


Microsoft PowerPoint interface showing a presentation slide titled "Important Moulding Sand Test".

Slide 10: Important Moulding Sand Test

1. Moisture Content test
2. Clay content test
3. Grain Fineness test
4. Permeability test
5. Compactability test
6. Strength test
 - (a) Green Compressive strength
 - (b) Green Shear Strength
 - (c) Dry Compressive strength
- (7) Hardness

Slide 11: Moisture Content test



Slide 12:

1. Take 50 to 100 gms of prepared sand in the pan and heat it in a oven for 1 to 2 hours.
2. The moisture in the moulding sand is thus evaporated.
3. Shovel the sand is taken out of the pan and weighed again.
4. The percentage of moisture can be calculated by difference of weight.
5. $\text{Moisture} = \frac{\text{Weight of the sand} - \text{Weight of the dry sand}}{\text{Weight of the sand}} \times 100$

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Slide 110 of 132 "Office Theme" 66%

Microsoft PowerPoint interface showing a slide titled "Moisture Content test" (Slide 112 of 132). The slide content is as follows:

1. Place 20 to 50 gms of prepared sand in the pan and heat it in a oven for 2 to 3 minutes.
2. The moisture in the moulding sand is thus evaporated
3. Moulding sand is taken out of the pan and weighted again
4. The percentage of moisture can be calculated by different of weight.
5. % of Moisture = $(W_1 - W_2) \times 100 / W_1$
Where W_1 = Weight of the sand before dry
 W_2 = Weight of the sand after dry

The slide is part of a presentation titled "Moisture Content test". The left sidebar shows the slide navigation pane with slides 09, 10, 11, and 12. Slide 11 is titled "Moisture Content test" and shows an image of a balance scale and a container. Slide 12 is titled "Moisture Content test" and shows a list of steps. The bottom status bar indicates "Slide 112 of 132" and "Office Theme".

Moisture Content test:



The image displays the equipment used for a moisture content test. On the left is a laboratory oven with its door open, revealing a glowing interior. On the right is a digital analytical balance with a glass enclosure. Below these, on a blue surface, are two white ceramic crucibles: one is a shallow dish and the other is a deeper, rounded vessel.


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Clipboard Outline

10 Important Clauses: **Standard**

- 1. Moisture Content Test
- 2. Soil Moisture Test
- 3. Permeability Test
- 4. Permeability Test
- 5. Permeability Test
- 6. Permeability Test
- 7. Permeability Test
- 8. Permeability Test
- 9. Permeability Test
- 10. Permeability Test
- 11. Permeability Test
- 12. Permeability Test
- 13. Permeability Test

11 **Moisture Content test**



12

1. Take 100 gms of prepared sand in the pan and heat it in a oven for 1 to 2 hours.
2. The moisture in the moulding sand is thus evaporated.
3. Cooling, sand is taken out of the pan and weighed again.
4. The percentage of moisture content calculated by difference of weight.
5. % of moisture = $\frac{\text{Weight of the sand before drying} - \text{Weight of the sand after drying}}{\text{Weight of the sand after drying}} \times 100$

13 **Rapid Moisture Teller:**

When calcium carbide comes in contact with moisture, acetylene gas is generated. This principle is used in the Rapid moisture Teller.

A weighted quantity of sand is mixed with a fixed quantity of calcium carbide reagent and the whole mixture is thoroughly shaken in a vessel to which a pressure gauge is fixed.

The acetylene gas produced develops pressure. The Instrument indicates moisture on the pressure gauge.

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Microsoft PowerPoint interface showing a slide titled "Clay Content Test (Total Clay)". The slide content is as follows:

Clay Content Test (Total Clay)

1. Separate 50 gms of dry moulding sand transfer to wash bottle.
2. Add 475 cc of distilled water + 25cc of a 3% NaOH
3. Agitate this mixture for 10 min with the help of sand Stirrer.
4. Fill the wash bottle with water upto marker.
5. After the sand etc has settled down the water Siphon from the wash bottle.
6. Dry the sand settled down

Now the % of clay content can be calculated
 $\% \text{ of clay content} = (W_1 - W_2) \times 100 / W_1$
 W_1 = Weight of the sand before test
 W_2 = Weight of the sand after test.

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Zoom meeting interface showing participants:

- You
- Kalyanmoy
- [Video feed of a person]
- [Video feed of a person]
- 2 others

Microsoft PowerPoint interface showing a presentation slide titled "Rapid Moisture Teller". The slide content includes a list of steps for a moisture test and a diagram of a beaker with a thermometer.

