



Doc No

Issue No Issue Date

PRTD/AR/PF:03	2	30 Sep 2020	Report of Action Research
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1	Action Research Project No (as assigned by PRTD)	AR-0026
2	Title of the Action Research Project	A Comprehensive new Indian Standard for 'Table Top Electric Wet Grinder for Domestic Use'.
3	Name & Designation of Officer	JOSE CHARLES Scientist D
4	Employee No.	55727
5	Deptt./BO/RO & Place of Posting	Certification , CNBO-1, SRO, Chennai
6	Date of Approval of the Project	PRTD/R/5:2/AR-0026 dated 29 May 2020
7	Objective of the Project	<p>Wet grinding is a unique process commonly used in Indian cuisine, especially South India, where an arrangement of granite stone plates is used to make pastes from rice, grains & lentils. During conversations with licensees and industry acquaintances, it was noticed that this common household Electro-Mechanical appliance does not have a comprehensive Indian Standard, despite multiple moving parts, electrical connections & contact with edible material, ie. Multiple points of hazard / failure.</p> <p>Product performance, production process & safety are currently neither quantifiable nor measurable, and cannot be monitored or improved, in the absence of a National Standard. Common consumers are not assured of Safety and Quality in this circumstance.</p> <p>Hence, it is proposed to take forward for formulation of a new Indian Standard for the commonly used "Table Top Wet Grinder for Domestic Use".</p>
8	Report of Action Research Activities	1. Carried out the Study of the similar product standards to understand the requirement of Electrical appliances. especially safety aspects. List of standards referred enclosed as Annexure 1.

		<ol style="list-style-type: none"> 2. Collected and studied the wet grinders Manufactures specifications. A sample list enclosed as Annexure II. 3. Created group of the manufactures obtained from COWMA (Coimbatore Wet Grinders Manufactures Association) from our Licensee list and through web search portal and Carried out a survey among the manufactures of wet grinders. Detailed of the survey enclosed as Annexure -III. 4. The consumers input were taken through a survey Details enclosed as Annexure IV. 5. The criteria framed by Tamilnadu State Government for the Purchase of Wet Grinder in year 2012 collected and the details noted. Pl see Annexure V. 6. A Watsapp group formed in which around 60 Wet grinder manufactures / brand owners including the representatives from Elgi Utra Kitchen Appliance, Butterfly Gandimathi Appliances , Preethi Kitchen Appliances , Philips India , Panasonic Appliances Ltd., , Maya Appliance (Vidiem), Amirtha, wet grinders Laxmi grinders, SIVANESAN INDUSTRIES (Premier) and many more were brought to one group to gather input for the formulation of the comprehensive Indian Standard. The response was really very encouraging.Pl see Annexure VI. 7. A virtual Google Meet carried out on 13/03/2021 in which 30 participants mainly members of COWMA and others were participated. The requirements to eb considered in a Wet Grinder Standard in detailed discussed. The requirements with respect to raw materials also discussed. Pl see Annexure VII. 8. A Two days visit to a local manufacturing unit was carried to condut the tests on a wet grinder mainly to arrive the performance requirements of grinding quality and soaking time of Rice and Urad Dal.
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		<p>9. Based on the above materials, discussions, survey results and Laboratory tests a draft Working Standard for the product with title ” Table top Electric Wet Grinder for Domestic Use “ prepared for the consideration . Enclosed as Annexure VIII.</p>
9	<p>Conclusion & Recommendations</p>	<ol style="list-style-type: none"> 1. During the interaction with the stake holders it was understood that the Manufactures of Wet Grinders are very much looking forward for a standard . 2. The Working standard prepared and submitted for the product Table top Electric Wet Grinder for Domestic Use (Annexure VIII) shall be further evaluated by Electro Technical department (ETD) and to finalise and published immediately. Members of COWMA and other manufactures volunteered and showed interest to join as members of Technical Committee for the finalization of this draft working standard. 3. The manufactures are looking forward to obtain BIS certification License for the Table top Electric Wet Grinder for Domestic Use once the standard is available. 4. Indian Standard for Table top Electric Wet Grinder for Domestic Use can be considered as a tool towards achieving the ATMA NIRBHAR BHARTH as it encourage the domestic production with Quality.

JOSE CHARLES Digitally signed by JOSE CHARLES Date: 2021.03.31 12:48:17 +05'30'

DECLARATION OF ORIGINAL WORK

I, **JOSE CHARLES, Sc D** (indicate official's Name & Designation), Employee No 55727 here by declare that the Action Research Project titled “- **A comprehensive Indian Standard Table Top Electric wet grinder for Domestic Use**” is the original research work done by me. I have not copied from any other Action Research Project or any other work of similar nature and topic done by any person/institution/body either published or yet to be published. Data and information from other sources, used if any, have been with prior permission, wherever required and is duly acknowledged appropriately in the project report submitted by me.

This declaration is made on the ...**30 day of March 2021**

**JOSE
CHARLES** Digitally signed
by JOSE CHARLES
Date: 2021.03.31
12:45:44 +05'30'
**Sign. of Officer
with Date**

Note: Joint Declaration should be submitted for Projects undertaken jointly

ANNEXURE 1

Sl no	IS/ IEC No & Title
1	IS 302 (Part 1) : Safety of household and similar electrical appliances: Part 1 general requirements
2	IS 302-2-14 : Safety of household and similar electrical appliances: Part 2 particular requirements: Sec 14 electric kitchen machines
3	Is 302-2-209 : Safety of household and similar electrical appliances: Part 2 particular requirements: Sec 209 low speed food grinding machines
4	IS 694:2010 / IEC 60227 : Polyvinyl chloride insulated unsheathed and sheathed cables/cords with rigid and flexible conductor for rated voltages up to and including 1100 V
5	IS 2993:1998 : A.C. motor capacitors
6	IS 996 :2007 / IEC 34-1 :Single phase a.c. induction motors for general purpose
7	1293:2019 : Plugs and socket - Outlets of rated Voltage up to and including 250 Volts and rated current up to and including 16 amperes -
8	IS 5522:2014: Stainless steel sheets and strips for utensils -
9	IS 15997:2012 : Low nickel austenitic stainless steel sheet and strip for utensils and kitchen appliances
10	IS 5856 : 2017 / ISO 14343: Welding consumables - Wire electrodes, strip electrodes, wires and rods for arc welding of stainless and heat resisting steels -
11	IEC 619 Electrically operated food preparation appliances - Measuring methods
12	IS 7603 Specification for portable low speed food grinding machines

Annexure 2

Few of the Manufactures Literature

Sl no	1	Manufacture / brand	
1		Butterfly Gandhimathi Appliance / Butterfly	
2		Sivanesan co / Premier	
3		Preethi Kitchen Appliance	
4		Panasonic Appliance	
5		Elgi Kitchen Appliance	
6		Amirtha Wet Grinders	
7		Maya Appliance	

1. Butterfly (Butterfly Gandhimathi Appliance)

In The Box

Wet Grinder, Stone Pipes, Power Cord, Manual

General

Brand	Butterfly
Model Number	Rhino 2 Ltr
Brand Color	Cherry Red
Body Material	ABS
Color	Red
Capacity	2 L
Motor Speed	900 rpm
Number of Stones	2
Attachments Present	Na
Motor Overload Protection	Yes
Auto off	No
Safety Lock	No



2. Sivanesan Company Chennai

Colour	Multicolour
Material	Stainless Steel
Brand	PREMIER
Item Weight	18.98 Pounds
Blade Material	Stainless Steel

About this item

- Jars: Wet Jar, Volume: 2 L, Body Material: Stainless Steel
- Care Instructions: Easy to Clean
- Would be a worthy addition to your kitchen

[Compare with similar items](#)



Product instructions

- For tough grinding such as turmeric, masala or idli batter - use mixer grinders with wattage rating 750 Watts or more.
- Please allow the motor to cool for some time between product uses. Most MGs come with overload protection which automatically turns off the motor in case of overheating.
- Burning smell during first few usage is normal due to varnish coating on motor and will stop after few usage cycles.



3. M/s Preethi Kitchen Appliance

- Brand Preethi
- **Efficient Grinding-** Cylindrically grooved stones for effective grinding & it's made up of Natural Black Stone for longer life.
- **150 Watt Motor-** High torque Induction Motor with 900 rpm grinds batter with ease.
- **Motor Endurance Test-** Preethi Iconic motor passed a 670 hour endurance test.
- **Cool touch Technology-** Advanced ventilation keeps the batter cool and preserves the authentic taste.
- **Life Long Free Service - No Labour Charge.**



4. Panasonic Appliance Ltd

Brand	Panasonic
Colour	White
Material	Plastic
Item Dimensions LxWxH	52 x 33 x 36.5 cm
Item Weight	13.67 Kilograms

About this item

- Alpha Flow. Lighter Grinding Stoner. Easy automatic timer
- Easy top lock. Anti-slip HTD Belt
- RPM: 1350; Hertz: 50 HZ; Switch type: Rotary switch;
- Switch type: Rotary switch; Capacity (Liters): 2 L;
- Volts: 230 V; Watts: 240 W

[Compare with similar items](#)



Product instructions

- For tough grinding such as turmeric, masala or idli batter - use mixer grinders with wattage rating 750 Watts or more.
- Please allow the motor to cool for some time between product uses. Most MGs come with overload protection which automatically turns off the motor in case of overheating.
- Burning smell during first few usage is normal due to varnish coating on motor and will stop after few usage cycles.



5. Elgi Ultra Kitchen Appliance

Brand	ULTRA
Voltage	230 Volts
Item Dimensions LxWxH	47 x 27 x 30.2 cm
Wattage	85 Watts
Item Weight	10.9 Kilograms
Is Dishwasher Safe	Yes

[See less](#)



Perfectly
made

About this item

- 1.25L WET GRINDER - Ideal for a family of 4
- 85WATT MOTOR - Powerful 85W motor for better grinding
- PATENTED CONICAL STONES - For effective grinding without high batter temperature rise
- AISI 304 STAINLESS STEEL - Rust-resistant food-grade stainless steel drum for healthy food



6. Amirtha Wet Grinders

Colour	PURPLE
Material	Stainless Steel
Brand	AMIRTHAA
Voltage	230 Volts
Item Dimensions LxWxH	49.5 x 29.5 x 31.5 cm
Wattage	90 Watts
Item Weight	10 Kilograms
Blade Material	Stainless Steel
Is Dishwasher Safe	No

[See less](#)

About this item

- Compact and Space-saving, Light in weight, portable and aesthetically designed
- Highly ventilated body increases the airflow inside the grinder
- Powerful, Smooth and Long-lasting Motor
- Has 5 years manufacturer warranty
- Rugged Plastic and Metal Construction, convenient lock and unlock system

[Compare with similar items](#)



Product instructions

- For tough grinding such as turmeric, masala or idli batter - use mixer grinders with wattage rating 750 Watts or more.
- Please allow the motor to cool for some time between product uses. Most MGs come with overload protection which automatically turns off the motor in case of overheating.
- Burning smell during first few usage is normal due to varnish coating on motor and will stop after few usage cycles



7. Maya Appliance Ltd / Brand Vidiem

PRODUCT SPECIFICATION

Capacity	2 Litre (Paste)
Voltage	230 V AC 50Hz
Power	90W
Motor	Single Phase High Torque Induction Motor
RPM	1400-1450
Power Cord	PVC / Length 1.5 Mtrs / 0.5 Sq.mm Thick
Drum	Stainless Steel with Stone Rollers
Net Weight	10 Kg
Carton Size	440 x 300 x 340 mm
Warranty	Product 2 Years
Warranty on Motor	Motor 5 Years



Telescopic Wipers & Axial Center Wiper
No Intervention



ANNEXURE 3

MANUFACTURES REPOSE GOOGLE SURVEY

Dear manufacturers,

BIS is the National Standard Body of India established under the BIS Act 2016 for the harmonious development of the activities of standardization, marking and quality certification of goods and for matters connected therewith or incidental thereto. BIS has been providing traceability and tangibility benefits to the national economy in a number of ways – providing safe reliable quality goods; minimizing health hazards to consumers; promoting exports and imports substitute; control over proliferation of varieties etc. through standardization, certification and testing

It was proposed in BUREAU OF INDIAN STANDARDS (BIS) , to prepare a comprehensive Indian Standard (IS) for Domestic Wet Grinders to ensure the safety and performance of the product in interest of the Domestic users. For this process we require your valuable inputs towards the basic requirements in a wet grinder and also the other technical specifications related to the product.

