मानकः पथप्रदर्शकः

COMPENDIUM OF INDIAN STANDARDS ON ELECTRIC KITCHEN APPLIANCES

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Introduction

Electric Kitchen appliances have become an essential part of modern households, helping save time, improve efficiency, and support healthier cooking practices. From electric mixers and blenders to microwave ovens, coffee makers, and electric kettles, these appliances are now found in almost every home. As their usage grows, ensuring their safety, quality, and performance becomes increasingly important to protect consumers and improve user experience.

This compendium provides a summary of key Indian Standards related to major electric kitchen appliances. For each appliance, it outlines the scope of the standard and its main provisions, including safety requirements, performance criteria, testing methods, and marking instructions. These summaries help simplify and highlight the critical aspects of each standard.

The compendium is intended to serve as a quick reference tool for manufacturers, testing laboratories, certification bodies, regulators, and consumer organizations. It will support better compliance, product development, quality control, and informed decision-making by all stakeholders involved in the electric kitchen appliance sector.

1. IS 4250:2025 Electric Food-Mixers (Liquidizers and Grinders) and Centrifugal Juicers

Scope: This standard outlines safety and performance requirements for electric motor-driven food-mixers (grinders and liquidizers) and centrifugal juicers intended for household and similar use and designed for operation at voltages not exceeding 250 V a.c.

Key Provisions

1. Defines components such as

- *Liquidizer*: Appliance with rotating blades for liquid and semi-solid materials.
- *Grinder*: Appliances for pulverizing or powdering dry foodstuffs.
- *Centrifugal Juicer*: Extracts juice using centrifugal force.

2. Specifies requirements such as

- **Construction**: Sturdy, hygienic materials, easy to clean.
- **Rating**: Voltage and frequency must match Indian domestic supply
- **Marking**: Appliances must be marked with manufacturer's name, model, voltage, wattage, frequency, and ISI certification mark. Instructions for usage also to be provided with the product

- **Workmanship**: Smooth finish, properly secured components, rustproof metal parts.

3. Performance Tests

- **Input Power Test**: Wattage must not exceed declared rating beyond a certain value
- **Operation Test**:
  - Liquidizers: Should handle water and solids efficiently without leakage or splashing.
  - Grinders: Must grind specified materials (e.g., rice, urad dal) to acceptable fineness
  - Juicers: Must extract juice from carrots/fresh seasonal fruits with acceptable yield
- **Endurance Test**: Appliance must withstand 48 ON hours with sufficient OFF periods interspersed during the test

4. Safety Requirements

- Must comply with IS 302-2-14 which covers safety requirements, such as protection against electric shock
- **Mechanical Safety**: Jars and lids must be secure during operation; no exposed rotating parts.
- **Temperature Rise**: Appliance motor winding temperature must stay within permissible limits

2. IS 19014: 2022 Household Electric Cooking Appliances — Performance Requirements of Electric Hobs

Scope

This standard specifies the performance requirements of electric hobs for household use, operating at voltages not exceeding 250 V for single-phase and 415 V for three-phase appliances. It applies to both built-in and freestanding hobs, which may be part of a cooking range. It defines the main performance characteristics relevant to users and lays down the test methods for assessing these characteristics. Safety requirements are covered separately under IS 302 (Part 2/Sec 6).

Key Provisions

1. Terminology and Classification

Defines essential terms like hob, cooking zone, cooking area, and warming zone. Classifies zones as single, multiple, solid hotplate, tubular, radiant, and induction types. Distinguishes standardized and alternative cookware, as well as operating modes (off, standby).

2. Performance Parameters and Testing

Specifies methods to assess dimensions, energy consumption, heating time, thermal efficiency (induction hobs), temperature control, heat distribution, and spillage capacity. Cooking zones are tested using standardized or approved

alternative cookware. Cooking area tests include browning uniformity, smallest detectable cookware size, and continuous frying capacity.

3. Safety and Compliance

Electric hobs must meet the safety requirements outlined in IS 302 (Part 2/Sec 6) prior to undergoing performance testing under this standard. Key safety checks include protection against electric shock, insulation resistance, moisture resistance, earthing, and electric strength.

4. Marking and Certification

All hobs must be marked with manufacturer details, electrical ratings, and other identifiers per IS 302 (Part 2/Sec 6). Products may also bear the BIS Standard Mark if licensed, under the provisions of the BIS Act, 2016.

