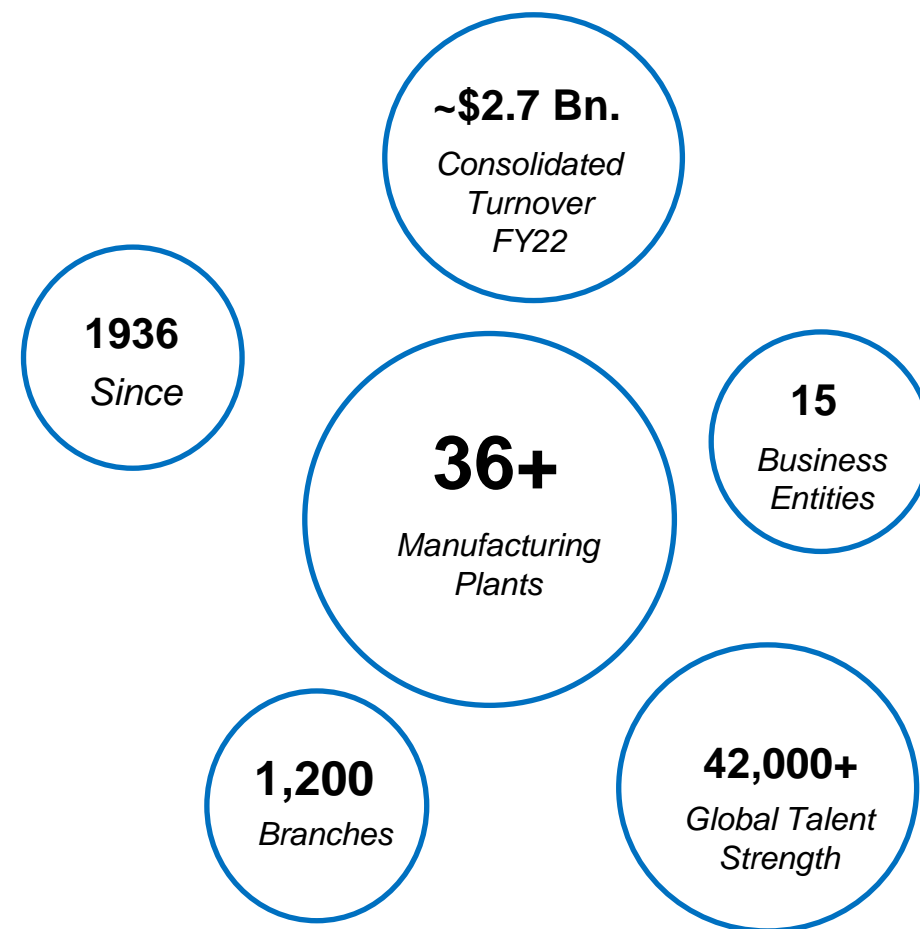




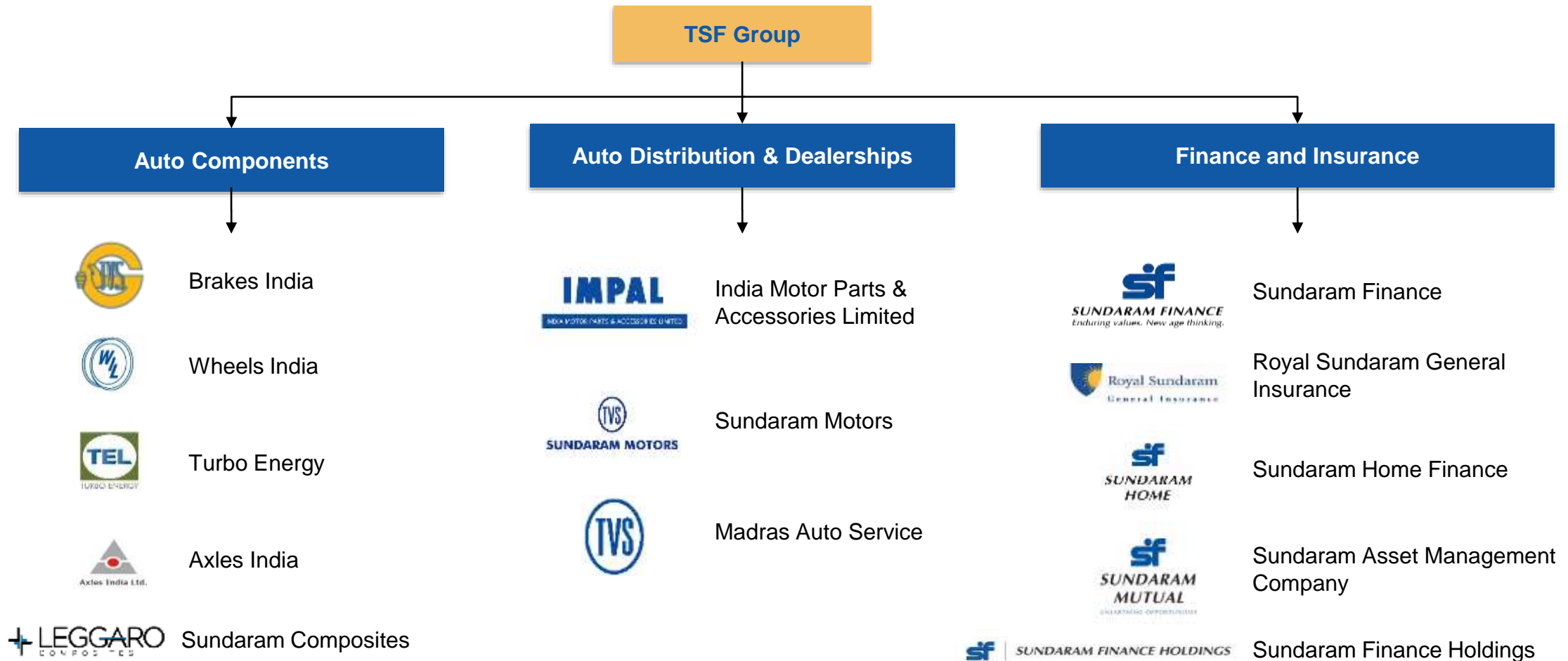
**Brakes India**

# Brakes India is part of the TSF Group (*erstwhile TVS*)

- Companies part of the **T S Santhanam family** with lineage from the erstwhile TVS Group
- **Diversified portfolio** across Auto components, Dealerships & Distribution and Financial services
- **Global supply chain partner** with strong relationships across North America, Europe and Asia Pacific regions
- Successful **Long-Term Partnerships** with global companies
- **Strong Customer Connect** and Focus
- Core beliefs - **Long-term business outlook**, Corporate Governance & Sustainability



# TSF Group Companies



# Brakes India at a glance

**1962** Established as a joint venture, currently fully owned by the TSF group

**INR ~6,900 Cr** (~USD 840 Mil)  
(FY22-23\*)

## Businesses

Light Vehicle  
Braking Systems

Heavy Vehicle  
Braking Systems

Friction &  
Aftermarket

Ferrous  
Castings

Polymers

## Capability

Design, development, test and validation  
Engineering team of 250+ (2.5% R&D spend)

Marquee global customers for safety critical parts  
Exports of INR 1,750+ Cr (~USD 210 Mil)

**~10,000** employees

**19** Plants across India (Tamil Nadu, Maharashtra, Haryana, Gujarat, Madhya Pradesh, Uttarakhand, Karnataka, Jharkhand, Uttar Pradesh, Andhra Pradesh), Oman and Indonesia

Pan India field support

Sales and support in US and Europe

IATF16949, ISO 14001, ISO 45001, ISO 50001 certified

\*Consolidated turnover

# Portfolio of Business Units

## Light Vehicle



- Largest producer of hydraulic braking systems for passenger and Small Commercial Vehicles
- Caters to most OEMs (multinational and Indian origin)
- Key products include calipers, drum brakes, actuation, slip control, hoses and clutch actuation

## Heavy Vehicle



- Largest producer of CV and tractor brakes in India
- CV product range includes S-cam, hydraulic brakes, clutch actuation, electro- magnetic retarders and air actuation (air management devices, control valves and wheel end solutions).
- Wet and dry brakes with hydraulic actuation.