As a manufacturer of this product we welcome input for the preparation of a draft Standard.

For your convenience we are attaching a questionnaire for your inputs. Kindly add any other points of relevance as occurred to you in the attachment along with details of Quality Control person for further discussion.

Your information will be kept confidential and will be used only for the purpose of standard making.

Your cooperation is highly appreciated, in case you require any clarification feel free to contact the undersigned .

Thanking you

Yours faithfully,

Jose Charles

Scientist D, CNBO-1

Bureau of Indian Standards

CIT campus, Taramani (PO)

Chennai -600113.

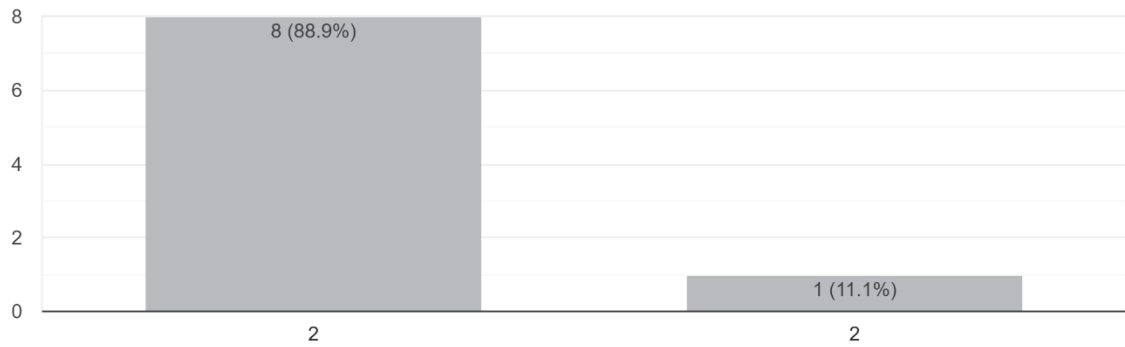
Mob 9567643978, 044-22541584 /22541442

- Email
- rudra@mayaappliances.com
 - sivakumar.sr@in.panasonic.com
 - renukagrinders@gmail.com
 - renukagrinders@gmail.com (1)
 - renukagrinders@gmail.com (2)
 - jrsengg.app@gmail.com
 - sales@maxelplus.com
 - info@wet-grinders.com
 - maloo@butterflyindia.com

🕒 Waiting for 41 responses Send email reminder

No of Grinding stones used. Eg 1,2,3

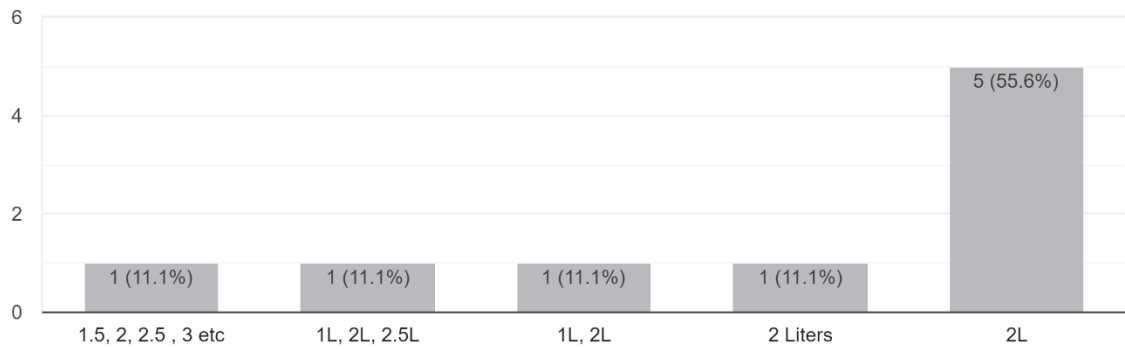
9 responses



What are the usually produced varieties in terms of NOMINAL CAPACITY of the product in liters?

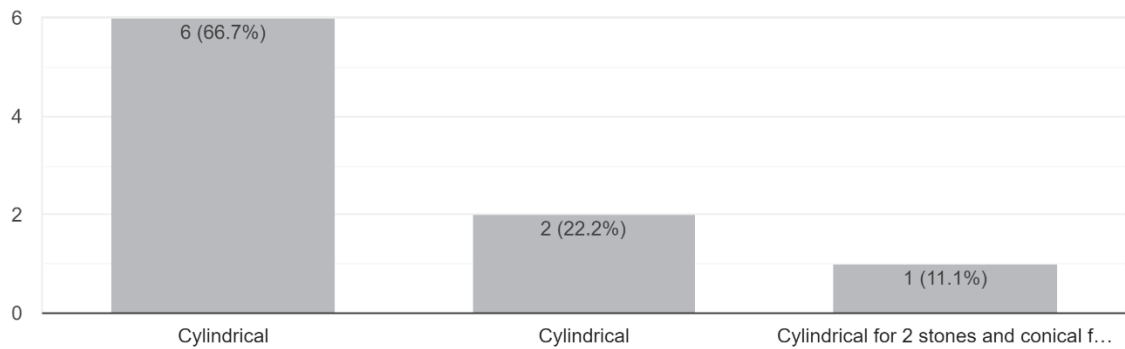
Eg: 1L, 2L, 2.5L, etc..

9 responses



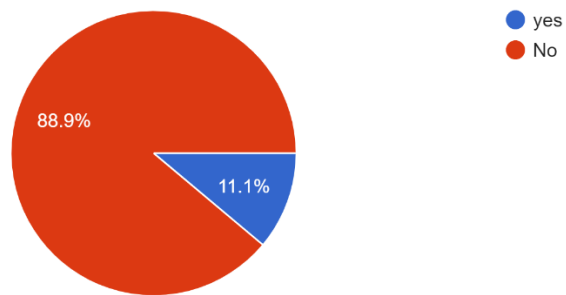
Shapes of roller stones used eg. Cylindrical, Conical

9 responses



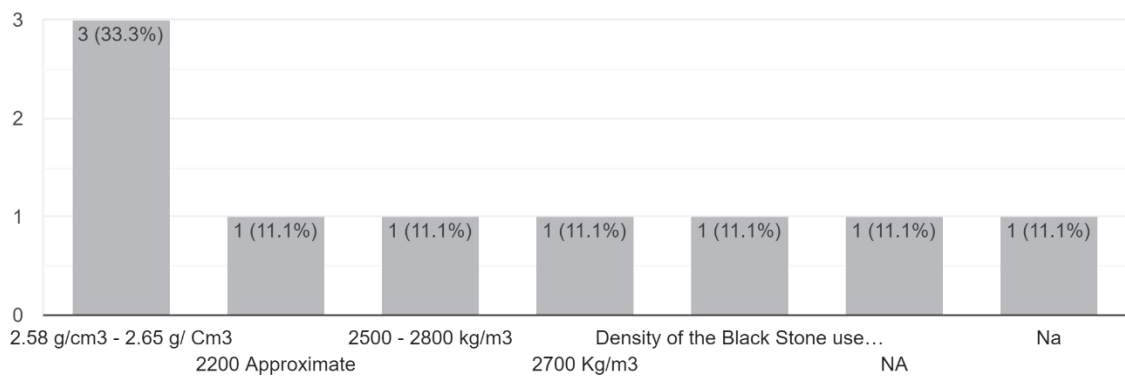
Other than stone any other material used for grinding? Eg., Steel rollers

9 responses



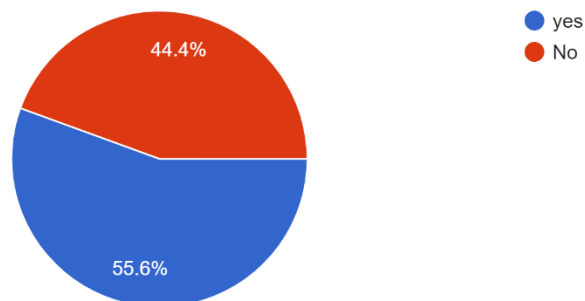
What is the density of stone used? eg. 2650 -2750 kg/ m3

9 responses



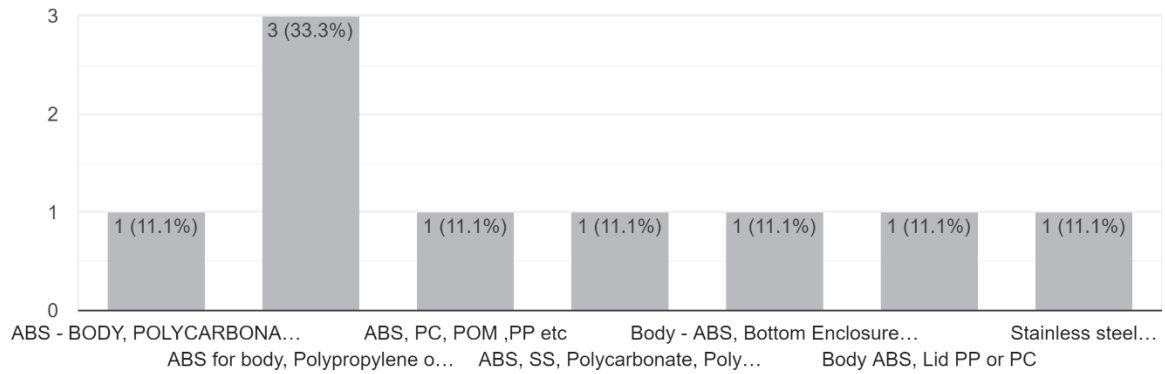
Any value of water absorption limit to the stone considered while a selection of stone?

9 responses



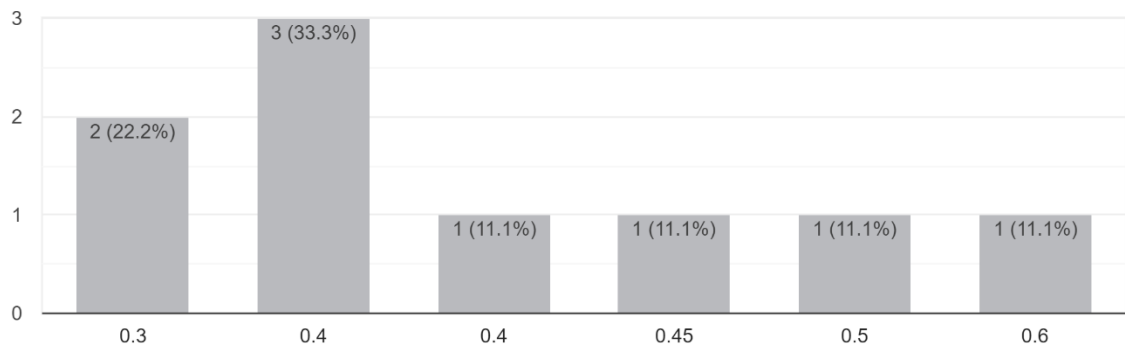
The material used for the manufacturing with details of grade etc., Body & Lid eg. Stainless steel, Polycarbonate, other

9 responses



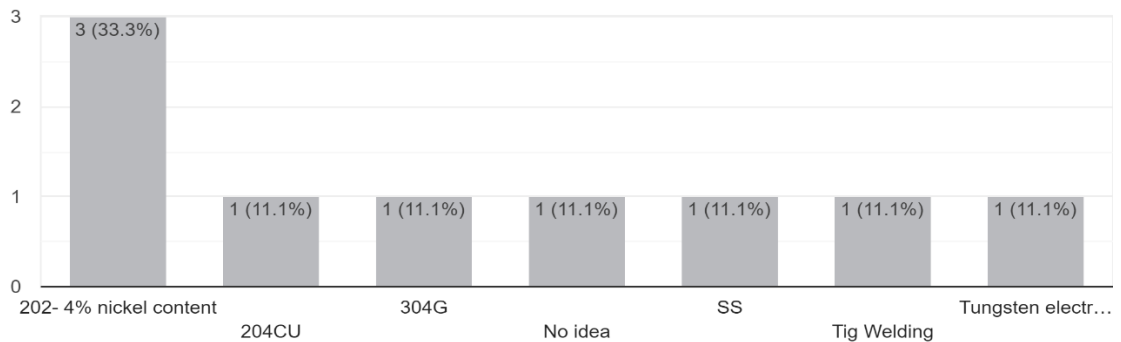
What is the minimum thickness of sheet material used for the manufacture of the steel drum in mm?

