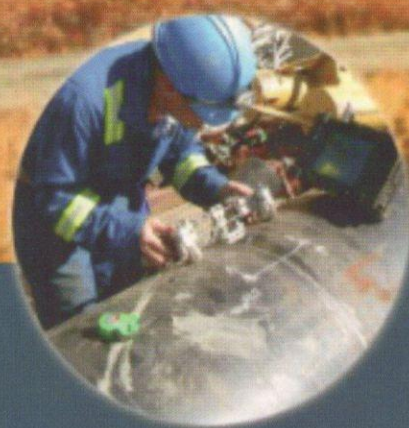
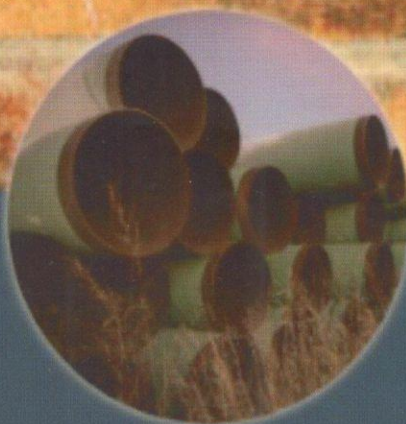
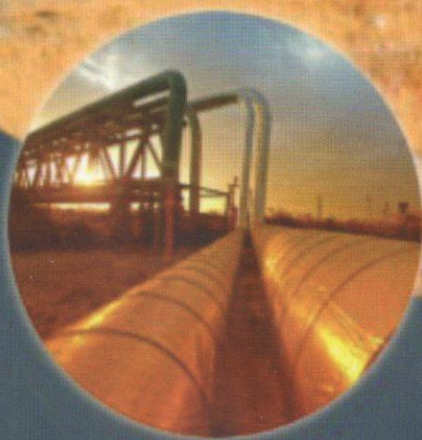


GUJARAT INDUSTRIAL RESEARCH & DEVELOPMENT AGENCY



(A Government of Gujarat Organization)



**Recognised R&D Institute by SIRO, Accredited by DSIR
(Ministry of Science & Technology, Government of India)**

About GIRDA

Is a State Chemical & Polymer Sector Research & Development Organization.

Established as '**Baroda State Laboratory**' in 1937 by the honorable ruler **Shrimant Sayajirao Gaikwad, III**.

Functioned under the supervision of **Shri R.C. Patel**, Advisor to the then **Shrimant Sayajirao Gaikwad, III**.

Shrimant Sayajirao Gaikwad, III handed over this laboratory to the **Govt. of Maharashtra** during 1948.

Later, undertaken by the **Govt. of Gujarat** in 1960 & renamed as '**Industrial Research Laboratory**'.

Finally, renamed as '**Gujarat Industrial Research & Development Agency (GIRDA)**' by following the recommendations of **Eswaran Committee**, constituted by the **Govt. of Gujarat** & registered under the **Society Act 1860 & Public Trust-F-372/Vadodara**, through resolution by the **Govt. of Gujarat**.

Became an autonomous body functioning under the **Office of the Industries Commissioner and Industries & Mines Department of Govt. of Gujarat** with **100% Grant-In-Aid**.

GIRDA' Objectives

To ensure that small & medium scale industries in general and chemical & petrochemical industries of all types are encouraged in Gujarat through Research, Development, Extension, Assistance & Guidance in Technology, Raw Materials, Finished Products, Quality Control and Development of New End Uses of Polymers

GIRDA's Highlights & Achievements

Ex. Director, **Dr. Vikram Sarabhai**, headed this laboratory & started activities in chemical area by establishing a pilot plant.

GIRDA is recognized by the **Department of Science & Technology (DST)** under **Scientific and Industrial Research Organizations (SIROs)**.

GIRDA is equipped with the modern facilities, expertise for quality assurance development, quality control services, testing and industrial research & development.

GIRDA is setting up a '**Centre of Excellence**' to meet every aspect of technology of **Water & Gas Pipeline** inclusive of **City Gas Distribution**.

The center will take care of every aspect of technology involved in Gas/Water pipelines.

Vision of GIRDA is to:

- Become a Nationally renowned laboratory & a Centre of Excellence in R & D for chemical, plastic & polymer industries and utilities.
- Become a premier center of international standards for promotion & development.
- Become an established technology & networking resource center for creation of technology based new enterprises.
- Become a major solution provider in plastic, rubber & chemical industries.
- Become a bridge between researches & industries for speedy commercialization of R & D outputs.
- Become a complimentary unit to the network of institutes working as catalyst for industrial growth.
- To create value added jobs & services.
- To create technological awareness and consciousness among the business enterprises.

