



2022-23

ANNUAL REPORT

(Northern Regional Laboratory)

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Message from Head (NRL)



Smt. Bhavana Sharma
Head (NRL)

As we conclude the achievements and efforts of NRL in the financial year, it is with a sense of pride I present our Annual Report for the year 2022-23. The Annual report highlights the major testing facilities available at NRL and the various initiatives taken by NRL team towards automation of these test facilities in order to increase accuracy and efficiency of our testing processes. The annual report also highlights the various initiatives taken by BIS to engage and facilitate stakeholder engagement alongwith their Skill development. In line with the top management's direction and guidance, NRL has been consistently striving to establish itself as a centre of excellence in testing and facilitating in the implementation of QCOs in the country.

I would like to acknowledge the collective efforts of all the members of NRL team and of all our stakeholders in making NRL one of the best BIS Labs. I would also like to extend my gratefulness to DG Sir and DDGL Madam for providing us guidance to enable us to achieve our assigned targets. We as a team look forward to exciting opportunities and Challenges in the coming year with renewed zeal.



LABORATORY AT A GLANCE

NORTHERN REGIONAL LABORATORY AT A GLANCE



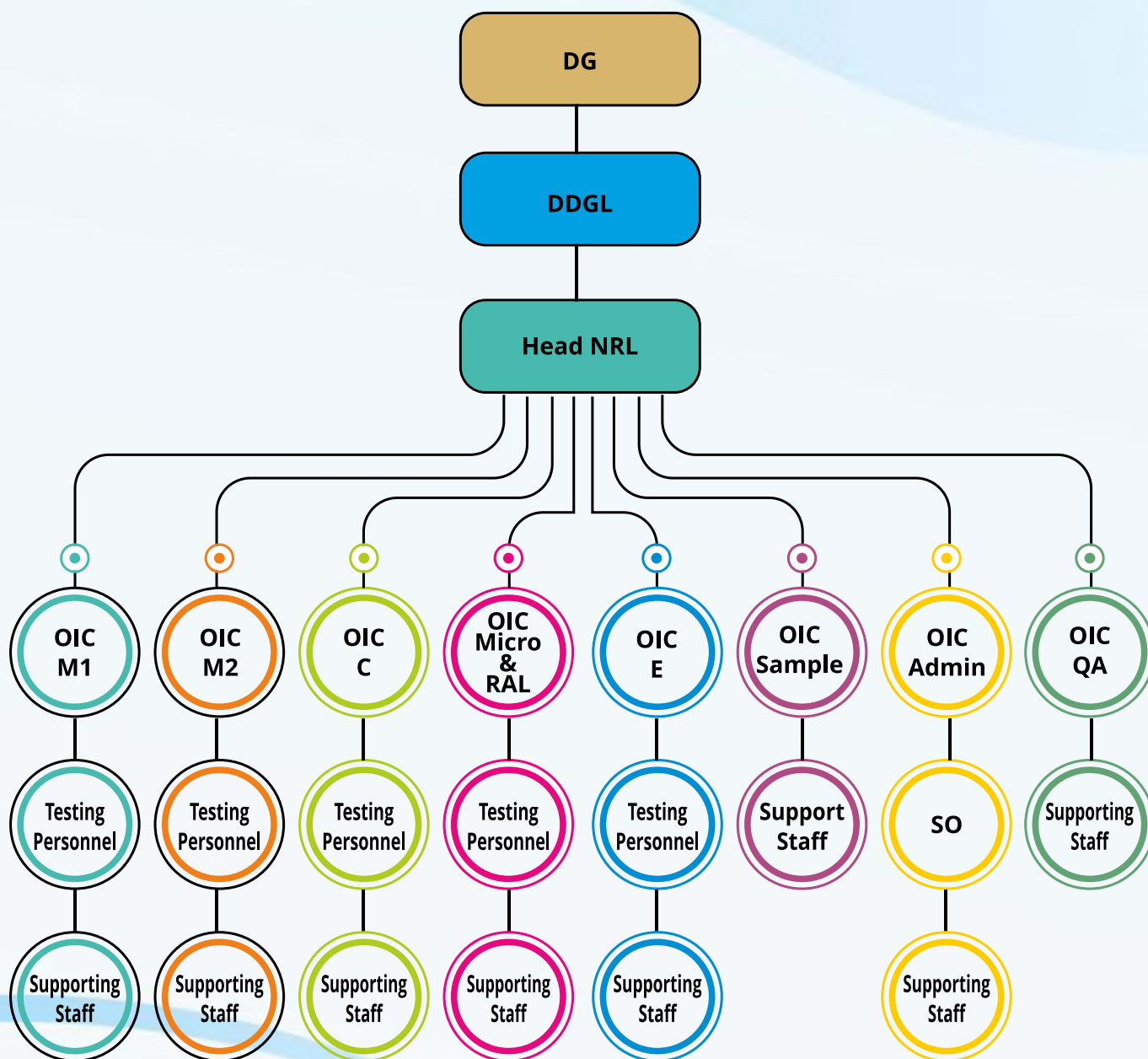
Bureau of Indian Standards (BIS) is the National Standards Body of India under Department of Consumer affairs, Ministry of Consumer Affairs, Food & Public Distribution, Government of India. To maintain quality ecosystem in the country and to protect consumer's interest, BIS is mandated to operate various conformity assessment schemes. Under these schemes, BIS grants licenses/registrations to such manufacturers who are capable of producing goods conforming to relevant Indian Standards, on continuous basis. To support these schemes, BIS has established a network of eight laboratories which requires complete testing of products to assess their conformity to the relevant Indian Standards.

