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Kaizen Presentation

Kaizen Theme: Paint Shop Muda Activity Elimination

Date of Implementation: 17.05.2025

Productivity
Quality
Cost
Delivery
EHS

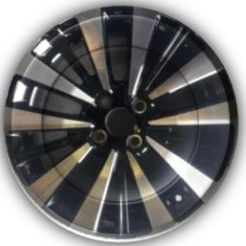
**Cost &
Delivery**

Company Introduction

Name: UNO MINDA LTD
(AW4W- LPS Division)

Product : 4W Alloy Wheel

Product Photograph & function



T00W
16 x 6.5 J



HONDA



Team Introduction



Name: Logeshwaran

Designation: Sr. Officer

Department:
Manufacturing



Name: Yogeshwaran

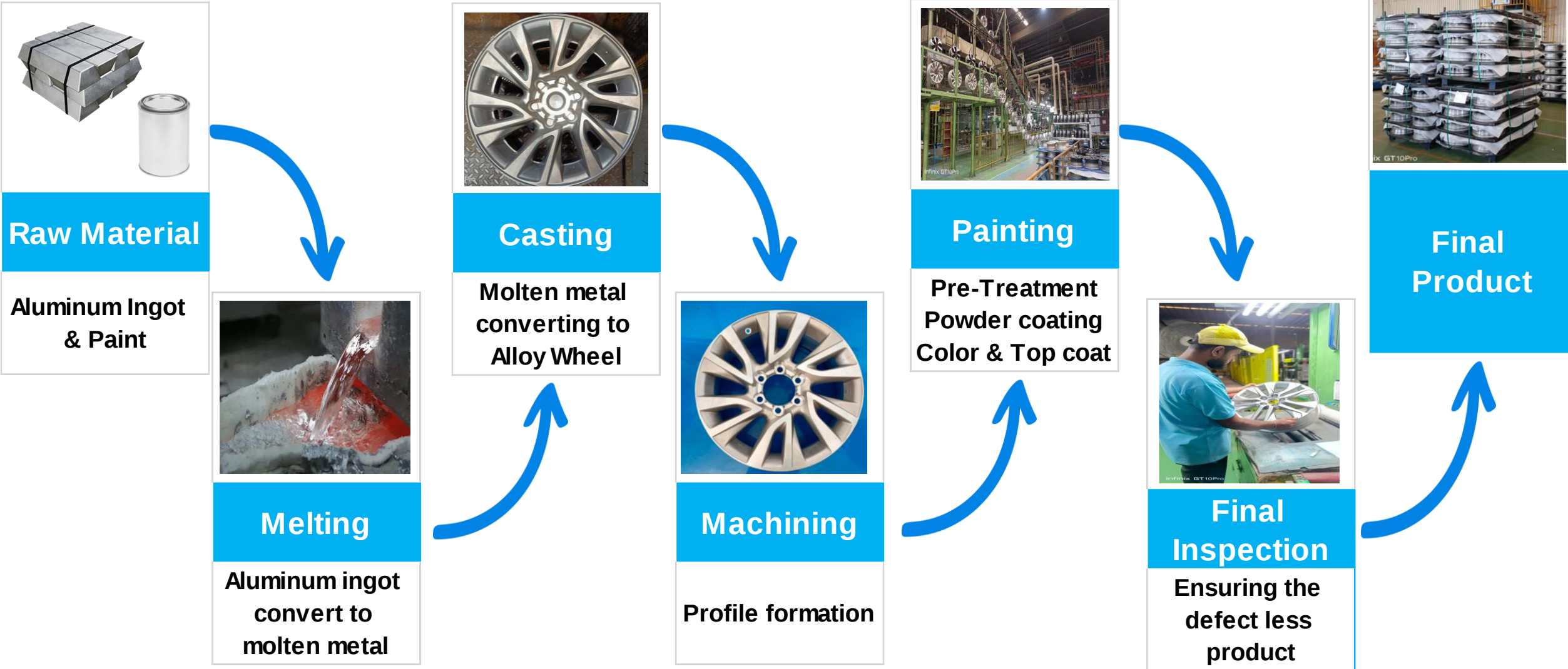
Designation: Associate

Department:
Paintshop



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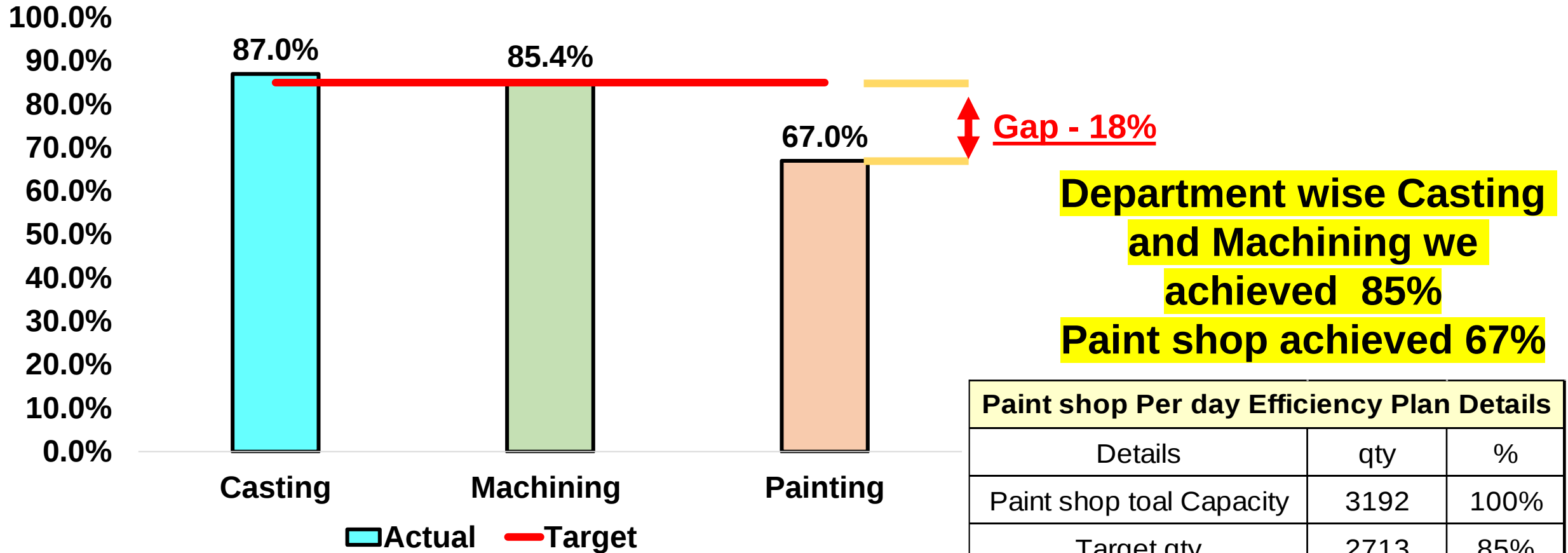
Manufacturing Process Flow





