



**PRODUCT MANUAL FOR
HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS SAFETY
PART 2 PARTICULAR REQUIREMENTS SECTION 1 DRILLS AND IMPACT DRILLS
ACCORDING TO IS 4665 (PART 2 / SECTION 1): 2023/ IEC 60745-2-1: 2003**

1.	IS No.	:	IS 4665 (Part 2 / Section 1): 2023/ IEC 60745-2-1: 2003
	Title	:	Hand-Held Motor-Operated Electric Tools Safety Part 2 Particular requirements, Section 1 drills and impact drills
	No. of amendments	:	Nil
2.	Sampling Guidelines:		
a)	Raw material	:	Components as per Cl. 23 of IS 4665 (Part 2/ Sec 1)
b)	Grouping Guidelines	:	Please refer ANNEX – A
c)	Sample Quantity	:	2 numbers
3.	List of Test Equipment	:	Please refer ANNEX – B
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – C .
5.	Possible tests in a day:	:	Please refer ANNEX-D
6.	Scope of the Licence:		
	Licence is granted to use Standard Mark as per IS 4665 (Part 2 / Section 1): 2023 with the following scope:		
	Name of the Product	<name of the electrical tool>	
	Type	Drill/Impact Drill	
	Class of Appliance	Class I/II/III	
	Rating	____ W, ____ V, ____ Hz, ____ Phase, a.c or ____ W, ____ V d.c	
	Degree of Protection		
	Maximum capacity of chuck	____ mm	

ANNEX – A
Grouping Guidelines

- 1) Manufacturer shall declare the model(s) of each type(s) of the Hand-held Motor Operated Electric Tools- Drill and Impact Drill manufactured by them and declare the following parameters in addition to those specified in the scope of licence for each model:
 - a) No load speed in rpm
 - b) Functions/ Features including maximum capacity of the Chuck size, in mm
 - c) Design/ Photographs of the model
- 2) For grant of licence/ change in scope of the licence, each model of each type of power tool is to be tested.
- 3) Following relaxation may be applicable for grant of licence/ change in scope of the licence of additional models, provided all other parameters remains the same including nature of electric supply:
 - a) If model with higher wattage of power tool is tested, models with lower wattage may be covered without further testing.
 - b) If model with higher chuck size is tested, models with lower chuck size may be covered without further testing.
 - c) If model having more functions is tested, model with less functions may be covered without further testing, provided the functions to be covered are already tested.
 - d) If model with higher insulation class is tested, model with lower insulation class may be covered without further testing.
 - e) If model with higher degree of protection is tested, model with lower degree of protection may be covered without further testing.
- 4) Change in colour/ aesthetics/ design may not require further testing provided the technical parameters remain the same.
- 5) The Scope of Licence may be restricted based on the Manufacturing capability and Testing facilities of the Manufacturer.
- 6) During the operation of the Licence, BO shall ensure that all the models of each type of appliance covered in the Licence are tested in rotation to the extent possible.

ANNEX – B
List Of Test Equipment
(INDICATIVE LIST, FOR GUIDANCE ONLY)

Major test equipment required to test as per the Indian Standard

Clause	Test	Testing equipment / Material needed
8	Marking and instructions	Cotton Cloth, Petroleum Spirit, stopwatch
9	Protection against access to live parts	Test fingers, Probe, Pin, Voltmeter, Ammeter, Force gauges
11	Power input and current	Voltmeter, Ammeter, Wattmeter,
12	Heating	Variable voltage source, Temperature Recorder, Fine wire thermocouples, Test corners, Winding resistance measurement system, Loading as required, Tachometer
13	Leakage current	Leakage current meter (Ammeter), Isolation transformer
14	Moisture resistance	Humidity Chamber (Temperature Indicator, Temperature Controller, Thermo hygrometer, Hour Meter), Test set up for degree of protection
15	Electrical strength	HV test equipment, stop watch
16	Overload protection of transformer and associated circuits	Variable Power Supply or Transformer Test Setup, Short-Circuit Simulation Setup, Multi-channel temperature data logger, Digital thermometer, Adjustable load bank, Insulation Monitoring Tools, Timer
17	Endurance	Endurance Test Apparatus (Voltmeter, Ammeter, Wattmeter, Energy Meter, Counter Meter, Timer)
18	Abnormal operation	Wattmeter, Variable voltage supply, Digital temp data logger, HV tester, Metal Foil, Fine wire thermocouple, Stopwatch, Surge test generator
19	Mechanical hazards	Inclined plane, Angle Finder, Push-pull gauge, Test probe similar to test probe B (as per Cl. 20.2), Steel scale, Spring Impact Hammer, vernier caliper, scratch tester, Torque screwdriver, Concrete floor
20	Mechanical strength	
21	Construction	Test rig for torque on pin supported appliance, Force gauge, steel ball 6 mm
22	Internal wiring	Flexing Test Apparatus, HV tester, Metal Foil, Stopwatch
24	Supply connection and external flexible cords	Cord Grip Test Apparatus, Measuring Tape, Micro-ohmmeter

25	Terminals for external conductors	Torque Screwdriver
26	Provision for earthing	Earth continuity tester,
27	Screws and connections	Torque gauge
28	Creepage distances, clearances and distance through insulation	Filler Gauge, Vernier Calliper, Micrometer
29	Resistance to heat fire and tracking	Ball Pressure test apparatus, glow wire test apparatus, proof tracking test apparatus
30	Resistance to rusting	Degreasing agent, 10 % ammonium chloride, heating cabinet

Note: The above list is indicative only and may not be treated as exhaustive.