Northern Regional Laboratory (NRL) is one of the BIS laboratories to carry out testing of products covered under the BIS conformity assessment scheme. NRL is spread over an area of 2 acres and it was inaugurated by Sardar Darbara Singh (Hon'ble Chief Minister, Punjab) on 12th February 1982. It had started with three testing sections that is Mechanical, Chemical and Electrical. Later in year 2020, Microbiology lab was also made operational. NRL has testing infrastructure for around 320 products with testing capacity of around 900 samples per month. NRL has been recognized as a Centre of Excellence for testing of Plywood and Cable products. NRL has tested a total of 9584 samples in the year 2022-23. Testing notional income of NRL in 2022-23 was ₹ 81,217,315.

NRL is carrying out its activities with a committed team consisting of Head of Laboratory, Officers in Charge of testing sections, Sample Cell, Quality Assurance and Administration & Finance sections.

NRL has been accredited by the National Accreditation Board for Testing and Calibration Laboratories (NABL) in accordance with ISO/IEC 17025:2017 in Chemical, Mechanical and Electrical fields.

Organizational Structure of NRL



NRL Team



Bhavana Sharma

HNRL, Sc-E

Ved Prakash

OIC (Mech-1), Sc-D

Neha Kumari

OIC (Mirco & RAL), Sc-D

Gulshan Kumar

OIC (Sample Cell & QA) Sc-D

Sahil Khatri

OIC (Mech-2), Sc-D

Divya Choudhary

OIC (Chem), Sc-B

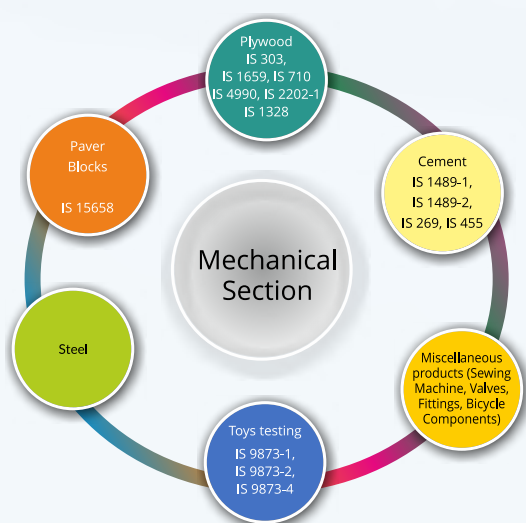
Rushikesh Ghodake

OIC (Elec.), Sc-B

Testing facilities available

Mechanical Section :

Mechanical Section, NRL is a vast section with testing in various mechanical and civil products. Major products being tested in Mechanical Section include, but is not limited to, Paver Blocks, Manhole Covers, Fly-ash Bricks, Cement, LPG Cylinders, Sewing Machines, Bicycle Components, Firehose Couplings, Landing Valves, Laboratory Glassware, various types of valves and fittings such as Ball Valves, Gate Valves, Sluice Valves, Butterfly Valves, MCI Fittings, etc.

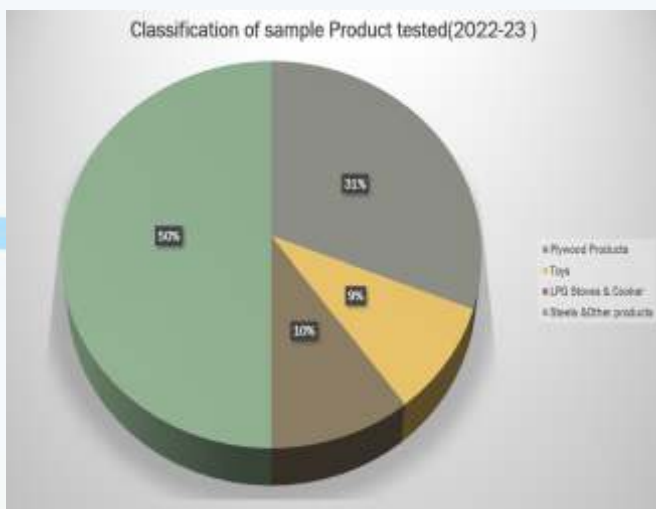


Mechanical Section in NRL has been Centre of excellence for Plywood and Paver Blocks and it is expanding its testing capacity to cover wider range of products.