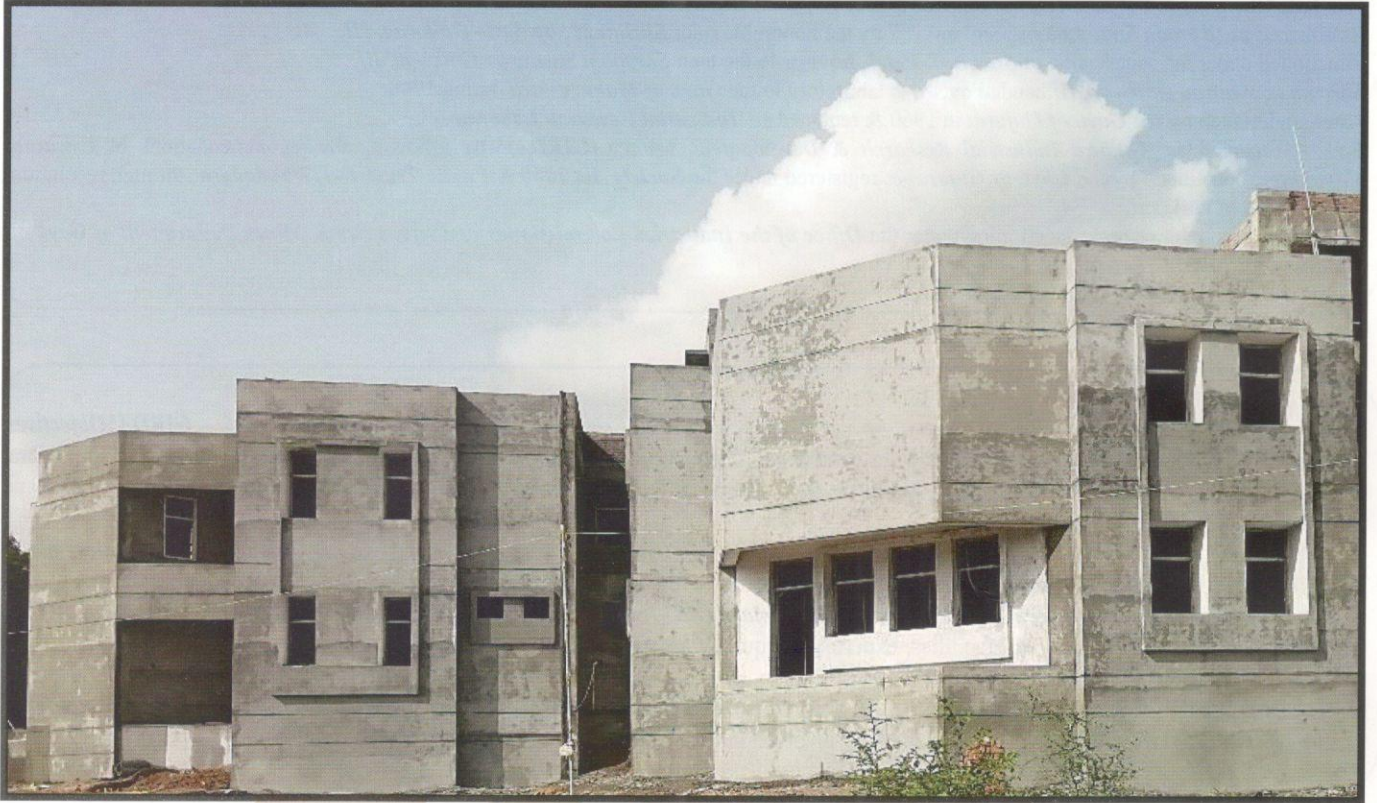
Mission of GIRDA is to:

- Achieve excellence by the virtue of competence through R & D, testing, inspection, training & information dissemination to improve quality & reduce the cost of equipments, materials & services for chemical, plastic & polymer industries, utilities & users.
- Promote & contribute to the growth of indigenous MSME-industry & economy by fostering the entrepreneurial spirit.
- Provide the Indian Pipeline Industry with an independent '**State of Art**' of pipeline coating testing facility that has capability & capacity to fulfill national needs of fast expanding pipeline industries of India for Oil, Gas & Water.

