



**FOR LARGE AND MEDIUM  
COMPANIES  
(Unit level / SBU level  
turnover > Rs.100 Crores)**

# IMTMA - ACE MICROMATIC Productivity Championship Awards 2024

## Rules & Guidelines governing the competition

Competition open to companies engaged in the manufacture of  
Engineering products / Components.

Contestants are advised to read the following guidelines carefully before filling in the format

- The objective of National Productivity Summit is to showcase best productivity practices in Indian manufacturing space, by sharing knowledge and experience.
- **Participation in this competition is FREE.**
- **Download and submit the entry form by logging on to [www.productivity.imtma.in](http://www.productivity.imtma.in) on or before 30th April 2024.** Please ensure that the file size being uploaded does not exceed 20 MB. Subsequently the hard copy of the entry duly signed and certified by the senior management should be sent to IMTMA's Bangalore office at the below address.
- There will be separate awards for Automotive and Non-Automotive sectors.
- Companies must submit Case study(s) that will showcase and highlight breakthrough achievements that have brought significant competitive advantage to the company. The case study(s) must clearly bring out the value creation and results achieved.
- While companies can send a maximum of 2 entries per plant/ manufacturing location, please note that only ONE best entry shall be considered for evaluation.
- **Project must have been implemented and put into regular operation for a minimum period of one year. The project start date must be after January 2020.** Entries that were submitted for the previous IMTMA Productivity championship competition(s) must not be resubmitted. Such entries will be summarily disqualified.
- The selected case study must be presented at the National Productivity Summit 2024 scheduled on 21-22 November 2024, Pune by a member of the Senior Management of the organization responsible for the project implementation. The presentation must be made in English language only.
- Entries will be judged by an independent jury comprising of eminent professionals, whose decision will be final. While significant weightage will be given to the conceptualization, link to business need, associated impact, value creation to stakeholders and business sustainability parameters, the other criteria for evaluation will also include analysis, determination of requirements, generation and evaluation of alternative solutions, innovativeness and the thoroughness of planning and implementation. Neither IMTMA nor ACE MICROMATIC will have any role in judging of entries. The jury reserves the right to accept or reject an entry without assigning any reasons thereof. Therefore IMTMA is not obliged to provide reasons for rejection.
- Projects may be validated onsite (physically or virtually) by the evaluation team as part of the process, if required.
- Winners will be awarded cash prizes, a trophy and a certificate. Multiple or partial awards may also be given. Cash prizes will be awarded to Individuals / Team Members.
- **Presentations can contain concepts and broad contours of the project without disclosing confidential information. Applicants are assured of the confidentiality and their IP rights.**
- IMTMA reserves the right to publicise the selected case study in their programs / website and other event promotional collaterals.

### Note:

- Minor improvements, Kaizens, will not be considered. Participants are expected to submit case studies that have brought in significant improvements to their business.
- Projects having application of standard products for productivity improvement / Service plugins that are commercially available will not be considered.
- Companies must submit their entry(s) strictly in the below format along with **Annexure A & B**. Entries without structured information on the case study(s) stands the risk of disqualification.

For any queries please contact:

**INDIAN MACHINE TOOL MANUFACTURERS' ASSOCIATION (IMTMA)**  
@ Bangalore International Exhibition Centre (BIEC)  
10th Mile, Tumkur Road, Madavara Post, Bangalore – 562 123

Madan (Email: [madan@imtma.in](mailto:madan@imtma.in))  
Mob: 7899437625, Tel: 080 66246711

Or  
Abhishek (Email: [abhishek@imtma.in](mailto:abhishek@imtma.in))

Mob: 9844294387, Tel: 080 66246829



## Indian Machine Tool Manufacturers' Association (IMTMA)

Head Office : 10th Mile, Tumkur Road, Madavara Post,  
Bangalore – 562123, Karnataka, India.

T: 080-6624 6829 / 6624 6711 W: www.productivity.imtma.in

### Annexure: A

#### IMTMA-ACE MICROMATIC PRODUCTIVITY CHAMPIONSHIP AWARDS 2024

#### FORMAT FOR SUBMISSION OF CASE STUDY FOR LARGE & MEDIUM COMPANIES ONLY (Unit level / SBU level turnover > Rs.100 Crores)

#### Title of the Case Study: Paint Shop Productivity Improvement at Hosur-2

1. Name of company: Ashok Leyland Limited. Hosur Unit 2

Address of the Plant / Site location: No. 77, Sipcot Electronic complex, Perendapalli, Hosur, Tamil Nadu - 635109

Tel No.: 04344 - 269441

Turnover (in Rs. Cr) - 12,800

No. of employees: - 3,000

Industry sector (mandatory): - Automobile industry

2. Name of the project leader: P M Saravanan

Designation: Divisional Manager

Mobile No.: 9176608304

Email ID: Saravanan.PM@ashokleyland.com

Alternate contact person: P Ananthan

**Plant Coordinator: Sreedhar Reddy**

**S**

Designation: Assistant General Manager  
Business Excellence

Designation: AGM – Operation Strategy &

Mobile No.: 9894448038

Mobile No.: 9841980369

Email ID: [Ananthan.P@ashokleyland.com](mailto:Ananthan.P@ashokleyland.com)

Email ID: sreedharreddy.s@ashokleyland.com

#### 3. Project implementation

Start date: 01-05-2020

End date: 18-05-2022

We certify that the project described here is factually correct and is in continuous operation.

We confirm that we have read the rules and guidelines governing this competition and agree to abide by the same.

We agree to nominate a member of our senior management to make the presentation, in case this entry is short listed for final evaluation of the award.

We have no objections in IMTMA publicizing our case study in their programs / website and other event promotional collaterals.