## Friction & Aftermarket



- Market leader in the Indian aftermarket
- Product range includes air actuation kits, assemblies, brake service kits, brake fluids and coolants, a wide range of friction products (Rotors, Pads, Linings and Lined shoes) catering to the passenger vehicle segment

## Foundry



- Largest exporter of automotive castings from India
- Capability to supply complex and safety critical castings like brake parts, turbocharger parts, chassis parts for heavy duty trucks, steering knuckle, drive end flanges, etc

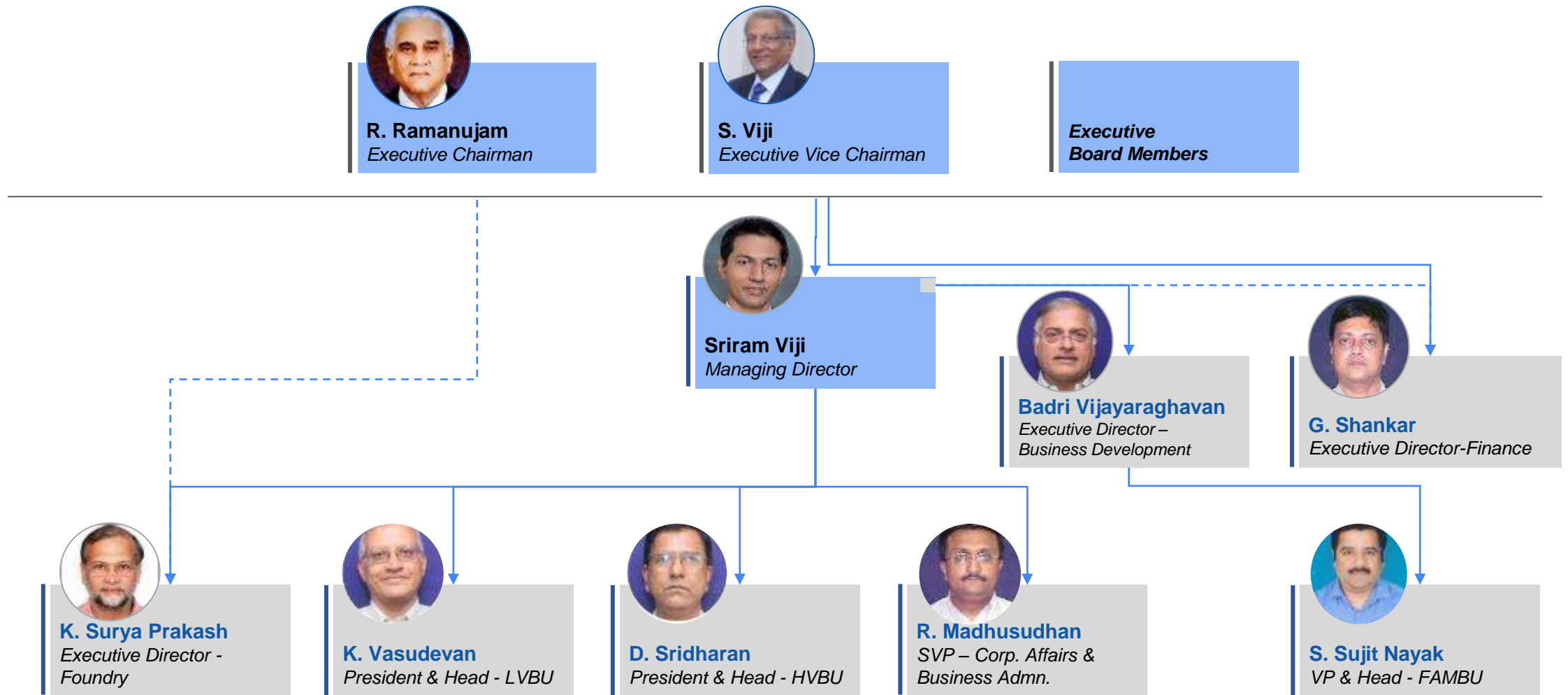
## Polymers



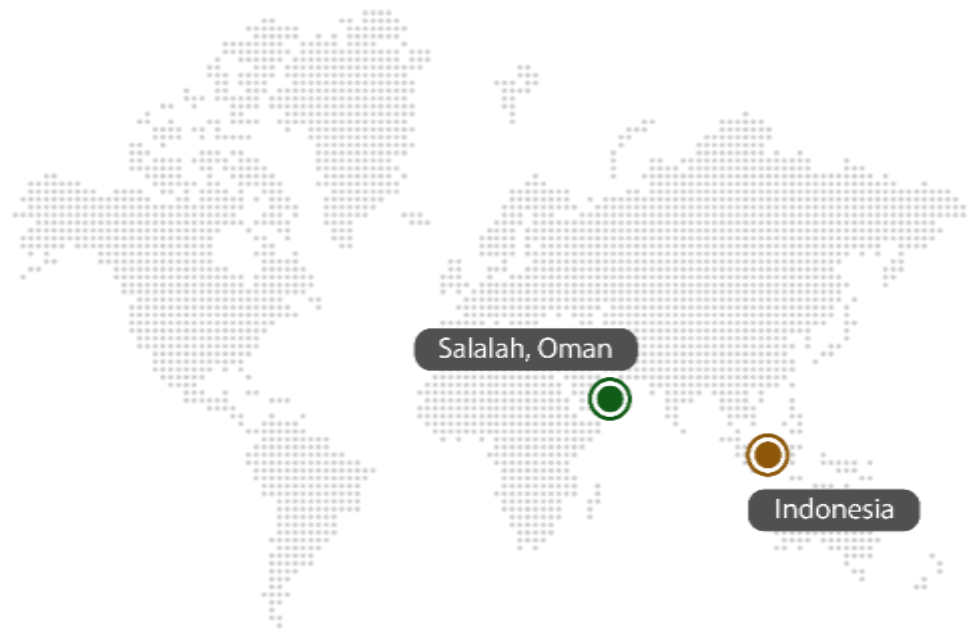
- Engineering plastics with portfolio spanning PP, PC, PA, PBT, ABS, etc.
- Service specialized needs for property and colour matching
- Value-added moulded products



# Organizational chart



# Manufacturing locations across India and Abroad



- Light Vehicle Braking