1. PROBLEM STATEMENT

Department Wise Efficiency Details

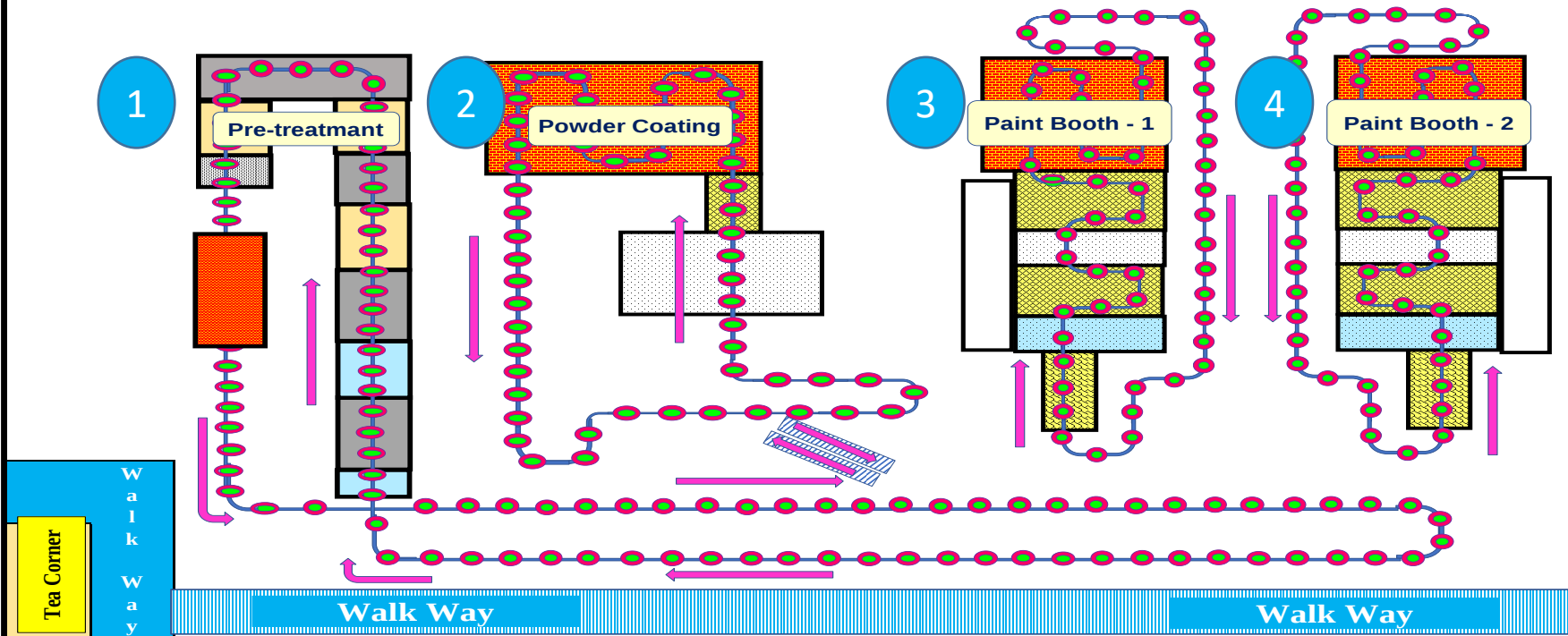


Paint shop Per day Efficiency Plan Details		
Details	qty	%
Paint shop toal Capacity	3192	100%
Target qty	2713	85%
Actual qty	2140	67%
Gap Qty	-573	-18%



2A. Observations

Paintshop Process Flow Chart& Capacity Details



Paintshop Line Wise Capacity Details