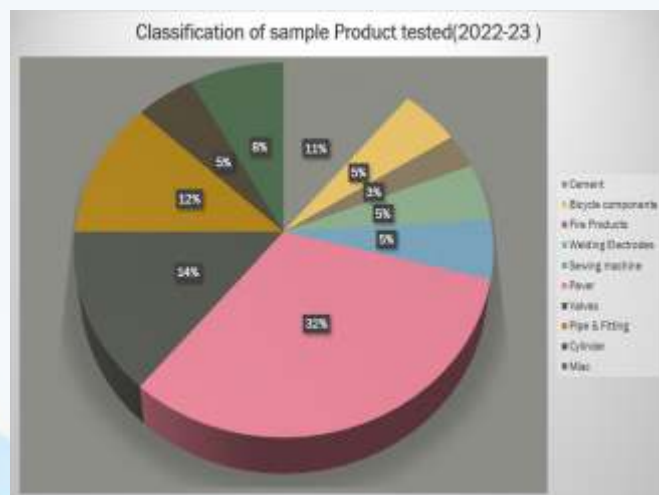
Considering the large inflow of sample and handling involved, the Mechanical section has been divided in 2 parts at NRL.

The division of the test facilities are being depicted as follows -

Mechanical-M1 Section



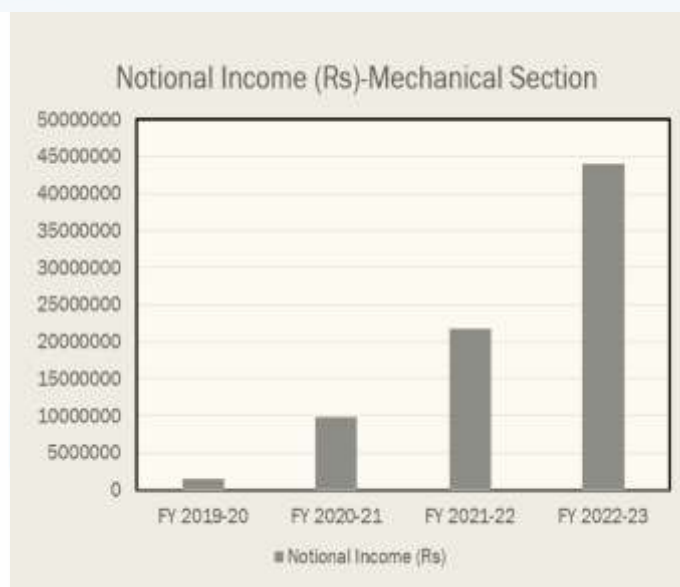
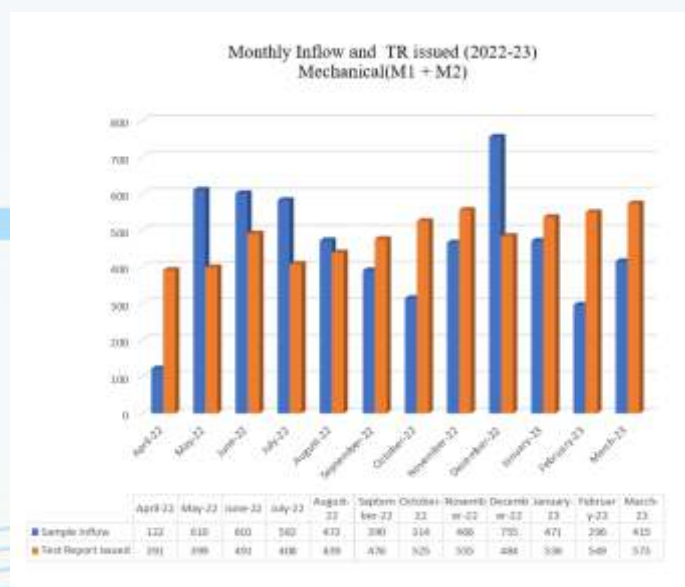
Mechanical-M2 Section



Major Equipments in the section

S.No.	Major Equipments	Testing Carried Out
1.	MUCTM 500 kN	Cement Cube Compression Test
2.	Automatic Compression Testing Machine	Paver Blocks
3.	Automatic flexural strength testing machine	Paver Blocks
4.	Automatic tensile splitting testing machine	Paver Blocks
5.	Burst Testing Machine	LPG Cylinders
6.	Fatigue Testing Machine	LPG Cylinders
7.	Humidity Chambers	
8.	Water Baths	
9.	Hot Air Ovens	

Statistics



Among various testing areas in mechanical areas some major testing area are as follows:

Plywood Testing Section :

There is centre of Excellence of Plywood testing at NRL. Complete testing facility of various products viz. General-Purpose plywood (IS303), Blockboards (IS1659), Shuttering Plywood (IS4990), Decorative Plywood (IS1328), Marine Plywood (IS710), Wooden Flush doors (IS2202-1). Recently, Facility of Fibre Hardboard (IS1658) was established at NRL.



Toys Testing Section :

There is complete test facility for Safety of Toys (IS 9873 Part 1 & 2) and Swings, slides & similar activity toys for indoor and outdoor family activity use (IS 9873 Part 4). The test facility was established recently after implementation of QCO on Safety of Toys. Capacity-60/Month.



Drop Test

Steel Testing :

Various tests are performed on steel like Tensile Test, Hardness Test (Brinell & Vickers hardness), Flattening Test, Bend Test, Impact Test (Charpy & Izod Impact Test) etc.