Name : Mr. Manjunath TS

(Head of Company/Business Unit / Division)

Designation: Plant Head – H2 & H3

Date: 30-06-2024

Electronic

  
**T S Manjunath**

Signature:



# IMTMA-ACE MICROMATIC PRODUCTIVITY CHAMPIONSHIP AWARDS 2024

## Annexure: B

*Tick (✓) the appropriate box(es) that best describe your Case study*

1. **Scope of the project:** (Please tick as appropriate)
  - Multiple Value streams** (Improvements in Multiple Value streams/ product families resulting in breakthrough benefits).
  - Single Value stream** (Improvements in a Value stream / product family with significant benefits).
  - Localized improvement within a Value stream** (Improvements in identified processes / pockets within a value stream, with incremental benefits).
  
2. **Project sponsor:**  Top management  Senior management (CEO / CXO level)  
 Middle management (GM/ DGM/ AGM level)
  
3. **Project trigger:**
  - 3.1  External conditions  Internal competitiveness
  - 3.2 **Market conditions:**
    - Uncertain demand  Cyclical demand  Low volume- High var  Sudden increase in demand
  - 3.3 **Project approach selection**
    - Primarily driven by the costs involved
    - Based on financial benefits, gains
    - Based largely on adoption by peers/ Industry standard
  
4. **Project focus:**

<input type="checkbox"/> Manufacturing System Redesign (MSR)	<input type="checkbox"/> Better Asset Utilization (BAU)
<input type="checkbox"/> Productivity Through Quality improvement (PTQ)	<input type="checkbox"/> Optimizing Metal working Process (OMP)
<input type="checkbox"/> Digital Manufacturing & I 4.0	<input type="checkbox"/> Total Productive Maintenance (TPM)
<input type="checkbox"/> Total Quality Management (TQM)	<input type="checkbox"/> Green & Clean
<input checked="" type="checkbox"/> Other innovation (Please specify) <b>Industry First Twin Cabin loading concept in a hanger</b>	
  
5. **Quality / Analytical tools:** Please tick If you have used any of the tools listed below for developing productivity improvement solutions.
 

<input type="checkbox"/> Statistical Process Control (SPC)	<input checked="" type="checkbox"/> Design of Experiments (DOE)
<input type="checkbox"/> Eight Disciplines of problem solving (8D)	<input type="checkbox"/> Root Cause Analysis (RCA)
<input checked="" type="checkbox"/> Standard problem solving tool	<input type="checkbox"/> Theory of Constraints (TOC)
<input checked="" type="checkbox"/> Six Sigma	<input checked="" type="checkbox"/> 7 QC Tools <input type="checkbox"/> Lean
Others (Please specify) .....	
  
6. **Project implementation includes**
  - All activities within the organization
  - Upstream and Downstream partners/ suppliers
  
7. **Productivity improvement include:**  Enhanced output  Reduced inputs  Manpower Rationalization  
 Others.



# IMTMA-ACE MICROMATIC PRODUCTIVITY CHAMPIONSHIP AWARDS 2024

## FORMAT FOR SUBMISSION OF CASE STUDY

### Instructions:

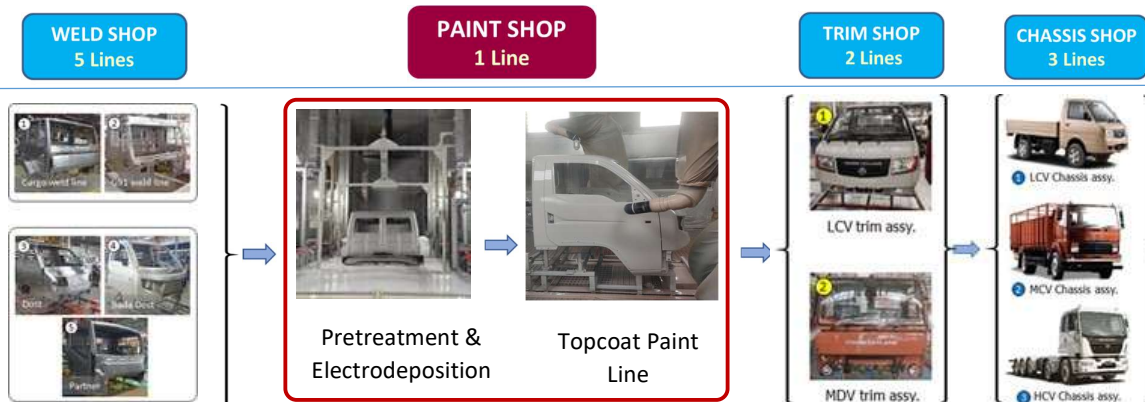
- Contestants are expected to present the case study on the following parameters within Eight (8) A4 size pages (Apart from Annexure A & B)
- Font size should not be smaller than Arial 11. Only MS Word format is to be used.
- Contestants are encouraged to include charts/ tables/ graphs/sketches/ photos / URL linked videos and other graphical illustrations to bring out the merits of their project / case study.

**Note: All sections listed below must be adequately addressed and cannot be left blank**

### 1 Brief description of the project.

Ashok Leyland is having 7 manufacturing units in India. **We are from Hosur plant - II**, Tamil Nadu producing very wide range of products. Our unit is the only plant amongst Ashok Leyland and competitors producing vehicles of all segments including Light, Medium & Heavy commercial vehicles.

**Paint shop is a common** facility to produce Cabins for LCV, M&HCV & Specialty vehicles, whereas other shops like Weld, Trim & Chassis are having multi lines to meet the production demand.



Installing a new Paint shop requires huge Capex and also operational expenses will become double. Due to cyclicity of Automobile it is advisable to have single Paint shop with improved productivity & capacity.

With this project, team has increased the cabin paint capacity **from 125K/annum to 199K/annum** through by **Process Innovation** and developing new Paint and chemical along with material supplier to fulfil the requirement.

The uniqueness & complexity of the project was that it needed to be completed in same building without stopping regular production.