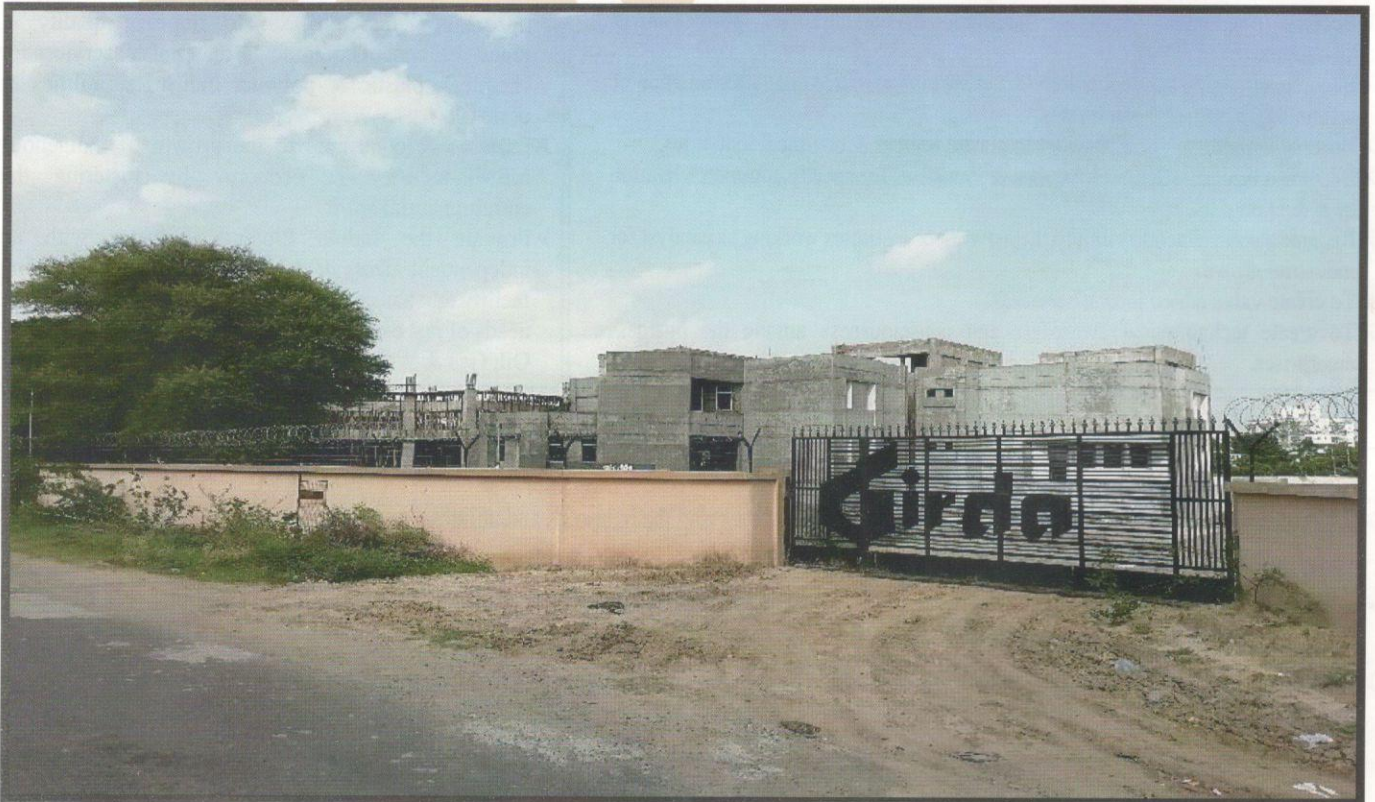
Management

- Is a professionally managed not-for-profit technical organization serving the industries and utilities since 1979 in the areas of testing, evaluation, third party inspection (TPI), consultancy and R & D related to chemical, polymer & plastic products and systems.
- Is managed by the Governing Council consisting of nominated members from industries, academic institutes, utilities, Government of Gujarat & eminent invited experts.
- The Governing Council is the Apex policy making body & operate through its honorable Chairman & members.

Centre of Excellence for Water & Gas Pipeline



Centre of Excellence for Water & Gas Pipeline



GIRDA's Participation in the Following Ongoing/Completed Gas Pipeline Projects in India

Gas Pipeline Projects	Pipeline Owners	Coated Applicators	
Mallavaram-Bhopal- Bhilwara-Vijaipur Natural Gas Pipeline (MBBBVPL) Project	GSPL India Transco Ltd.	M/s. Essar Steel India Ltd. M/s. PSL Ltd.	M/s. Welspun Corp. Ltd.
PalanpurPali Pipeline Project (MBPL)	GSPL India Transco Ltd.	M/s. Essar Steel India Ltd.	M/s. Welspun Corp. Ltd.
BarmerPali Pipeline Project (BPPL)	GSPL India Transco Ltd.	M/s. Essar Steel India Ltd.	M/s. Welspun Corp. Ltd.
Jalandhar-Amritsar Pipeline Project (JAPP)	GSPL India Transco Ltd.	M/s. Essar Steel India Ltd.	M/s. Welspun Corp. Ltd.
Anjar-Mundra Pipeline Project (AMPP)	GSPL India Transco Ltd.	M/s. Essar Steel India Ltd.	M/s. Welspun Corp. Ltd.
Vijaipur-Auraiya Phulpur Pipeline Project	GAIL	M/s. Essar Steel India Ltd.	M/s. Welspun Corp. Ltd.
Dhobi-Durgapur Pipeline Project	GAIL	M/s. Essar Steel India Ltd.	M/s. Welspun Corp. Ltd.
Mundra-Kandla LPG Pipeline Project	Adani Power	M/s. Essar Steel India Ltd.	M/s. Welspun Corp. Ltd.

