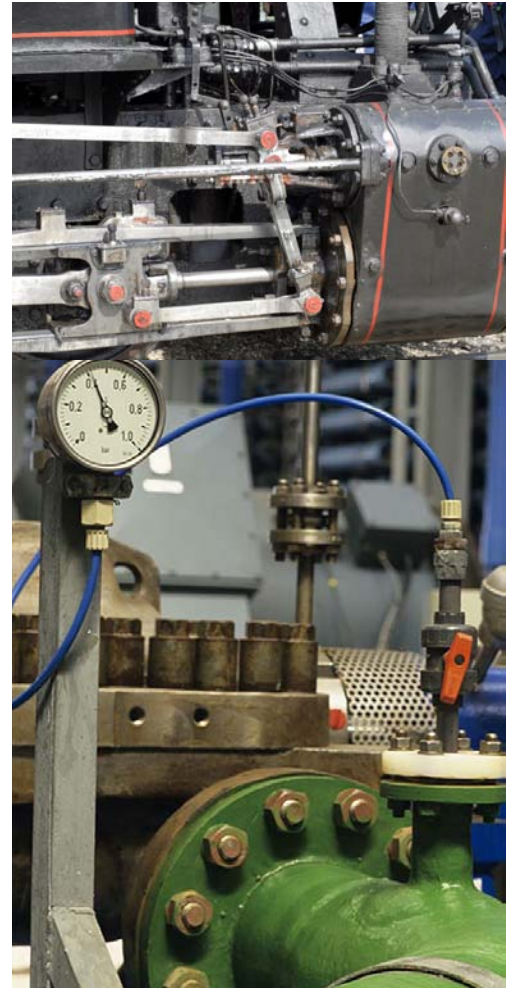
ASME PTC Committee Membership

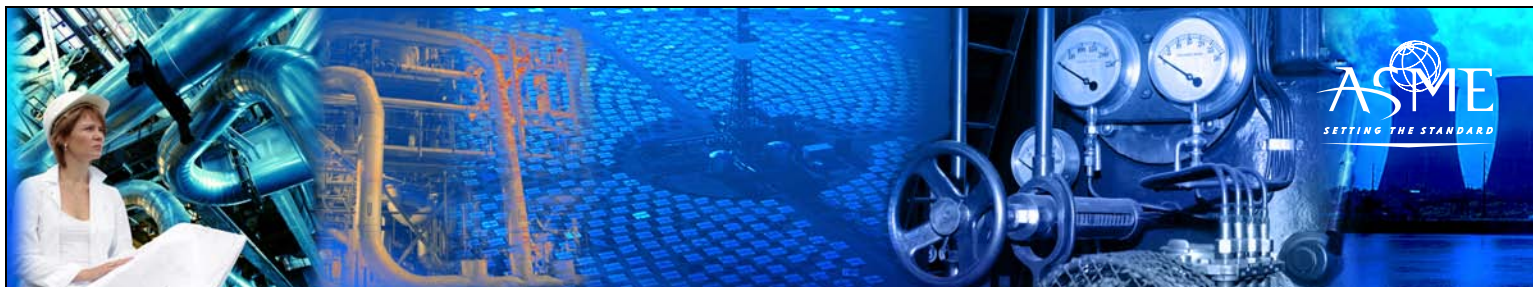
ASME PTCs are developed in committee settings to ensure balanced participation and open access to public interest groups. The ASME PTC Standard Committee and supporting technical subcommittees consist of experts from various stakeholder groups, who provide their time and resources on a voluntary basis. The success of ASME PTCs is based on technical and operational experience from stakeholders drawn from a broad range of industries. The volunteer members who participate on the ASME PTC technical committees play a vital role in ensuring that the published PTCs will be useful to and used by the wide range of industry users – manufacturers of the equipment or systems, user or owner operators, consultants, testing agencies, governmental agencies and academia.

There are no fees or geographical restrictions associated with membership on the ASME committees or subcommittees. ASME membership is not required. Applicants for committee membership are selected based primarily on technical expertise. ASME uses an Internet-based voting and tracking system that allows committee members and other interested parties to participate in ongoing business from anywhere in the world. The committee meets at least three times each year to discuss changing industry needs and best operational practices.

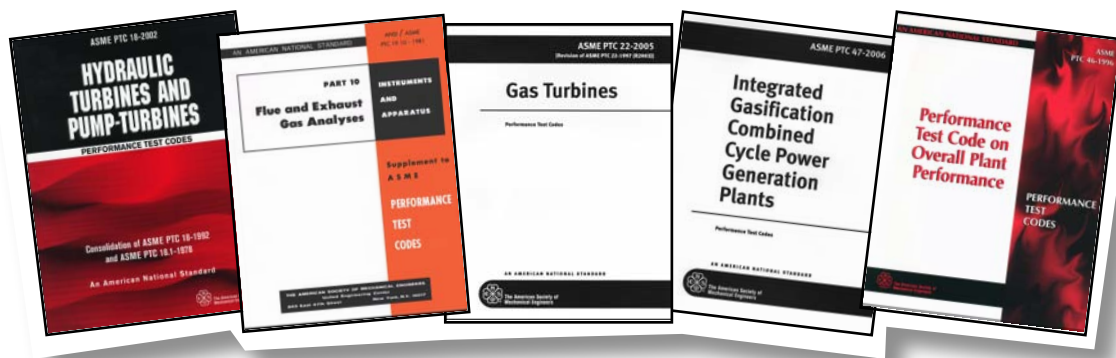
The Standards Development Process

In developing ASME PTCs and other codes and standards, ASME employs a consensus-based process that considers the input of all relevant stakeholders. Due process for all input regarding ASME PTCs is assured and monitored. The development process is open to public review at appropriate stages, and the actions of the committee are documented and completely transparent. The American National Standards Institute (ANSI) has accredited the Society's process for the development of ASME PTCs and other standards. The principles of ASME's standards development process are consistent with those of the World Trade Organization's Technical Barriers to Trade Agreement.





Some Key ASME Performance Test Codes



PTC 4 - 2008 Fired Steam Generators

Order No. C02508

Price: \$225.00

No. of pages: 292

PTC 19.5 - 2004 Flow Measurement

Order No. G0180Q

Price: \$185.00

No. of pages: 180

PTC 25 - 2008 Pressure Relief Devices

Order No. C0610

Price: \$85.00

No. of pages: 84

PTC 6 - 2004 Steam Turbines

Order No. C02804

Price: \$215.00

No. of pages: 112

PTC 19.10 - 1981 Flue and Exhaust Gas Analyses

Order No. C00031

Price: \$70.00

No. of pages: 99

PTC 46 - 1996 Performance Test Code on Overall Plant Performance

Order No. C06496

Price: \$250.00

No. of pages: 192

PTC 18 - 2002 Hydraulic Turbines and Pump-Turbines

Order No. C01802

Price: \$125.00

No. of pages: 88

PTC 22 - 2005 Performance Test Code on Gas Turbines

Order No. C01505

Price: \$95.00

No. of pages: 100

PTC 47 - 2006 Integrated Gasification Combined Cycle Power Generation Plants

Order No. C06806

Price: \$145.00

No. of pages: 100

PTC 19.1 - 2005 Test Uncertainty

Order No. D04505

Price: \$125.00

No. of pages: 102