# IMTMA-ACE MICROMATIC PRODUCTIVITY CHAMPIONSHIP AWARDS 2024

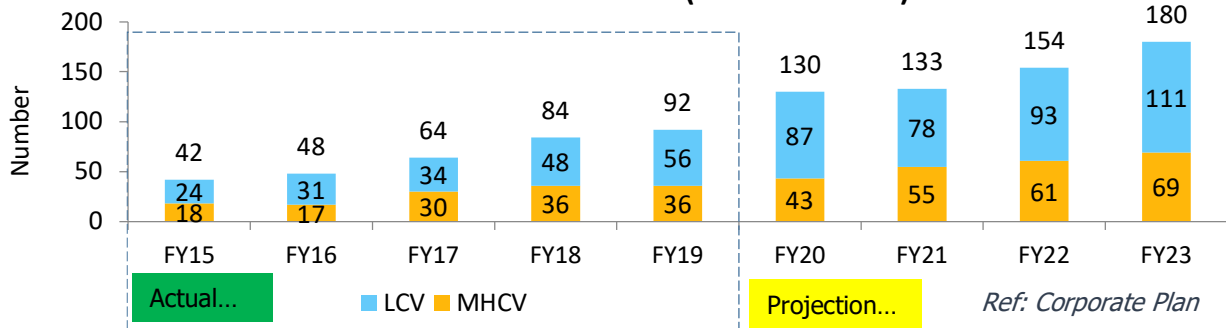
## FORMAT FOR SUBMISSION OF CASE STUDY

### 2. Trigger for the project. (10 points)

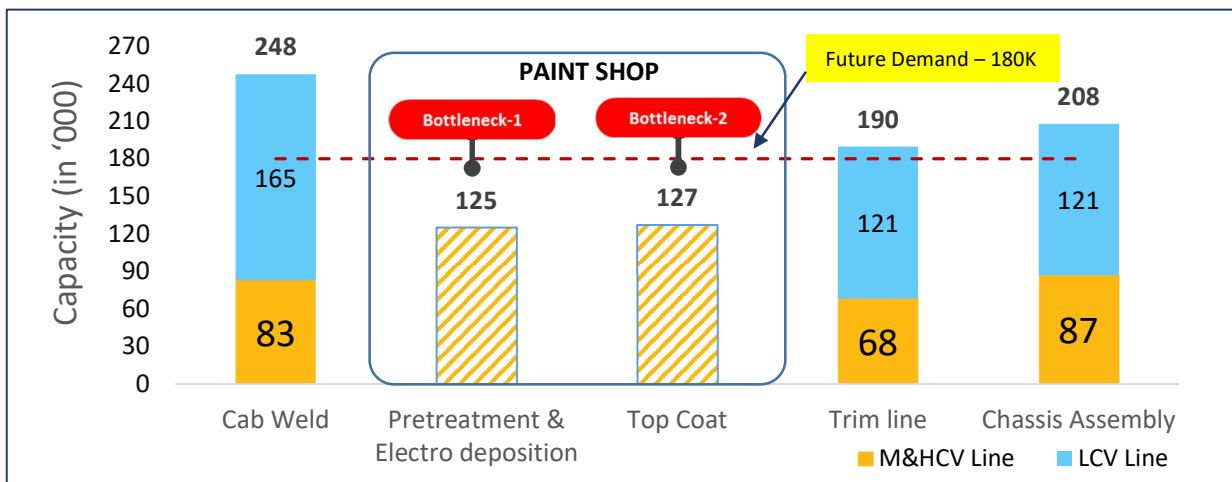
Outlook of automotive industry is good and prediction is that India will be the number one automobile manufacturing hub in the world by 2029, so we need to prepare ourselves for more challenging and excited journey ahead and play an important role in nation building by utilizing this opportunity which will also enable us to meet our Company Vision to be a top 10 global CV player. Now, demand of trucks with factory fitted Cabin is increasing due to customer focus on safety & comfort. Also as focus is to increase LCV business, cabin manufacturing capacity becomes the key.



**Cabin demand (Volume in '000)**



As per corporate plan, FY'23 forecast for our plant is 180 K vehicles production. **Paint shop was a bottleneck process as it was having lower capacity than weld and trim shop.**