5. Test Categories

The standard includes a schedule of:

- **Type Tests**: Full performance evaluation on representative samples.
- **Acceptance Tests**: Selected tests to confirm batch quality.
- **Routine Tests**: Basic checks like earthing continuity, electric strength, and functional operation for every unit.

6. Testing Environment

Specifies controlled test room conditions: ambient temperature of 27 ± 5 °C (23 ± 2 °C for certain energy tests), regulated power supply with ±1% tolerance, and air pressure between 913 and 1063 hPa.

7. Cookware Specifications

Standardized and alternative cookware must meet strict requirements regarding material (e.g., stainless steel with ferromagnetic base), flatness, thickness, and dimensional tolerances to ensure reliable, reproducible test results.

3. IS 11676:1995 – Microwave Ovens for Household Use

Scope

This standard applies to microwave ovens used in homes or similar settings. It covers general, safety, and performance requirements and testing methods. It is meant for ovens working on single-phase AC supply up to 250 V and 50 Hz and includes relevant clauses from IS 302-2-25.

Key Provisions

1. Safety Requirements

- Ovens must meet safety clauses (8 to 32) from IS 302-2-25.
- Must resist heat, moisture, and corrosion.
- Microwave leakage must not exceed **5 mW/cm² at 5 cm distance** during normal use.

2. Physical Features

- **Dimensions**: External height, width, and depth must match manufacturer's data.
- **Usable Cavity Volume**: Space inside the oven for cooking; must be within ±10% of declared value.
- **Usable Shelf Area**: The shelf area usable for food, also within ±10% tolerance.

3. Performance Tests

- **Power Output**: Measured as per IS 302-2-25; should be within ±10% of declared value.
- **Efficiency**: Ratio of output power to input power; also within ±10% range.
- **Uniform Heating**:
  - *Water tank and cup tests* are used to check how evenly heat is distributed.
  - Heating should not vary by more than ±20% across different areas.
- **Heating Test**: Checks how evenly and quickly beverages are heated to 80±5°C.
- **Cooking Tests**: Involves foods like custard, cake, and minced beef, assessed on speed, quality, and ease of use.

- **Defrosting Test**: Focuses on how well and evenly meat defrosts without hot or frozen spots.

4. Testing Requirements

- **Type Tests**: Conducted on two samples to check full performance.
- **Acceptance Tests**: Check electrical safety, insulation, temperature rise, and moisture resistance.

Routine Tests: Daily checks for electric shock protection, high voltage safety, and proper earthing.

4. IS 1287:1993 – Electric Toaster

Scope

This standard applies to electric toasters used at home or in similar places like small hotels and tea rooms. It covers general, safety, and performance requirements for toasters that operate on single-phase electricity up to 250 volts AC or DC.

Key Provisions

1. **Safety**: Toasters must meet safety rules from IS 302-2-9:1993, including protection from electric shocks, overheating, and mechanical issues.

2. **Design & Dimensions**: Toasters must be measured for size, weight, number and size of toasting slots, and heating elements. These should match the manufacturer's claims.

3. **Cord Length**: The power cord must be at least 2 meters long.

4. **Performance**:

    a. **Toasting Time**: Toasting should take between 60 and 180 seconds.

    b. **Browning Control**: Users should be able to set how brown the toast gets. The control must work consistently.

    c. **Evenness**: Bread should brown evenly on both sides.

    d. **Force to Use**: The effort to push down the bread carriage must be within 10% of what the manufacturer claims.

5. **Durability**: The toaster must work properly for 200 hours in a repeated on-off cycle without damage.

6. **Finish**: The outer surface must resist heat, moisture, and not get damaged during normal use.

7. **User Instructions**: The toaster should come with a manual explaining how to remove bread crumbs, details about the cord, how the bread carriage works, and how to toast one or both sides.

8. **Testing**:

   a. **Type Tests**: Done on two samples to check all functions and safety.

   b. **Acceptance Tests**: Include checks for safety, heating, insulation, moisture resistance, and performance.

   c. **Routine Tests**: Ensure each unit meets basic electrical safety before sale.

5. IS 367:1993 – Electric Kettles and Jugs for Household Use

Scope

This standard covers the safety, performance, and general requirements for electric kettles, jugs, and similar appliances used in homes, small hotels, tea rooms, and similar places. It applies to appliances with a maximum capacity of 5 litres and meant to run on single-phase electricity not exceeding 250 volts AC or DC. It excludes electrode-type heaters and other unrelated appliances.