- Heavy Vehicle Braking
- Friction
- Foundry

\*Oman houses our Foundry business through subsidiary company Dunes Oman

\*\*Indonesia presence is through a dedicated contracted plant



# Light vehicle product portfolio

## Foundation Brakes

### Calipers



### EPB – Motor on Caliper



### EPB – Motor on Drum



### Integral Parking Brake



### Drum Brakes



### Drum Brakes – Drum in Hat



## Friction

### Pads



### Lining



## Slip Control Systems

### ABS



### Valves



### Wheel Speed Sensor



## Brake Actuation

### Booster Master Cylinder



### Vacuum Sensor



## Clutch Actuation

### Plastic Clutch Master Cylinder

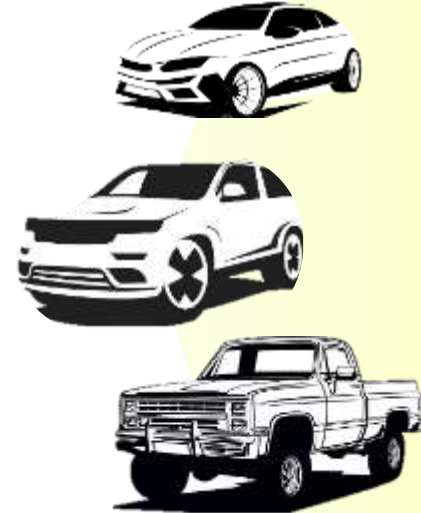


### Clutch Slave Cylinder



## Hoses

### Hose Assemblies



ADVICS

F

Ford

HONDA

ISUZU

Mahindra

MARUTI SUZUKI  
Way of Life!