9 responses



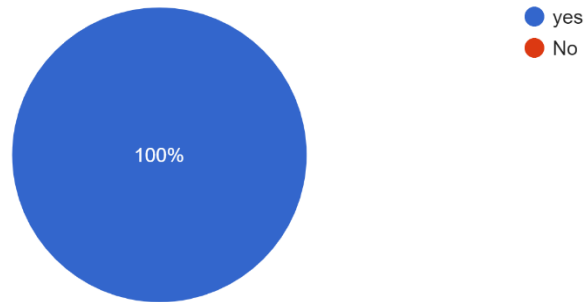
What is the type /grade of the welding electrode used to form the sheet into drum shape?

9 responses



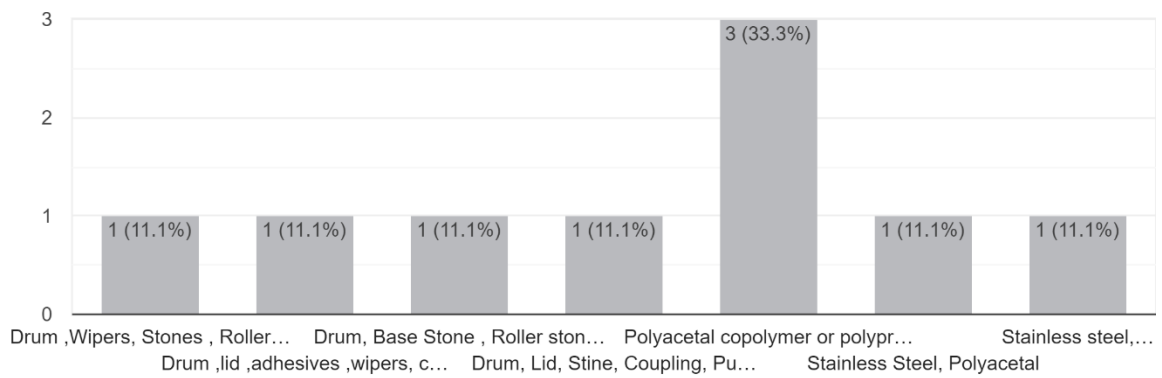
Is the polymers used are of food-grade ?

9 responses



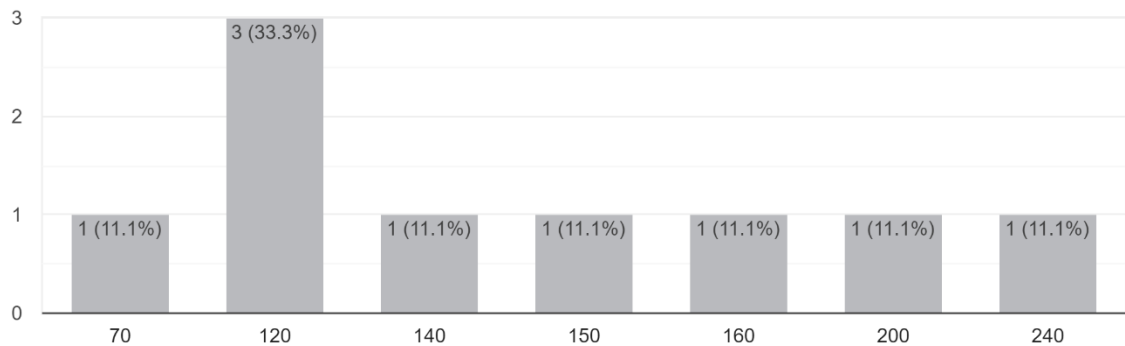
Mention material which will be in contact with food items used for the manufacture of the Wet Grinder like a drum, lid, screws, washers, rivets, couplings, adhesives, wipers, gaskets, etc.,?

9 responses



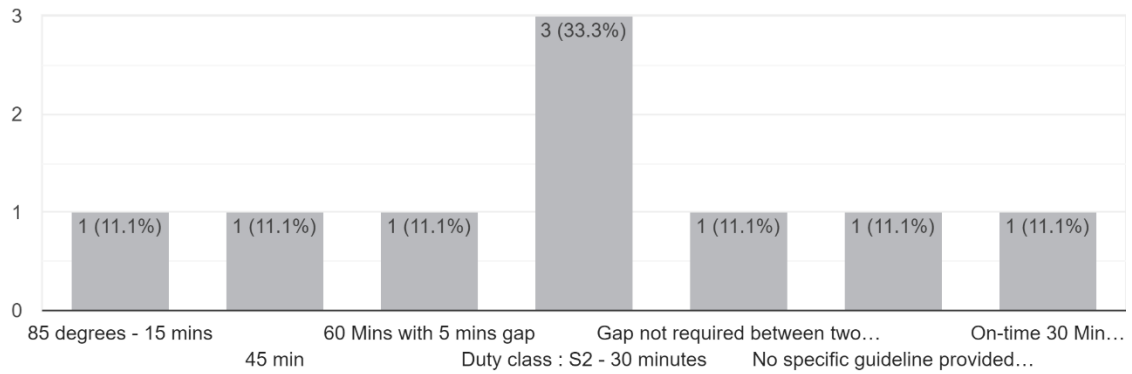
What is the various rated power (in Watts) of the Grinder manufactured? eg., 200 W/160 W

9 responses



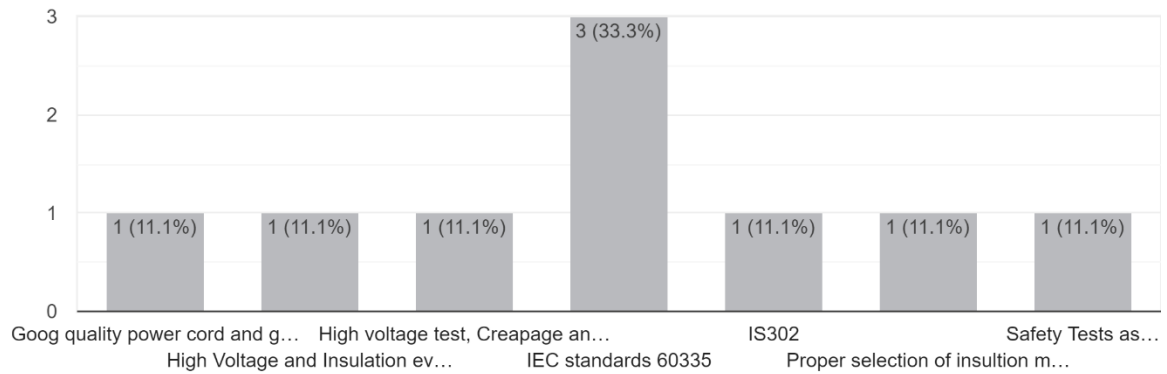
What are the restrictions on the heat generated during the operation and the interval that is to be given between two cycles of operation? Eg On time / Off Time

9 responses



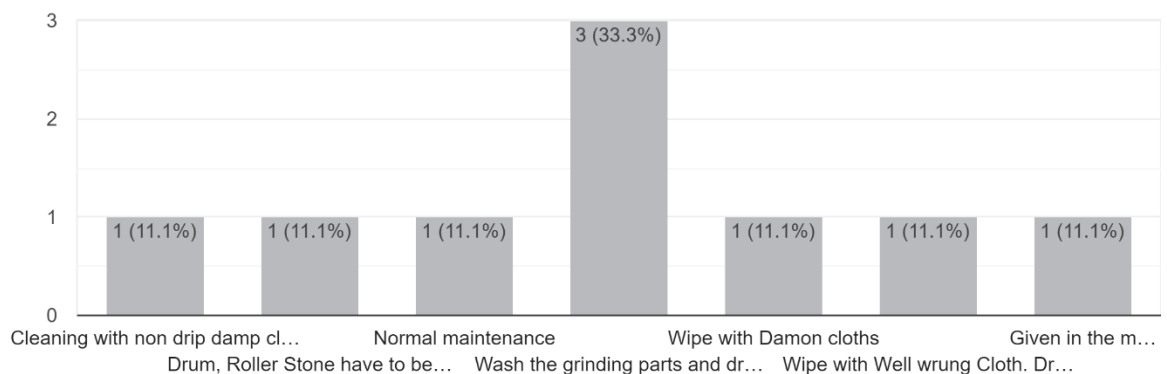
What are the various methods followed to ensure the electrical safety of the appliance?

9 responses



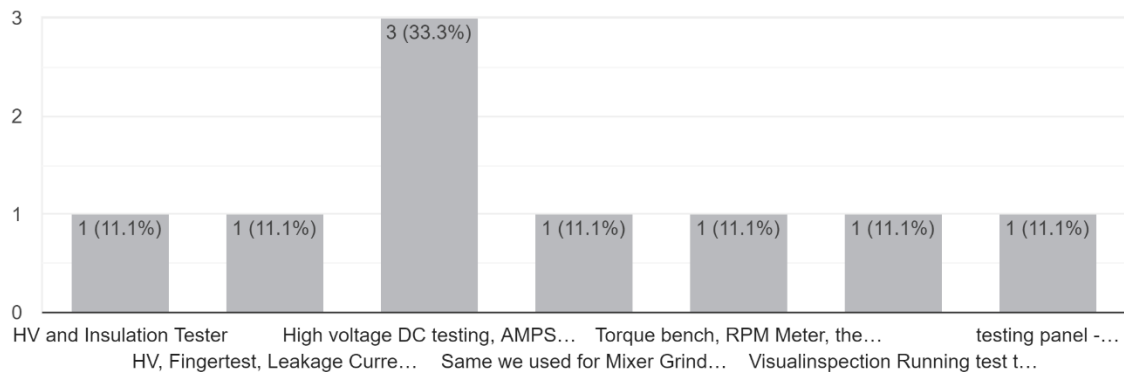
What is the procedure for cleaning and maintenance during the regular usage of the product?

9 responses



Mention the standard operational procedure for in-house testing of the products. List the equipment used

9 responses



Mention the composition and mechanical properties of the stone used

9 responses

Natural black stone is not machinable. If higher density over 2.7g/cm³ and bell sound higher than 220 decibels.

Not measure

Natural Stone.

NA

2500 - 2800 kg/m³

No idea

Density of the Black Stone used: 2650 to 2750 kg/m³.

Mention the usual feedback and reviews received from the customers after the usage of the product

9 responses

Very satisfied. Have received many testimonials from various customers.

About Grinding consistency depends and time for grinding.

General feedback is good.

Good convenient product

Packing style has to be improved

late grinding

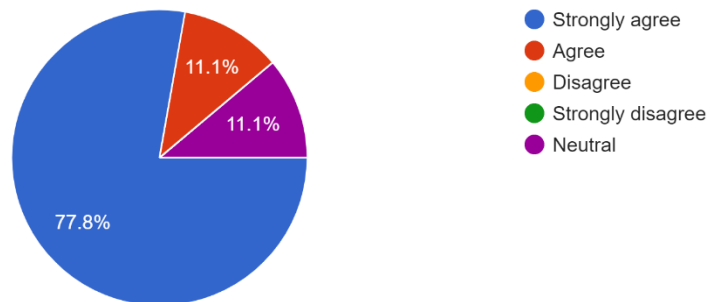
No negative feedback from customers.

Any other relevant information which you might think useful in the preparation of a standard on Domestic Wet Grinders.9 responses

IEC standards 60034/ 60335
 Grinding pressure between rollers and base. IE spring tension
 IS 302-2-14 can be used for safety evaluation.
 Use of food grade materials which come in direct contact with food
 All plastics must be Virgin and Contact parts must be Food Grade, Motor must be Copper
 wound for long life.
 A good motor , a standard FHP belt and drive pulley is essentials of a good grinder
 Domestic electric low speed wet grinders.

