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ARAI
Progress through Research

THE AUTOMOTIVE RESEARCH ASSOCIATION OF INDIA





FOREWORD

I have pleasure in presenting this brochure to you. The automotive sector has always been of paramount importance for the country's growth and ARAI has been playing dynamic role in the progress of Indian automotive sector for over last five decades, working in harmony and confidence with its stakeholders, like Government, Industry and Academia for development of Automotive Industry, by playing multiple roles. Testing & Validation, Certification & Homologation, Design & Development, Standardization & Harmonization, Advisory & Consultancy, Education & Training, Audit & Inspection, R&D, India specific studies & data generation, indigenous & cost effective technology development, etc. are some of the ARAI activities that shaped the automotive excellence, where it is today.

ARAI, in its commitment to develop sustainable mobility solutions is acting as a catalyst in moving towards safer, sustainable and cleaner environment and transportation sector. In today's VUCA World scenario, ARAI is committed to leverage all its resources to protect the interest of its customers, stakeholders, employees and overall operations. Our teams are trained not only for testing and homologation for Indian requirements but are also accredited for export homologation. With right people, technology and tools to fulfil our commitments, ARAI is well equipped to take up future challenges. ARAI also recognizes the need to develop engineers to meet the rising demands of the automotive industry. ARAI Academy continues not only develop the next-gen engineers, but also upskill the working professionals for providing cutting edge solutions.

We, at ARAI, are proud to be an important element of the growth of automotive sector, with our world-class infrastructure and research expertise. It's time for collective, collaborative and cooperative efforts to innovate newer solutions for inclusive development. ARAI - the tried, tested and trusted partner of the industry, with its motto – 'Progress through Research' pledges support to all stakeholders.

Let's drive together to a brighter future.

Dr. Reji Mathai
Director- ARAI

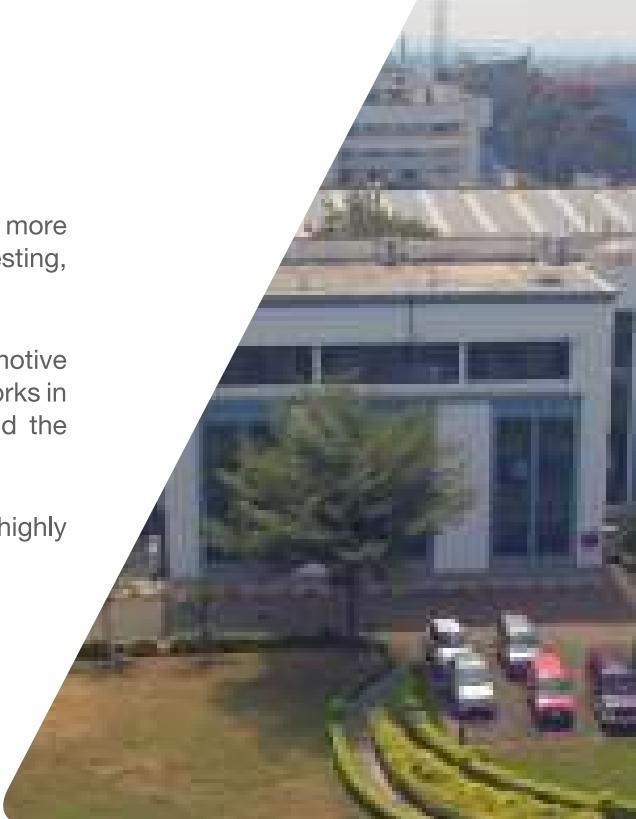


PROFILE

ARAI has been playing crucial roles assuring safe, less polluting and more efficient vehicles. ARAI provides technical expertise in R&D, testing, certification, homologation and framing of vehicular regulations.

ARAI is a co-operative industrial research association of the automotive industry with the Ministry of Heavy Industries, Government of India. It works in harmony and complete confidence with its members, customers and the Government of India to offer the finest services.

ARAI is well-equipped with state-of-the-art infrastructural facilities and highly qualified and trained manpower is its main strength.