Impact Tester

Paver Blocks :

NRL is having complete test facility for testing of paver blocks as per IS 15658 except Optional Requirements. In fact, NRL is the first BIS lab to setup testing facility for paver blocks (in 2016-17) owing to the geographical demand for a third-party testing laboratory in northern region due to large number of manufacturers in Haryana and Punjab.

Present capacity of testing of paver blocks as per IS 15658 is 150 samples per month (which was 60 samples per month in 2021-22).



Cement Section :

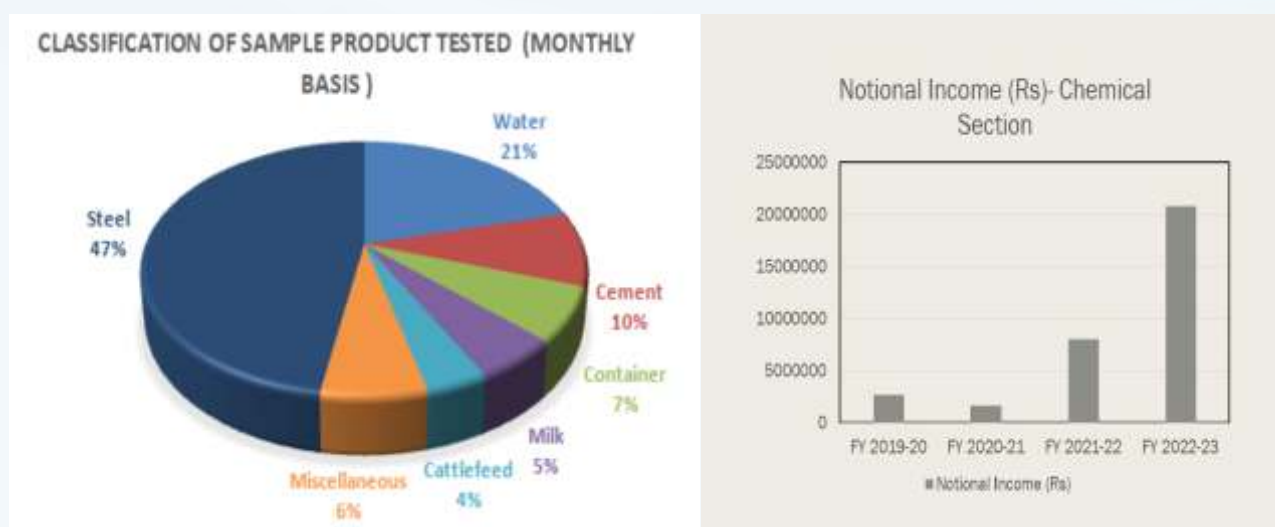
NRL is having complete test facility for testing of various kinds of cement like Ordinary Portland Cement (OPC) as per IS 269, Portland Pozzolana Cement (PPC) as per IS 1489-1 and IS 1489-2, Portland Slag Cement (PSC) as per IS 455, etc.



Present capacity of testing of paver blocks as per IS 15658 is 40 samples per month (which was 25 samples per month in 2021-22).

Beside this, there is workshop where various machinery like Lathe Machine, Power Hacksaw, All-cut Machine, Drill Machine, Horizontal Shaper, Surface grinder etc. are placed which are required for sample specimen preparation for testing.

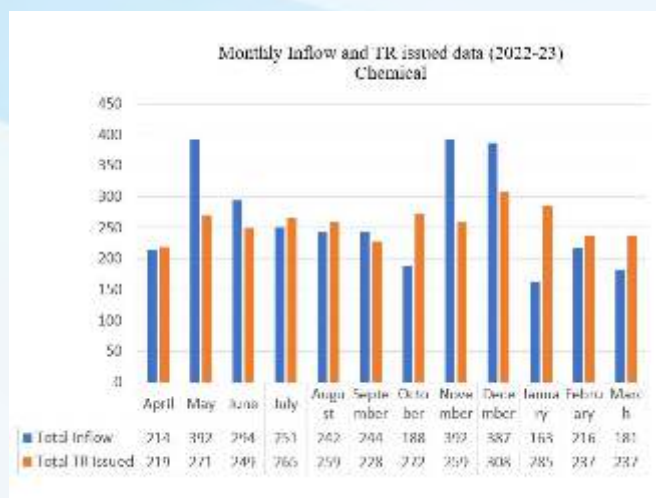
Chemical And Microbiology Section :

Chemical and Micro Section at NRL has been continuously thriving to upgrade its test facilities while achieving targets each month. Empowering and acknowledging the knowledge sharing culture, the section is being operated by 9 testing persons (3-permanent, 6-Contractual) giving an average output of 350 per month and generating notional income recovering the major portion of the cost of sophisticated instruments purchased for heavy metals and residues testing



Containers for NMW&PDW	PDW	MILK and Dairy products	Metals and Alloys	BM & Cement
				
<ul style="list-style-type: none"> With the latest amendments in IS15410:2003 Containers for NMW & PDW, NRL has upgraded the test facility for specific migration in the product 	<p>The water testing is being carried out using advanced technology equipments as follows-</p> <ul style="list-style-type: none"> Anions using IC PR using LC-MS and GC-MS Heavy metals using ICP-MS 	<ul style="list-style-type: none"> NRL has been testing various dairy products like SMP, Infant Milk Powder, Whole milk powder, Skimmed milk powder 	<ul style="list-style-type: none"> NRL has widely expanded its scope in the metal alloys and has been catering to 454 metal licenses in the northern region 	<ul style="list-style-type: none"> With the ongoing purchase, further advancements in cement testing is in the progress which will reduce the testing time and human intervention to the maximum extent possible