ANNEX – C**SCHEME OF INSPECTION AND TESTING****1. QUALITY ASSURANCE PLAN**

- 1.1** It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance plan that is a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.
- 1.2** The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.
- 1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:**
For the guidance of manufacturers, the recommended definition of control unit is: *All Hand held motor operated Electric Drills or Impact Drills of the same type, class and rating manufactured in a day under similar conditions*, shall constitute a control unit.
- 1.3.1** For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in Table 1.
- 1.3.2** The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.
- 1.4** However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING

- 2.1** It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.
- 2.2** For the guidance of manufacturers, Table 1 of this manual provides the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as “R” or other tests which can be subcontracted as “S”. Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.
- 2.3** For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as “R” in Column 2 of Table 1) is also optional.

2.3.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.4 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1), where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.4.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.5 TEST RECORDS

The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING

3.1 The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each Hand-held motor operated Electric tools and also on its packaging (wherever applicable) provided always that the Hand held motor operated Electric tools so marked conforms to each requirement of the specification. In addition, marking shall be done as per the Cl. 8 of the IS 4665 (Part 2 / Sec 1): 2023/ IEC 60745-2-1-: 2003.

3.2 Additional Marking requirements:

- a) The material shall also be marked with the following additional details on packaging:
“For BIS certification details please visit www.bis.gov.in”
- b) Instruction shall be provided with each Hand held motor operated Electric tools as per requirement prescribed at Cl. 8 of the IS 4665 (Part 2 / sec 1) : 2023/ IEC 60745-2-1: 2003

4. HYGIENIC CONDITIONS (if applicable) – NA.

5. REJECTION

All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1
(ONLY FOR GUIDANCE PURPOSE)

	(1)		(2)	(3)			
	Test Details			Test equipment requirement R: required (or) S: Subcontracting permitted	Levels of Control		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
23	Components	23	IS 4665 (Part 2 / sec 1): 2023/ IEC 60745-2-1: 2003 and IS 4665 (Part 1) : 2023/IEC 60745-1: 2006	S	Each consignment of components received	Further testing is not required if supplied with BIS Standard Mark or with Test certificate, as applicable	
N.2	Correct operation test	N.2		R	Each hand held motor operated Electric Drills/Impact Drills.		
N.3	Electric strength test	N.3		R			
N.4	Earthing continuity test	N.4		R			
8	Marking and instructions	8		R	Firm should exercise adequate control so that whole production should meet the requirements.		
9	Protection against access to live parts	9		S	One	Each model of hand held motor operated Electric Drills/Impact Drills manufactured in a month.	
10	Starting	10		S	One		
11	Input and current	11		S	One		
12	Heating	12		S	One		
13	Leakage current	13		S	One		
14	Moisture resistance	14	IS 4665 (Part 2 / sec 1): 2023/ IEC 60745-2-1: 2003 And IS 4665 (Part 1) : 2023/IEC	S	One	Each model of hand held motor operated Electric Drills/Impact Drills manufactured in six months.	
15	Electric strength	15		S	One		
16	Overload protection of transformers and associated circuits	16		S	One		
17	Endurance	17		S	One		
18	Abnormal operation	18		S	One		

19	Mechanical hazards	19	60745-1: 2006	S	One	Each model of hand held motor operated Electric Drills/Impact Drills manufactured in six months.
20	Mechanical strength	20		S	One	
21	Construction	21		S	One	
22	Internal Wiring	22		S	One	
24	Supply connection and external flexible cords	24		S	One	
25	Terminals for external conductors	25				
26	Provision for earthing	26		S	One	
27	Screws and connections	27				
28	Creepage distances, clearances and distances through insulation	28		S	One	
29	Resistance to heat, fire and tracking	29		S	One	
30	Resistance to rusting	30		S	One	
31	Radiation, toxicity and similar hazards	31		S	One	

ANNEX – D

Possible Tests in a day

1. Marking (Cl. 8);
 2. Correct operation test (N.2);
 3. Electric strength test (N.3);
 4. Earthing continuity test (N.4)
 5. Protection against access to live parts (Cl.9)
 6. Starting (Cl. 10);
 7. Input and current (Cl. 11).
 8. Leakage current (Cl.13)
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