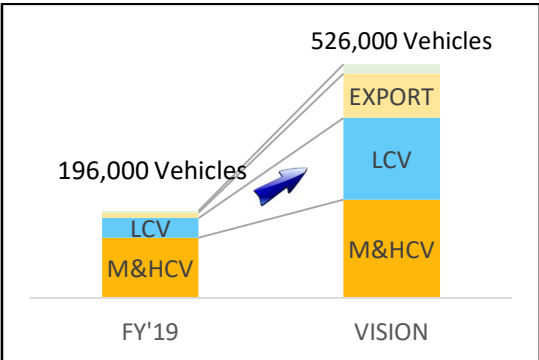
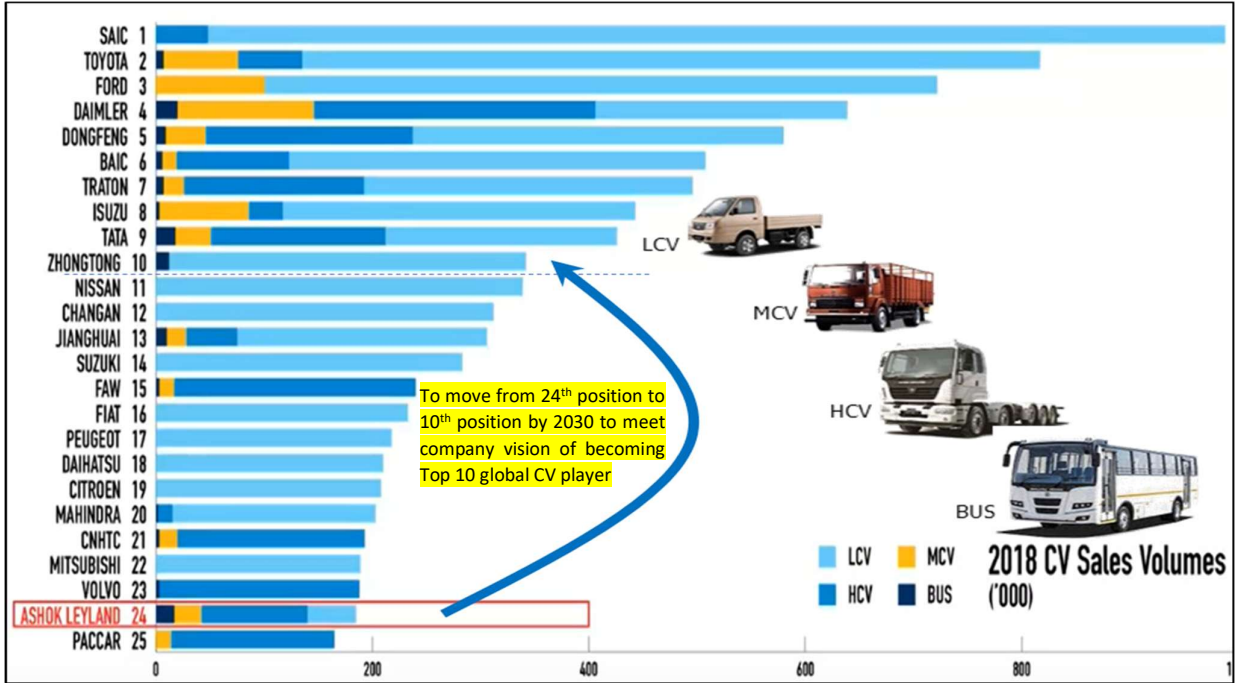




# IMTMA-ACE MICROMATIC PRODUCTIVITY CHAMPIONSHIP AWARDS 2024

## FORMAT FOR SUBMISSION OF CASE STUDY

2. Ashok Leyland to move from 24<sup>th</sup> Position to 10<sup>th</sup> position to meet company vision by 2030, for which need to improve LCV business significantly



Our Hosur Plant - II is the only plant in Ashok Leyland manufacturing LCV range of vehicles and to meet cabin demand, there was a proposal for installing new cabin Paint shop but it requires huge capex and also operational expenses will become double. Due to cyclic demand of Automobile it is advisable not to have multiple Paint shop in the same premises.

Therefore, to meet growing cabin demand & LCV volume towards achieving **Vision of "To be a Top 10 global CV player"**, our team took challenge to Increase the capacity of existing Paint shop by **Process innovation** (introducing **New generation chemical & Paint**, extending the **Twin Loading in PTED** with LCV cabins models and using vertical space for installing new top coat line to avoid huge capex for installing new Paint shop.



# IMTMA-ACE MICROMATIC PRODUCTIVITY CHAMPIONSHIP AWARDS 2024

## FORMAT FOR SUBMISSION OF CASE STUDY (Contd.)

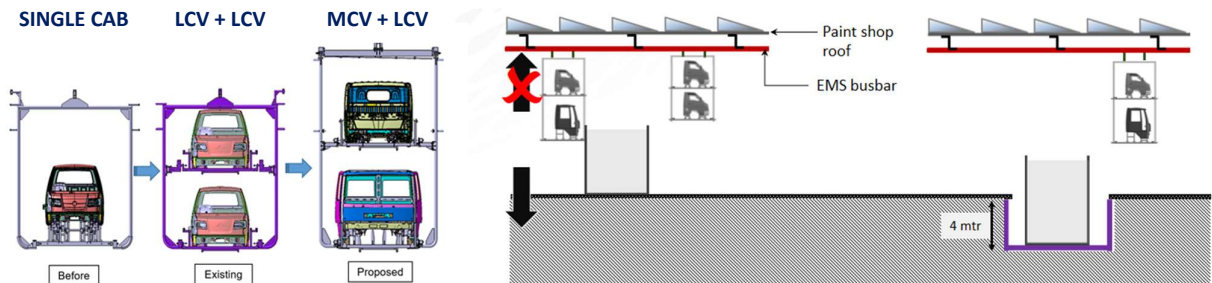
### 3. **Solution generation, Innovation and Complexity. (20 points)**

Out of two ideas as mentioned below team decided to take challenge to meet the production target in existing Paint shop by introducing twin cabin loading of LCV cab over Cargo cab, there were 3 main challenge.

#	Ideas	Expected capacity increase	CAPEX reqd.	Challenges / Remarks	Feasible
A	Setting up of a New Paint shop.	125 → 250 K	300 Cr.	<ul style="list-style-type: none"> <li>Lead time - 24 to 36 months lead time,</li> <li>High Operational cost,</li> <li>Operational complexity &amp; High Capex</li> </ul>	
B	Twin loading Cargo with LCV model	125 → 180 K	70 Cr.	<ol style="list-style-type: none"> <li>Shop floor roof height constraint.</li> <li>Cycle time reduction through...                             <ol style="list-style-type: none"> <li>Extended Process tank</li> <li>Process innovation &amp; Optimization</li> </ol> </li> <li>Carrying out project without stopping the regular Production</li> </ol>	