ASHOK LEYLAND

NISSAN

RENAULT

STELLANTIS

STELLANTIS

TATA

TOYOTA

KIA

VW

ZF

SUZUKI

Note: Customer portfolio includes those where business has been awarded and production is yet to start



# Heavy vehicle (commercial vehicle) product portfolio



## Foundation brakes & actuation

Hydraulic caliper



Hydraulic drum



Air caliper



S-cam drum brake



Unibooster



Booster Master Cylinder



## Air management

Air dryer



System protection valve



Air processing unit



Condensate separator



## Wheel end solution

Spring brake actuator



Brake chamber



## Control Valves

Dual brake valve



Hand control valve



Relay valve



Check valve



Quick release valve



Pressure reduction valve



Relay emergency valve



## Trailer Valves

Palm coupling



Trailer control valve



## Clutch actuation

Clutch hydraulics



Clutch booster



## Auxiliary brake

Electro magnetic retarder



Exhaust brake



Magnetic valve



# Heavy vehicle (tractor & off-highway) product portfolio



## Foundation brakes

Dry disc brake



Oil immersed



Annular piston



## Brake actuation

Master cylinder



Compensating master cylinder



Hydraulic booster / master cylinder



Slave cylinder



## Valve

Shuttle valve



## Clutch Actuation

Clutch master cylinder



Clutch slave cylinder



Clutch booster



Mahindra



# Foundry product portfolio

Casting products across braking, turbo charger and critical chassis components

**Brake parts –  
Caliper housings and  
bracket, torque plate**



**Turbocharger parts**



**Steering knuckle**



**Chassis parts for  
heavy duty trucks**



**Engine bearing  
housing and cap**



**Mahindra**



# Brake Fluid and Coolant

## > BRAKE FLUIDS

### Features

- Improves life of brake and clutch parts
- Excellent corrosion protection
- Specially formulated to control viscosity & low hygroscopic to ensure safe braking

### DOT 3

- Conforms & exceeds SAE J1703F, FMVSS 116 DOT 3 & IS 8654 standards
- High boiling point (above 205°C) helps in consistent and safe braking performance
- Excellent stability at low temperatures (-40°C)
- Available in 100 ml, 1/4 L, 1/2 L, 1 L, 20 L & 205 L packaging



### DOT 4

- Meets to SAE J1703F, FMVSS 116 DOT 4 & IS 8654 standards
- Excellent flow characteristics at temperatures as low as -40°C
- ERBP minimum 230°C & wet ERBP minimum 155°C
- Low evaporative fluid even at 100°C
- Available in 100 ml, 1/4 L, 1/2 L & 205 L barrel



### DOT 4+

- Compatible with regular DOT 3 & DOT 4 brake fluids, corrosion resistance for ferrous & non-ferrous metals as per SAE J1704
- Low viscosity at -40°C
- Compatible with all rubber components - SBR & EPDM seals
- High boiling point - >255°C
- Available in 100 ml, 1/4 L, 1/2 L & 205 L barrel



## > COOLANTS

### Features

- Excellent resistance to rust, corrosion and scaling
- Free from fungus and foaming
- Non-amine based coolant
- Suitable for turbo engines and generators
- Low maintenance
- Suitable for ferrous and non-ferrous radiators
- Enhances heat transfer ability and ensures longer engine life

### VERICOOL (GREEN)

- Mixing ratio is 1:4
- Available in 500 ml, 1 L, 3 L, 5 L, 20 L & 205 L barrel



### VERICOOL (RED)

- Mixing ratio is 1:4
- Available in 500 ml, 1 L, 3 L & 5 L packaging



### AQUACOOOL

- Mixing ratio is 1:4
- Available in 500 ml, 1 L, 3 L, 5 L, 20 L & 205 L barrel



### EZCOOL

- Mixing ratio is 1:3
- More effective even at sub-zero geographical location
- Available in 500 ml, 1 L, 3 L, 5 L, 20 L & 205 L barrel





