

NCB

ENDURING EXCELLENCE



NATIONAL COUNCIL FOR CEMENT AND BUILDING MATERIALS

(Under the Administrative Control of Ministry of Commerce & Industry, Govt. of India)



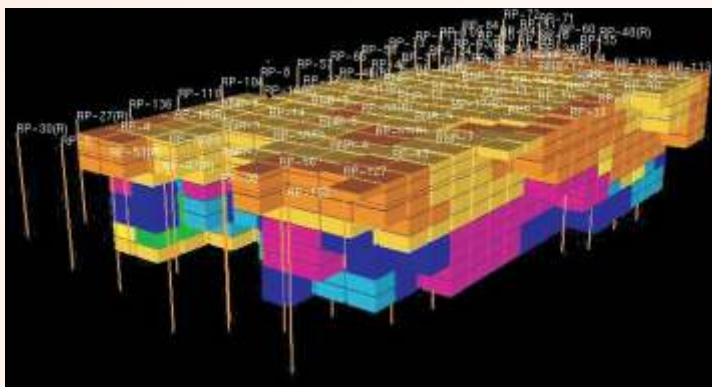
National Council for Cement and Building Materials (NCB), set up in 1962 and then known as Cement Research Institute of India (CRI), is the apex body in India under the administrative control of Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India, devoted to research, technology development and transfer, education and industrial services for cement, building materials and construction industries. Its multi-disciplinary activities are performed in an integrated and co-ordinated manner through its two larger units located at Ballabgarh (near Delhi) and Hyderabad (Both ISO: 9001-2008 Certified) and the third unit at Ahmedabad, guided by the six corporate Centres.

FUNDAMENTAL AND BASIC RESEARCH

- Development of newer cements and binders
 - Geopolymeric cements
 - Composite cements
 - High volume fly ash cements
- Application of Nano Technology in cements and concrete
- Improvement in concrete durability
- Sustainable development and conservation of conventional raw materials and energy



Scanning Electron Microscope with EDAX for morphological and microstructural studies of cement, concrete etc



3D Block Model of Limestone Deposit

*More Than 70 Projects
on Supervision of Exploration
& Computer Aided
Deposit Evaluation and Mine Planning
Completed in India and Abroad*

GEOLOGY AND MINING

- Identification, technical appraisal & feasibility study of potential limestone deposit for new projects
- Planning, supervision and monitoring of exploration activities
- Computer aided deposit evaluation and mine planning, production scheduling and blending using advanced softwares like Datamine Studio, RM Scheduler and Multimine Scheduler
- Long term mine production sensitivity analysis based on grade constraints and production target using advanced softwares
- Technical audit of open cast limestone mines
- Lab scale beneficiation studies of low / marginal grade limestone

RAW MATERIALS, CEMENTS AND REFRACTORIES



- Assessment of raw materials for cement manufacture
- Quality monitoring of raw materials, clinker and cement
- Establishing Limestone Consumption Factor (LCF) for cement plants
- Designing and optimization of cost effective raw mixes for improved quality of clinker
- Feasibility studies for utilization of mineralizers and additives for fuel economy and improved cement quality
- Refractory engineering services

X-ray Diffractometer for Mineralogical and phase analysis of raw materials, clinker, cement, in-process materials, industrial by-products etc

Completed more than 50 Studies on Optimization of Raw Mix Design and 180 studies for Determination of Limestone Consumption Factor for Cement Plants

WASTES UTILIZATION

- Techno-economic feasibility studies on utilization of industrial wastes and by-products such as lead-zinc slag, copper slag, LD slag, Spent Pot Lining (SPL) waste, barium sludge, ETP sludge, iron oxide sludge, E-cat waste from petroleum refinery etc as raw material / mineralizer / blending component / performance improver in cement manufacture
- Use of 'Jarosite', a by-product of zinc industry as partial substitute of mineral gypsum in cement manufacture
- Studies on utilization of alternate materials such as mine rejects, overburden stone, LD slag, coarse and fine fraction generated during clay beneficiation etc. as replacement of natural sand in concrete
- Development of synthetic slag using low grade materials and mine rejects
- Development of plaster coatings, tiles, bricks, blocks, boards, etc. using industrial wastes such as marble slurry, fly ash, by-product gypsum, etc.



Jarosite dump



Barium Sludge dump

TESTING SERVICES

- NABL accredited testing laboratories
- Complete physical and chemical testing of cement including minor and heavy elements, building and related materials as per national and international standards
- Mineralogical and microscopic evaluation of raw materials, clinker, stone / aggregates, etc.
- Thermal characteristics of materials including burnability studies
- Proximate and ultimate analysis of fuel including determination of calorific value
- Mechanical properties e.g. crushability, grindability, bond index, particle size distribution, etc.