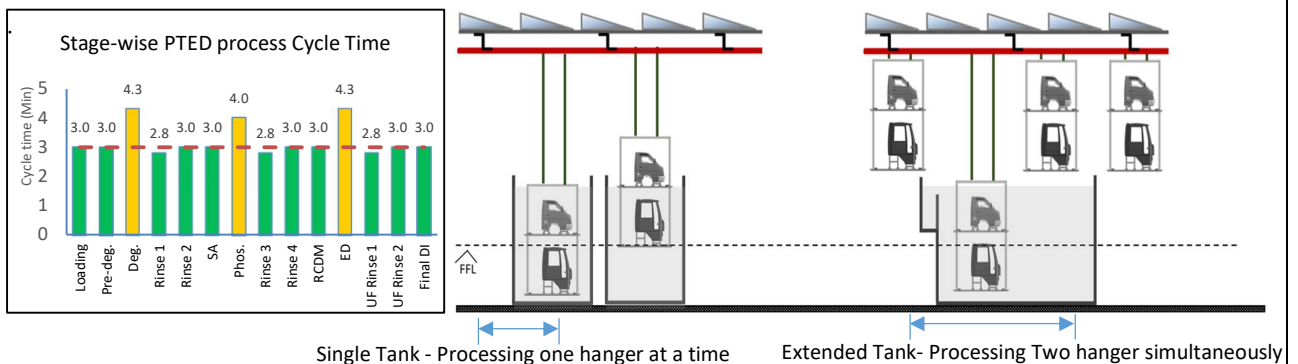
#### ① **Shop Floor Roof height constraint:**

**First challenge was to Load LCV cabin over cargo cabin (MCV) the hanger length needs to be increased and due to this cabin processing was not possible as shown below as roof height was constraint. To overcome this challenge team decided to go below the floor level so that hanger can move to the tanks and can get processed.**



#### ② **a. Extended Process tanks (Critical process):**

**Second challenge was cycle time which needed to be reduced. We have decided to do 2 improvements for cycle time improvement, in first improvement decided to increase the length of tank in bottleneck stages (Degreasing, Phosphating & Phosphating) so that 2 Hangers can get processed simultaneously. And another was new alternate innovative PT chemical introduction for process time reduction with other environmental benefits**

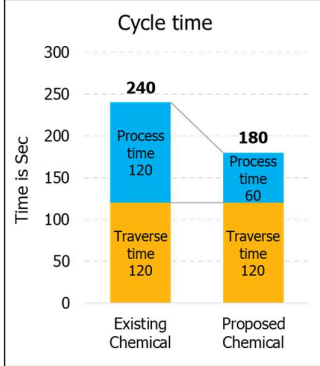


# IMTMA-ACE MICROMATIC PRODUCTIVITY CHAMPIONSHIP AWARDS 2024

## FORMAT FOR SUBMISSION OF CASE STUDY (Contd.)

### 3 **2 b. Process time reduction by implementing Innovative New Generation Chemicals**

New generation and Innovative pretreatment chemical introduced & reduce the Process time as below...



Inference: Process time to be reduced from 120 seconds to 60 seconds.

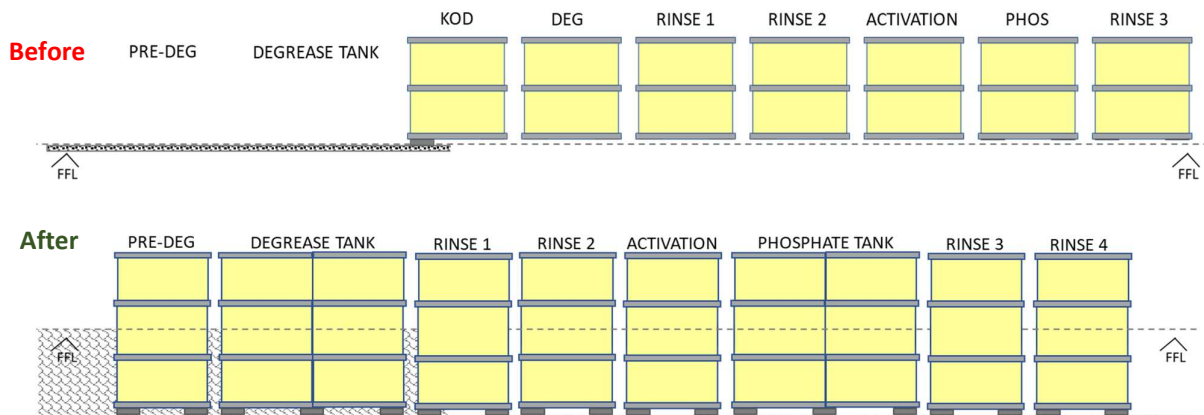
Parameter	Existing chemical	New generation chemical & Process optimization
Process time	120 sec	60 sec
Phosphate Coating wt.	2.5 gm/m <sup>2</sup>	2.0 gm/m <sup>2</sup> ✓
Phosphate crystal structure		
Phosphate crystal size	2 - 3 micron	1 - 2 micron
P-ratio (>90)	92	92
Salt spray test	Passes 1200 Hrs.	Passes 1200 Hrs.



### 4 **Implementation – (15 Points)**

#### **3 Carrying out project without stopping the regular Production**

Process tank installation in phased manner without affecting the regular production: There were 14 Tanks needed to be replaced by new tanks. It has been done in phased manner by dismantling old tanks, concrete flooring, installation of new tanks without affecting production.