Location		Hooks per Hanger	Cycle Time in Sec	Jigs Per hour	100% Capacity per day	85% Capacity per day
Pre treatment	Bottom Hanger	1	27	133	3192	2713
	Top Hanger	1	27	133	3192	2713
Powder line		1	27	133	3192	2713
Paint	Booth -1	1	27	133	3192	2713
	Booth – 2	1	27	133	3192	2713

We have 2 types of painting process

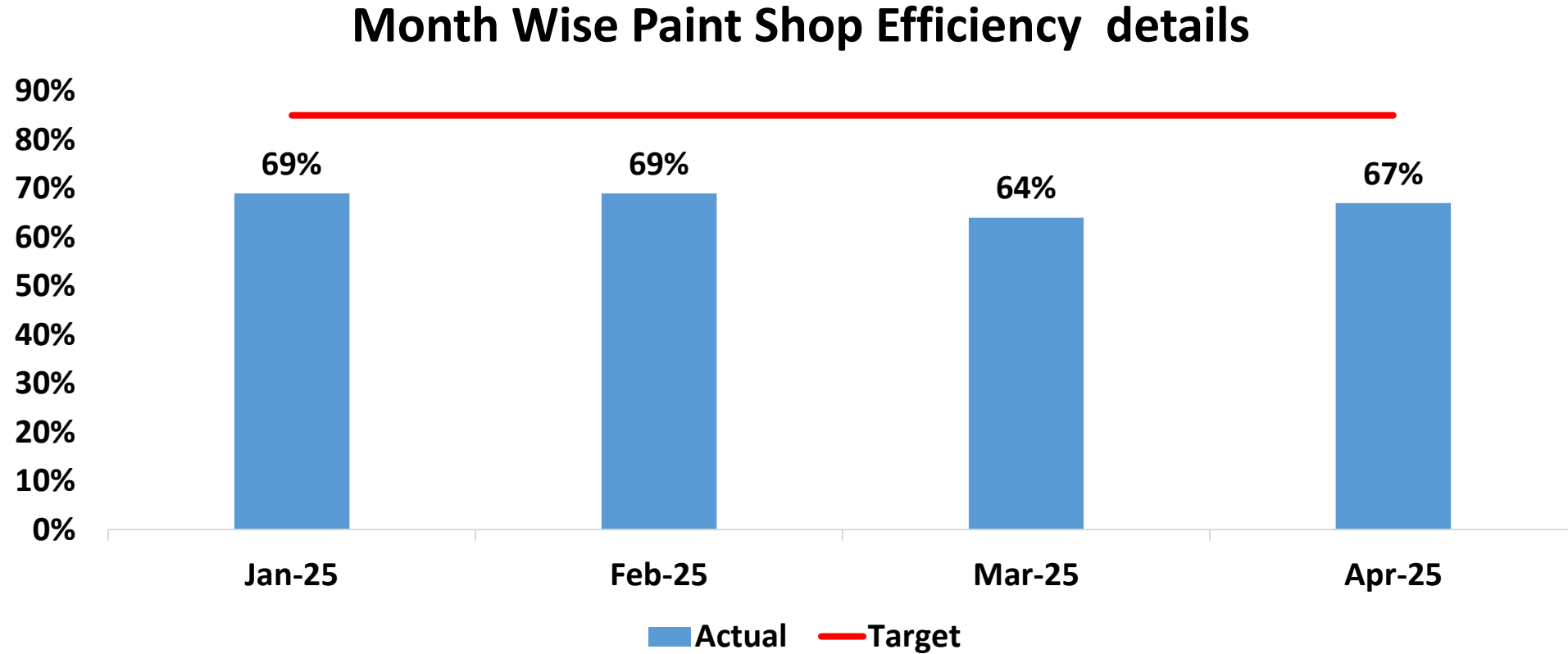
Direct	1 - Time Paint process
Indirect (Diamond cut)	2 - Time Paint process