Establishment : 1966

Location : Pune, India (160 km from Mumbai)

Manpower : 675+

Accreditation : ISO 9001, ISO 14001, ISO 27001, ISO 45001:2018 and ISO / IEC 17025 (NABL)



ARAI, Kothrud

Automotive Electronics, Calibration, Engineering Design and Simulation, Emission Certification, Environmental Research, Homologation Management & Regulation, Knowledge Centre, Noise Vibration & Harshness, Passive Safety, Powertrain Engineering, Safety and Homologation, Structural Dynamics, Vehicle Evaluation

ARAI - HTC, Chakan

Centre of Excellence Green Mobility, Fatigue & Materials
Centre of Excellence, Centre of Excellence Power train, Passive Safety, Drive train Development center

ARAI - FID, Chakan

Learning Centre, Training Centre, Knowledge Centre, Forging and Heat Treatment Research, Simulation Lab, Digital Twin lab

ARAI - MRC, Takwe

International representation in China, Europe & South Korea

Regional Offices in Chennai, Bangalore & Hyderabad





Recent Recognitions and Awards

ARAI bags the prestigious Golden Peacock Innovative Product / Service Award, 2025!

ARAI has received 'Committee of the Year 2025' award on the 78th Foundation Day of Bureau of Indian Standards (BIS)

ARAI receives the Public Procurement Excellence Award at the Next-Gen Procurement & Supply Chain Conference 2025.

ARAI receives a Letter of Appreciation from ISHRAE at the COOL Conclave for contributions to India's Net Zero Mission.

National Agency of Automobile & Land Transport Technology, Japan has designated ARAI for Emission Testing

2023 IESA Industry Excellence Award on Battery Safety

'Best Corporate Award' by SAEINDIA Foundation

Recognized as Scientific & Industrial Research Organization (SIRO)

'Recognized Overseas Test Lab' by Land Transport Authority (LTA) and National Environmental Agency (NEA), Singapore

Appointed as 'Technical Service Provider' by RDW, Netherlands for CoP verification audits

Recognition by Department of Infrastructure, Australia to provide Test Reports in compliance to ADRs (Australian Design Rules)

BIS Recognition for Automotive Safety Components



SERVICE OFFERINGS

Testing and Validation

Service Data Acquisition

Failure Analysis

Benchmarking

Development Validation Plan

Metrology

Equipment Calibration

Technology Transfer

Process Simulation

Forging Process Design / optimisation

Plastic Moulding Process Design / Optimisation

Design and Development

3D scanning & CAD Data Generation

Computer Aided Engineering

Virtual Engineering and Simulation

Onsite / Offshore Development Centre (ODC)

Optimisation

Calibration

New Product Development (NPD)

Advisory and Consulting

Inspection and Audit

Project Management

AUTOMOTIVE ENGINEERING AREAS

Active Safety

Alternate Fuel Technology

Automotive Electronics

Autonomous Driving / ADAS

Connected Mobility

Cyber Security

Electric / Hybrid Vehicles

Engineering Design & Simulation

Emission

Environmental Research

Equipment Calibration

Forging Technology Materials

Noise & Vibration

Passive Safety

Powertrain Design

Powertrain Engineering

Software Defined Vehicles

Structural Dynamics

Vehicle Evaluation



CERTIFICATION & STANDARDISATION

Certification

Comprehensive Certification and Homologation Services under one roof covering wide range of National and International standards
CMVR Type Approval of vehicles, sub-assemblies and components
Conformation of Production (COP)Accreditations
Export Homologation
Web based e-services for Homologation and Regulation

Regulatory Areas

Environment - Noise, Exhaust Emission, EMI / EMC
Alternate Fuel
Hybrid / Electric Vehicles
Passive Safety
Active Safety
Light / Light Signaling devices
ADAS
Cybersecurity

Standardization

Assistance to Government for formulation of country's automotive standards and harmonization of regulations at international forum.

