

IAQ QUALITY SUSTAINABILITY AWARD - ONE-PAGE SUMMARY

Project and contact details

The name of the quality sustainability project (max. 100 characters):

Steel coil width reduction of 'Frame Side Member' through product parameter optimization.

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Organisation(s), country, where the project-members are working, including Web-page links

Ashok Leyland Ltd, India <https://www.ashokleyland.com>

Project description

Essence of the Project and Problem Statement:

Steel is the major raw material for all type of automobile industries. Steel generation process (Metal mining) is not only a prime toxic polluter but also causes deforestation & defiles water bodies. Steel manufacturing from ores also consumes large amount of energy and emits toxic gas like CO & CO₂ etc. This project was initiated to reduce steel scrap and fresh consumption.

Mean value of flange height of **Frame Side Member (FSM)** was shifted towards higher side which was leading to high consumption of steel.

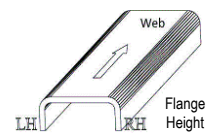
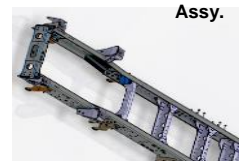
Project base line: 64.01 mm **Target:** 62 mm (spec = 62±3mm)

Methodology: Ashok Leyland, Pantnagar (ALP) has followed its 7 steps problem solving methodology & PDCA approach in this project for optimizing the steel coil width for manufacturing Truck FSM.

Analysis and Steps taken:

Trigger point of this project was initiated from FSM rejection due to excess flange height issue. Team has collected the FSM flange height data for process capability study. Study indicated that flange height mean (64.01 mm) has been shifted towards upper specification range (USL = 65 mm).

Total 09 potential causes for excess flange height issue were validated one by one using Gemba observation, hypothesis & regression tools and finally concluded that coil width is more than requirement. In this validation, 04 types of coils have been developed at supplier end for multiple trials at different M/C settings. Design of Experiment tool helped us to optimize the coil width by approx. 3mm (from 300mm to 297mm). Reduction in coil width helped to achieve desired FSM flange height (62.08 mm from 64.01 mm).



Result Achieved:

- 1) Water consumption and effluent generation reduced by 191700 KL annually
- 2) FSM average weight reduced from 140.83 Kg/ FSM to 139.42 Kg/ FSM (1.41 Kg reduction/ FSM)
- 3) Total 462.88 Tons of steel saved till May'23 through this project. Coal consumption reduced by 2176 Tons annually.
- 4) Carbon footprints reduced by 498 Tons annually
- 5) Recurring BOM (bill of material) cost saving- 3.15 Cr cum till May 23 (FY22 – 1.03 Cr, FY23 – 1.85 Cr).
- 6) FSM rejection PPM reduced from 3750 to 0 (Zero) for excess flange height defect.

Relevance to UN Sustainability Goals:

GOAL 4.4.1: Enhancement in Technical knowledge (Product & Process) along with advanced statistical tools covering teams of Ashok Leyland (02 plants) and 03 steel suppliers.

GOAL 6.3: Water consumption and effluent generation reduced by 191700 KL annually which helped in preservation of natural resources for next generation.

GOAL 7: Huge heat required to process the ores into steel. Coal consumption reduced by 2176 Tons annually.

GOAL 13.2.2: Greenhouse gases (CO₂) emission reduced. Carbon footprints reduced by 498 Tons annually.

GOAL 15.1.1: Mining takes place for steel ore & Limestone which rise the deforestation. Mining reduced by 1088 Tons & 272 Tons annually respectively.

Project Start and Completion date: The project started on 01.04.2020 and completed by 25.09.2021.

Quality Methods and tools used: Process Capability, Measurement System Analysis, Hypothesis tests (2-Sample t test, Paired t Test), Cause and effect diagram, Linear regression & Design of Experiment

Project leverage potential

This project could be replicated in other organization globally of metallic parts and FSM manufacturing plants. Project has been horizontally deployed at Ashok Leyland Hosur 2 plant.

Picture/Image describing the project

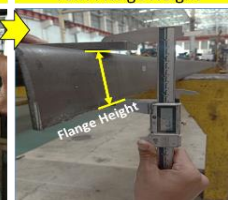
FSM Raw Material (Steel Coil)



Coil width



FSM Flange Height



Improvement

#	Before	After
Coil Width	300 mm	297 mm
Flange Height	64.01 mm	62.08 mm

Saving:
462.88 Tons of steel saved worth 3.15 Cr till 30th May'23