About 7500 Samples Tested Annually



ICP-Atomic Emission Spectrometer



Rising Hearth Furnace



Adiabatic Bomb Calorimeter

PROJECT ENGINEERING AND SYSTEM DESIGN

- Project formulation and engineering services
- Project management and field services
- Plant performance assessment
- Plant system design audit
- Corporate debt restructuring (CDR) studies
- Assessment of plant capacity and bottle neck study for capacity enhancement

35 Techno Economic Feasibility Studies/ Detailed Project Reports for Large Cement Plants Completed

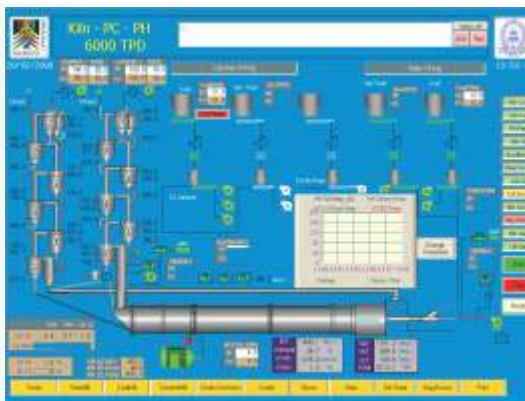


NCB CAD Centre

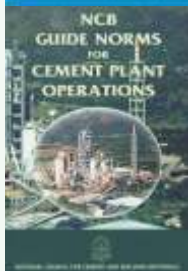
PROCESS AND PRODUCTIVITY

- Long-term productivity enhancement studies
- Diagnostic Studies : High PH exit gas temperature, kiln shell corrosion, unstable combustion / burning of fuel, coating formation / build-up in kiln system, lump formation in cement silos, buckling of chimney
- Process Optimization studies for kiln-PH-calciner & cooler system, mills and separators
- Determination of pre-blending and blending efficiency
- Rational utilization of alternate fuels including hazardous wastes
- Improvement in fuel combustion efficiency

110 Productivity Enhancement and Process Optimisation Studies Completed



Simulation of Parameters in Kiln System



Cover Page of 5th Edition of NCB Guide Norms

ENERGY MANAGEMENT

- Energy audit studies in cement plants including captive power plants
- Energy management, monitoring and target setting
- Heat balance studies
- Gas balance studies
- Identification of potential for thermal and electrical energy savings and recommendations for remedial measures
- Techno Economic Feasibility studies for Waste Heat Recovery System (WHRS) in cement plants
- National Award for Energy Excellence for Indian cement industry

NCB is Accredited with Bureau of Energy Efficiency (BEE) as Energy Auditor

185 Energy Audit Studies Completed



Measurement of Process Parameters in Cement Plant



NCB National Awards Distributed at the NCB International Seminars

ENVIRONMENT MANAGEMENT

- Environment monitoring (*Point Source & Ambient Air*)
- Life Cycle Assessment (LCA) studies
- Carbon & water footprint assessment
- Pollution load assessment
- Performance evaluation of air pollution control equipment (APCE)
- Environment audit
- Noise & ground vibration studies
- Water & waste water analysis
- Solid and hazardous waste
- EIA and EMP studies
- National award for environment excellence for Indian cement industry



Monitoring of PM & Gaseous Emissions at Kiln Stack

PLANT MAINTENANCE

- Maintenance system audit / evaluation
- Compressed air optimization (*studies carried out in 30 cement plants*)
- Condition monitoring, computerized maintenance, diagnostic studies on maintenance, preventive maintenance, safety audit, inventory control etc

12 Technical Health Audits Carried Out

More than 70 EIA | EMP | Pollution Load | Environment Audit Studies and Development of Norms for Refractory, Cement and Plywood Industries Completed LCA Studies carried out for Cement Sector, Construction Industries, Steel Re-Rolling Mills etc



Calibration of Sieve at Profile Projector

CALIBRATION AND INTER LABORATORY SERVICES

- NABL accredited calibration services
- Calibration services to meet the requirements of ISO:9001 and ISO:17025 and other quality systems
- Calibration of equipment & instruments used in measurement of temperature, pressure, dimension, revolution, force, mass, volume, RH etc.
- NABL accredited Inter Laboratory Comparison (ILC) and proficiency testing (PT) services meeting ISO 17043:2010 requirements

1500 to 2000 Equipment Calibrated Annually for Various Industries.

44 PT Studies Executed (By June, 2016)

TOTAL QUALITY MANAGEMENT AND STANDARD REFERENCE MATERIALS

- Consultancy for setting up Quality Control Laboratories and NABL accreditation
- Assistance in ISO:9001 Quality Management System implementation
- Quality Monitoring Service
- Laboratory assessment and proficiency improvement study
- Development and supply of Certified Reference Materials (CRMs) of cement, raw meal, clinker, lime, limestone, clay, gypsum, etc. for physical and chemical parameters
- Development of plant specific CRMs for calibration of X-ray analyser (XRF / XRD)
- Benchmarking and customer satisfaction measurement / enhancement studies



NCB Developed CRMs

- Application of statistical tools and techniques for continual improvement and TQM
- Application of Japanese improvement techniques for system / process / product improvements
- National quality excellence awards for Indian cement industry

*10,000 CRMs Supplied Annually to Domestic and Overseas Laboratories
46 Laboratory Assessment and Proficiency Improvement Studies Carried Out for Cement and Other Industries (By June, 2016)*

