

Ceramic Technology

DIPLOMA STANDARD

I. INTRODUCTION TO CERAMICS

History - Definition - Domestic and Industrial uses of Ceramics - Modern Ceramics - Hi-tech ceramics - Sub-division in Ceramics.

TERRACOTTA

Formation of clay - Varieties of clays - Non Plastic materials - Properties of clays - varieties of bricks, Tiles and Vessels - Method of manufacture - Properties - uses - Drying - firing - Testing and calculations.

II. WHITE WARES

Origin of clays - Composition of clays - Classification of clays - Impurities in clays - washing of clays - Raw materials - Properties - uses - crushing and grinding - grain sizes - compounding of bodies - shaping methods - casting - Throwing - Jiggering and jolleying - Pressing - Turning - Extrusion - Drying - Drying defects - Biscuiting - Firing - Firing defects and remedies.

BODIES

Type of bodies - Flow sheets - Earthen Ware - Stoneware - Fine stone ware - Chemical stone ware - Electrical stoneware - Sanitary wares - Porcelain wares - Chemical porcelain - Tableware - Bone chinawares - I. S. Specification - Special bodies - Insulator bodies - Mullite, Forsterite - steatite - Cordierite - Zircon, Ferrite - Wollastonite.

III. RAW MATERIALS

China clays - Bal clays - Fire clays - Quartz - Felspar - Alumina - Gypsum and plaster of paris - Calcite - Bentonite - Talc.

GLAZES

Definition of glaze - Varieties of glazes - Glaze Raw materials - Oxides, Frits and stains - Preparation - Properties - Application - Decorations - Glaze defects and remedies - Calculations conversion of Batch composition to percentage composition - Empirical formula.

IV. GLASS

History - General glass making - Types of glass - opal glass, Transparent glass - Amber glass - Crystal glass - Soda Lime glass - Water glass etc. Raw materials - Batch mixing and calculation - Batch to Chemical composition - Chemical Composition to Batch etc.

GLASS FURNACES

Direct fired furnace - Semi direct fired furnace - Producer gas fired furnace - Oil fired tank and pot furnace - Regenerative and recuperative system.

MANUFACTURING OF GLASS

By hand - By machine - Full automatic press - Blow machine - properties and Testing of glass - Defects and Remedies.

DECORATION

Cracking - off machine - Edge smoothing - Glass cutting - Engraving - Intagliowork - etching Acid polishing, sand blasting - Glue etching - Iridescent glass - Silvering - Staining - Enamelling.

V. ENAMEL

Introduction - Fundamental properties of Basic metals and preparation of metal surface - Classification of metal surface - Classification of Enamel and composition Calculation for Enamel and Frits Enamelling Furnace and - Classification - Frit making and milling - application - Firing - Controls - Properties of Enamel and Testing - Decoration - Defects and Remedies.

VI. REFRACTORIES AND CEMENT

Classification - Type of Refractories - Acid - Basic - Neutral - Synthetic and oxides refractories - Insulation Bricks - Preparation - Drying - Firing - Application - Refractory failure and other defects and control - Testing of Refractories - Industries, Dependent of refractories.

CEMENT

Types of cement - Raw materials - manufacturing process - Physical and Chemical properties - uses.

VII. FUELS

Classification of fuels - Solid - liquid - Gaseous - Sources - Essential properties of fuels - character and specification of fuels - General arrangement of Oil supply - Burner - Automization. Heat transfer - Fuel Calculation.

VIII. FURNACE

Types and Classification of kilns and furnaces - Kiln accessories - flues and chimney calculations

IX. PYROMETRY

Pyrosopes - Heat work recorder - Wedge wood cylinder - Sagger cones - Advantages and Disadvantages of cones - Hold Craft bars - Buller's rings - Pyrometers - Principles - Electrical Resistance Pyrometer - Thermo couple Pyrometer - Radiation. Pyrometer - Optical pyrometer - Temperature recorder and controllers.

X. PROCESSING MACHINARIES FOR CERAMIC INDUSTRIES

Jaw crusher, edge runner, pulverisers, Roller crusher - Vibrating sieves, magnetic separator, Tube mill, Ball Mill, Blungers, Agitators, Filterpress, pugmills, De-airing pugmills, pressing machines, dryers.