Key Provisions

1. **Safety**: Kettles and jugs must meet safety norms given in IS 302-2-15. This includes protection from electric shock, overheating, and proper insulation.

2. **Marking**: Appliances must be marked with capacity, boiling time, minimum water level, and thermal efficiency. These details can be printed on the appliance or in an instruction sheet.
3. **Performance Tests**:
    1. Boiling time for 1 litre and full capacity should match the manufacturer's claims.
    2. Minimum water quantity (for immersion type) must be safe to boil.
    3. Thermal efficiency should be acceptable and not fall below required levels.
4. **Design Measurements**:
    1. Overall size and weight must be declared and verified.
    2. Water capacity must not be less than rated.
    3. Surface temperature during operation should be within safe limits.
5. **Durability (Endurance)**: Appliances must operate continuously under test conditions for 96 hours without failure.
6. **Finish**: Metal parts should resist rust and handle heat and moisture without damage. Coatings must meet Indian Standards on electroplated nickel/chromium coatings.
7. **Testing Categories**:
    1. **Type Tests**: Full performance and safety tests on samples.
    2. **Acceptance Tests**: Selected checks on size, capacity, boiling time, and earthing.

Routine Tests: Daily checks for insulation, leakage, temperature rise, and electric shock protection.

6. IS 14144:1994 – Electric Coffee Makers

Scope

This standard applies to electric coffee makers used at home and in similar places like offices or small cafes. It covers types with fixed heating elements (immersion, clamp-on, and cast-in), working on single-phase power up to 250 V. It includes devices like percolators, filter coffee machines, and espresso makers. The standard does not cover models with removable thermostats or ones operating under high pressure.

Key Provisions

1. **Safety**: The coffee maker must follow safety norms from IS 302-2-15, including protection from electric shock, overheating, and proper insulation.
2. **Marking**: Devices must be labelled with details like power rating and thermal efficiency.
3. **Performance Tests**:
    1. Checks are done for coffee quantity produced (max/min water input), preparation time, coffee temperature, and warming ability.
    2. Coffee temperature must stay within the declared range over 60 minutes.
    3. Thermal efficiency must be at least 85% for immersion types and 65% for others.
4. **Durability (Endurance)**: The machine should run safely for 96 hours under test conditions without breaking down.

5. **Finish**: External surfaces should resist heat and moisture, and not corrode or peel during use.
6. **Safety Devices**: Coffee makers with cut-off mechanisms are tested for their response when overheating occurs, including thermal shock tests.
7. **Testing Types**:
    1. **Type Tests**: Full checks on selected samples for safety, performance, and build.
    2. **Acceptance Tests**: Key functional and safety tests during batch inspection.
    3. **Routine Tests**: Daily production checks like earthing and shock protection.

7. IS 302-2-14:2009 – Safety of Electric Kitchen Machines

Scope

This standard covers the **safety** requirements for electric kitchen machines used in homes and similar places. These appliances operate at voltages not more than 250 volts and include mixers, grinders, blenders, juicers, food processors, and other related machines. It applies even to appliances used in small shops or on farms if used by the general public. It does **not** cover machines meant for industrial or commercial use, or those working in special environments like explosive areas.

Key Provisions

1. **Appliances Covered**: Includes a wide range of machines like food mixers, blenders, juicers, mincers, processors, coffee mills, shredders, and more.
2. **General Safety**: Appliances must protect users from electric shock, overheating, fire, sharp blades, and accidental contact with moving parts.
3. **Operation Tests**: Machines are tested under normal and worst-case conditions with actual food items (like carrots, flour, meat, coffee beans) to simulate real use.
4. **Overheating & Load Protection**: Appliances are run for specific durations to check for safe heating and proper shutdown in case of overuse.
5. **Mechanical Safety**: Devices must be built to avoid hazards from sharp edges, unstable parts, or loose components. Special safeguards are required for slicing machines and high-speed parts.
6. **Child & User Protection**: Machines should not be easily operated by children or allow access to dangerous parts during use or cleaning.
7. **Instructions & Marking**: Clear operating instructions, warnings, and correct usage guidelines must be provided. Rated power must be marked.
8. **Testing Requirements**:
    1. **Type Tests**: Full range of safety tests on samples.
    2. **Acceptance Tests**: Essential safety checks like insulation, heating, and leakage current.

3. **Routine Tests**: Basic checks for live part protection and earthing for every unit.