GIRDA's Participation in the Following Ongoing/Completed Water Pipeline Projects in Gujarat

Water Pipeline Projects	Coated Applicators		
Saurashtra Narmada Avtaran Irrigation (SAUNI) Pipeline Project	M/s. Essar Steel India Ltd. M/s. Ratnamani Metal & Tubes Ltd.	M/s. Welspun Corp. Ltd. M/s. Jindal Steel Ltd.	M/s. PSL Ltd.
Kakrapar GordhaVad Lift Project	M/s. Essar Steel India Ltd.	M/s. Welspun Corp. Ltd.	

Centre of Excellence for Water & Gas Pipeline

The said state of art laboratory 'Centre of Excellence' is under construction and would be functional during 2020.

Divisions at the Centre of Excellence for High Pressure Gas Transmission Pipeline Laboratory as Planned

Material Selection Division	Pipeline Construction Division	Commissioning & Decommissioning of Pipeline Division
Chemical Division	Welding Division	City Gas Distribution (CGD) Laboratory Division
Integrity Management of Pipeline Division	Failure Analysis Division	Pipeline (Onshore & Offshore) Coating Division
Mechanical Testing Division	Metallurgical Division	Corrosion Testing & Corrosion Diagnosis Division
Pigging Division for Diagnosis of Pipeline	Cathodic Protection (C.P.) Division	R & D Division for Development of New Materials
Skill Development Training Division	Quality Governance (in Pipeline) Division	

List of Samples/Materials Tested by GIRDA

Refractories & Materials	Metals	Polymers & Plastics	Chemicals & Allied Materials	Rubber
Cement Fly Ash Pond Ash	MS Plates MS-HR Coils TMT Bars TMT Rods	Extruded Products Molded Products Films Raw Materials Woven & Non-Woven Sacks	Lead & Chlorine Fire Control Chemical AFFF & Soaps Bleaching Powder Alum NaHCO ₃ (Sodium Bicarbonate) Sealing Wax Ink Insecticides & Pesticides	Compounded Rubber EPDM Rubber Ring PVC Rubber Stopper
Lubricant & Petrochemical Section	Pipes	Coatings	Internal & External Coatings for Pipeline	Miscellaneous
Greases & Fuel Products Lubricating Oil Residual Oil Hydrocarbon Oil Crude Oil Petrochemicals Coal Tar Tapes Bitumen Tapes Heat Shrinkable Tapes	UPVC Pipe HDPE Pipe Casing Pipe Lateral Pipe Sprinkler Pipe	Paints Resins Construction Chemicals Powder Coatings Architectural Coatings Specialty Coatings Aerosols Coated Panels	PU Coatings & Cement Linings 3LPE-External Coating Raw Materials (PE, Adhesive, FBE Powder) 3LPE-Internal Coating Raw Materials (Friction Free Epoxy, Food Grade Epoxy, Related Paint) 3LPE Coated Pipes High Build Epoxy Coatings	Primers Shoe Polish Heat Shrink Sleeves Papers Felts Sheets Bitumen

Testing & Evaluation Facilities Provided by GIRDA

Laboratory Testing	Pipeline Coatings	Special Coating Tests	Physical & Chemical Measurements
Cathodic Disbondment Adhesion Impact Flexibility Hardness Peel Adhesion Abrasion Resistance Penetration Test Cure Test QUV Resistance Gouge Test	Fusion Bonded Epoxy Powder Coating Food Grade Epoxy Paint Coating 3 Layer Poly Ethylene (3-LPE) Coating 3 Layer Poly Propylene Coating Heat Shrinkable Coating Liquid Epoxy Coating Cold Applied Tape Coating Visco Elastic Coating Liquid Poly Urethane Coating Epoxy Modified Coating White Epoxy Paint Coating High Build Epoxy Paint Coating Epoxy Green Paint Coating Bituminous Tape Coating Petroleum & Wax Tape Coating Polymeric Tape Coating Elastomeric Coating Liquid Applied Coating Polyolefin Based Coating (Hot Applied) Spray Polyurethane/Epoxy Coating	Autoclave Test Facility AC Electrochemical Techniques DC Electrochemical Techniques Microscopy Accelerated Weathering & Thermal Cycling	Specific Gravity Density Viscosity Glass Transitions Cure Time/Cure Rate Fourier Transform Infrared Spectroscopy Analyzer Thermal Properties Simultaneous Thermal Analyzer Dynamic Mechanical Analyzer Differential Scanning Calorimeter Thermal Gravimetric Analyzer Dilatometry