Microbiological section of NRL was started around two years back in March 2021. The scope of Microbiological section includes the testing of Packaged Drinking water, Milk and Milk products and other related products. Being the newly developed testing facility of the NRL, microbiological section has contributed significantly towards the overall output of the NRL combined with the chemical section. It is also catering to the needs of the Quality testing in the fields of Microbiology in the Northern region thereby contributing toward the Quality ecosystem in the country as envisaged through the Conformity assessment scheme of the BIS.



Microbiological section has purchased new incubator with dual Chamber which can be operated at two different temperatures. The new incubator is first of kind in any of the BIS laboratory and which will further help to optimize the space utilization in the Laboratory.



Wet Analysis Lab

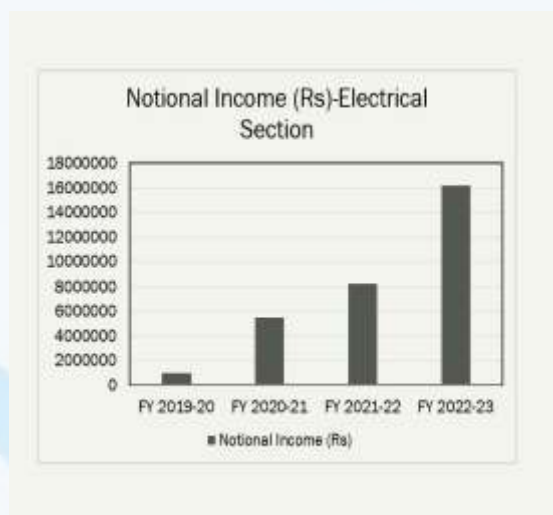
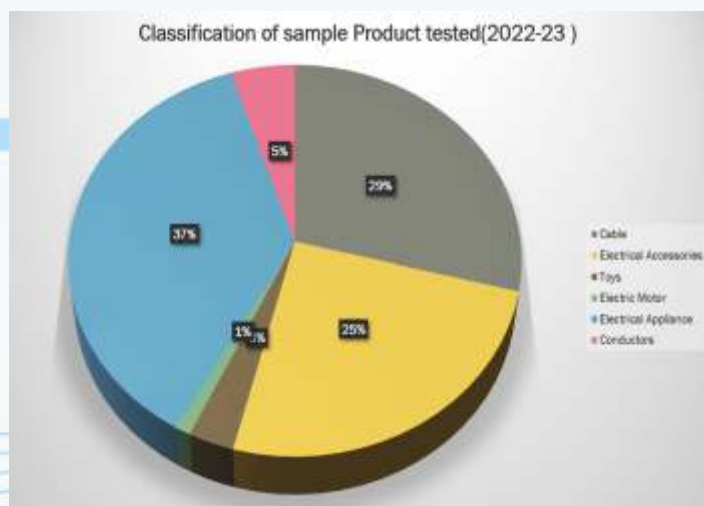
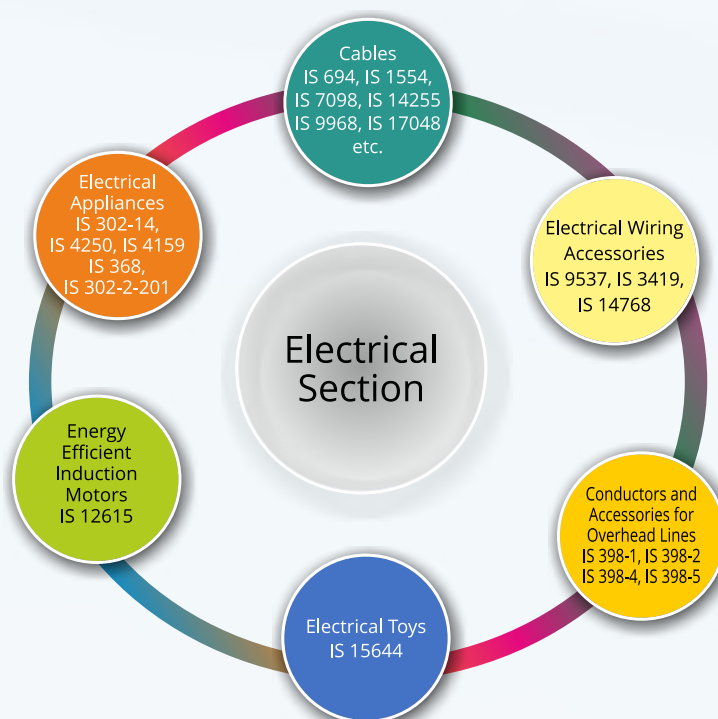


ICP-MS, GC-MS, LC-MS

Electrical Section :

NRL has been designated as "Centre of Excellence for cable products". Electrical section has increased its testing capacity to 150 samples/month in 2022-23 from 40 samples/month in 2021-22 with the help of augmentation of test facilities, automation of equipments & optimum utilisation of manpower. Electrical section has test facility against 40 ISS. Electrical section has test facility for major product groups like Cables. Electrical Wiring Accessories, Conductors and Accessories for Overhead Lines, Electrical Appliances, Electrical Toys & Energy Efficient Induction Motors.

