



If it's not
CETA Certified
it's not worth
the risk.

“The Industry Standard”



Purpose: The purpose of this standard is to provide a uniform method for testing and rating the primary performance characteristics of pressure washers that produce high-pressure water within the scope of UL 1776.

Scope: These guidelines cover portable, stationary and fixed pressure washers, in which the discharge line is hand supported and manipulated, that are built for household, or commercial/industrial application as defined in UL 1776, Section 1.1, 1995 or latest edition. This is a self-certification program, with the primary responsibility for compliance resting with the manufacturer.

1.0 DEFINITIONS

- 1.1 Nozzle: A device with an orifice of known size, typically located at the end of the gun/wand assembly.
- 1.2 Bypass: Condition under which trigger is released and the machine is recirculating water internally.
- 1.3 PSIG: Pounds per square inch gauge.
- 1.4 GPM: Gallons per minute.
- 1.5 RPM: Revolutions per minute.
- 1.6 Loaded RPM: For engine-driven units, the governed rpm while spraying water at system-rated conditions.
- 1.7 Engine: An internal combustion device that converts energy into mechanical force and motion.
- 1.8 Governed RPM: Engine regulated RPM.
- 1.9 Unloader: Device used to regulate or limit pressure.
- 1.10 Chemical Injector: Device used to introduce chemicals into the water stream.
- 1.11 Pressure Washer: A powered device, intended and designed for cleaning, that produces high pressure water at a minimum pressure of 100 psig and no greater than 5,000 psig.
- 1.12 Pump Head Discharge Pressure: Pressure measured in the high pressure manifold area, upstream of any regulating or chemical injection devices, while the unit is operated at rated flow condition.
- 1.13 Rated Water Flow: High pressure fluid flow through machine, while the unit is operated at maximum pressure condition and measured per Section 4.1.8.
- 1.14 Engineering Test Unit: A non-production unit built to establish ratings.

2.0 RATINGS

$$Hp_{eng} = [(GPM)(PSIG)] / [1201 (E_{pump})(E_{trans})]$$

$$Hp_{mtr} = [(GPM)(PSIG)] / [1714 (E_{pump})(E_{trans})]$$

Hp_{eng}/Hp_{mtr} – Calculated horsepower of the motor or engine based on the measurements required by this standard

GPM – Gallons per minute as measured per 4.1.6 and 4.1.8

PSIG – Pounds per square inch gauge as measured per 4.1.6 and 4.1.7

E_{pump} – Pump efficiency expressed as a decimal, use default value of .87, or the pump manufacturer's stated efficiency may be used if substantiated by data

E_{trans} – Transmission device efficiency expressed as a decimal. For CETA certification the value of E_{trans} shall be:

Direct drive – 1.0

Gearbelt/toothbelt – .98

V belt – .97

Gear box w/helical gears – .96

The following formula is provided to convert mass flow to volume when using a scale and stop watch to measure mass flow:

$$GPM = \frac{(W_{wo} - W_o) \times 0.1198}{\text{Test Time in Minutes}}$$

W_{wo} – Total weight including container

W_o – Weight of container

3.0 TEST EQUIPMENT

3.1 Calibration

3.1.1 Measuring devices shall be calibrated according to the device manufacturers' specification and calibration standards shall be traceable to National Institute of Standards and Technology (NIST).

3.1.2 The date of calibration shall be clearly marked on each measuring device.

- 3.1.3 Measuring devices shall have been calibrated not more than 12 months prior to test date.
- 3.2 The manufacturer name and model number for all test equipment (measuring devices) shall be recorded. The following test equipment shall be used:
 - 3.2.1 Pressure measurement device: Accuracy - $\pm 1\%$ f.s. (full scale)
 - 3.2.2 Flow measurement device: Accuracy - $\pm 1\%$ f.s. (full scale)
 - 3.2.3 Tach/strobe meter: Accuracy - $\pm 1\%$ f.s. (full scale)
 - 3.2.4 Ammeter: Accuracy - $\pm 1\%$ f.s. (full scale)
 - 3.2.5 Voltmeter: Accuracy - $\pm 1\%$ f.s. (full scale)
 - 3.2.6 Scale: Accuracy - $\pm 1\%$ f.s. (full scale)
 - 3.2.7 Stopwatch: Accuracy - $\pm 1\%$