Slide 12:

1. Place 20 to 50 gms of prepared sand in the pan and heat it in a oven for 5 to 10 minutes.
2. The moisture in the sand is driven out of the sand and is collected in the condenser.
3. The sand is then taken out of the pan and weighed again.
4. The percentage of moisture is calculated by difference of weight.
5. % of moisture = $\frac{W_1 - W_2}{W_1} \times 100\%$, where W_1 = Weight of the sand before drying, W_2 = Weight of the sand after drying.

Slide 13:

Rapid Moisture Teller:

When calcium chloride comes in contact with moisture, exothermic heat is generated. This principle is used in the Rapid Moisture Teller.

A weighed quantity of sand is mixed with a fixed quantity of calcium chloride. The mixture is then placed in a thermally insulated container in which a pressure gauge is fitted.

The exothermic heat produced causes the pressure to rise. The instrument indicates moisture of the product group.

Slide 14:

Clay Content Test (Rapid Clay):

1. Separate 10 gms of dry material and transfer to a clean bottle.
2. Add 100 ml of distilled water + 10 ml of 10% hydrochloric acid.
3. Shake the mixture for 10 minutes with the help of a shaker.
4. Fill the sand bottle with water upto the mark.
5. After the sand has settled down the water level from the sand bottle.
6. On the sand bottle down.

Now the % of clay content can be calculated.

% of clay content = $\frac{V_1 - V_2}{V_1} \times 100\%$, where V_1 = Volume of the sand before test, V_2 = Volume of the sand after test.

Slide 15:

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Office Theme

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66%

Clay content test (Active clay)

• Methylene Blue Test

Methylene blue is a heterocyclic aromatic chemical compound with molecular formula $C_{16}H_{18}N_3SCl$

Methylene blue is a potens Cationic dye.

Steps:

1. Calibrate the Methylene-clay system (No. of ml of methylene blue required for each percent of bentonite or clay)
2. Take 5 gm of sand in a stainless steel container
3. Add 50 ml of 2% tetrasodium pyrophosphate solution via pipette
4. Disperse the sand particles using an ultrasonic accessary

Microsoft PowerPoint interface showing a presentation slide titled "Clay Content Test (Active clay)".

Slide 14: Clay Content Test (Normal Clay)

- 1. Prepare 50gms of dry moulding sand and transfer to wash bottle.
- 2. Add 100cc of distilled water + 10cc of 10% NaOH.
- 3. agitate the mixture for 10 min with the help of hand shaker.
- 4. Fill the wash bottle with water until marked.
- 5. After the sand has been added pour the water from the wash bottle.
- 6. On the sand added down.
- 7. Use the % of clay content can be calculated.
- 8. % of clay content = $\frac{(W_2 - W_1)}{W_2} \times 100\%$
- 9. W_1 = weight of the sand before test
- 10. W_2 = weight of the sand after test

Slide 15: (Image of a test setup)

Slide 16: Clay content test (Active clay)

- 1. **Method (Active Clay Test)**
- 2. Prepare a suspension of the soil in water in a 1000cc container (100cc of soil + 900cc of water).
- 3. agitate the mixture for 10 min with the help of hand shaker.
- 4. Fill the wash bottle with water until marked.
- 5. After the sand has been added pour the water from the wash bottle.
- 6. On the sand added down.
- 7. Use the % of clay content can be calculated.
- 8. % of clay content = $\frac{(W_2 - W_1)}{W_2} \times 100\%$
- 9. W_1 = weight of the sand before test
- 10. W_2 = weight of the sand after test

Slide 17: (Image of the apparatus used for the test)

the apparatus used for the me
test in which we will be finding

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Microsoft PowerPoint interface showing a slide titled "Clay content test (Active clay)". The slide content is as follows:

5. Slowly fill the vessel with Methylene blue from burette and stir the system.
6. Using a glass rod, remove a single drop of the liquid and place it on filter paper. watch for the formation of a blue green halo around the central spot.
7. Increase the addition of Methylene blue drop by drop till blue-green halo appears.
8. Calculate the amount of Methylene blue consumed
9. Using the calibration factor, determine the clay content of the sand

The slide is part of a presentation titled "Clay content test (Active clay)". The interface includes a ribbon with tabs for Font, Paragraph, Drawing, and Editing. The status bar at the bottom indicates "Slide 118 of 132" and "Office Theme".