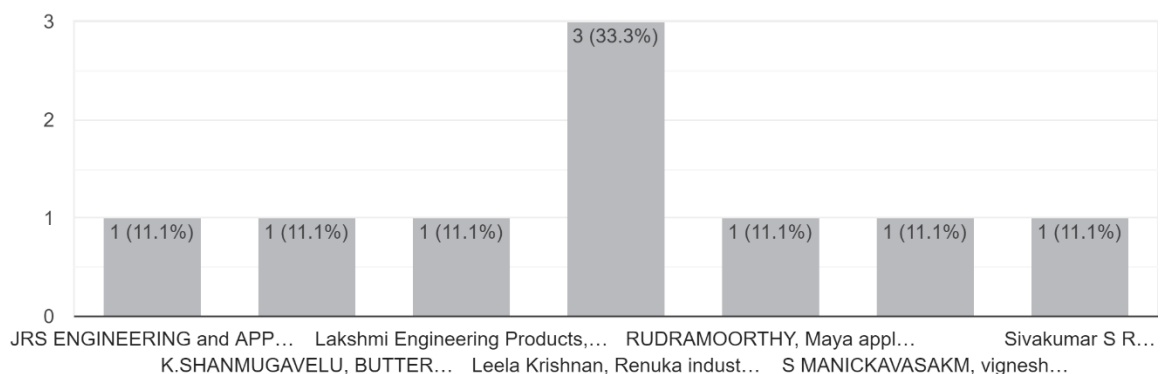
Will you agree that the product manufactured as per our national standard will improve business and customer satisfaction?

9 responses



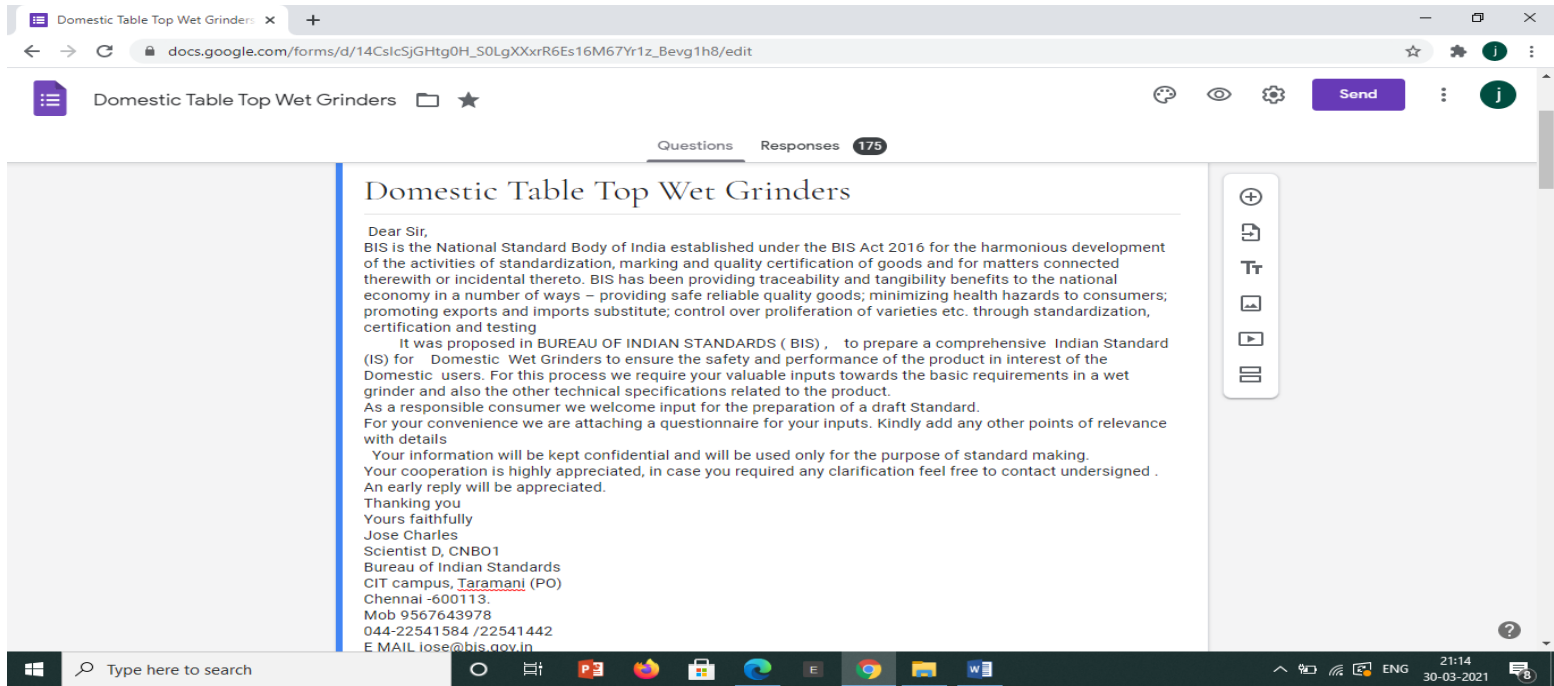
Share your Name, Name of Firm, and Mobile no E mail

9 responses



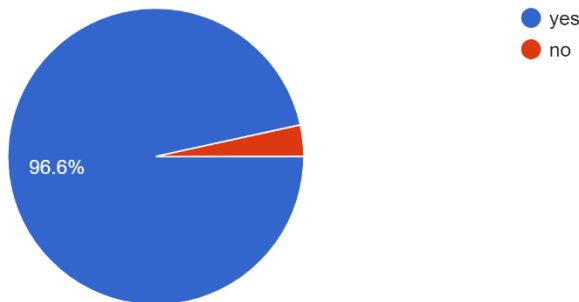
ANNEXURE 4

CONSUMER SURVEY – GOOGLE FORM



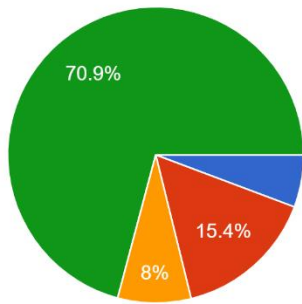
Is Table top wet grinder available in your home?

175 responses



How long wet grinder is being used (years)

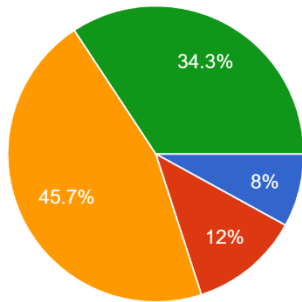
175 responses



- 1 year
- 3 years
- 5 years
- more than 5 years

How frequently the Grinder is used?

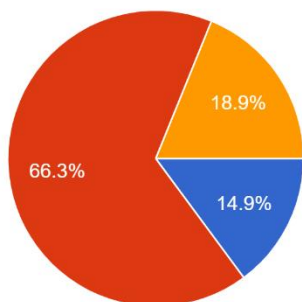
175 responses



- daily
- once in two weeks
- Once in a week
- twice in a week

What is the capacity?

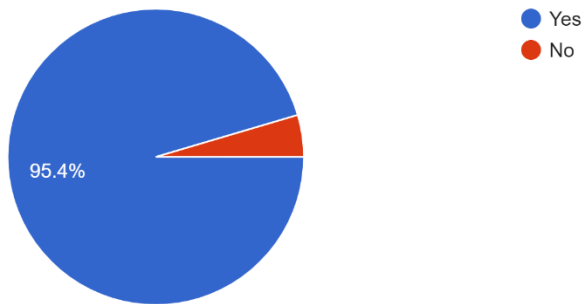
175 responses



- 1 litre
- 2 litres
- more than 2 litres

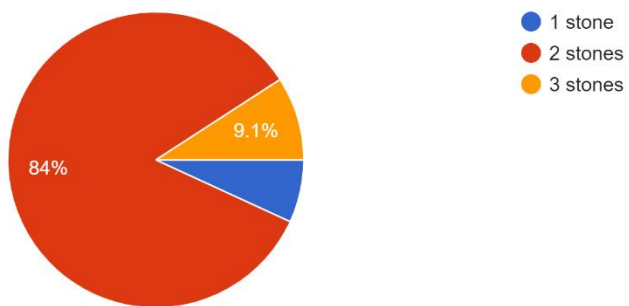
Are u happy with the capacity of the wet grinder?

175 responses



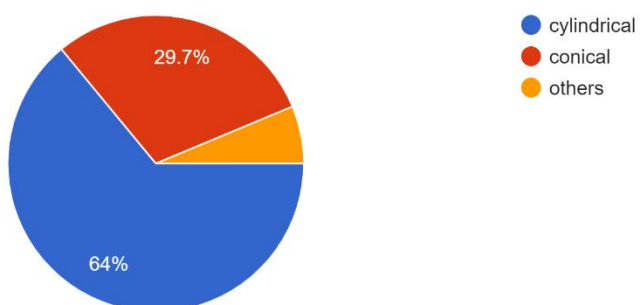
No of moving stones in the wet grinder?

175 responses



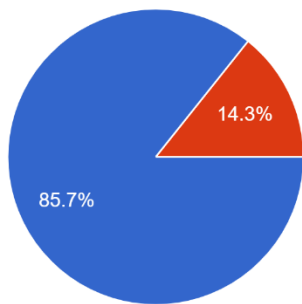
The shape of stone in the wet grinder?

175 responses



Are you Satisfied with the weight of the wet Grinder?

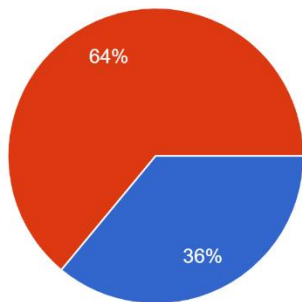
175 responses



- Yes
- No

Body and Lid

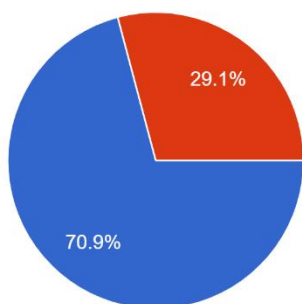
175 responses



- all stainless steel
- stainless steel and polycarbonate

Type of wet grinder

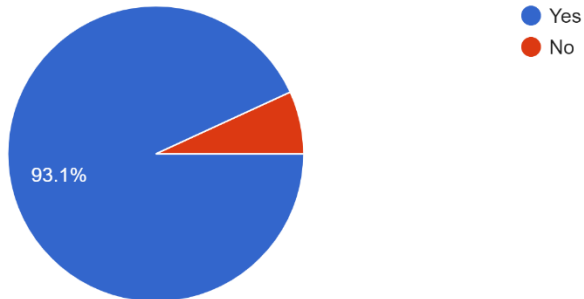
175 responses



- ordinary
- tilt in type

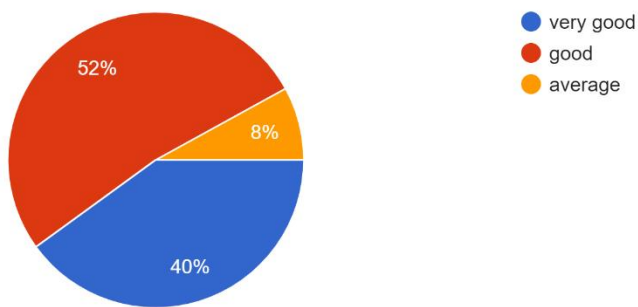
Are you happy with the performance of the grinder?

175 responses



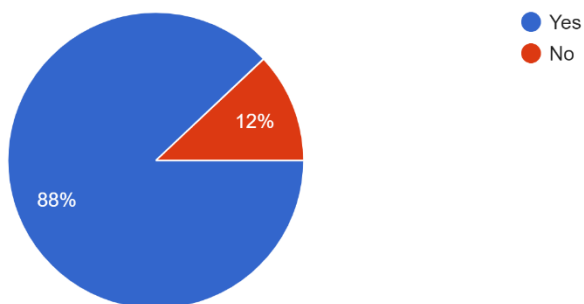
How do you rate your wet grinder?

175 responses



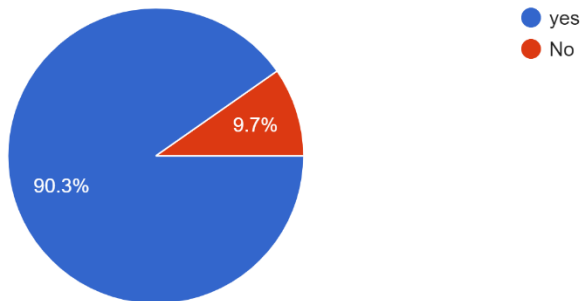
Are you Satisfied with the service provided by the supplier?