Certification as per

CMVR	ECE
AIS	ADR
IS	SANS
ISO	SASO
FMVSS	GSO
JASO	JIS



RESEARCH & DEVELOPMENT

RECENT R&D PROJECTS

Powertrain & Transmission:

- H2 Fuelled ICE for Heavy Duty CVs and H2 ICE for Bus
- Bharat VECTO for HDVs (>3.5 T)
- CPCB IV+ compliant Genset Engine with HCNG Fuel
- Design and development of 4 Cylinder Engine for CNG Application
- HCNG 3W meeting BS-VI Emission Norms
- Conversion of Fishing Vessel Engine from Gasoline to LPG & from Diesel to Hybrid Electric

EV-HEV:

- Life Cycle Analysis Case study on Lithium ion battery Recycling
- Battery Management System (BMS) Training Setup for Li-ion Battery
- Development of Switch Reluctance Motor (SRM) controller
- Design and Development of Thermal Management System for Fast Charging of Removable Battery Pack for 2W and 3W Applications

Vehicle System

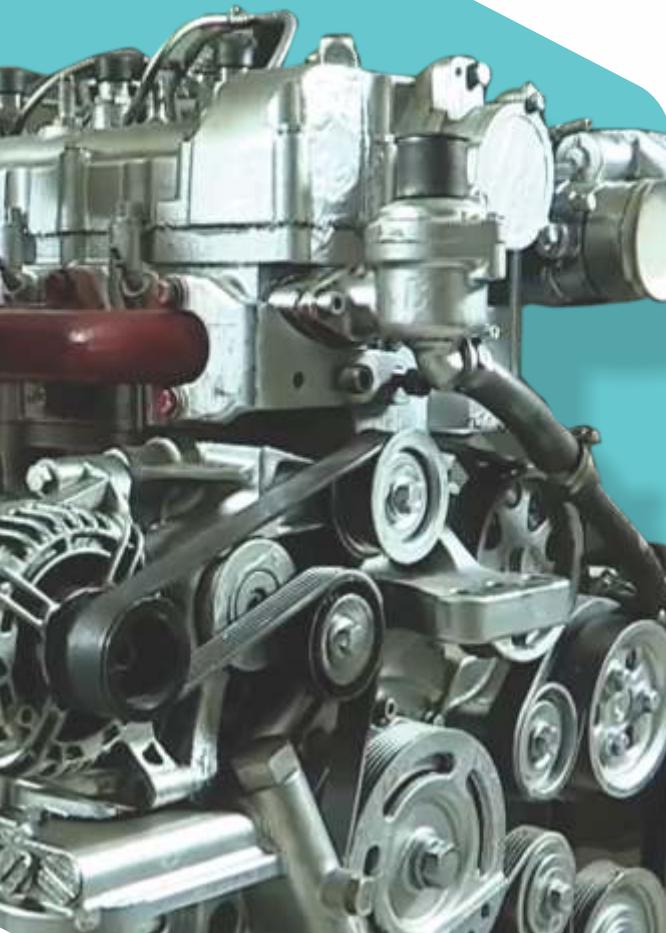
- Development of Tire Characterisation
- Methodology for 3D Digitization of Public Roads and Road Corridors
- Development of HD maps
- Material Model Card Generation

Autonomous Vehicle Program

- Digital twin of Indian traffic scenarios for ADAS functionality verification and validation
- Localization of soft target for on-track Verification & Validation of Advanced Driver Assistance Systems
- Front Cross Traffic Alert (CTA) systems for India specific Vulnerable Road Users
- Lane Departure Warning system for Indian specific conditions (on roads without lane markings)
- Automotive Cybersecurity Assessment for in-house Vehicles