The following graphics represent major ISS covered under product groups:





Smoke Density Chamber



Ozone Resistance Test Apparatus



Ageing oven



Motor Test Panel



Switch Endurance Test Apparatus



Flexing Test Apparatus

Referral Assay Laboratory (RAL) :

- Consequent upon Mandatory Hallmarking order on 23rd June 2021, RAL established at Jammu office by Northern Regional Laboratory in August 2022.



Creation of New Test Facilities

- In 2022-23 NRL has developed test facilities for products such as Electric Toys, Halogen Free Flame Retardant (HFFR) Cables for Working Voltages up to and including 1100 Volts – Specification, Flexible steel conduits for electrical wiring, Conduit Fittings for electrical Installations, Part 2 : Metal Conduit Fittings, Chain pipe wrenches, Pulverized Fuel Ash-Cement Bricks etc.
- Test Facility for IS 15410:2003 Containers for PDW and NMW is completed as per the latest amendments.
- NRL has recently set up complete test facility for Chain Pipe Wrenches as per IS 4123 and Pipe Wrenches as per IS 4003-1. Plans are there to identify various new mechanical products which are there / planned in QCOs to cater the need of testing for the industries located in the Northern Region of India.
- Efforts have been made to enhance the testing capacity in Mechanical Section from around 250 samples per month in 2019-20 to more than 600 samples per month as on date. This has been made possible under the able guidance of DG BIS and DDGL by identification of areas where expansion is possible followed by swift and targeted actions to procure equipment needed for such enhancement, training of testing personnel, wherever needed, identification and/or creation of space for housing equipment etc.

Automation and Augmentation

Automation is the need for fast changing technology as it reduces the testing time, increase accuracy and storage & retrieval of data. NRL has strived for automation of existing testing facilities in all the testing sections. Automation of testing enabled reduction in human intervention, increased accuracy in testing, better storage and retrieval of testing data.

Automation Efforts :

- Considering the need of automatic data logging and automation in the field of quality testing, the BIS NRL has been procuring the computerized equipment wherever possible.
- In compression testing machines at BIS NRL, the sample data, time, load parameters are automatically saved, once the sample is subjected to compression. The details are saved in computers, for review in future.
- Similarly the flexural strength testing machine and tensile strength testing machine are also computerized, hence all the operations are computer controlled.
- The humidity chambers, water baths, hot air ovens have been procured with data logging capability. All the sensors data is being automatically recorded in the equipment itself and can be extracted in future through USB cable to any computer/laptop.
- The chemical testing-heavy metals, pesticide residues and PCB, PAH are being done by ICP-MS, LC-MS and GC-MS respectively from which direct graph and accurate test values are extracted via software.
- Cable testing capacity increased to 70 samples/month by installing Aging ovens with data logging facility, Hot air ovens, Thermal stability Test apparatus,, etc. The analog equipments are replaced by Digital equipments. Electrical section is also involved in process of new test facility creation for QCO's notified by different ministries.
- Electrical Appliances equipped with Temperature data logger, Digital Leakage Current Tester, Humidity Chamber, Digital Cord Flexing Test apparatus etc to augment and automate the testing.
- Full automation of Motor testing is done by installation of motor test panel with dynamometer. It helped to reduce human intervention during its testing.

Future Plans on Automation

After implementation of LIMS, the efforts to make equipment online with LIMS are under progress at HQ level. In NRL Category 6, ethernet cables have been extended to each equipment lab table and have been commissioned with a central router available at BIS NRL. Once the integration with LIMS project starts, BIS NRL's equipment can be made online without any issue.

Some of the chemical equipments are under centralized purchase which will reduce the dependency on wet analysis testing on steel and cement to a significant level.



Motor Test Panel



IC-Anions Testing (Water)

Stakeholder Engagement and Skill Development

Industrial Visits :

To create awareness among industry on the testing infrastructure required for assessing quality of the products manufactured, frequent programmes are organized which includes interactive session with the participants on importance of quality and testing familiarization of testing equipment's and practical demonstration of testing of critical parameters.

In the year 2022-23, 17 exposure visits of quality control personnel were organized by various product groups.

Students Visits_:

With an objective to promote scientific aptitude and quality consciousness in school students, exposure visit on Quality testing for students are organized regularly. In the year 2022-23, 16 school students' visit were organized.

