**SOP for Mixing Factor**

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| --- | --- | --- | --- |
| **1** | **Standard and Clause.** | **Standard** | **Clause** |
| IS:2082:2018 | 18 |
| **2** | **Precautions** | * Prior to executing this process, the user must understand the electrical laboratory and measurement safety practice. The user must be familiar with the equipments utilized by this process and must review user manual of the equipment. * Connections are made under OFF Condition of the Standing loss test panel. | |
| **3** | **Test Preparations** | * The appliance should not be in operating condition during the test. The test should be carried out just after Reheating Time Calculation. | |
| **4** | **Test Requirements** | * Glass Thermometer * Measuring Jar | |
| **5.** | **Operating Instructions** | * Ensure that the instrument is clean and free from dust. * The mixing factor Fm is determined by comparing the mean water temperature with & without cold water flowing in to the water heater. * The mixing factor is expressed as a percentage. * The water heater is switched off & the water supply turned off. * The water is withdrawn through the inlet without replenishing with cold water. * Procedure to measure the Temperature of withdrawn water will be same as in Hot Water output * The mean temperature Ɵw is calculated. * Mixing Factor Fm is calculated as   Fm = Ɵw – ƟP .100  Ɵw  Fm = Mixing Factor, Ɵw = Mean water Temperature without replenishing the water & ƟP is Hot water Output. | |
| **6.** | **Results** | * 1. The Mixing factor shall be as declared by manufacturer | |

**SOP for Reheating Time**

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| **1** | **Standard and Clause.** | **Standard** | **Clause** |
| IS:2082:2018 | 17 |
| **2** | **Precautions** | * Prior to executing this process, the user must understand the electrical laboratory and measurement safety practice. The user must be familiar with the equipments utilized by this process and must review user manual of the equipment. * Connections are made under On Condition of the Standing Loss Test Panel. | |
| **3** | **Test Preparations** | * The appliance should be in operating condition during the test. | |
| **4** | **Test Requirements** | * Stop watch. * Data Logger * Standing Loss Test Panel. | |
| **5.** | **Operating Instructions** | * Ensure that the instrument is clean and free from dust. * The Reheating Time required for heating up the water from 22⁰C to 72⁰C is calculated with the help of formula as mentioned below. * The Test should be carried out immediately after Hot water Output. * Connect Device under test to test panel. * Supply the test voltage to the device under test. * The temperature measured by the Data Logger. * The Time measured by the Stop watch. * Operates the device under test at normal operating condition. * Reheating Time is calculated as   tR.50 = tR 50  ƟR -ƟC  tR= Reheating Time, ƟR = Water Temperatureafter Reheating,ƟC = Coldwater Temperature | |
| **6.** | **Results** | * The Reheating Time shall be as declared by manufacturer | |

**SOP for Hot Water Output**

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| --- | --- | --- | --- |
| **1** | **Standard and Clause.** | **Standard** | **Clause** |
| IS:2082:2018 | 16 |
| **2** | **Precautions** | * Prior to executing this process, the user must understand the electrical laboratory and measurement safety practice. The user must be familiar with the equipments utilized by this process and must review user manual of the equipment. * Connections are made under Off Condition of the Standing Loss Test Panel. | |
| **3** | **Test Preparations** | * The appliance should be in operating condition during the test. | |
| **4** | **Test Requirements** | * Stop watch. * Glass Thermometer * Measuring Jar. | |
| **5.** | **Operating Instructions** | * Ensure that the instrument is clean and free from dust. * Ensure that the instrument is clean and free from dust * A quantity of water equal to the rated capacity is withdrawn through the outlet at a constant rate of flow by supply cold water. * The rate of flow is adjusted to 2 liter/min. for water heater with a rated capacity less than 10 liter. * The rate of flow is adjusted to 3 liter/min. for water heater with a rated capacity less than 10 liter up to 50 liter. * The rate of flow is adjusted to 10 liter/min. for water heater with a rated capacity less than 50 liter up to 200 liter. * The temperature measured by the glass thermometer. * The average temperature of withdrawn water Ɵ’P is calculated. * The Mean Water Temperature ƟP is calculated from the following formula   ƟP = 50.  Ɵ’P - ƟC +15  ƟA – ƟC  ƟP = mean water temperature when determining the hot water output, Ɵ’P = Mean water temperature for the determination of ƟP, ƟC = Cold water Temperature, ƟA= Mean water temperature after thermostat cut off. | |
| **6.** | **Results** | * The Hot Water Output shall be as declared by manufacturer | |