Major Equipments Used for Testing the Following Materials

Polymers & Plastics	Paints/Internal & External Coatings	Petrochemicals & Lubricating Oils
Computerized UTM 10 Ton Capacity Machine Melt Flow Index Tester Vicat Softening Point/Heat Deflection Tester Izod/Charpy Impact Tester Hydrostatic Pressure Tester Shore A & Shore D Hardness Tester Impact/Dart Impact Tester Tear Tester Opacity Tester UV Weathering Exposure Chamber Environmental Stress Cracking Resistance Tester Color/Gloss Meter Dimensional Instruments Breakdown Voltage Tester Volume/Surface Resistivity Tester	Cathodic Disbondment Tester (with Accessories) Specific Insulation/Electrical Coating Resistance Tester Differential Scanning Calorimeter (-150 °C to 650 °C) Simultaneous Thermal Analyzer (RT to 1400 °C) Dynamic Mechanical Analyzer (-150 °C to 600 °C) Fourier Transform Infrared Spectroscopy Analyzer Taber Abrasion Tester Pull off Adhesion Tester Salt Spray (Fog) Chamber UV Accelerated Weathering Chamber Brookfield & Ubbelohd Viscometers Holiday Detector Shore A & Shore D Hardness Tester Scratch, Pensile & Buchholz Hardness Testers Bend Tester 3LPE/DFBE Coated- Flexibility Triangle Gloss Meter Tabular Impact Tester Color Measurement Ultrasonic Film Thickness Tester for Metals, Woods, Plastics & Glass Coatings Tensile Testing Machine (10 & 100 Ton) Gel Time Tester Conical Mandrel Tester-Flexibility Cylindrical Bend Tester-Flexibility Hydraulic Blistering & Gas Pressure Variation Vessel Cross Cut Adhesion Tester Melt Flow Index Tester Dart Impact Tester Volume/Surface Resistivity Tester Breakdown Voltage Tester Surface Roughness & Surface Profile Testers	Flash Point Tester Cloud/Pour Point Tester Bomb Calorimeter Kinematic Viscosity Specific Gravity/Density Meter Copper Strip Corrosion Tester Foaming Characteristics Tester TAN/TBN Content Tester Moisture Analyzer Ductility Meter Penetrometer Dart Impact Tester Peel Strength Tester Indentation Tester Breaking Strength Tester Conditioning Chamber Zero Degree Chamber UV Visible Spectrophotometer Distillation Range

3LPE-External Coating Raw Materials-PE/Adhesive/FBE Powder

Major Test Parameters	Related Standards
Specific gravity & Density	ISO 1183-1/ASTM D792-13, IS 12235 (Part-14):2004, IS 7328:1992
Shore D hardness	ASTM D2240-15, ISO 868-III edition 2003-03-01
Vicat softening temperature	ASTM D1525-09, ISO 306-V edition 2013-11-15, IS 12235 (Part-2):2004
Melt Flow Index (MFI)	ASTM D1238-13 & ISO 1133-1-I edition, 2011-12-01, ISO 1133-2-I edition, 2011-12-01, IS 7328:1992, IS 2530:1963 (RA 2008)
Carbon Black content	ASTM D1603-14, IS 2530:1963 (RA 2008)
Tensile strength & Elongation, %	ASTM D638:2014, ISO 527:2012, IS 4984:2016 (Annex H)
Oxidation Induction Time (OIT)	ISO 11357, ASTM D3895:2007
Water content	ISO 15512
Indentation	DIN 30670:2012-04/ ISO 21809-1
Moisture content	ISO 21809-1:2011(E)-Annex K, CSA Z245.20-14 Clause 12.3 & 12.4
Water absorption	ASTM D570:2010, ISO 62:2008, IS 13360 (Part-8/S1):1997 (RA 2008)
Impact properties: Izod, Charpy & Tensile impact strength	ASTM D256:2010, IS 13360 (Part-5/S4):2013, IS 13360 (Part-5/S5):2013, ASTM D6110:2010, ISO 8256:2004
ESCR, F50 (Condition B)	ASTM D1693
Volume resistivity at 23±2 °C	ASTM D257
Dielectric withstand (at +25 °C @ 1000 volt/sec rise)	ASTM D149
Gel time at 205 °C ± 3 °C	ISO 21809-1:2011(E)-Annex J, CSA Z245.20-14 Clause 12.2
Density of epoxy powder	ISO 21809-1:2011(E)-Annex N, CSA Z245.20-14 Clause 12.6
Minimum glass transition temperature (T _g)	ISO 21809-1:2011(E)-Annex D, DIN EN ISO 11357-1, CSA Z245.20-14
Cure time	CSA Z245.20-14 Clause 12.1
Thermal characteristics	CSA Z245.20-14 Clause 12.7

3LPE-Internal Coating Raw Materials-Friction Free Epoxy/Food Grade Epoxy/Related Paint