A total of 33 such programmes were hosted by NRL in year 2022-23

Sr. No.	Date of Exposure visit (Students and Capsule Course)	Institution
1.	08.04.2022	PG College Student, Sec 1, Panchkula
2.	12.04.2022	KV Sector-80, Mohali
3.	27.04.2022	Industry Representative for Electrical Domestic and Kitchen Appliances Industry.
4.	04.05.2022	Students of Govt. Girls Model Sen. Sec. School., Sec-20 B, Chandigarh
5.	11.05.2022	Student of GMSSSS, Sector-20, Chandigarh
6.	26.05.2022	Govt. Model Sen. Sec. School, 3B1 Mohali
7.	17.06.2022	QCIs of Cement Plant IS 1489 & 269
8.	24.06.2022	Capsule course Plywood Industry
9.	29.06.2022	Quality Control Personnel, Packaged Drinking Water, IS 14543:2016 and IS 13428:2005
10.	30.06.2022	Capsule Course of Paver Blocks, IS 15658.

Sr. No.	Date of Exposure visit (Students and Capsule Course)	Institution
11.	15.07.2022	KV, Zirakpur, School
12.	04.08.2022	Induction Training officers
13.	18.08.2022	Govt. Model Sen. Sec. Sector 46 D Chandigarh
14.	23.08.2022	QCP Participants from conduits for Electrical Installations: Part 3 (IS 9537 Part-3)
15.	02.09.2022	Govt. Model School Chandigarh
16.	09.09.2022	Govt. Model Sen. Sec. School, Sec-19 C Chandigarh
17.	13.09.2022	Capsule course IS 3196 : 2013(Part-1)
18.	22.09.2022	Paver Blocks Industries
19.	07.10.2022	Quality Control Incharge Personnal from Cycle association
20.	11.10.2022	DAV Sen. Sec. School
21.	15.11.2022	GSSS, MMT Chandigarh
22.	01.12.2022	CBSA, Landran
23.	06.12.2022	Capsule Course, IS 269, IS 1489 (Part-1 and 2)
24.	09.12.2022	Govt. College Ropar
25.	16.12.2022	Capsule course on Paver Blocks as per IS 15658:2021
26.	22.12.2022	Electric Water Heater and Geyser manufacturing IS 2082 & IS 8978
27.	23.12.2022	Capsule Course for QCPs of Marine Plywood & Plywood for Concrete Shuttering Work
28.	31.01.2023	Govt. Model Sanskrit Senior Secondary, School
29.	16.02.2023	PG College, Sec-1 Panchkula
30.	24.02.2023	Govt. Sen. Sec. School, Banur
31.	10.03.2023	Paver Block Industry personnel
32.	24.03.2023	Capsule Course
33.	29.03.2023	Capsule Course Package Drinking Water



Scientific Endeavors by NRL Officers

Details of Action Research Project undertaken by scientific cadre Officers of NRL as follows-

S.No.	IS	Title
1	4798: 1968	Specification for safety pins
2	8311: 1976	Specification for instrument jewels
3	7504: 1995	Gears - cylindrical gears - accuracies methods of inspection
4	7020:1973	Crystals and dielectric materials used in instrument industry
5	5614:1980	Tobacco seed oil
6	7187:1989	Ice cream cones
7	6663:1972	Method for determination of angle of repose of grains
8	2681:1993	Non - ferrous metal sliding door bolts (aldrops) for use with padlocks
9	362:1991	Parliament hinges
10	2193: 1986	Precast prestressed concrete street light poles
11	1328:1996	Veneered decorative plywood
12	5105:1969	Specification for twist drills, taper square shanks for ratchet braces
13	5106:1969	Specification for twist drills, taper square shanks for
14	5362:1969	Specification for twist drills, parallel shanks, stub series, left hand cutting for automatics
15	6270:1971	Code of safety of phenol
16	201:1992	Quality tolerance for water for textile industry - specification(second revision)
17	13119:1991	Ammonium bifluoride-specification
18	3025(part 41):1992	Methods of sampling and test(physical and chemical) for water and waste water part 41 cadmium(first revision)
19	717:1998	Carbon disulphide, technical -specification (second revision)
20	13032 : 1991	Ac miniature circuit - breaker boards for voltages not exceeding 1000 v
21	3396 : 1979	Methods of test for volume and surface resistivity of solid electrical insulating materials
22	7755 : 1975	Specification for high tension insulating cotton tape impregnated with bitumen - based compound
23	7538 : 1996	Three - phase squirrel cage induction motors for centrifugal pumps for agricultural application
24	IS 204(Part 1) :1991	Tower Bolts Ferrous Metals
25	IS 204(Part 2):1992	Tower Bolts Non Ferrous Metals
26	IS 303:1989	Plywood for general purpose

Modernisation & Renovation efforts

BIS management has emphasized on the modernization and renovation of the existing building blocks of Laboratories. Towards this endeavour, NRL had completed the flooring work in the entire laboratory with new flooring material suitable for existing testing facilities. The electrical load enhancement work was also taken up in NRL through CPWD. The old furniture including Lab benches were replaced with new one in the entire NRL.



Expenditure and Testing Notional Income Statement for 2022-23.