175 responses



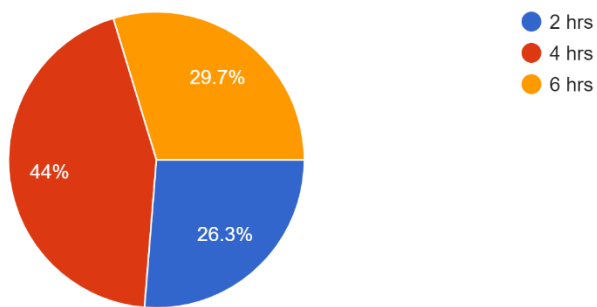
Are you happy with the details in the Instruction sheet provided along with the Grinder?

175 responses



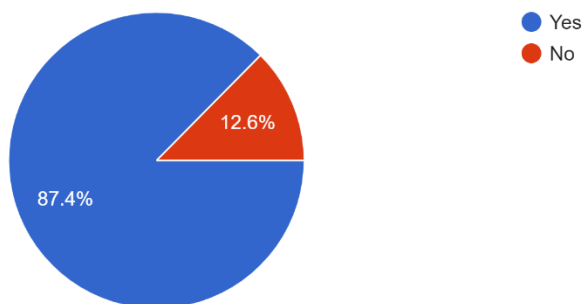
Before grinding Rice and Urad Dal, How much time it is being soaked?

175 responses



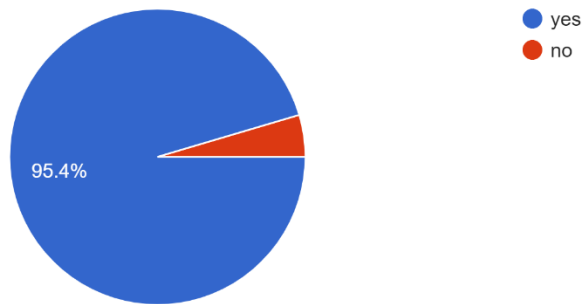
Are you aware of the BIS standards mark? i.e, ISI Mark

175 responses



Do you think the ISI mark on the product can improve product quality?

175 responses



----- END -----

ANNEXURE-5

TECHNICAL SPECIFICATION FOR TABLE TOP WET GRINDER

A. Minimum specification : **Table Top Wet Grinder**
Conforming to safety
provisions of IS 302 Part-I-1979/2008

B. Supplementary Specifications : **As noted below.**

S.No	Description	Specification
1.	Rated voltage and frequency	230 /240 V, AC and 50 Hz
2.	Rated Motor output Power	150 watts
3.	Grinding Capacity of Drum	2 liters
4.	Operational time for grinding	1 kg Boiled Rice & 250 gm Black gram : Maximum 30 minutes for each
5.	Motor a) Rated current b) Nominal Full load Efficiency	As per IS: 996 - 2009 with Class "F" insulation and copper wire winding (capacitor start and run). Insulation Material: Made of class B materials that are upgraded with adhesives, silicone, and alkyd-resins varnish of higher thermal endurance to withstand upto 155°C. Maximum 2.0 Ampere 50% (tolerance minus 2.5 %)
6.	Power Cord	ISI marked with CML number 3 pin moulded type plug with power cord of minimum 2 metres length, Poly Vinyl Chloride insulated, sheathed, 3 core, copper cable, Cross sectional area not less than 0.75 sq. mm
7.	Motor body & cooling fan	Body of Motor: Cast Aluminium or Sheet metal. Motor should be mounted on a Virgin ABS plastic base as shown in the drawing in the Annexure-XII or on a metallic base. Cooling fan: Virgin, high impact strength Polypropylene
8.	Housing (Top & Bottom) and Switch knob material	High impact strength, virgin, food grade, ABS plastic of minimum 2.5 mm thick. The entire housing of the grinder shall be moulded and assembled by fastening

		with brass inserts. Minimum 2 nos. of Brass inserts are required to fix the motor. Minimum 4 nos. of Brass inserts are required to fix the pulley wheel – bearing assembly. Alternatively, Centre shaft of the Wet Grinder containing bearing assembly (Moulded with POM) shall be directly mounted on 6 mm thick ABS moulded base. Minimum 5 nos. of Brass inserts are required on the periphery to fix bottom cover.
9.	Drum and shaft	Drum material: Austentic Stainless steel having minimum of 4% Nickel and 16% Chromium content and 26 gauge or thickness of minimum 0.475 mm. The top rim of the drum should be provided with a ring (made of Austentic Stainless Steel having minimum of 4% Nickel and 16% chromium content) of diameter 3 mm. Alternatively, the edge of Austentic Stainless Steel sheet (having minimum of 4% Nickel and 16% Chromium content) may be curled for reinforcement and should withstand minimum 40kg of load when compression load is applied perpendicular to the axis of the drum at rim. The central shaft made of Austentic Stainless having minimum of 4% Nickel and 16% Chromium content. Guard for center Shaft: Made up of Polypropylene (PP)/ Polyoxymethylene (POM). Height of central shaft and guard should be in such a way that there should not be any leakage of batter/ water either inwards or outwards.
10.	Lid	Fully covered with virgin, high impact strength, food grade, clear transparent polycarbonate moulded lid with secured fitness to prevent spillage of batter. The gap between the SS drum and the lid should not exceed 6 mm.
11.	Grinding stones and its fittings	<p>a) Circular type base stone properly secured (by using epoxy adhesive) with SS drum for leak proof.</p> <p>b) Roller stone – twin, Cylindrical type, placed opposite to each other, fitted on the central Austentic stainless steel shaft (having minimum of 4% Nickel and 16% Chromium content) of diameter 8 to 10 mm. The stone assembly coupler and spade should be made of virgin, high impact food grade polypropylene (PP) / polyoxymethylene (POM) properly secured with lock-nut attached with Austentic Stainless Steel (having minimum of 4% Nickel and 16% Chromium content) spring.</p> <p>c) All the metal parts used in this area should be of Austentic Stainless Steel having minimum of 4% Nickel and 16% chromium content.</p>

		<p>d) The stone material should be of Natural Black Hard Stone of density in the range of 2650 – 2750 kg/cubic. m with high wear resistance, duly machined to the surface finish required as per industrial standards. Granite and soft stone should not be used.</p> <p>e) The diameter of the base stone should be 238 mm., and thickness 20 mm. Roller Stone diameter minimum 100 mm., and thickness minimum 45 mm.</p>
12.	Drum driven pulley wheel	V-groove pulley of diameter not less than 200mm strengthened with suitable ribs made of 30% glass filled Nylon-6 material. Suitable poly V belt of 9 mm width having 3 grooves for maintaining fractional horse power fitted with life lubricated ball bearings mounted on minimum of 6 mm thick cast aluminum plate or 30% Glass filled nylon 6 material or Cogged V-belt used on a minimum 24 mm dia motor pulley in such a way that when the drum is being used it should not lead to spillage of batter or rice.
13.	Colour	Maroon colour
14.	Dimension	The drawing for overall dimension and shape is given in annexure II. The shape is indicative. The tenderers may offer their own models which generally conform to the shape indicated. However the purchaser reserves the right to arrive at a common uniform design and shape with minor changes and direct the suppliers to supply as per the common uniform design chosen. The distance between the motor housing and drum be such that the drum does not rub the motor housing when running.
15.	Class of Appliances protection against electric shock	Class 1
16.	Testing for safety & construction	As per IS : 302 part-I 1979 / 2008
17.	Instruction manual	To be provided with details of 1) Do's and Don'ts 2) Operating and cleaning procedure.
18.	Name plate details	1) Rated voltage 2) Wattage 3) Capacity 4) Class of insulation 5) Class of protection 6) Sl. Number

19.	Details to be given by the Manufacturer in the manual	For normal load: 1) Rice: Quantity, soaking time and Final grinding time. 2) Black gram: Quantity, soaking time and Final grinding time.
20.	Sample to be tested at	Any NABL accredited or BIS recognized laboratory in India.
21.	Third party test Certification as per the prescribed requirements	The testing requirements in the schedule of test indicated below shall be carried out in any NABL accredited or BIS recognized laboratory in India and a valid test report shall be furnished.
22.	Specifications for plastic materials to be used in various parts	Specifications for plastics material as per TABLE 1 and test certificates shall be produced from any NABL accredited or BIS recognized laboratory for ensuring the quality.