# IMTMA-ACE MICROMATIC PRODUCTIVITY CHAMPIONSHIP AWARDS 2024

## FORMAT FOR SUBMISSION OF CASE STUDY (Contd.)

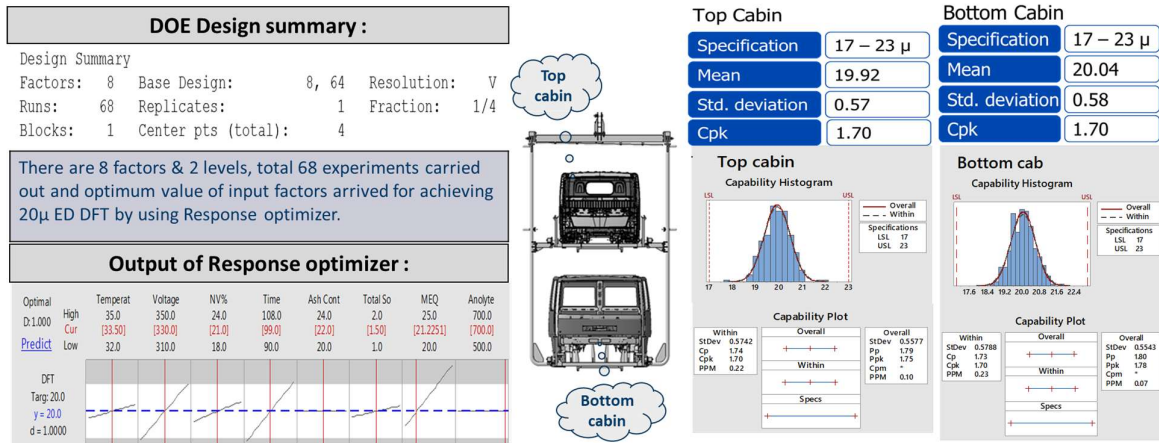
### 4 Implementation – (Continued)

All potential Risks Mitigated & action plans are worked out before implementing the project.

#	Solution	Potential risks	Risk mitigation plan	Resp	RYG
1	Replacement of old Process tanks with increased height.	Production disruptions during project phase	<ul style="list-style-type: none"> <li>Prefabricated tanks to reduce the shutdown period</li> <li>Identification of alternate sources for cabin painting as contingency arrangement</li> </ul>	CFT	
2		Safety risk for hot work inside paint shop	<ul style="list-style-type: none"> <li>Installation of isolation barriers.</li> <li>Ensuring 24X7 availability of safety and firefighting team</li> </ul>	CFT	
3		Increase in fallen dust deposition over cabin due to civil work	<ul style="list-style-type: none"> <li>Increase in checking frequency of bath parameters.</li> <li>Revision of rinse tank draining frequency</li> </ul>	CFT	
4		Intermediate Cabin drying due to increase in the travel time between process tanks	<ul style="list-style-type: none"> <li>Installation of mist spray in the new process tanks</li> </ul>	CFT	
5		May have effect on key characteristics performance	<ul style="list-style-type: none"> <li>Maintaining process capability</li> <li>Validation at every stage of the process</li> </ul>	CFT	
6		Variation in ED coating thickness between top & bottom cabin	<ul style="list-style-type: none"> <li>Anode positioning based on the cabin surface area</li> <li>Process parameter optimization by conducting design of experiments</li> </ul>	CFT	

### Process Optimization through DOE:

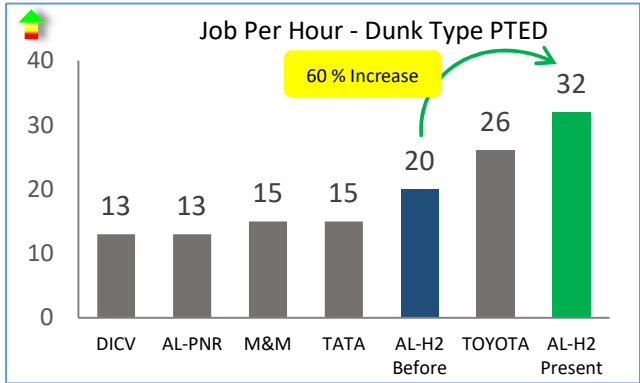
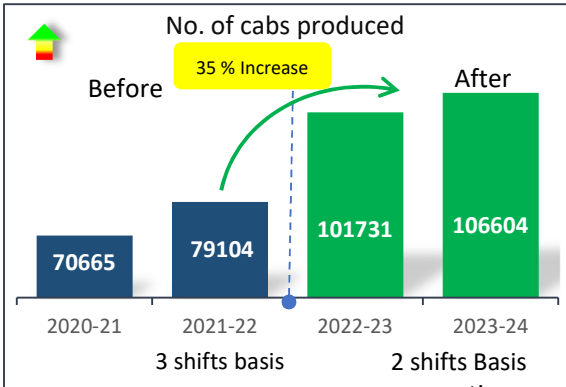
Design of experiment conducted to optimize process parameter to obtain required film thickness of ED coating.



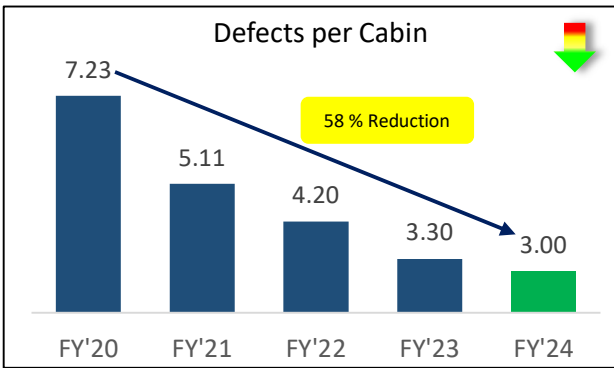
5

**Results / Impact. (20 points)**

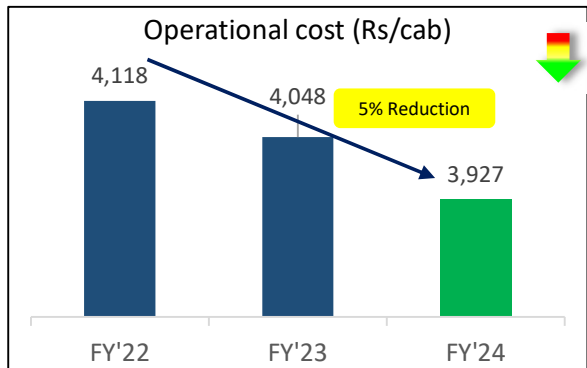
Mandatory parameters:	Before	After	Unit of Measurement
1. Productivity details:	20	32	Jobs per Hour
2. Reduction of rejects and rework	54	18	Cabin scrap/annum
3. Quality	2.0	0.4	Defect per cabin (PTED QG)
4. Direct Cost	4118	3927	Rs per cabin
5. Manpower cost	30000	27000	Rs./Vehicle (Entire plant one shift production cancelled due to productivity improvement in Paint shop which was major bottleneck)
6. Delivery	95	99	Service level percentage
7. Safety	0	0	No. of Reportable & non reportable injury
8. Production Capacity	125K	199K	Nos/annum @ 3 shift operation
9. Recurring cost saving	Rs. 32.03 crores per annum		
10. Capex avoidance (One time)	Rs. 130 Crores		
11. Opportunity Cost saving	Rs. 370 crores per annum		



After completion of the project, our Pre-treatment & Electrodeposition line productivity improved from 20 JPH to 32 JPH against benchmark auto OEM Toyota which is 26 jobs per hour in PTED Dunk system.