Major Test Parameters	Related Standards	Major Test Parameters	Related Standards
Non-volatile matter (by mass)	ISO 3251	Resistance to water immersion	ISO 2812-2
Non-volatile matter (by volume)	ISO 3233-1	Resistance to chemicals	ISO 2812-1:2007
Density of liquid epoxy paint	ISO 2811	Curing test	ISO 15741:2016(E)- Annex F
Ash (residue on ignition)	ISO 15741:2016(E)-Annex A	Wet-sponge test	ISO 15741:2016(E)-Annex G
Taber abrasion	ASTM D1044, ASTM D4060	Porosity	ISO 15741:2016(E)-Annex E
Cross hatch adhesion	ASTM D3359 – 2009, ISO 2409:2013	Holiday Detection Test	EN 10289-2002-Annex B,
Pull - off adhesion	ASTM D4541 Method D, ISO 4624		EN 10290-2001-Annex B
Volume solids, %	API 5L2-2015-Appendix #1	Impact Test	EN 10289-2002-Annex C,
Grind	ASTM D1210		EN 10290-2001-Annex C
Viscosity	ASTM D1200	Adhesion test- Resistance to removal	EN 10289-2002-Annex D,
Neutral salt spray	ASTM B117, ISO 9227		EN 10290-2001-Annex D
Water Immersion	API 5L2-2015 – Table 3.5	Indentation resistance	EN 10289-2002-Annex H,
Stripping	API 5L2-2015-Appendix #3		EN 10290-2001-Annex H
Resistance to artificial ageing	ISO 15741:2016(E)-4.3.7	Thermal ageing	EN 10289-2002-Annex J
Adhesion	API 5L2-2015-Appendix #4, ISO 2409		EN 10290-2001-Annex J
Buchholz Hardness	DIN 53153, ISO 2815	Flexibility	EN 10290-2001-Annex K
Abrasion	ASTM D968 Method A	Penetration (indentation) resistance	ASTM G17,
Bend test (conical & cylindrical mandrel)	ASTM D522, ISO 6860		ISO 21809-1:2011-10,
Gloss	ASTM D523 – 2014	Scratch resistance	ISO 21809-3:2016 (E)
Dry Film Thickness (DFT)	ISO 19840		ASTM D2197-2013,
Pencil hardness	ASTM D3363-2005 (RA 2011), ISO 15184:2012	Resistance to hydraulic blistering	ISO 1518-1:2011
		Resistance to gas pressure variations	ISO 15741:2016/API 5L02
			ISO 15741:2016/API 5L02



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(EPABX) : 26565694, 26562133
: 26565687, 26562144
: 26562134, 26562122
फैक्स/FAX : 26960829, 26529745
Website : <http://www.dair.gov.in>
(अप्रैल 9001:2008 प्रमाणित विभाग)
(AN ISO 9001:2008 CERTIFIED DEPARTMENT)



भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
वैज्ञानिक और औद्योगिक अनुसंधान विभाग
टेक्नोलॉजी भवन, नया महेराली रोड,
नई दिल्ली - 110016
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Scientific and Industrial Research
Technology Bhavan, New Mehrauli Road,
New Delhi - 110016



F.No.11/700/2016-TU-V

Date: 18th March, 2019

The Director
Gujarat Industrial Research Development Agency (GIRDA)
The M.S. University,
Science College Compound, Sayajigunj,
Vadodara - 390 002
Gujarat

Subject: Renewal of Recognition of Scientific and Industrial Research Organisations (SIROs).

Dear Sir,

This has reference to your application for renewal of recognition of Gujarat Industrial Research Development Agency (GIRDA), Vadodara, Gujarat as a Scientific and Industrial Research Organisation (SIRO) by the Department of Scientific and Industrial Research under the Scheme on Recognition of Scientific and Industrial Research Organisations (SIROs), 1988.

2. This is to inform you that it has been decided to accord renewal of recognition to Gujarat Industrial Research Development Agency (GIRDA), Vadodara, Gujarat from 01.04.2019 upto 31.03.2022. The recognition is subject to terms and conditions mentioned overleaf.

3. Receipt of this letter may kindly be acknowledged.

Yours faithfully,

(Dr. S.K. Deshpande)
Scientist - 'G'

3LPE-Coated Pipe

Major Test Parameters	Related Standards
Cathodic Disbondment (CD)	CSA Z245.20 Section 12.8; CSA Z245.21 Section 12.3; ASTM G8; ASTM G42; ASTM G95; ASTM D 6676, ISO 21809-1,2,3, ISO 21809-1,2,3 ISO 21809/DIN 30670 ISO 21809/DIN 30670 ISO 21809/DIN 30670
Flexibility	
Resistance to hot water immersion test	
Specific electrical insulation resistance	
Peel strength test	
Lap shear strength test	

Utilization of the Following Established Test Standards

American Petroleum Institute	(API)
Canadian Standards Association	(CSA)
American Society for Testing & Materials	(ASTM)
International Standard Organization	(ISO)
Bureau of Indian Standards	(BIS)
The Society for Protective Coatings	(SPC)
National Association of Corrosion Engineers	(NACE)
American Water Works Association	(AWWA)
German Institute for Standardization	(DIN)
European Standards	(EN)