In our process Pre – Treatment line and Painting process we have double capacity for 2 Time paint process wheel



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2B. Month Wise Paint Shop Efficiency details



Jan25 to Apr-25 Paint shop avg efficiency - 67%

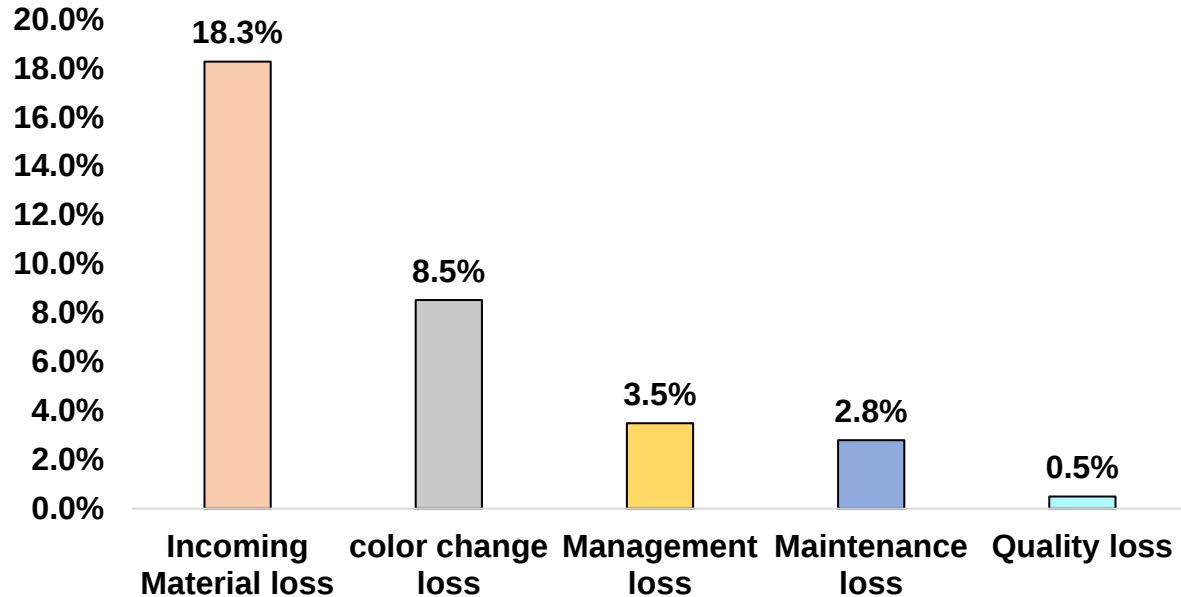
Efficiency target - 85%

Paint shop efficiency loss 18%



2C.Efficiency Loss Break up Trend

Paint shop Efficiency Loss Break Up Trend for 33%



Efficiency Loss Break up Trend

Loss Matrix	Details	Gap in qty
Incoming Material loss	Paintshop capacity high compare to machine shop	583
color change loss	Due to WIP shortage color change frquency increase	128
Management loss	Muda activity high	112
Maintenance loss	Power cut and Air pressure low	89
Quality loss	Paint spray volume adjustment	16
Total Avg Loss per day Qty		928