Defect per Cabin reduced by ~58 %



Operational cost reduced by ~ Rs. 191/cab



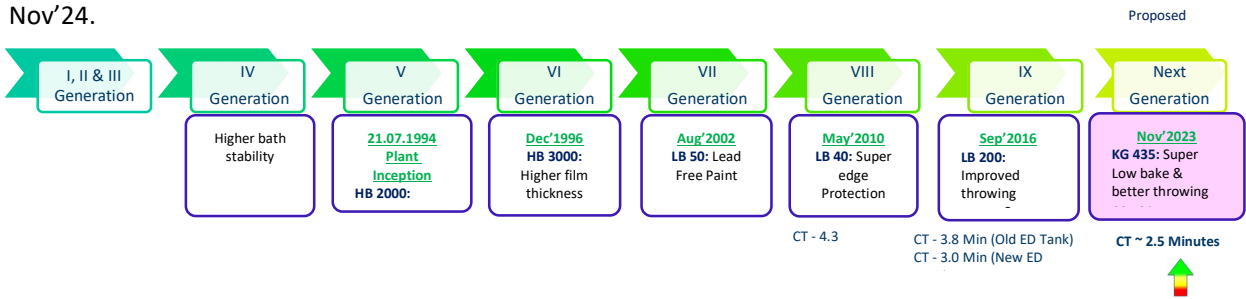
# IMTMA-ACE MICROMATIC PRODUCTIVITY CHAMPIONSHIP AWARDS 2024

## FORMAT FOR SUBMISSION OF CASE STUDY (Contd.)

### 6 Business Sustainability and Future Focus (5 Points):

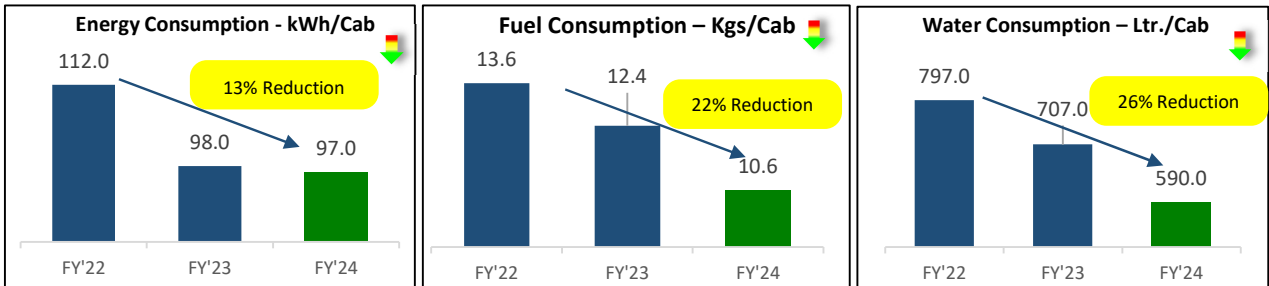
Ashok Leyland has moved ahead globally in CV sales from 24<sup>th</sup> position in 2018 to top 20 global CV maker in FY' 23 and well on the path of becoming top 10 global CV player which is our vision and this improvement in global positioning achieved through mainly increase in LCV sales which could be possible through this project also we could move **from 3<sup>rd</sup> position to 2<sup>nd</sup> position in Small commercial vehicle manufacturing in FY24.**

There is further scope for reduction of Cycle time from **3.0 minutes to 2.5 minutes** through implementing **Innovative super low bake ED paint (First time in India)**, which will increase the **capacity further 199K to 239K per annum & reduce Carbon emission.** Currently this project is under progress & expected to complete by Nov'24.

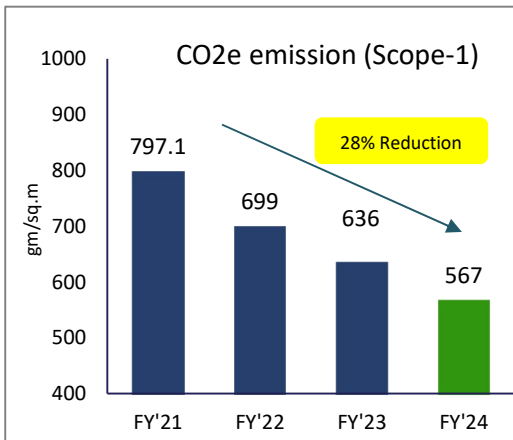


### 7 Resource impact. (10 points)

There is a significant reduction in Energy, Fuel and water consumption per cabin after the project.



Similarly, CO2 emission has reduced significantly from 797 gm/sq.m to 567 gm/sq.m and team has received International Quality Sustainability award for this improvement.