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You

Kalyanmoy

2 others

2 others

- Place the sample of dry sand (Clay removed sand) in the upper sieve
- Vibrate the Sieve shaker for a definite period.
- Weigh the amount of sand retained on each sieve
- Compute the percentage distribution of grains.



A sample of 50 gms of moulding sand was sieved through a sieve shaker. The quantities of sand collected in different sieve were recorded. Determine AFS grain fineness number(GFN) of the said sand

US Sieve Serial no	Sand retained On each sieve(gm)	% of sand retain (A)	Multiple factor (B)	Product (AXB)
6	none	0.0	3	0
12	none	0.0	5	0
20	none	0.0	10	0
30	none	0.0	20	0
40	0.20	0.40	30	12
50	0.65	1.3	40	52
70	1.20	2.4	50	120
100	2.25	4.5	70	315
140	8.55	17.1	100	1710
200	11.05	22.1	140	3094

GFN = Sum of products / Sum of % weight of sand retained
= $15243 / 88.2 = 172.8 \approx 173$

Permeability Test:

The quantity of air that will pass through a standard specimen of the sand at a particular pressure condition is called the permeability of the sand



Major part of
Permeability test
equipment

1. An inverted bell Jar,
which floats in a
water
2. Specimen tube (for
holding the sand
specimen)
3. Manometer (for
measuring the air
pressure)

Step involved;

1. The air (2000 cc volume) held in the bell jar is forced to pass through the sand specimen
2. At this time, air entering the specimen is equal to the air escaped through the specimen
3. Take the pressure reading in the manometer
4. Note the time required for 2000 cc of air to pass the specimen

Permeability number (N) = VH/APT

Where, V = Volume of air (cc)

H= Height of the Specimen (cm)

A = Area of the Specimen (cm²)

P = Air pressure (gm/cm²)

T = Time taken by the air to pass through
the sand Specimen (Sec)

- ❖ Determine the permeability a AFS standard sand specimen of 5.08 cm (2 inch) diameter and 5.08 cm in height. The air drum was raised to take 2000 cm³ of air into it. The whole air was then allowed to escape through the sand specimen at a pressure of 10g/cm³ in a span of 15 sec.

Microsoft PowerPoint interface showing a slide titled "Compactibility".

Compactibility:

The compactibility indicates the water tempering degree of the green sand moulding. Compactibility is the percentage decrease in height of a loose mass of sand under the influence of a controlled compaction.

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Microsoft PowerPoint interface showing a presentation slide titled "28" with a large image of a sand compaction test apparatus.

Slide 28 Content:

Compaction:
The compaction indicates the water content of the soil. The compaction is the percentage increase in height of a loose mass of soil under the influence of a controlled compaction.

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Microsoft PowerPoint interface showing a slide titled "Green Compression Strength: Green Compression Strength indicates the load bearing capacity of the mould in the presence of moisture". The slide is part of a presentation titled "Office Theme". The interface includes a ribbon with tabs like Design, Layout, and Font, and a sidebar with slide thumbnails. The slide number is 29.

Green Compression Strength:
Green Compression Strength indicates the load bearing capacity of the mould in the presence of moisture

Green Shear strength:
Green Shear strength indicates the strength of the mould during the removal of pattern or while the core in the mould

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Zoom meeting interface showing a list of participants. The participants listed are You, Kalyanmoy, and 2 others. The interface includes a video feed of a participant and a list of other participants.

You

Kalyanmoy

2 others

Universal sand strength Testing Machine



A photograph of a Universal sand strength Testing Machine. The machine is primarily white with a prominent blue rectangular section in the center. It features a black hand-crank wheel on the right side and a black cylindrical component on top. To the right of the machine, there is a circular pressure gauge with a white face and a black needle, and a small, clear plastic bottle. The entire setup is placed on a light-colored surface against a plain background.



Compressibility:
The compressibility indicates the water tempering degree of the green sand moulding. Compressibility is the percentage decrease in height of a loose mass of sand under the influence of a controlled compaction.




Green Compression Strength:
Green Compression Strength indicates the load bearing capacity of the mould in the presence of moisture

Green Shear strength:
Green Shear strength indicates the strength of the mould during the removal of pattern or while the core is in the mould.

Universal sand strength Testing Machine



Hardness: Hardness indicates the resistance of the mould to plastic deformation



Mould hardness Tester



Mould hardness Tester



Specimen plate used for shear strength

Hardness: Hardness indicates the resistance of the move

