



**The New Face of
Mass Transportation**

RELX
COMPOSITES

RAIL COACH SOLUTIONS

ABOUT RELIANCE INDUSTRIES LIMITED

Reliance Industries Ltd (RIL), one of the most prestigious and largest organizations in India, has diversified into various businesses across the globe like Energy, Textiles, Oil & Gas, Petrochemicals, Telecommunication, Retail, Media & Entertainment, Advanced Materials and Composites among other sectors. It is India's largest and most profitable private sector company.

The company is ranked 106th on the 'Fortune Global 500' list of the world's biggest organization as of 2019 and ranked 3rd in top Global Energy companies by 'S&P Global Platts' in 2017.

Reliance Industries Limited has now ventured into the GFRP/CFRP composites market to cater to the growing needs of various industrial segments like Power & Renewable Energy, Oil & Gas, Electrical & Electronics, Telecommunication, Defense, Aviation, Ship Building, Mass Transportation, Automobile, Roads & Infrastructure, Construction & Disaster Management, as well as the Industrial Solutions sector. Equipped with an experienced, all-round team and revolutionary, world class manufacturing technologies, RIL has launched into this market with unique product segments.

Reliance Composite Solutions – Vadodara, Gujarat



Reliance Composite Solutions (RCS) is the latest venture by Reliance Industries Limited (RIL) offering RelX Composites, advanced and innovative composite-based products using state-of-the-art technology and unparalleled designing power.

Utilizing a wide variety of production and mass manufacturing technologies, RCS also handles backward integration into resins, fabrics and carbon fibres – all under a single roof at the site in Vadodara, Gujarat. The state-of-the-art facility offers a range of products complying with customer specifications as well as national and international standards. Our services encompass conceptual design, prototype development, testing, manufacturing, logistic support, installation and comprehensive after sales service.

Rapid urbanization requires transportation solutions that address unique social, economic, and environmental issues associated with large populations. RelX composites help in providing these transportation solutions.

The dedicated RCS facility in Vadodara, covering an area of 25000+ squaremetres, is equipped to manufacture products for the Rail, Metro and Automotive Industry. We are IRIS certified and our products meet the global standard of EN 45545- HL3. The in-house facility at our works includes various processes like RTM, VRTM, contact moulding, compression moulding, vacuum bagging, etc. The other facilities include Painting, Assembly, Finishing, and more.

Transport Division



Making Reliable, Safe & Efficient Modern Transport

RCS provides a large portfolio of advanced composite products for ready as well as customized mass transport solutions that are ideal replacements for traditional metallic systems prone to corrosion.

We follow an integrated approach from concept to commissioning and our design studio can deliver solutions based on reliability, safety, efficiency & maintainability.

Advantages of FRP Advanced Composite Rail Coach interiors and exteriors:

1. Lighter in weight compared to metal parts, resulting in substantial reduction in weight per coach, leading to energy savings, monetary benefits, lower engine load, etc.
2. Maintenance-free products with a longer life cycle, resulting in reduction in maintenance costs
3. Fire retardant products, ensuring safety of passengers and property
4. Non-corrosive & Non-Conductive by nature

Products Offered

- Side Wall
- End Wall
- Partition Wall Panel
- Seats
- Doors & Windows Panels
- Modular Drop-down Toilet
- Luggage Rack
- Ceiling Panels
- Electrical Cubical Panels
- Door Pillars
- Aerodynamic Front End / Front Mask
- Driver's Cab Interior
- Interior of Crew Friendly Locos



Advanced
R&D set-up
with
in-house testing
facilities



Flame Spread Test



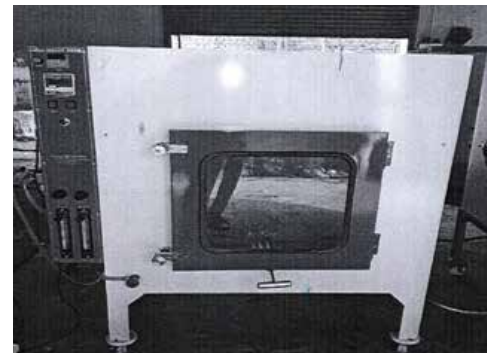
HDT Tester
& Gas Chromatograph



UV Weatherometer
& UV VIS Spectrophotometry



Smoke Visibility Test



Toxicity Test



Microscope Polarized



Thermal Properties Testing



Impact Tester



Elemental Analyzer



Viscometer LV, RV, CAPS



Industrial Design

RCS has 3-Axis & 5-Axis CNC (Computer Numerical Control) Machine to make precise tooling. The design itself can be programmed on CNC to get the final tool profile which helps in speedy and precise mould/pattern making. The tools used for Industrial Design are Rhino and Keyshot.

The process is as follows:

1. Market and User Experience research
2. Benchmarking
3. Brainstorming & Ideation
4. Concept Generation
5. Form & aesthetics (Styling)
6. HMI & Ergonomic Study
7. Color, Material and Finish
8. Renderings
9. Scaled Mock-ups & Prototyping
10. Usability testing

Engineering Design

Our Engineering Design team is equipped with sophisticated tools such as CATIA (Composite modeller and manufacturing), SolidWorks, AutoCAD, Minitab. This team of engineers develops products' tolerances and dimensions, analysis, simulate to meet specifications and reduce time-to-market and development costs to help our clients meet their requirements. The generated data and details are the primary inputs for the tooling and production.

With input from the detailed design and drawings established by the engineering team, a series of templates are produced with help of CNC machine, depending on the product to construct a pattern with different types of materials used for making patterns. Moulds are made by using zero shrink materials.

The process is as follows:

1. Design Feasibility Study
2. Parameter diagram
3. Design calculation
4. Concept & Detail Engineering (3D & DWG)
5. DOE, Optimization & Robustness
6. Engineering BOM & BOP
7. Material & Process selection
8. Manufacturing feasibility
9. Assembly Tolerance stack-up & analysis
10. Prototype development
11. Testing



- Mumbai Metro (MRS1) – An order of 78 cars (13 train sets) awarded to Reliance



- Pune Metro -An order of 102 cars awarded to Reliance for Coach interiors

Credentials

1. RCS is a registered vendor of Indian Railways (ICF, Chennai)
2. RCS is a registered vendor of various Domestic & International Clients dealing in Railway/Metro Projects

Projects under execution

- Modular Toilet for Indian Railways



Certifications





Manufacturing
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