4.0 TEST PROCEDURES

- 4.1 Prepare units for test (See Figure 1).
 - 4.1.1 Units shall be tested with production hose, gun, wand, and nozzle as intended for sale.
 - 4.1.2 Cold or hot pressure washers will be tested in the cold water mode.
 - 4.1.3 Inlet water temperature at 50°- 80°F.
 - 4.1.4 Inlet water pressure not to exceed 80 psig.
 - 4.1.5 The test shall be conducted at an ambient temperature of $77^\circ \pm 10^\circ\text{F}$.
 - 4.1.6 Pressure measurement and flow measurement shall be taken upstream of any pressure regulating, chemical injection or heat exchanger devices.
 - 4.1.7 Pressure measurements shall be taken at the discharge of the pump manifold. Pressure shall be measured at rated flow conditions during operation.
 - 4.1.8 Flow measurements may be taken upstream or downstream of the pump. Unit shall be operated at maximum rated pressure when measuring flow.
- 4.2 Electrically driven machine test criteria.
 - 4.2.1 Power supply voltage to be within $\pm 5\%$ of motor name plate rated voltage.
 - 4.2.2 Motor amperage during the test shall not exceed the motor name plate rating, including service factor.
- 4.3 Engine driven machine test criteria.
 - 4.3.1 The engine used for the test purpose shall be representative of the engine supplied for sale with all mufflers, deflectors, guards, etc., installed.
 - 4.3.2 The engine speed shall be adjusted to the published setting for the unit.
 - 4.4 CETA will accept power source manufacturers' test data.

5.0 LABELING

- 5.1 Pressure washers shall be rated and marketed using Maximum Pressure and Water Flow Rate as determined using the test procedures outlined in PC100. Products must operate within $\pm 5\%$ of advertised performance rating.
- 5.2 The following data shall be displayed on the product and packaging.
 - 5.2.1 Maximum Pressure _____ PSIG
 - 5.2.2 Water Flow Rate _____ GPM
- 5.3 The following statement may be used in reference to product which complies with this standard: "Conforms to CETA Performance Certification Guidelines PC100, the Industry Standard."

6.0 DOCUMENTATION

- 6.1 Manufacturers are to retain Technical Construction Files for each current certified model.
- 6.2 CETA Performance Standard Test Report Form PC100-1 for internal combustion engine driven units must be completed and retained for each certified model.
- 6.3 CETA Performance Standard Test Report Form PC100-2 for electric motor driven units must be completed and retained for each certified model.
- 6.4 A completed CETA Model Registration Form PC100-3 must be filed at CETA headquarters.

7.0 REFERENCES

UL 1776 High Pressure Cleaning Machines, 1995 or most recent.

Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062

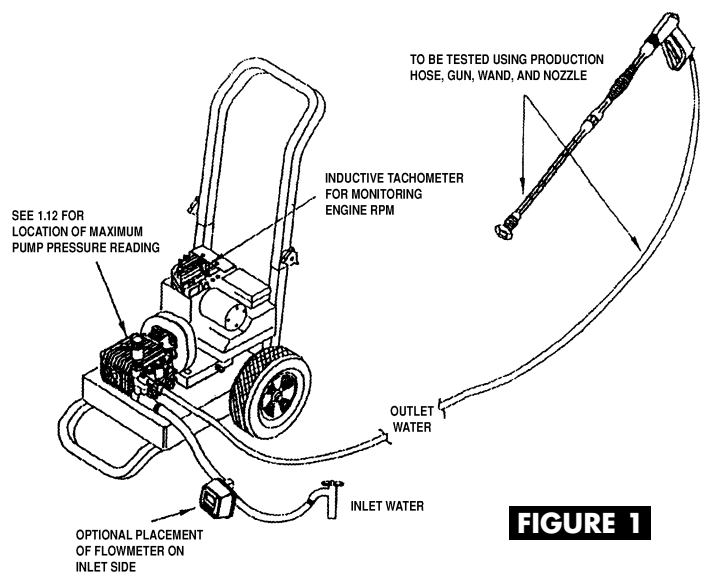


FIGURE 1



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- Production Unit
 Engineering Test Unit