# Engineering capabilities of Brakes India (1/2)

Prototyping



Performance



Dyno testing



Endurance



NVH



Electronics

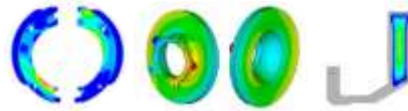


Brakes India has full design, development, test and validation capability

- Upfront design capability



CAD/CAE compatible with customer requirements



Structural, thermal and modal analysis

- Inhouse prototype development
- Advanced testing and validation - Bench validation - Performance, durability, NVH

Technical alliances

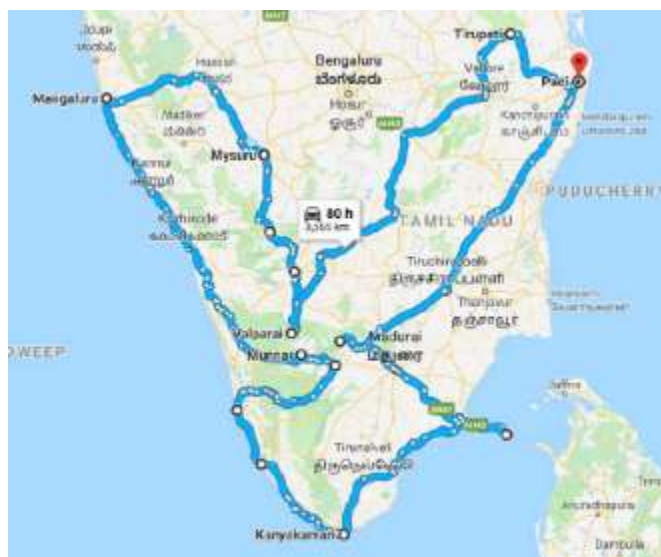




# Engineering capabilities of Brakes India (2/2)

- Extensive analysis of duty cycle for both PV and CV in India
- Tailoring the brake design and friction to suit Indian conditions
- Extensive route runs covering major terrains
- State-of-the-art test track with ABS testing facility

## Route run with instrumentation



**15 days**  
**3739 kms**  
**60%**  
**23%**  
**17%**

Duration  
 Distance  
 National highway  
 Hilly terrain  
 Rough roads



## High speed test track – 4 kms



- Field service team to resolve any modifications or improvements required post launch

# Multi-layered systems to meet global quality standards



## Sourcing

- Dedicated supplier development team, supplier quality team and structured supplier development process



## Manufacturing

- Flexible manufacturing systems to cater to both **high volume** and **low volume** demands from customers
- Enabled with **poke yoke** systems and **camera-based vision inspection** systems.
- **Vertically integrated** capability inclusive of design and manufacturing of tools dies and fixtures
- End-to-end **traceability** with assembly lines integrated with IOT system



## Quality management

- Quality planning starts early in each new product launch
- Customer concern management - Dedicate window person, close monitoring of PPMs, 8D approach to problem solving, joint warranty investigations

# Caring for the Community



Sundaram Medical Foundation  
& Community hospital, Chennai  
and Sholinghur



Covid Relief – Supply of Oxygen  
concentrators



Drinking water for local villages



Direct and indirect employment  
of locals



Supporting Swachh Bharath -  
Construction of free toilets in  
rural areas



Promoting Single Teacher Schools |  
Education for backward communities



Supporting research projects in  
SASTRA University



Technical training school  
and Vidya Peetam School, Sholinghur



# Sustainable by Choice

Leading the way in energy conservation and green initiatives at every location



## Green energy consumption

Utilising solar & wind energy for more than 3 decades



## Reverse osmosis plants

Wastewater treated in effluent treatment plant & recycled for in-house usage across facilities



## Minimize discharge of pollutants

Aiming towards Net Zero



## Sustainable construction

Construction of STP with discarded steel;  
Reusage of foundry waste as an alternative to concrete building blocks



World's first "Green Foundry" in Naidupet



## Vermicomposting

Utilising green waste to convert them into green manure for fruit & vegetable gardening in Nanjangud plant



## Rainwater Harvesting

In-house water supply catered to via recycled rainwater



## Kitchen garden & green belt development

1 lakh + trees across our offices and facilities

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THANKYOU



**Brakes India**