Forthcoming Corrosion Testing Facilities

Major Test Parameters	Related Standards
Pitting & Crevice Corrosion Testing	ASTM G48
Sulfide Stress Cracking (SSC) Testing	NACE TM0177, ISO 15156
High Pressure High Temperature (HPHT) Testing for polymers, metals, coatings & components used in highly aggressive environments	
Hydrogen Induced Cracking (HIC) Testing in sour environment	NACE TM0284
Intergranular Corrosion (IGC) Testing	ASTM A262, ASTM G28, ASTM G67
Slow Strain Rate Testing (SSRT) uses Rippled SSRT methods to ensure safety & reliability of metals	
Sour Service Corrosion Testing	NACE MR0175, ISO 15156
Stress Corrosion Cracking (SCC) Testing: Susceptibility of metal to cracking failure under tensile stress & corrosion	
Hydrogen Embrittlement Testing	ASTM F591, NACE 0175, ISO 15156
Galvanic Corrosion Testing	ASTM G71, ASTM G82
Corrosion Resistance, High Pressure Vessels, Dynamic Autoclaves & Flow Loops, 3D Laser Profilometry	NACE TM0177, NACE TM0198, NACE TM0284

Electrochemical Impedance Spectroscopy (EIS) (Gamry)

Characterizes:

Electrochemical Systems viz. coatings

Measures:

Impedance of a system

Degradation of a coating

Change in corrosion rate of a substrate

Complies:

ISO 16773-1, ISO 16773-2

ISO 16773-3, ISO 16773-4



Gas Chromatography

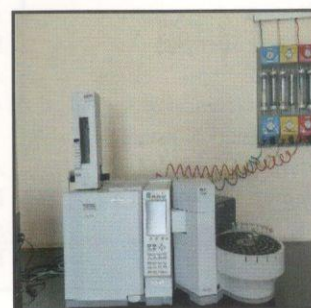
Analytically Tests:

Molecular Species

Specific Compounds

Traces

Sample Molecular Components



UV Accelerated Weathering (QUV)-QLAB



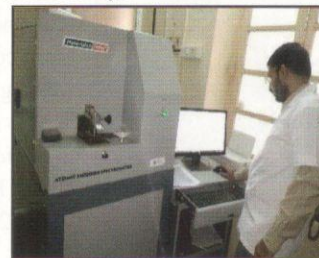
Simulates damaging effects of long term outdoor exposure of material & coating
Examines resistance of coatings to the effect of UV radiation & humidity
Correlates well within service performance of maintenance coatings

Complies:
ASTM G154, ASTM D4329,
ASTM D4587, ISO 4892, SAE J2020

Optical Emission Spectroscopy

Analyses chemicals of metals to help companies with:
Reverse engineering for determination of alloys
Failure investigations
Manufacturing quality control

Complies:
IS 5508:1969
IS 3589:2001
IS 1786:2008
IS 10748:2004
IS 4270:1992



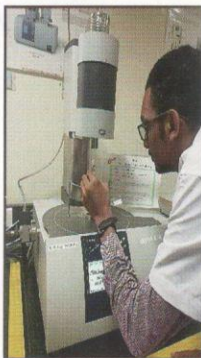
Simultaneous Thermal Analysis (TGA/DSC/DTA) – NETZSCH

Complies: ASTM E473, ISO 11357

Determines: Endotherms, exotherms, weight on heating & cooling

Materials Tested:

Polymers, plastics, composites, laminates, adhesives, food, coatings, pharmaceuticals, organic materials, rubber, petroleum, chemicals, explosives & biological samples



Taber Abrasion

Determines:
Abrasion (wear) resistance of organic coatings to abrasion

Complies:
ASTM D4060
ASTM D1044



Fourier Transform Infrared Spectroscopy (ATR-FT-IR) - Brooker

Identifies chemical compounds & substituent groups, contaminants, structure, fillers & coating failure

Elucidates molecular structure

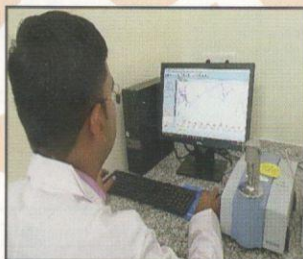
Determines if a failing coating is a specified epoxy

Identifies mix-ratio problems

Detects coating degradation evidence

Detects degree of cure monitoring

Complies:
ASTM D7588



Dynamic Mechanical Analyzer (DMA) - NETZSCH

Purpose: Product development, quality assessment & quality control for plastics & polymers

Complies: ASTM D4065-90/4092-90/4473-95/5418-99/5023-99

Identifies transition regions in plastics
Example: Glass Transition
Recognizes small transition regions that are beyond resolution of Differential Scanning Calorimetry (DSC)



UTM Machine - 100 Ton

Availability:

Range of tensile testing machines applying loads from a few newtons to 1,000 kN

Determines:

Behavior of *metal* when it is being pulled

Complies: IS 5508:1969, IS 3589:2001, IS 1786:2008, IS 10748:2004, IS 4270:1992

Measures:

