

PRODUCT MANUAL
HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS- SAFETY
PART 2 PARTICULAR REQUIREMENTS SECTION 3 GRINDERS POLISHERS AND DISK-TYPE SANDERS
ACCORDING TO IS 4665 (PART 2 / SECTION 3): 2023/ IEC 60745-2-3: 2006

1.	IS No.	:	IS 4665 (Part 2 / Section 3): 2023/ IEC 60745-2-3: 2006
	Title	:	Hand-Held Motor-Operated Electric Tools- Safety: Part 2 Particular requirements, Section 3 Grinders, Polishers and Disk-Type Sanders
	No. of amendments	:	Nil
2.	Sampling Guidelines:		
a)	Raw material	:	Components as per Cl. 23 of IS 4665 (Part 2/ Sec 3)
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 3): 2023 with the following scope:		
	Name of the Product	<name of the electrical tool>	
	Type	Grinders/ Polishers/ Disk-Type Sanders/ Any other	
	Rated Capacity	___ mm	
	Class of Appliance	Class I/II/III	
	Rating	___ W, ___ V, ___ Hz, ___ Phase, a.c.; or ___ W, ___ V d.c	
	Degree of Protection		

ANNEX – A
Grouping Guidelines

- 1) Manufacturer shall declare the model(s) of each type(s) of power tool manufactured by them and declare the following parameters in addition to those specified in the scope of licence for each model:
 - a) Rated speed
 - b) 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/ inclusion of additional models, provided all other parameters remains the same:
 - a) If model with higher wattage of power tool is tested, models with lower wattage may be covered without further testing.
 - b) Following grouping may be applied to cover models with different disc sizes

Group I	Disc size up to and including 100 mm	If the model with higher disc size is tested, models with lower disc sizes, within the group, may be covered without further testing
Group II	Disc size above 100 mm	
 - 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.
- 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
10	Starting	Power source and voltage regulator
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 during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) i.e. 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 (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is : *All Hand held motor operated Grinders, Polishers and Disk-type Sanders of the same type, class and rating manufactured in a day under similar conditions*, shall constitute a control unit.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

1.3.3 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.

2. ENSURING COMPLIANCE THROUGH TESTING-

Manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred :

- i) Shared testing resources like common facility,
- ii) Cluster based testing facility,
- iii) Sub-contracting to outside laboratories which may either be:
 - a) BIS recognised/empanelled laboratories, or
 - b) Any accredited laboratory as per ISO/IEC 17025

2.1 TEST RECORDS-

The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made 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 3): 2023/ IEC 60745-2-3: 2006.

3.2 Additional Marking requirements: Additionally, the following shall be marked on product or package or both

- a) 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 3): 2023/ IEC 60745-2-3: 2006

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

	(1)		(3)			
	Test Details		Levels of Control			
Cl.	Requirement	Test Methods		No. of Sample	Frequency	Remarks
		Clause	Reference			
23	Components	23	IS 4665 (Part 2 / Sec 3): 2023/ IEC 60745-2-3: 2006 and IS 4665 (Part 1) : 2023/IEC 60745-1: 2006	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		Each hand held motor operated Electric Tool.		
N.3	Electric strength test	N.3				
N.4	Earthing continuity test	N.4				
8	Marking and instructions	8		Firm should exercise adequate control so that whole production should meet the requirements.		
9	Protection against access to live parts	9		One	Each model of hand held motor operated Electric Tool manufactured in a month.	
10	Starting	10		One		
11	Input and current	11		One		
12	Heating	12		One		
13	Leakage current	13	One			
14	Moisture resistance	14	IS 4665 (Part 2 / Sec 3): 2023/ IEC 60745-2-3: 2006 And IS 4665 (Part 1) : 2023/IEC 60745-1: 2006	One	Each model of hand held motor operated Electric Tool manufactured in six months.	
15	Electric strength	15		One		
16	Overload protection of transformers and associated circuits	16		One		
17	Endurance	17		One		
18	Abnormal operation	18		One		
19	Mechanical hazards	19		One		

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

ANNEX – D

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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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