2D. Paint shop Current condition

- ☐ Paint shop color change frequency high 68nos per day.
- ☐ Paint loading qty standardized 80nos.
- ☐ Wheel storage capacity 540nos. Wheel storage layout not defined.
- ☐ Paint wastage increase during color change process & Paint Sludge qty increased
- ☐ Paint shop operator ergonomics high during loading and unloading



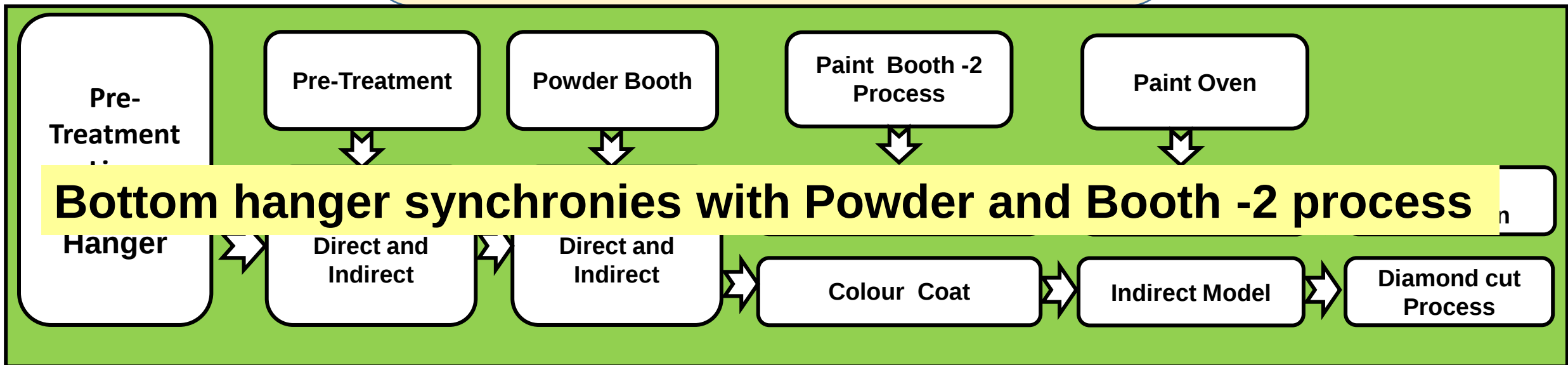
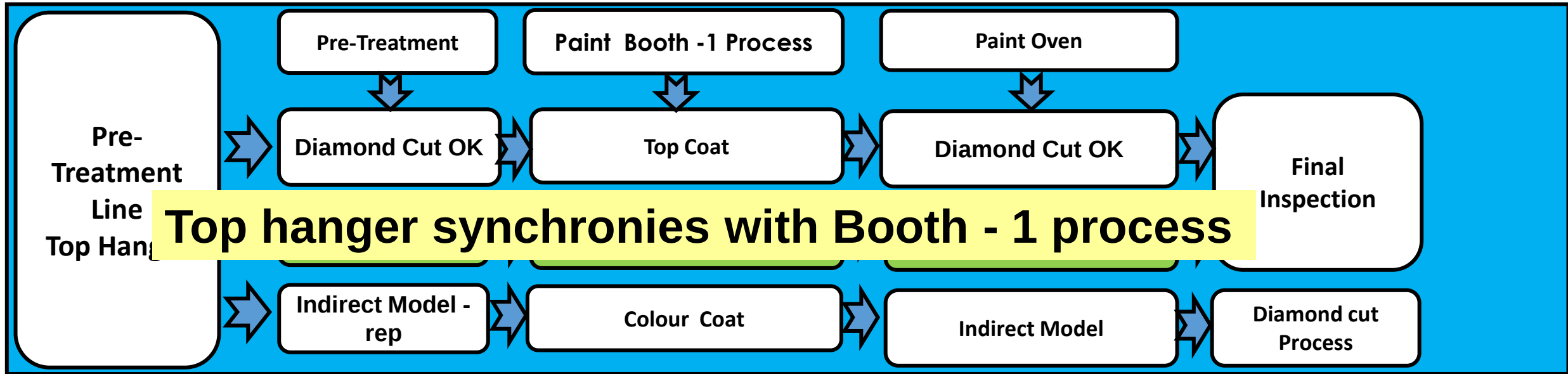
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3. This are the identify Improvement point smooth Pattern Production Operation

- ☐ Paint shop wheel process flow need to standardized (Direct and Indirect model)
- ☐ Color change frequency Reduce.
- ☐ Model wise loading lot size need to increase and standardized the layout for wheel storage.
- ☐ Operator engagement & efficiency improve.
- ☐ Paint wastage to reduce the sludge generated.