PROJECT OF NATIONAL IMPORTANCE

- Direct Injection Hydrogen Fueled Internal Combustion Engines for Heavy Duty Commercial Vehicles
- Bharat VECTO for HDVS (>3.5 Ton) Fuel Consumption Calculation
- Front Cross Traffic Alert (CTA) systems for India specific Vulnerable Road Users
- Automotive Cybersecurity Assessment
- Life Cycle Analysis for battery recycling process
- Emissions Outlook and Air Quality Modelling projects
- Genset Retrofit for emission control certification
- Inspection & Certification Centres across India with MORTH & State Govt.
- Pilot Projects for use of Green Hydrogen in the Transport Sector under National Green Hydrogen Mission (NGHM)
- Generalization of KSS Scale for DMS under Indian Specific Driver conditions
- Dummy Kinematics Assessment based on Ergonomic Inputs
- Material model card for foam material
- Structural evaluation of Components and Subsystems in Railways and Defence Sectors
- Design and Development of Unmanned Aerial Vehicle (UAV)





NEW & UPCOMING FACILITIES

MRC- TAKWE

- High energy Impact Test Facility (HEIT)
- Cylinder test Lab
- ADAS Smart City Zone

FID- CHAKAN

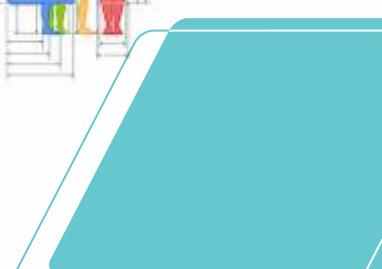
- Advanced NVH development centre
- Advanced Acceleration Sled facility

HTC- CHAKAN

- Advance Battery Safety Lab
- Photometry Lab
- H2 ICE

TECHNOLOGY & PRODUCTS

- 100 kW Fast Charger Technology
- Battery Management System (BMS) technology
- Technology Know-how of AC Charger
- Light Electric Vehicles (LEV) AC Charge Point technology
- Vehicle Control System
- GISSMO Material Model Card
- Acoustic Vehicle Alerting System (AVAS)
- E-axle Powertrain Kit for 3-Wheeler application
- Packaging material solution for Battery Thermal Management System
- Drive-by-Wire Platform
- Mobile Energy Storage Device for 2 & 3 Wheeler EVs
- EV & EVSE Simulator
- E-Lite – Electric Bus Development: A Conventional Bus with
- Aluminium Superstructure for city application
- HIL Validation of EV Controllers
- Dual Fuel (Diesel + CNG) Engine for off-road applications
- Simulation based certification of seat anchorage strength
- Air Bag simulation
- Indian Traffic Scenarios for ADAS Functionality V&V
- 3D Digitization of Public Roads and Road Corridors
- Database for Laboratory test method for Tyre wear



KNOWLEDGE INITIATIVES

Learning Centre

Graduate, Post Graduate and Doctoral Program in Automotive Engineering
in collaborations with Indian and Overseas Universities

Training Centre

Proficiency Improvement Programs (PIP)
Domain Training Programs (DTP) at customer location

Knowledge Centre

Journals, Books and Digital Library
Publishing of Automotive Abstracts and Literature search service

Conferences and Seminars

Symposium on International Automotive Technology (SIAT), International Conference
on Automotive Materials & Manufacturing (AM&M) and many more

Support to knowledge Societies

Supporting Lectures / Workshops, Seminars, Conferences, Student Events by SAE, ASM, CII and many more

Technology Theaters & Technology Days

Facilitation to showcase contemporary Technologies to Automotive Fraternity
Technology Awareness Program at Organizations

COLLABORATIVE PLATFORM



- TechNovuus, a web based digital platform is a Collaborative Ecosystem launched by ARAI under the aegis of Department of Heavy Industries.
- TechNovuus enables Indigenization, Innovation and Technology Development in collaborative manner giving impetus to Make in India and Atmanirbhar Bharat
- TechNovuus brings together all the stakeholders like Government, Industry, Research Institute, Academia, Knowledge Societies, Individual Experts and Students
- TechNovuus has modules for Collaborative Technology Solutions (CTS), Technology Transfer, Resource Sharing, Technology Discussion Forum, Technology Consortium, Expert Connect.

Come be a part of TechNovuus to shape future of
Mobility in India

Visit : www.technovuus.araiindia.com





ARAI MEMBERS





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