S.NO.	BUDGET HEAD	BUDGET CODE	B.E. 2022-23 (in ₹)	EXPENDITURE (UTILIZED BUDGET) (in ₹)
	OTHER STAFF BENEFITS			
1	CGHS & OTHER MEDICAL BENEFITS-EMPLOYEES	2201	7,00,000.00	764569.77
2	STAFF WELFARE	2203	5,50,000.00	841403.58
3	LEAVE TRAVEL CONCESSION	2204	3,00,000.00	232434.00
	OTHER ADMINISTRATIVE EXPENSES			
4	TA OFFICERS AND STAFF (TRAVELLING)	2301	12,50,000.00	1453835.55
	TESTING			
5	TESTING CHARGES	2501	10,00,000.00	160700.00
6	LABORATORY CONSUMMABLES R & M OF LAB EQUIPMENT	2502	60,00,000.00	5761864.81
7	OFFICE EXPENSES	2801	5,25,000.00	487929.31
8	STATIONERY	2802	1,75,000.00	160503.59
9	POSTAGE	2803	2,00,000.00	146047.12
10	TELEPHONES TELEX	2805	1,00,000.00	68362.00
11	REFRESHMENT & ENTERTAINMENT	2507	3,75,000.00	425937.20
12	FREIGHT & CARTAGE MISCELLANEOUS	2809	1,00,000.00	67697.00
13	RENT & TAXES	2810	10,00,000.00	750938.02
14	ELECTRICITY AND WATER CHARGES	2811	35,00,000.00	3365500.00
15	TAXI HIRE CHARGES	2812	7,00,000.00	658836.50
16	INSURANCE & BANK CHARGES	2808	1,00,000.00	63413.00
	REPAIR & MAINTENANCE			
17	R & M (FURNITURE AND EQUIPMENT)	2901	5,00,000.00	378502.40
18	R&M (BUILDING)	2903	35,00,000.00	650869.11
	CONFERENCE, SEMINAR & TRAINING			
19	CONFERENCE AND SEMINAR	3001	75,000.00	0.00
	OTHER EXPENSES			
20	INFORMATION TECHNOLOGY	3201	5,00,000.00	342975.26
21	AUDIT FEES AND CHARGES	3203	5,00,000.00	405467.50
22	STAFF TRAINING	3205	3,00,000.00	58680.00

S.NO.	BUDGET HEAD	BUDGET CODE	B.E. 2022-23 (in ₹)	EXPENDITURE (UTILIZED BUDGET) (in ₹)
23	HINDI PROMOTIONAL ACTIVITIES		1,00,000.00	99134.00
24	VIGILANCE AWARENESS		45,000.00	41865.26
25	PUBLICITY		2,00,000.00	40100.00
26	WORLD STANDARD DAY		30,000.00	24150.00
	MANPOWR EXPENSES			
27	SKILLED & UNSKILLED, HOUSE KEEPING & SECURITY SERVICES	3301	2,00,00,000.00	19164298.82
	CAPITAL EXPENDITURE			
28	FURNITURE, OFFICE EQUIPMENTS, COMPUTER & SOFTWARE		40,00,000.00	1399377.42
29	LAB EQUIPMENTS	708-709	6,51,00,000.00	19537100.00
	EXPENDITURE TOTAL			₹ 57552491.22
	TESTING NOTIONAL INCOME			₹ 8,12,17,315.00

*** Remarks**

₹ 8,12,17,315 - Income Only From Testing

₹ 8,50,88,122.98 - Income from Testing as well as sale of Scrap & Penalty
Charged from Vendors for Late Delivery of Equipments

Major events – organized in NRL

Events	Organized
Vigilance Awareness Week 2022	31 October to 6 November 2022.
Hindi Pakhwada 2022	14.09.2022 to 28.09.2022.
Swachhta Pakhwada 2022-23	16.02.2023 to 28.02.2023
World Environment Day 2022	05 June 2022
Hindi Workshops	04 numbers
Fire Safety Training	30 January 2023
International Yoga Day 2022	21 June 2022
International Women's Day 2022-23	8 March 2023

Capsule Courses organized in NRL

- QCPs of various Licensees participated from different sectors like concrete Paving Block, LPG, conduits fitting, plywood, packaged drinking water and Natural Mineral Water etc in capsule courses.



Hindi Pakhwada organized in NRL 14.09.2022 - 28.09.2022



Vigilance Awareness Week Celebrations in NRL 31 October - 6 November 2022



International Yoga Day 2022



The Journey Ahead

The renovation work including replacement of old windows and doors, false ceilings, transformer, DG Set etc is planned to be taken up in the coming months and approval of competent authority has already been received for the same.

Creation of new test facilities under QCO and Automation Efforts:

- Work is being done for computerization of Hydrostatic test setup (HST) and Universal Testing machine (UTM) with full data logging facility by 2023.
- Also, Electrical section is planning to install few fully automated equipments. The Digital Tensile Testing machine with Video extensometer, Automatic Cable Dimension Measurement Machine, Hot Set Test Apparatus using laser based measurement, Digital Compression Testing Machine user defined load profile, Automatic Test Set up for Stationary storage water heaters etc. are some examples of it.
- Plans are there to identify various new mechanical products which are notified in QCOs to cater to the need of testing for the industries located in the Northern Region of India. As per advise of BIS management, NRL will initiate efforts towards setting up of test facility for Cotton Bales against IS 12171.



**BUREAU OF INDIAN STANDARDS
NORTHERN REGIONAL LABORATORY, MOHALI**

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