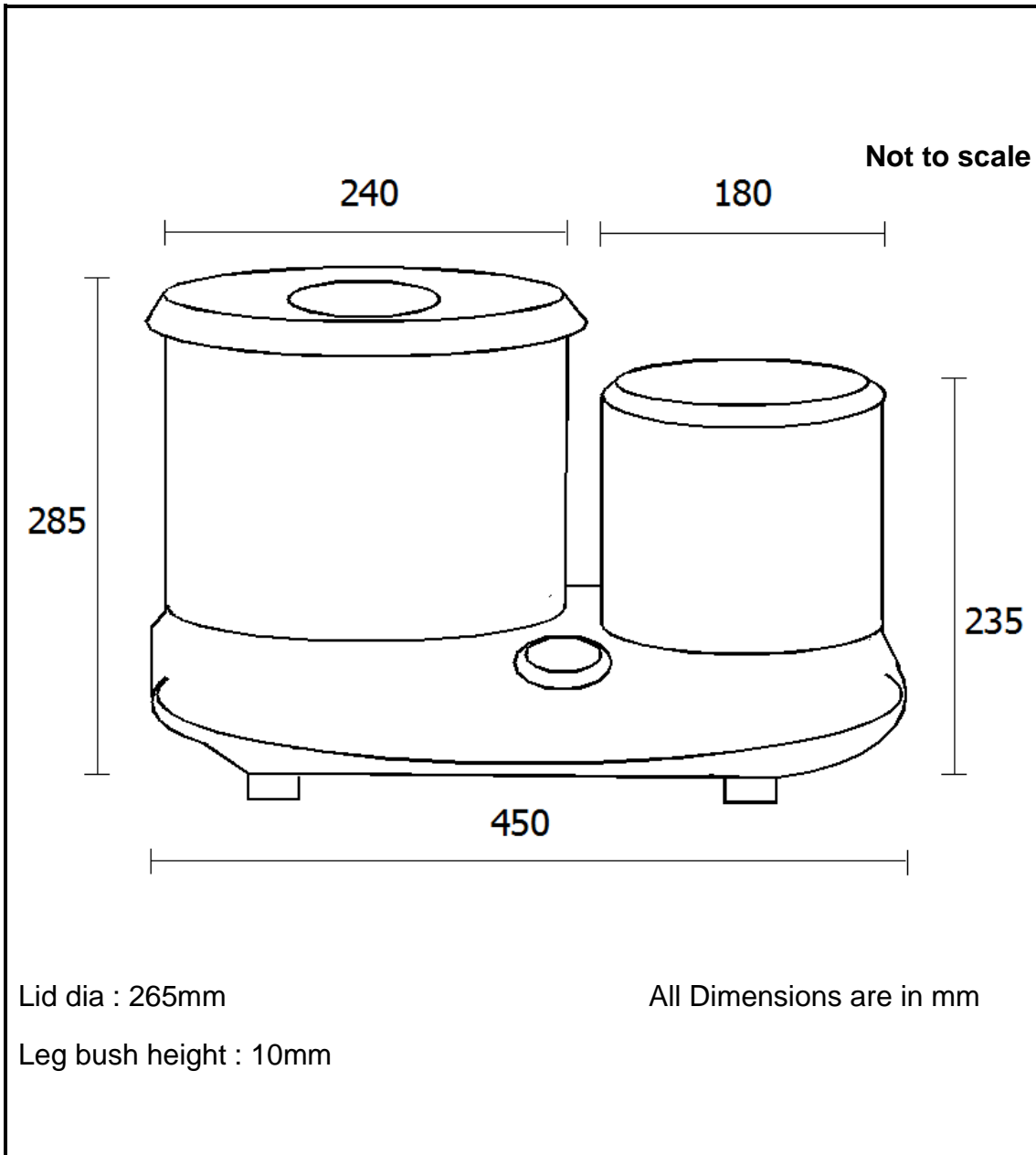
TABLE 1
TECHNICAL SPECIFICATION OF PLASTIC MATERIALS

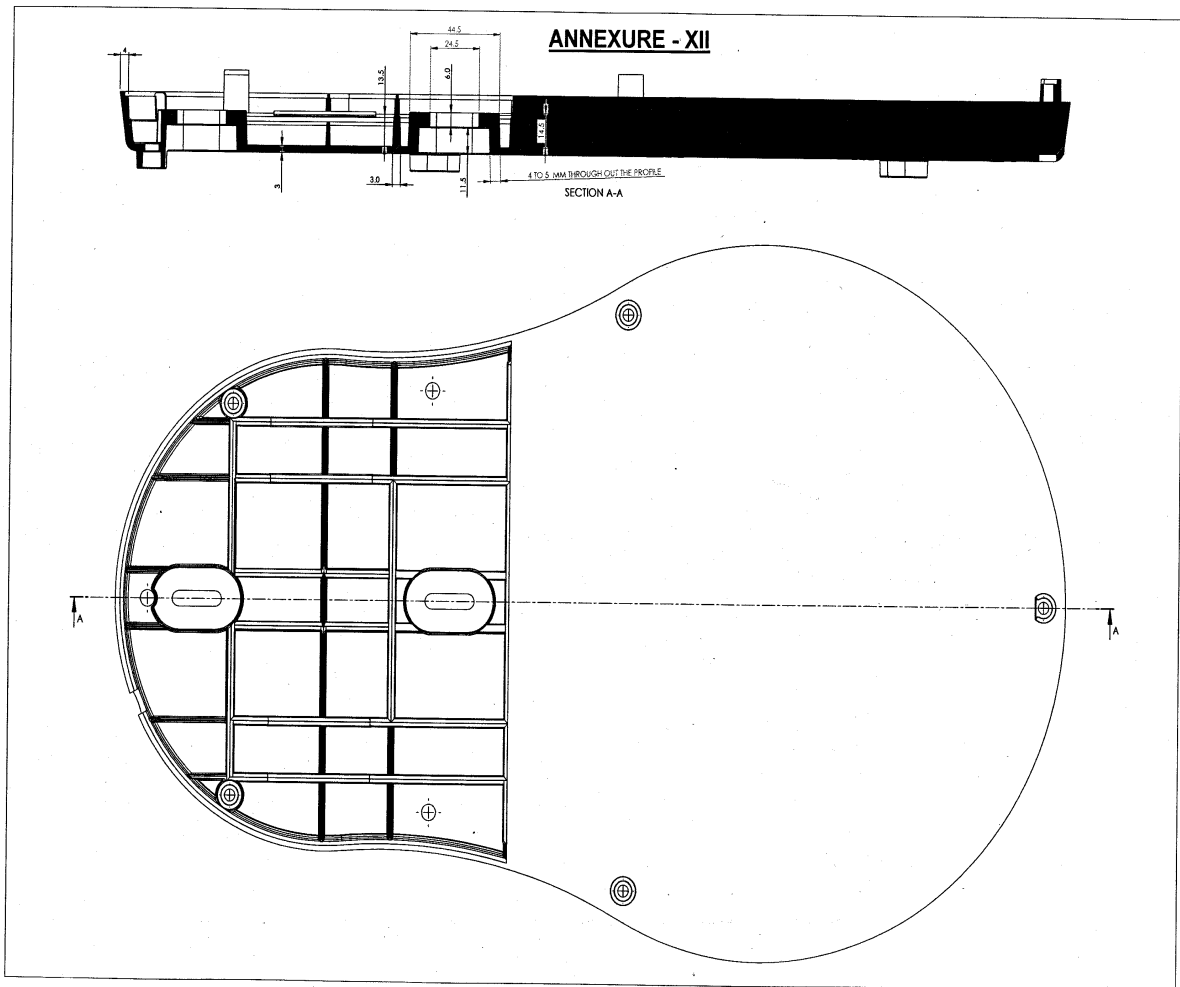
Parts	Material	Specific Gravity	Melt Flow Index at (g/10 min.)	Izod Impact strength (Notched) (kJ/m ²)	Tensile strength (MPa)	Flammability (Rate of burning) mm/min.	Heat Distortion Temperature at 4.6 kg/m ² (°C)	Light Transmittance %
		ASTM D – 792	ASTM D - 1238	ASTM D - 256	ASTM D – 638	ASTM D – 635	ASTM D - 648	ASTM D - 1003
Body housing (Top & Bottom)	ABS	1.03 – 1.07	12.0-14.0	Min. 18.0	Min. 35	Max. 40	Min. 90	-
Lid	PC	1.15 – 1.20	18.0- 21.0	Min. 45	-	-	-	Min. 80
Grinding wheel fittings	POM	1.37 – 1.40	-	-	-	-	-	-
Wiper	PP	0.89 – 0.91	-	-	-	-	-	-
Insulation materials used in motor coil winding to be complied as per S.No. 5 of specification								

ANNEXURE-II

ILLUSTRATIVE MODEL OF TABLE TOP WET GRINDER

Not to scale
Allowable tolerance $\pm 5\%$



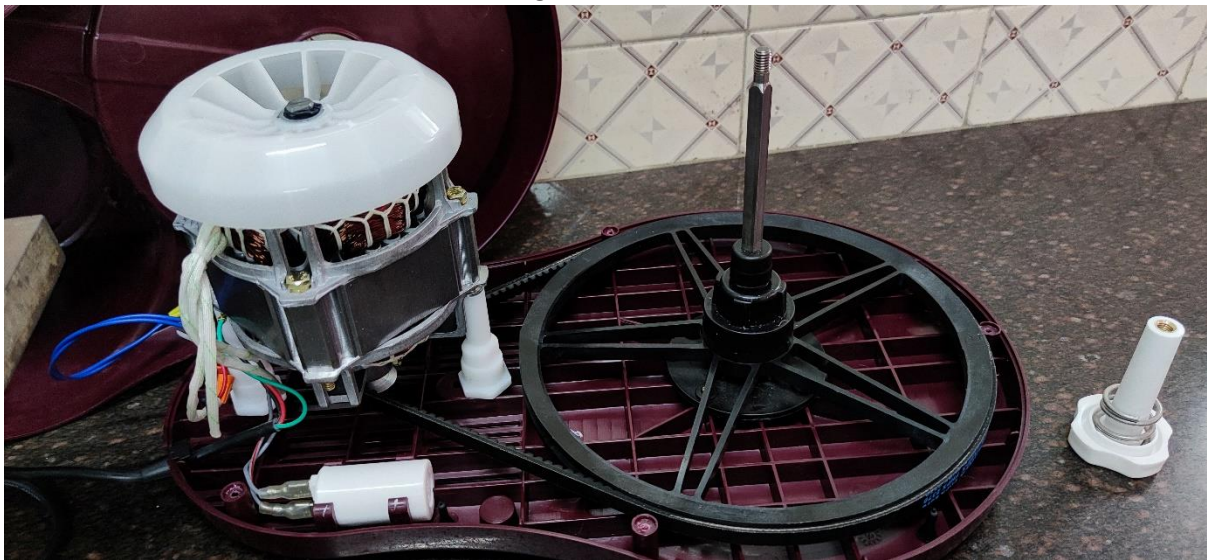


ANNEXURE 6

WET GRINDER PERFORMANCE EVALUATION STUDY TEST @ MANUFACTURES FACILITY, CHENNAI



Pic 1 -LOADING TEST FOR THE DRUM @ 20 kg



Pic 2 -Internal components of a Table Top Electric Wet Grinder.

ANNEXURE 6

WET GRINDER PERFORMANCE EVALUATION STUDY TEST @ MANUFACTURES FACILITY, CHENNAI



Pic 3 -5- WET GRINDER TRAIL TEST PERFORMACE REQUIRMENTS @ Manufactures facility

ANNEXURE 6

WET GRINDER PERFORMANCE EVALUATION STUDY TEST @ MANUFACTURES FACILITY, CHENNAI



Pic 4 Gringing quality check soaked rice and Urad dal



ANNEXURE 6

WET GRINDER PERFORMANCE EVALUATION STUDY TEST @ MANUFACTURES FACILITY, CHENNAI



MNM

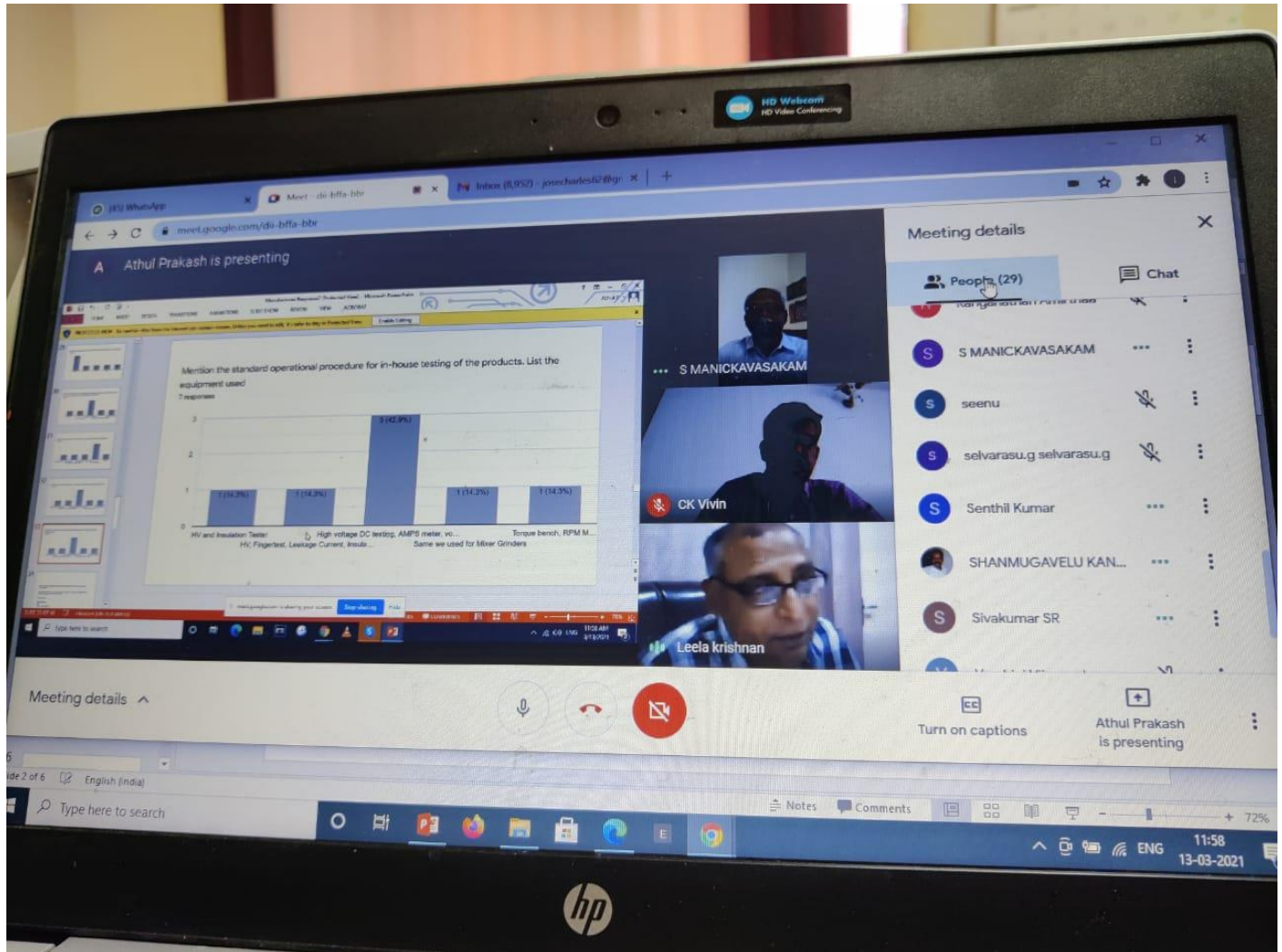


ANNEXURE 7

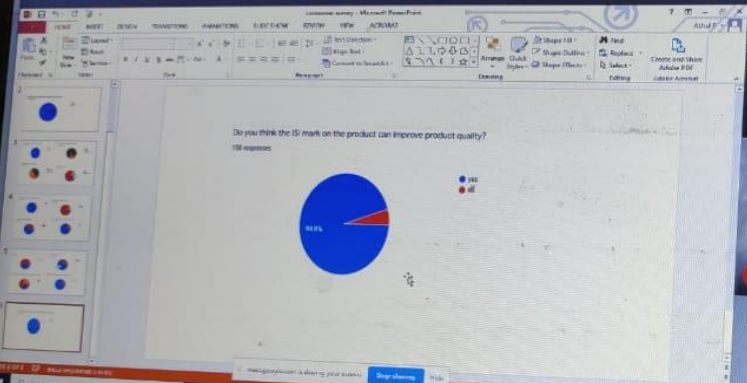
WET GRINDER WATSAPP GROUP WITH 61 PARTICIPANTS

The screenshot displays a web browser window with the URL `web.whatsapp.com`. The main content is a WhatsApp group chat titled "Wet Grinder Table Top" with participants including Balu Sowbagya, Basker B Fly Bis, CNBO 2 BHANU KIRAN, CNBO1, and COW... The chat history shows a notification for a new participant, a confirmation from "Panasonic Appliance Sivakumar", and a green reminder message: "REMINDER Kindly note the below link for tomorrow morning..". Below this is a forwarded message: "Standard for table top wetgrinder -draft-webinar for stakeholders on 13.03.2021 Saturday at 10.30am to 12.30pm. Join in google meet at the following link <https://meet.google.com/dii-bffa-bbr> Those who do not have meet kindly download app from play store." A message from "+91 98940 88070 ~Leela krishnan" is also visible. The right sidebar shows "Group info" with 61 participants and a list of members including "You", "CNBO1 ASARAF ALI", "Balu Sowbagya", and "Basker B Fly Bis". The bottom of the screen shows a Windows taskbar with various application icons and a system tray with the date "30-03-2021" and time "23:36".

