

OBJECTIVE

To enable the students to have a basic knowledge about the various testing methods of ceramic raw materials and samples and also the basics about quality control.

OUTCOME

On completion of the course the students are expected to

- Have learnt the basics about the testing methods for ceramic raw materials.
- Have learnt the various methods of testing the physical properties.
- Have learnt to test the various properties of glaze.
- Have an immense knowledge about testing of refractories.
- Have a basic knowledge about quality control.

UNIT I TESTING OF RAW MATERIALS

Sampling methods – coning and quatering– measurement of moisture content by IR moisture balance – speedy moisture test – particle size analysis – sieve test, sedimentation method – Stokes, Andreasen Pipette, sedigraph, laser diffraction, x-ray broadening, light scattering. Determination of surface area by permeametry, adsorption.

UNIT II TESTING OF PHYSICAL PROPERTIES

Plasticity – Pfefferkorn test, Atterberg test, Casting – Control of casting slips- fluidity, thixotropy, specific gravity, contraction – wet to dry, dry to fired, wet to fired, modulus of rupture –vitrification – density – porosity – water absorption.

UNIT III TESTING FOR GLAZE

Measuring coherence parameter – pick up – testing of viscosity of glazes at low temperatures and high temperatures – test for the solubility of lead frits – glaze fit –hardness testing – glaze thickness – autoclave and crazing – thermal shock measurement.

UNIT IV TESTING FOR REFRACTORIES

Refractoriness – RUL – cold crushing strength – permanent linear change on reheating – spalling resistance – reversible thermal expansion – thermal conductivity – creep – thermal shock resistance – hot modulus of rupture – slag resistance test.

UNIT V QUALITY CONTROL

Introduction – basic concepts – Indian standards for ceramic materials – ISO 9000 -zero defects – concept quality marking and certification scheme – total quality management in ceramic industries.

TEXT BOOKS

1. W.Ryan & Radford C, Whitewares : Production, Testing and Quality Control, The Institute of Ceramics by Pergamon Press, Oxford, 1987.
2. Felix Singer & Sonja Singer, Industrial Ceramics, Oxford & IBH Publishing Ltd, New Delhi, 1992.

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1. D.Ganguli, S.Kumar, Elements of Ceramics –Vol II, Indian Institute of Ceramics, 1984.
2. Hiraoki Yanagida, The Chemistry of Ceramics, John Wiley and Sons, 1996.
3. Juran J.M and Gryna F.M, Quality Control Handbook, McGraw Hill Book Co.,1988.
4. Rashid Chesti.A, Refractories, Prentice Hall of India Pvt Ltd, 1986.
5. Kenneth Shaw, Ceramic Glazes, Elsevier Publishing Co, NY, 1971.
6. H.Lal, Total Quality Management – A Practical approach, Wiley Edn, 1990.