CETA PC100-1 Test Report Form

Internal Combustion Engine Driven Units

Name of product OEM: _____

Model number/name/type: _____

Rated maximum pressure (psi): _____

Rated water flow (gpm): _____

Name of pump manufacturer: _____ Pump model number: _____

Name of engine manufacturer: _____

Engine model number/name/type: _____

Label engine horsepower: _____

Design engine rpm: _____

Nozzle size: _____

Chemical injection system: No Yes If yes, orifice size: _____ Type: Adjustable Fixed

Unloader: Adjustable Fixed Actuation: Flow actuated Pressure actuated

TEST EQUIPMENT/MEASURING DEVICES*

Pressure _____

Flow _____

RPM sensor: _____

**Type of Device, Manufacturer, Model Number and Date of last Calibration*

TEST READINGS**	READING NUMBER						
TEST PARAMETER	1	2	3	4	5	6	Average
Maximum pressure							
Water flow							
RPM of engine							
Water inlet pressure							

***During continuous running, record readings every 5 minutes and calculate the average. The average of each set or readings will be used to establish the pressure washer performance and conformance to ratings.*

TABLE 1 – Test Results

Maximum Pressure (Average from Table 1) _____

Water Flow (Average from Table 1) _____

Testing Conducted by _____ of _____

Signature of Tester _____ Date _____

Test Facility and Location _____



- Production Unit
 Engineering Test Unit

CETA PC100-2 Test Report Form

Electric Motor Driven Units

Name of product OEM: _____

Model number/name/type: _____

Rated maximum pressure (psi): _____

Rated water flow (gpm): _____

Rated amps: _____

Rated voltage: _____ Frequency: _____

Name of pump manufacturer: _____ Pump model number: _____

Name of motor manufacturer: _____

Model number: _____ Label horsepower: _____ Service factor: _____

Nozzle size: _____

Chemical injection system: No Yes If yes, orifice size: _____ Type: Adjustable Fixed

Unloader: Adjustable Fixed Actuation: Flow actuated Pressure actuated

TEST EQUIPMENT/MEASURING DEVICES*

Pressure _____

Flow _____

Ammeter _____

Voltmeter _____

**Type of Device, Manufacturer, Model Number and Date of last Calibration*

TEST READINGS**	READING NUMBER						
TEST PARAMETER	1	2	3	4	5	6	Average
Maximum pressure							
Water flow							
Amps							
Volts							
Water inlet pressure							

***During continuous running, record readings every 5 minutes and calculate the average. The average of each set or readings will be used to establish the pressure washer performance and conformance to ratings.*

TABLE 1 – Test Results

Maximum Pressure (Average from Table 1) _____

Water Flow (Average from Table 1) _____

Testing Conducted by _____ of _____

Signature of Tester _____ Date _____

Test Facility and Location _____



CETA PC100-3

MODEL REGISTRATION FORM

The following models have been designed, built and tested to CETA PC100.

MODEL NUMBER	Gas/Electric	Max GPM	Max PSI	Labeled HP	Calculated HP

Return to:



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Forest Lake, MN 55025-2615

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Fax: 651-982-0030
www.ceta.org

COMPANY NAME

CONTACT NAME (Please Print)

POSITION or TITLE

SIGNATURE

DATE



Performance Certification **APPLICATION**

As a member in good standing of the Cleaning Equipment Trade Association we

_____ (company)

do hereby affirm our compliance with the Cleaning Equipment Trade Association's Performance Certification Standards as set down in the CETA Performance Certification Program Guidelines PC100, Rev. 902.

By pledging compliance to this standard, it is understood that we are granted a non-exclusive, non-transferable license to use the CETA Performance Certified trademark on all qualifying equipment in support of our advertising program. There are no color restrictions when adapting the black and white CETA Performance Certified logo. The only restriction is that it must be used in total, in a size that remains complete and legible.

As an authorized representative of

_____ (company),

I _____ (representative)

hereby accept the conditions of the CETA Performance Certification Program.

The Cleaning Equipment Trade Association hereby accepts and approves this manufacturer's commitment to comply with the CETA Performance Certification Standards.

REPRESENTATIVE'S SIGNATURE

DATE