VIRTUAL MEET FOR THE MANUFACTURES WITH 30 PARTICIPANTS



A Athul Prakash is presenting



SHANMUGAVELU KANDIAIAH

Leela Krishnan

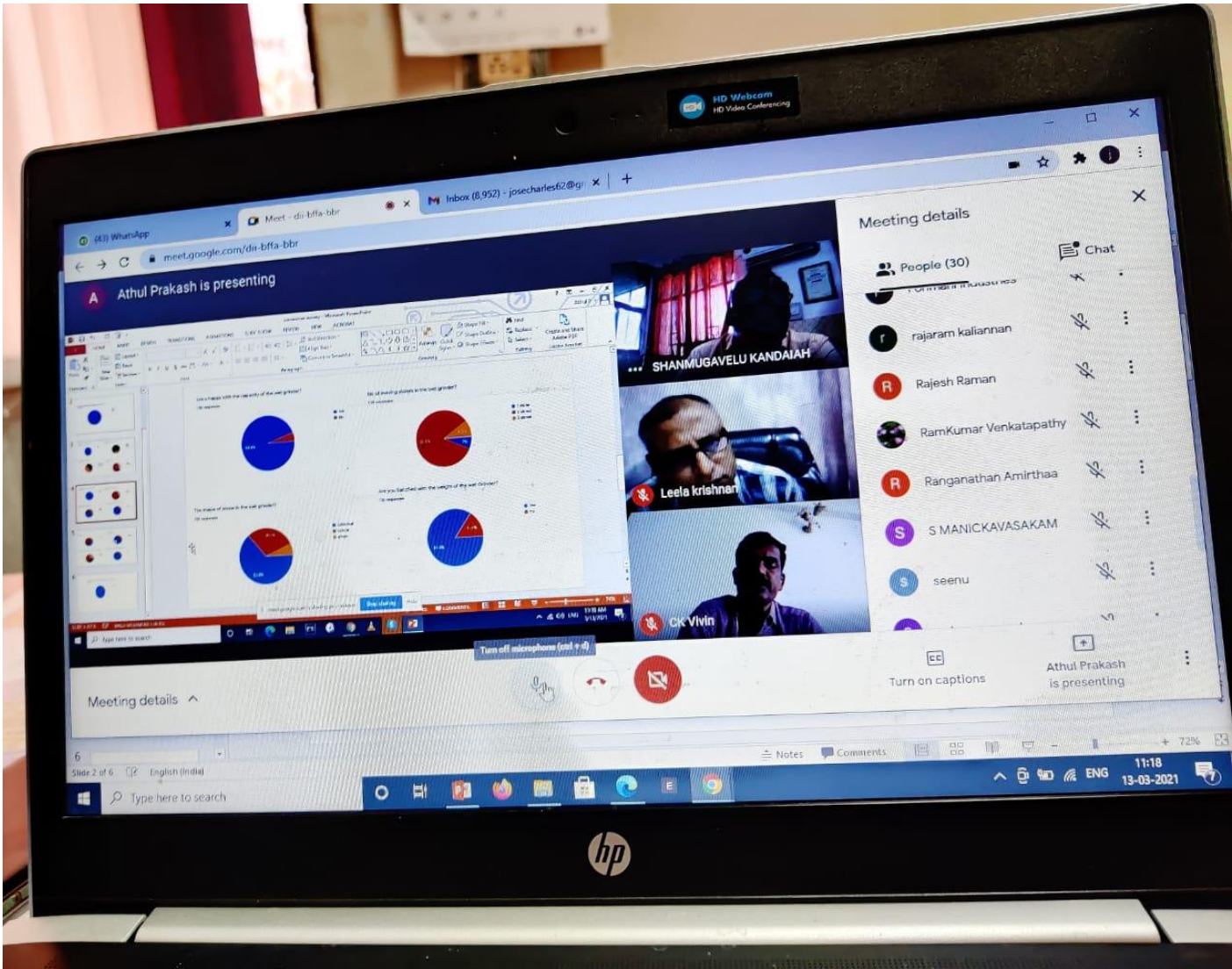
CK Vivin

Meeting details

- People (11/13)
- RamKumar Venkatapathy
 - Ranganathan Amirthaa
 - S MANICKAVASAKAM
 - seenu
 - selvarasu.g selvarasu.g
 - Senthil Kumar

Meeting controls: Microphone, Video, Mute, Turn on captions, Athul Prakash is presenting





FOR BIS USE ONLY

भारतीय मानक मसौदा

घरेलू शीर्ष उपयोग के लिए टेबल टॉप इलेक्ट्रिक वेट ग्राइंडर — विशिष्टि

Draft Indian Standard

**TABLE TOP ELECTRIC WET GRINDER FOR DOMESTIC USE—
SPECIFICATION**

ICS XX.XXX; XX.XXX

**Working Draft Indian standard prepared by Shri Jose Charles Last date for receipt of
Comments XXXXXXXX**

FOREWORD

(Formal clauses will be added later on).

This standard does not cover electric motor driven food-mixers. (Grinders, Liquidizers and Centrifugal Juicers) intended for domestic use and designed for operation at voltages not exceeding 250 V).

The relevant SI units and corresponding conversion factors are given below for guidance:

Power: 1 hp (horse power) = 746 Watts
1 Watt = 1 N-m/s.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2: 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1 SCOPE

1.1 This standard covers the requirement for Table top Low Speed Electric Operated Wet Grinder for Domestic use and similar use, designed for operation for a voltage not to exceed 250 V ac 50 Hz and input Power not exceeding 300 W.

1.2 This standard does not cover electric motor driven food-mixers. (Grinders, Liquidizers and Centrifugal Juicers) intended for domestic use and designed for operation at voltages not exceeding 250 V).

2 REFERENCES

The standards listed below contain provision which, through reference in this text, constitute provision of this standard. At the time of publication, edition was valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate possibility of applying the most recent edition of the standard indicated below:

<i>IS No</i>	<i>Title</i>
302 (part 1) :2018	Safety of household and similar electrical appliances: Part 1 general requirements
302-2-14	Safety of household and similar electrical appliances: Part 2 particular requirements: Sec 14 electric kitchen machines
302-2-209	Safety of household and similar electrical appliances: Part 2 particular requirements: Sec 209 low speed food grinding machines
IS 694:2010/ IEC 60227	Polyvinyl chloride insulated unsheathed and sheathed cables/cords with rigid and flexible conductor for rated voltages up to and including 1100 V
IS 2993:1998	A.C. motor capacitors
IS 996:2007 / IEC 34-1	Single phase a.c. induction motors for general purpose
IS 1293:2019	Plugs and socket - Outlets of rated Voltage up to and including 250 Volts and rated current up to and including 16 amperes -
IS 5522:2014	Stainless steel sheets and strips for utensils -

Is 15997:2012	Low nickel austenitic stainless steel sheet and strip for utensils and kitchen appliances
IS 7603	Specification for portable low speed food grinding machines
IS 4250:1980	Domestic Electric Food Mixers (Liquidizers and centrifugal Juices)

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.0 The Following definitions in addition to the relevant definition given in IS 302 (Part 1)

3.1 Domestic Table Top Wet Grinder — A portable appliance which by operation of slow speed rotating parts intended primarily for preparing batter generally used for cooking idlis and dosas.

3.2 Roller Stone – The stone, conical or cylindrical in shape, that grinds against a flat stone to convert the soaked rice and /or urad dal and water into batter.

3.3 Flat Stone – The stone flat in shape fixed at the bottom of the drum and helps in grinding the batter along with the roller stones.

3.4 Drum – A stainless steel cylindrical vessel having a flat stone fixed at its bottom within which the grinding process takes place.

3.5 Normal Load - The load obtained when the appliance is operated under the load indicated in the instructions booklet in terms of recipes or the load necessary to attain the rated input at rated voltage in case the actual load in-terms of recipes is not indicated by the manufacturer in the instructions booklet.

3.6 Grinding Capacity – The maximum quantity of soaked rice that can be pulverised comfortably without any spillage.

4 Drum capacity , and Rating

4.1 The wet grinder normally comes in various grinding capacities from 1 liter to 2 litre grinding capacities.

4.2 The nominal capacity of the drum shall be as agreed to between the purchaser and the manufacturer.

4.3 Rated Voltage -The provisions of 5.1 of IS: 302-1: 2008 shall apply.

4.4 Rated Input – The rated input shall declared by the manufacturer. The rated input shall not exceed 300 watts when measured under normal loading conditions.

5 MANUFACTURE AND WORKMANSHIP AND MATERIALS

5.1 The drum and other parts that come into contact with the food items shall be clean, reasonably free from distortion, dents, wrinkles, wavy surface, colouring, burrs, scratches, pitting, deep tool marks and other surface defects. The design of the drum and other accessible parts shall be such that it is easy to clean and prevent accumulation of dirt and batter.

5.2 The wet grinders shall be subjected to tests as specified in sections from 8 to 34.

5.3 Welding if done for stainless steel, the weld shall be free from welding defects. The weld shall be finished properly so that when a finger is passed on the joint, it shall be smooth.

5.4 The top beading that comes in the wet grinder drum shall be smooth, no sharp edges. The design shall be such that it is easy to clean and accumulation of any foreign materials.

5.5 MATERIALS

5.5.1 The material used to manufacture the drum shall be according to IS 5522 or IS 15997.

The minimum sheet thickness used for the drum shall be 0.40 mm

5.5.2 The stainless steel rod other than the drum that come in contact with food stuff shall be according to IS 6527 .

5.5.3 If polymers are used, they should be of food compatible grades.

5.5.4 The flat stone and roller stones used shall conform to the requirements prescribed in 24.9.

5.5.5 ac Capacitors used shall conforms to IS 2993

5.5.6. The Power supply cord used shall confirm to IS 1293.

5.5.7 The motor used shall be as per IS 996

6. CLASSIFICATION

6.1 The relevant provisions of 6 of IS: 302-1 shall apply.

7 MARKING

7.1 The relevant provisions of 7 of IS: 302-1 shall apply in addition to those indicated in 7.2 to 7.5.

7.2 Each appliance shall be accompanied by an instructions booklet containing the following information:

- a) Precautions
 - 1) While positioning of the appliance, and
 - 2) Before switching on the appliance.
- b) Warning
 - 1) About the parts of the appliance which shall not be brought into contact with liquids;
 - 2) About keeping away from moving parts; and
 - 3) About running the appliance empty, if necessary.
- c) Instructions
 - 1) For assembling and dismantling the drum, stones and top lid for cleaning and servicing;
 - 2) Type of supply to which the appliance may be connected, and instructions for electrical connections;
 - 3) Instructions to the effect that after every use of the wet grinder, pour little hot water into the drum to remove left over materials, specially sticky substances like the batter, so that the rotation takes place freely during the subsequent use; and
 - 4) The manufacturer may include instructions stating that the appliance may be overhauled at least once in a year so that its useful life is increased.
- d) Directions to switch off when the motor stalls or smoke emanates from the appliance, and.
- e) Guide for operation, giving maximum quantity per loading and in the case of multi-speed appliances speed/control positions suitable for various operations.