Yield Strength

Proof Strength

Ultimate Tensile Strength



UTM Machine -10 Ton -Tinius Olsen

Determines:

Behavior of *plastic* when it is being pulled

Measures:

Elongation & Percent Elongation at break

Elongation & Percent Elongation at yield

Tensile Modulus

Tensile Strength (at yield & at break)

Tensile Strain

Complies:
ASTM D638, ISO 527, BIS 4984



Melt Flow Index (MFI) Tester - Tinius Olsen

Differentiates grades as with polyethylene

Measures extrusion rate of thermoplastics

Determines the extent of plastic degradation & flow rates

Complies:
ISO 1133
ASTM D1238



Vicat Softening Temperature (VST) Tester (4 Stations)

Determines:

Softening temperature of plastic materials

Complies:
ISO 306:2013
IS:12235 (Part -2):2004
IS 2530:1963 (RA2003)
ASTM D1525-09

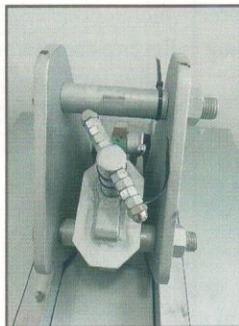


Flexibility Mandrel Bend Tester



Examines resistance of the coating to the bending of substrate

Complies:
NACE RP0394
CSA Z245.20

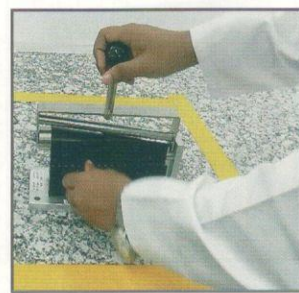


Conical Cylindrical Bend Tester (Conical Mandrel)

Evaluates the Following of Coatings to the Bending of Substrate:

Color Change
Adhesion
Cracks
Degree of Elasticity

Complies:
ISO 6860

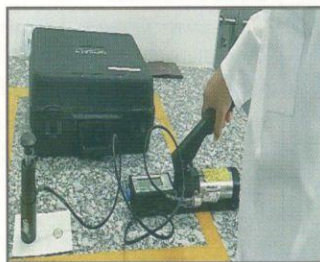


Pull Off Adhesion

Evaluates:

Pull off strength (Adhesion) of coating
Nature of failures

Complies:
ASTM D4541
ISO 4624

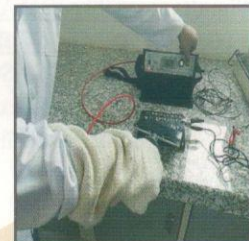


Holiday Tester

Assesses/Detects:

Degree of a coating continuity
Discontinuities viz. small voids, cracks, thin spots, pinholes, foreign material inclusion or contamination in coatings that are applied to conductive substrates

Complies: ASTM G62, ASTM D5162 & NACE RP0188



High Pressure Autoclave/Blistering Test

Evaluates:

Internal Coatings/Linings for Tank & Vessel Applications

Determines:

Coating performance, chemical resistance, resistance to steam out, resistance to gas variation

Complies:
API RP 5L2 Appendix 5 & Appendix 6,
ISO 15741



Salt Spray (Fog) Chamber

Measures: Corrosion resistance of products, paints, coatings, coated/non-coated metallic samples over extended period &/or at accelerated rate

Examines:

Coating resistance in highly humid & high salt content environment

Predicts:

Suitability of coated samples in use as protective finish

Complies: ASTM B117



Differential Scanning Calorimetry (DSC)

Evaluates:

Glass Transition Temperature, Melting, Crystallization, Specific Heat Capacity, Oxidation Behaviour, Thermal Stability, Cure Degree, Purity, Crosslinking Density

Analyzes: FBEs, Solid, Liquid & Paint Samples

Complies: ASTM E473, ISO 11357/11409



Cathodic Disbondment (CD) Tester

Determines: Resistance of coating to disbondment around initial holiday

Investigates: Behaviour of adhesion of coating to substrate when exposed to a controlled corrosive environment

Examines: Ability of coating under immersion conditions to withstand stresses

Complies: CSA Z245.20 Section 12.8, CSA Z245.21 Section 12.3, ASTM G8, ASTM G42; ASTM G95, ASTM D6676-01e1, ISO 21809-1,2,3



Tabular Impact Tester

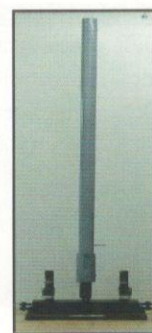


Determines: Impact Resistance & Durability of a pipeline coating against impact (physical &/or mechanical) damage which causes its failure

Examines: Energy required to rupture the coating applied to a pipe under specified condition of impact

Complies: CSA Z245.20 Section 12.12, ISO 21809-1,2,3, ASTM G14, ASTM D2794

Impact Tester



Our Technical Team



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