**SOP for Standing Loss Calculation**

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| --- | --- | --- | --- |
| **1** | **Standard and Clause.** | **Standard** | **Clause** |
| IS:2082:2018 | 15 |
| **2** | **Precautions** | * Prior to executing this process, the user must understand the electrical laboratory and measurement safety practice. The user must be familiar with the equipments utilized by this process and must review user manual of the equipment. * Connections are made under On Condition of the Standing Loss Test Panel. | |
| **3** | **Test Preparations** | * The appliance should be in operating condition during the test. | |
| **4** | **Test Requirements** | * Data Logger * Standing loss Test Panel. | |
| **5.** | **Operating Instructions** | * Ensure that the instrument is clean and free from dust. * The water heater is filled with cold water; Electrical supply is switched on for few cycles of operation of the thermostat until steady state condition have been reached. * Starting & Ending at a cutout of thermostat the energy E1 consumed during time t1 (Hours) is measured over a period of not less than 48 hrs. * The water temperature ƟE1 at each thermostat cut – in & ƟA1 at each thermostat cut – out are measured by means of a thermocouple. * The energy consumption E per 24 h is calculated with following formula:   E= E1 X 24 / t1   * The Mean water temperature ƟM is calculated by the following formula   ƟM = ƟA + ƟE / 2   * The Standing loss per 24 h ƟPr is calculated with following formula   45  ƟPr = ----------------- X E  ƟM  - Ɵamb  ƟPr is expressedin kilowatt – hours per 24 h related a temperature rise of 45 K & EXPRESSED TO THE NEAREST 0.1 kWh | |
| **6.** | **Results** | * The Standing loss per 24 hours shall not be more as declared in BEE. | |

**IOP Standing Loss Test Panel**

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| **1** | **Objective** | * To describe the procedure for operation and calibration of Standing Loss Test Panel. |
| **2** | **SCOPE** | * It is applicable for the procedure for operation and calibration of Standing Loss Test Panel. |
| **3** | **CLEANING PROCEDURE** | * Wipe the surface, walls, top and bottom of the Standing Loss Test Panel with dry lint free cloths in daily basis so that there will be no dust particle in the Standing Loss Test Panel. * Wipe all the parts and outer surface of the Standing Loss Test Panel with wet lint cloth soaked in purified water, on weekly basis and fill the weekly cleaning record. |
| **4.** | **OPERATING PROCEDURE:** | * Ensure that the instrument is clean and free from dust. * Switch “ON” in the panel. * Fill the water in water heater then connect to the panel. * Supply the rated voltage to the water heater. |

**IOP for Humidity Chamber**

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| 1 | **OBJECTIVE** | To Describe the Procedure for Operation of Humidity Chamber |
| 2 | **SCOPE** | It is Applicable for the Procedure for Operation of Humidity Chamber |
| 3 | **CLEANING PROCEDURE** | * Wipe the surface, Wall, Top, Bottom and Trays of the Humidity Chamber with dry lint free cloths in daily basic so that there will be no dust particle in the Humidity Chamber * Wipe all the parts and outer surface of the Humidity Chamber with wet lint cloth soaked in purified water, on weekly basic and fill the cleaning record |
| 4 | **OPERATING PROCEDURE** | * Ensure that the instrument is clean and free from Dust * Ensure that the Water are full in Water Tank * Connect the instrument to main supply * Switch “ON” the main supply then “Red” main indicator “ON” then main switch “ON” and also humidifier switch “ON” * Press the Temperature Controller and Set the Temperature as per Standard Requirement * Press the Humidity Controller and Set the Humidity as per Standard Requirement * When Temperature & Humidity Reach the Required Temperature and Humidity then green indicator “ON/OFF” to maintain the Temperature and Relative Humidity * Place the Sample “ON” the Shelves after Retaining its Received Temperature and Relative Humidity * Close the door of the humidity chamber and Continued the Test as per Standard Requirement |

**IOP for Leakage Current Tester**

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| 1 | **OBJECTIVE** | * To Describe the Procedure for Operating Leakage current Tester |
| 2 | **SCOPE** | * It is Applicable for the Procedure for Operating Leakage Current Tester. |
| 3 | **CLEANING PROCEDURE** | * Wipe the surface, Wall, Top, Bottom with dry cloths in daily basic so that there will be no dust particle in the instrument |
| 4 | **OPERATING PROCEDURE** | * Ensure that the instrument is clean and free from dust and required safety devices acquired during test. * Connect the instrument to main supply * Switch “ON” the main supply and insert 3 pin socket to the panel. * Note down the reading with switching the pin line to earth & neutral to earth. * In both cases this should not exceed to 210 uA. |

**IOP Earth Continuity Resistance (ECR)**

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| **1** | **Objective** | * To describe the procedure for operating the Earth Continuity Resistance Meter. |
| **2** | **SCOPE** | * It is Applicable for the Procedure for Operating Earth Continuity Resistance Meter |
| **3** | **CLEANING PROCEDURE** | * Wipe the surface, Wall, Top, Bottom with dry cloths in daily basic so that there will be no dust particle in the instrument |
| **4.** | **OPERATING PROCEDURE:** | * Ensure that the instrument is clean and free from dust and required safety devices acquired during test. * Connect the instrument to main supply * Switch on the main supply & short the two terminals of testing machine & gradually increase the current up to 25 ampere. Note down the correspondence voltage V2 * Now apply one wire with earth pin of the product & second one to live metallic parts * Gradually increase the current to 25 ampere & note down the correspondence voltage V1 * Calculate the resistance with V2 -V1 / 25 * Value of resistance should be less than 0.1 Ω. |