7.3 If the appliance is delivered with alternative input shall correspond to the most unfavourable accessories and speed setting.

7.4 Marking of Control Switch – The “on” or “off” or both positions of the control switch shall be clearly marked. If any speed control device is provided, various positions shall be clearly and indelibly marked.

7.5 Accessories sold separately by the appliance manufacturer shall be accompanied by an instructions sheet giving all relevant information, unless it is included in the manufacturer’s instructions for the appliance.

7.6 The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed there under, and the product(s) may be marked with the Standard Mark.

8 PROTECTIONS AGAINST ELECTRIC SHOCK

8.1 The relevant provisions of 8 of IS: 302-1 shall apply.

9 STARTING

9.1 The relevant provisions of IS: 302-1 shall apply. However, care shall be taken to see that accidental stalling does not occur during the test. The speed control shall be at the lowest setting and the test shall be carried out under normal load (see 3.3).

10 INPUT

10.1 The input of the wet grinder shall be measured with the normal load as indicated in the instructions booklet by the manufacturer. For the purpose of this test, the normal load shall preferably be in terms of weight/volume of the food required for operational tests indicated in 34.

The method of preparation of the batter and the operating procedure shall also be as indicated by the manufacturer. The input shall be measured for the corresponding operation only. If the input varies considerably during the operation, the energy consumed is measured by means of an energy meter and the mean value of the input is determined for the representative period. The input so measured shall conform to 10.1 of IS: 302-1.

11 TEMPERATURE RISE

11.1 The relevant provision of 11 of IS: 302-1 shall apply.

11.2 The temperature of any material or insulation which may be exposed to excessive temperature during the operation of the appliance shall be measured. The values measured shall not exceed the values specified in Table 1 of IS: 302-1 when measured by the methods indicated therein.

12 OPERATIONS UNDER OVERLOAD CONDITIONS OF APPLIANCES WITH HEATING ELEMENTS

12.1 Clause 12 of IS: 302-1 does not apply.

13 ELECTRICAL INSULATION AND LEAKAGE CURRENT AT OPERATING TEMPERATURE

13.1 The relevant provisions of 13 of IS: 302-1 shall apply.

14. RADIATION AND TELEVISION INTERFERENCE SUPPRESSION

14.1 The relevant provisions of 14 of IS: 302-1 does not apply.

15. MOISTURE RESISTANCE

15.1 The relevant provisions of 15 of IS: 302-1 shall apply .

16. INSULATION RESISTANCE AND ELECTRIC STRENGTH

16.1 The relevant provisions of 16 of IS: 302-1 shall apply.

17. OVERLOAD PROTECTION

17.1 Clause 17 of IS: 302-1 is not applicable.

18. ENDURANCE

18.1 The relevant provisions of 18 of IS: 302-1 does not apply.

19. ABNORMAL –OPERATION

19.1 The relevant provisions of 19 of IS: 302-1 shall apply except that the provisions of 19.2 to 19.5 are not applicable.

20. STABILITY AND MECHANICAL HAZARDS

20.1 The relevant provisions of 20 of IS: 302-1 shall apply except that the test finger test specified at 20.2.

21. MECHANICAL STRENGTH

21.1 The relevant provisions of 21 of IS: 302-1 shall apply.

22. CONSTRUCTION

22.1 The relevant provisions of 22 of IS: 302-1 shall apply in addition to those specified in 22.2 to 22.9.

22.2 The machine shall be compact, self-contained, and of rigid construction.

22.3 All parts required to be cleaned and kept in a hygienic condition shall be readily accessible without the use of special tools.

22.4 All moulded parts required to be handled shall be smooth, round edged, free from foreign matter and surface imperfections and of good finish.

22.5 Machined and formed parts, if any shall be made to ensure complete interchangeability and parts subject to wear shall be easily replaceable.

22.6 A lid shall be provided to retain batter during preparation. It shall be so designed as to remain secured to the appliance during its extended operation.

22.7 The design shall ensure that no accidental bodily contact is made with the stones during the operation of the appliance.

22.8 The machine shall be designed to ensure that lubricants do not contaminate the food and that food is prevented from reaching the moving parts of the machine except the stones.

22.9 The stones and such other exposed parts of the machine in contact with food shall be of such material as to prevent fouling of foodstuffs and to resist corrosion and rusting. Stainless steel is one such material which can meet the above-requirements.

23. INTERNAL WIRING

23.1 The relevant provisions of 23 of IS: 302-1 shall apply.

24. COMPONENTS

24.1 The relevant provisions of 24 of IS: 302-1 shall apply in addition to the following.

24.2 Body and Lid of the Grinder - It shall be made of high impact plastics like acrylonitrile-butadiene-styrene (ABS), polypropylene (PP), Polyethylene (PE) and or polycarbonate (PC) of adequate strength and shall provide stability to the appliance and shall also withstand all stresses encountered during normal use.

Openings for ventilation of the motor shall be properly screened to ensure that no water, dirt or vermin can enter the housing during normal use.

24.3 Drum - The Drum is made materials which are neutral to food acids and salts, which do not deteriorate with age and which are able to withstand temperatures 100°C without change in their physical, mechanical and chemical structures and properties. Also the drum shall be easily removable from the appliance, and shall be free from pits, cracks and crevices. It shall be smooth and shall not have corners and niches, to facilitate cleaning. The fixing arrangement of the drum shall be adequately strong to withstand repeated operations. It may be fitted with handling grips.

The compliance is checked by filling the drum with hot water at a temperature around 100°C. Check for any change in physical, chemical and mechanical properties after five minutes.

24.4 Electric Motor and assembly - For satisfactory performance of wet grinders, it is recommended that the motors used may generally conform to the requirements of IS: 996. However, if there are any deviations between the requirements of IS: 996 and those of this standard, the provisions of the latter shall apply. It may be provided with facility to operate at more than one speed:

The drum shall have arrangements for its stable and easy mounting on the motor housing without the use of any tools.

24.4 Controls -- Switches shall conform to the provisions of the test mentioned in Cl. 36.1. For safety purpose a resettable overload protection shall be provided.

They may have stable positions for operation at various speeds. However, they may have a non-holding quick action position for instantaneous operation extending over controlled short duration

24.9 Stones - The material used shall conform to the requirements laid down in 24.9.1 and 24.9.2

24.9.1 The flat stone shall be properly secured (for example: by using food grade epoxy adhesive) with the drum for leak proof. The polymers if used in the rolling stones assembly shall be of food grade.

The stone material shall be of natural stone of density in the range of 2500 – 2750 kg/cubic metres, duly machined to the required surface finish shall be used. Soft stone shall not be used.

24.9 Power cord - The flexible Power Cord used shall conform to IS 1293.

24.10. Capacitor - The ac Capacitor used shall conform to IS 2993.

24.11. Driven Pulley: The driven pulley, if any used it shall be made of Nylon of relevant grade or light weight metal.

25 SUPPLY CONNECTIONS AND EXTERNAL FLEXIBLE CABLES AND CORDS

25.1 The relevant provisions of 25 of IS: 302-1 shall apply except that the provisions of 25.2, 25.3, 25.14 are not applicable.

26. TERMINALS FOR EXTERNAL CONDUCTORS

26.1 The relevant provisions of 26 of IS: 302-1 shall apply.

27. PROVISION FOR EARTHING

27.1 The relevant provisions of 27 of IS: 302-1 shall apply.

28. SCREWS AND CONNECTIONS

28.1 The relevant provisions of 28 of IS: 302-1 shall apply.

29. CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION

29.1 The relevant provisions of 29 of IS: 302-1 shall apply.

30. RESISTANCE TO HEAT, FIRE AND TRACKING

36.1 The provisions of 30.1 and 36.2 of IS: 302-1 shall apply. The provisions of 30.3 of IS: 302-1 are not applicable.

31. RESISTANCE TO RUSTING

31.1 The provisions of 31 of IS: 302-1 shall apply.

32. RADIATION

32.1 Clause 32 of IS: 302-1 is not applicable.

33. FINISH

33.1 The relevant provisions of 33 of IS: 302-1 shall apply.

34 OPERATIONAL TEST

34.1 Idli / Dosa Batter - The general procedure for preparing the batter is to take decuticled black gram (*URAD DAL*) and parboiled rice in the proportions 1 : 4 by mass, soak them separately in the required quantity of water for 4 hours and then to grind them separately before mixing them together. The black gram is ground to a smooth and frothy consistency, and the rice is ground to fine semolina in water.

For the purpose of this test the solid ingredients shall be taken in the weights specified below for different capacities of wet grinders and soaked in the quantity of water shown against each mass of solid. The soaked solid with the unabsorbed water shall then be transferred to the drum

and ground. Excess water to the extent of 20 percent can be added as and when needed for achieving smooth grinding results during grinding.

Rated Drum Capacity, Litres	Black Gram		Parboiled Rice	
	Solid g	Water, ml	Solid, g	Water, ml
1.0	200	600	750	1000
1.5	300	850	1000	1200
2.0	350	1000	1250	1400

The maximum operational time for grinding each ingredient shall 30 minutes.

NOTE:

1. A maximum of 300 ml extra water may be added during grinding depends on the requirement.

The results of grinding the black gram are assessed by working the mixture between the thumb and fingers. The mixture shall be smooth and frothy and no lumps shall be detected.

The results of grinding the rice shall be assessed by diluting the ground mixture with sufficient quantity of clean Water and sieving it successively through the following Indian Standard Sieves:

- 1.40 mm, 1.00 mm and 500 microns:

The ground material from the drum is recovered as fully as possible by rinsing it with water, the same water being then used for dilution. After sieving, the water from the material retained by each sieve shall be allowed to drain away for 5 minutes and the material should then be recovered and weighed.'

The grinding shall be considered satisfactory if not more than 10 percent of the *mass* of rice originally taken is retained by the 1.40 mm sieve; not more than 15 percent by the 1.00 mm sieve and not more than 70 percent by the 0.5mm sieve.

35. TEMPERATURE WITHSTAND TEST FOR DRUM AND FLAT STONE ASSEMBLY

35.1 Boiling water shall be poured into the drum at room temperature rapidly to fill it to its capacity.

35.1.1 After the test the drum shall be emptied and brought back to room temperature. The test shall be repeated five times. The flat stone shall not show any sign of cracks and de-lamination and shall properly fit into the holder after the test.

36. TEST FOR CONTROLS

36.1 **Test for Switches** — Controlling switches shall be capable of breaking the stalled motor current at the maximum rated voltage six times without failure. This test is carried out on DC unless the machine is marked 'AC only'. (For the purpose of these tests the rated capacity shall be taken as equivalent to the rated input of the machine.).

37 Strength for the assembly – The drum shall be assembled on the body. Place a load of 30 kgf on the body transmission coupler 6 times. There shall be no chipping, cracking or visible tenting on the mating surface..

38. Speed of grinding surface - The speed of the grinding surface shall not exceed 300 m/min on full load condition on the highest speed position of switch nor shall be less than 150 m/min on the lowest position of the switch.

NOTE — The speed of the surface is measured where it offers the maximum velocity, even if such a surface does not actually perform grinding operation, but constitute a part of the grinding surface

39 Test for Input — The input shall be measured with the grinder connected to a supply circuit at maximum rated voltage and at rated frequency (for ac machine), under conditions of maximum normal loading and adequate heat discharge, as specified in cl 4.4.

39.1 The input when measured in accordance with 11.3.6 shall not differ from the rated input by more than 15 percent

40 Spillage test :

Place the drum with the lid in the body of the Wet Grinder for this test. Water at room temperature shall be poured slowly over a period of one minute over the lid. The spilled water shall not damaged the wet grinder within the meaning of this standard. This shall be confirmed by carrying out the Leakage current and Electric Strength test.

41 Endurance Test — The test shall be carried under normal load prescribed by the manufacturer and the total operating time shall be 250 hours. The operation cycle 30 minutes of running followed by 5 minutes idle time. The cycles can be broken in to convenient number of slots. During the period of test, the grinder shall be fed with the material and water recommended by the manufacturer.

After the endurance test, the grinding surfaces shall not deteriorate, and the grinder should run normally.

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