

Direction on NEE 05- Ice Point Test Form and Procedure

According to a non-compliance that we received from Measurement Canada recently for incorrectly filled out Ice Point Test Form NEE-05, **each Inspector Technician (IT) needs to send their thermometer's Ice Point Test filled out form NEE-05 IMMEDIATELY, and going forward you need to send the form to Roaa Hameed rhameed@nee.ca :**

- Every 6 months from the acquisition date of the thermometer

OR;

- Whenever you receive a new/replacement thermometer from us

IPT procedure: refer to Quality Assurance Manual > QPM> QPM-17: Ice Point Testing of Electronic Thermometers

IPT Purpose: Because the sensors of electronic thermometers are susceptible to damage, and electronic components are susceptible to drift, a scheduled check should be performed every month. The purpose of this check, an ice point test, is to evaluate the performance of electronic thermometers, ensuring that the calibration has not shifted beyond the acceptable limits of error.

IPT Frequency: If the Thermometer is used on a regular basis then the ice point test must be done every month. If the thermometer is only used occasionally it must be ice point tested before each inspection takes place. The Thermometers must be sent to Measurement Canada for re-calibration every two years or as often as deemed necessary.

Attached is:

- 1 - The IPT form NEE 05 -Rev04 is a 12-month log that is updated and kept with the thermometer at all times.
- 2- filled out SAMPLE of IPT form for your reference.

and here are few things to note before you start using the form including terminologies' used and definitions:

- Read the Ice point test procedure (QPM-17) and make sure you use the proper equipment to do the Ice point test at your office (such as a blender with ice-crushing capability, wide-mouth vacuum-insulated thermal flask, etc.).
- Follow the sample IPT form attached as a guideline when completing your ice point test
- The IPT time interval is 2 minutes ONLY, meaning that you need to wait for 2 minutes for probe's reading to stabilize before recording the ***As found result in the designated column.

- ****As left:** the thermometer's reading recorded by MC laboratory at 0.000 °C (indicated on thermometer's certificate > calibration results table > As Left) see below pic as an example :

| Measurement Canada An Agency of Industry Canada | | Mesures Canada Un organisme d'Industrie Canada | | Calibration (CYMO) - Etalonnage (A) V16-0180 2016/07/15 Project/Appoint - Projet/Requiemt: Recalibration - Date de réétalonnage CP-VL-16-0057 2018/07/15 National Energy Equipment Inc. | |
|----------------------------------------------------|---------|---------------------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Certificate of Calibration and Designation | | | Certificat d'Étalonnage et de Désignation | | |
| CALIBRATION RESULTS TABLES | | | | | |
| TABLES DES RÉSULTATS D'ÉTALONNAGE | | | | | |
| AS FOUND: TEL QUE TROUVÉ: | | | | | |
| Reference Temperature Température de référence | | P1 | P2 | Reading Lecture | |
| | °C | °C | °C | | |
| Ice Point / Point de glace | 0.000 | -0.1 | 0.0 | | |
| | 49.990 | 49.8 | 50.0 | | |
| AS LEFT: TEL QUE LAISSÉ: | | | | | |
| Reference Temperature Température de référence | | P1 | P2 | Reading Lecture | |
| | °C | °C | °C | | |
| Ice Point / Point de glace | 0.000 | -0.1 | 0.0 | | |
| | 49.990 | 49.8 | 50.0 | | |
| | 40.001 | 39.8 | 40.0 | | |
| | 30.002 | 29.8 | 30.0 | | |
| | 19.994 | 19.8 | 20.0 | | |
| | 10.002 | 9.8 | 9.9 | | |
| | 0.002 | -0.1 | 0.0 | | |
| | -9.996 | -10.1 | -10.1 | | |
| | -20.000 | -20.1 | -20.1 | | |
| | -29.996 | -30.2 | -30.2 | | |

- *****As Found:** The thermometer's reading after 2 minutes of the probe being immersed in the ice bath when you are doing the IPT.
- Hence, the temperature readings recorded on the IPT form over is the result of (**As Left - As found**)
- If the **ABSOLUTE value** of the ice point test results from the above equation $\geq 0.2 \text{ }^\circ\text{C}$, the probe is removed from service. Vice versa to pass and return to service.

For example from the above picture, P1 As left at 0.000C = -0.1C

and let's say the As found = 0.1C

The recorded result = **As Left - As found**

$$= (-0.1) - (0.1) = -0.2 \text{ C} = 0.2 \text{ C (which is not within the accepted range then P1 fails)}$$

- Put in the "pass/fail" column that P1 is failed.
- Remove P1 from service, and communicate with Zanyar/Roa to send you a replacement thermometer if needed (in case you only have one probe)
- If you have a second probe P2 that still passes, keep using it until you receive a replacement
- Send back your thermometer with its defective probes as soon as you receive the new one.

NEE 05-IPT Form- Rev04 is on measurement documents website under "Forms"





Electronic Thermometer Ice Point Test

| | | | |
|-----------------------|-----------|---------------------------|-----------------------------------|
| Make | Cooper | Assigned to | IT name |
| Model | TM99A-UL | Thermometer's Expiry Date | 2018/07/15 |
| Serial | 030609008 | Certificate/Document# | V16-0180 |
| P1 **As left Value °C | -0.1 | P2 **As left Value °C | 0.1 (NA if there is no 2nd probe) |

lab reading @ 0.000C from As left table on page 2 of the thermometer certificate

The Ice point test is only valid for 30 days from the day it's conducted

* As Left: Thermometer's reading when doing the IPT by MC laboratory at 0.000 °C (indicated on thermometer's certificate > calibration results table > As Left)

*** As Found: Thermometer's reading after 2 minutes of the probe being immersed in the ice bath when you are doing the IPT.

| Date | P1 ***As Found °C | Probe 1 absolute value= As Left- As found | P2 *** As found °C | Probe 2 absolute value= As Left- As found | Pass/ Fail |
|----------------|-------------------|-------------------------------------------|--------------------|-------------------------------------------|------------|
| Dec5-2017 | 0.0 | 0.1 | 0.1 | 0.0 | PASS |
| Jan5-2018 | 0.0 | 0.1 | 0.1 | 0.0 | PASS |
| Feb5-2018 | | | | | |
| and keep going | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |
| | | | | | |

SAMPLE

Is the absolute value of the ice point test ≥ 0.2 °C? YES

NO

select NO since probes pass the IPT

- If No, return to service.
- If yes, has the thermometer been removed from service, sent to Port Coquitlam for adjustment (repairs if necessary) and then sent to Calibration Services Laboratory for recalibration?

Comments:

Signature: 