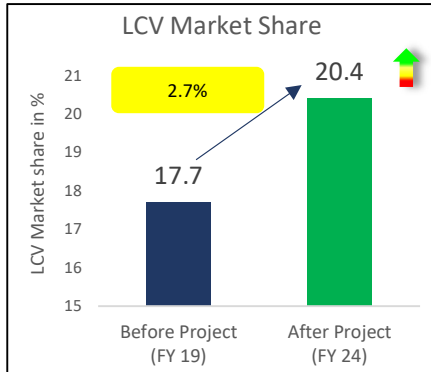


# IMTMA-ACE MICROMATIC PRODUCTIVITY CHAMPIONSHIP AWARDS 2024

## FORMAT FOR SUBMISSION OF CASE STUDY (Contd.)

### 8 Business metrics. (10 points)

Ashok Leyland market share has improved significantly & **AL has moved from 3<sup>rd</sup> position to 2<sup>nd</sup> position** in domestic LCV market (2-3.5 T segment) in 2024. In addition to this Ashok Leyland is moved to 20<sup>th</sup> position from 24<sup>th</sup> position in Global CV ranking.



### Small commercial Vehicles Market Share – FY 24

Player				
Market Share %	<b>20.4</b>	61.1	17.9	0.6
MS Change %	<b>▲0.8</b>	▲0.6	▼1.7	▲0.2

**ALL-TIME HIGH SCV MS**  
**EVER HIGHEST VOLUME OF ~67K**

### 9 Scope for horizontal deployment. (5 points)

As we have installed process tanks by going down 4 meter below floor level to process M&HCV Twin cabins in a hanger, similar way to install the new Topcoat line we have utilized the vertical empty space available in the shop floor which is shown below -

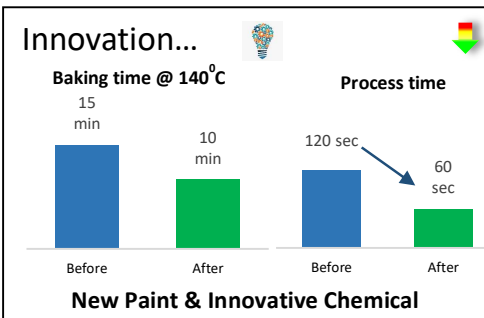


PTED tanks at 4 mtr depth pit



New Topcoat line in Mezzanine floor

Also Super low bake topcoat paint has developed (First time in auto industry) for optimized cycle time in Topcoat Baking Oven.



As painting/coating is involved in all type of industries, this project improvement like Twin loading, New generation Paint & Chemicals can be implemented in all auto OEMs, Consumer Durable companies, Home Appliance businesses etc. which will help in reducing Carbon emission, Power/fuel consumption, effluent generation reduction. If implemented in all Indian auto OEMs, will result in carbon emission reduction by 1.0 lakh MT per annum.

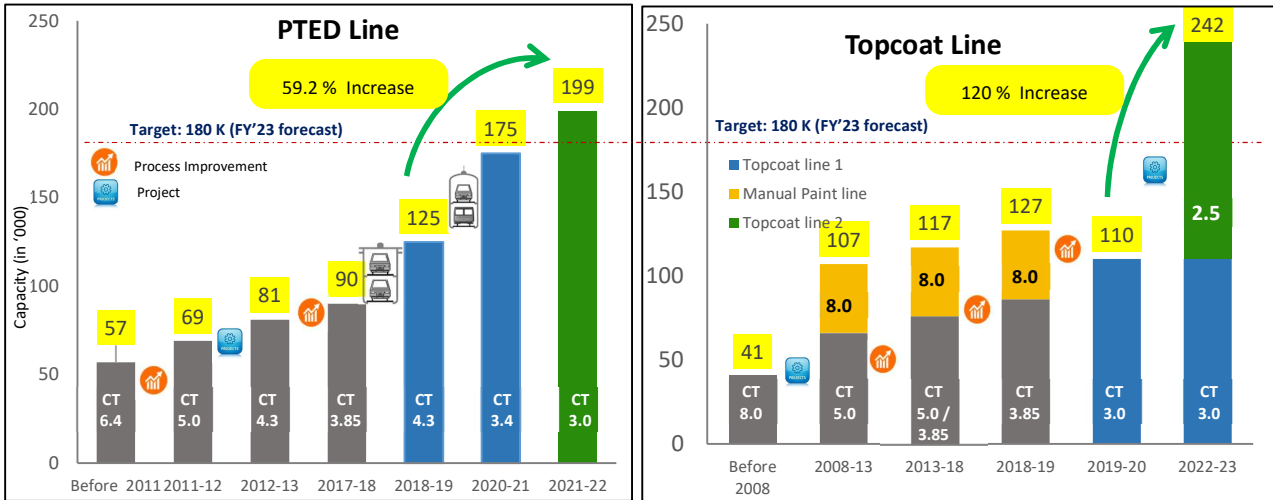


# IMTMA-ACE MICROMATIC PRODUCTIVITY CHAMPIONSHIP AWARDS 2024

## FORMAT FOR SUBMISSION OF CASE STUDY (Contd.)

### 9 Paint shop Production enhancement journey:

Production capacity of Pretreatment & Electro Deposition (PTED) as improved from 125K to 199K/annum, similarly Topcoat capacity has improved to 242 K/annum.



Other unique features of this projects are ...

- **First time in industry** Twin cabin loading concept introduced.
- **The highest Jobs per hour in the world** (32JPH) in dunk type Pre-treatment & Electrodeposition.
- We are the **First Indian OEM** introduced new Pre-treatment chemical having fine and compact phosphate coating which resulted Hazardous sludge generation reduction.
- **First time in India** to introduce innovative latest technology Super low bake paint, which resulted in CO<sub>2</sub>e emission reduction.
- **Productivity increase by 59% in PTED line and 120% in Top Coat line** in same premises has maximised utilisation of building and infrastructure.
- **Significant reduction** in Carbon emission, resource consumption (Fuel, energy, water etc).
- This project has direct positive impact on **UN Sustainability goals no 6, 9, 12 & 13**.
- Also there is scope of reducing **cycle time further from 3.0 minutes to 2.5 minutes** by introducing new generation ED paint first time in India to reduce oven time.

**The journey towards Process Innovations for Productivity & Sustainability improvements continues.....**