CONCRETE TECHNOLOGY & CONCRETE MIX DESIGN

- Evaluation of concrete making materials such as OPC, PPC, PSC, fly ash, slag, silica-fume, super-plasticizers, accelerators, VMA, anti washout admixture, corrosion inhibitors, anti shrinkage compounds, water proofing chemicals, curing compounds etc
- Evaluation of Aggregates : physical and chemical evaluation, petrography and soundness, alkali - aggregate reactivity
- Concrete mix design of standard concrete, special concrete such as plastic concrete, pervious concrete, Controlled Low Strength Material (CLSM) etc. and advance concrete composites such as high performance concrete, high volume fly ash concrete, self-compacting concrete, roller compacted concrete, steel fiber reinforced concrete
- Durability studies of concrete through accelerated test

Some of the Studies Undertaken Recently

1. *Evaluation of material and potential alkali aggregate reactivity studies for hydroelectric & thermal power plants (about 50 projects per annum)*
2. *Concrete mix proportioning (more than 250 mix design per annum)*
3. *Development of special concrete and high abrasive strength concrete composite for spillways and glacis*
4. *Development of accelerated mix design method for concrete using PPC & OPC with flyash*
5. *Evaluation of Low Density Aggregates (LDA) and structural lightweight concrete using LDA*
6. *Use of flyash, bottom ash, copper slag and recycled aggregate in concrete*



V-Funnel & L-Box Test for SCC



Confined & Unconfined Compressive Strength Determination for Plastic Concrete

STRUCTURAL ASSESSMENT AND REHABILITATION & CONSTRUCTION MANAGEMENT

- In-situ quality assessment, durability investigation, residual life assessment and recommendation and supervision of repair, rehabilitation and retrofitting



UPV test of Concrete Structure for Quality Assessment

- Assessment of structural adequacy, load carrying capacity and load testing of structural elements in buildings and structures
- Third party quality audit and quality assurance (TPQA) of new constructions

Some of the Studies Undertaken Recently

1. *Distress Investigation & in-situ quality assurance of more than 35 structures per annum*
2. *Study on field and laboratory investigation of concrete dam*
3. *Performance evaluation for Steel Fibre Reinforced Shotcrete (SFRC) lining of the underground desilting chamber of a hydro power project*
4. *Assessment of fire damaged Reinforced Concrete Structures*
5. *Third Party Quality Audit and Quality Assurance (TPQA) for more than 1000 construction projects including flyover, underpass, buildings, roads etc.*



Load Test on Pretension Girder for Flyover Project



Inaugural Address by Chief Guest

INDUSTRIAL INFORMATION SERVICES

- Library with 46,439 documents
- Database of over 40,750 bibliographic records for quick interactive searches
- Regular and ad-hoc publications
- National and international seminars / exhibitions
- Web enabled services and modern IT infrastructure

17 International Events Already Organised

CONTINUING EDUCATION SERVICES

- One year PG diploma course in Cement Technology
- Four/eight weeks certificate course in Cement Manufacturing Technology
- Short Term refresher courses for cement, concrete and construction technology
- Special group training programmes
- Industry specific training programmes for newly recruited professionals
- Simulator based courses for Cement Plant Operation
- Distance learning correspondence course on Diploma in Cement Technology
- Contact training programmes
- Workers' development programmes
- Pedagogy covers lectures, group discussions, case studies, field visits, audio-visual presentations, educational films, experience sharing, lab demonstrations and hands-on-training
- Facilities include:
 - Spacious class rooms with state-of-the-art training aids
 - Well furnished, airconditioned accommodation with mess facility



Hands-on Practice Session of Simulator for Cement Plant Operation



*40000 Professionals Trained under
2400 Different Programmes Organised for
Indian and Overseas Participants*



NCB BALLABGARH



NCB HYDERABAD

ABOUT THE COUNCIL

The six corporate Centres of the Council guide the activities at the different units. The Centres and their main areas of activity are :

Centre for Cement Research and Independent Testing (NCB-CRT) - Fundamental and Basic Research, Cement and Other Binders, Wastes Utilisation, Refractories & Ceramics and Testing Services.

Centre for Mining, Environment, Plant Engineering and Operations (NCB-CME) - Geology, Mining & Raw Materials, Process Optimisation & Productivity Enhancement, Energy Management, Plant Maintenance, Project Engineering & System Design, Environmental Management.

Centre for Construction Development and Research (NCB-CDR) - Structural Optimisation & Design, Structural Assessment & Rehabilitation, Concrete Technology, Construction Technology and Management.

Centre for Industrial Information Services (NCB-CIS) - Industrial Information and Data Bank, Integrated IT Solution, Publication, Seminars & Conferences, International & National Linkages, Image Building.

Centre for Continuing Education Services (NCB-CCE) - Long Term & Short Term Courses, Special Group Training Programmes, Simulator Based Courses, Distance Learning Correspondence Courses, Workers' Development Programmes.

Centre for Quality Management, Standards & Calibration Services (NCB-CQC) - Total Quality Management, Calibration Services, Standard Reference Materials.

FOR FURTHER DETAILS, PLEASE CONTACT:

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