4A.Paint Shop Process Flow Standardized

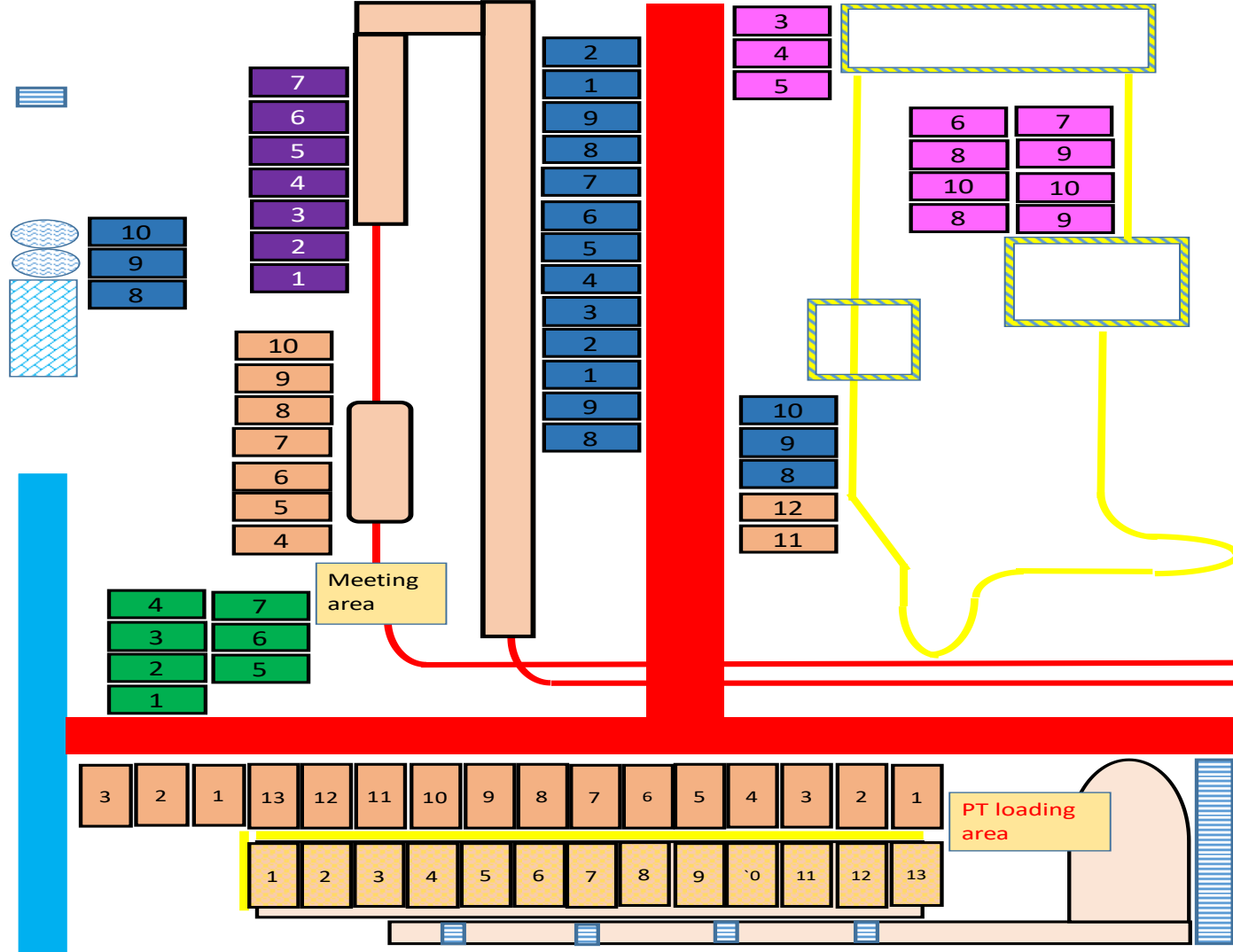




4B.Paint shop Wheel Storage Layout Model Wise



PT LOADING WHEEL PALLETAIZATION LAYOUT



Palletaization Layout Details

Location	Model	Qty	Pallet Qty	Total Qty	Colour code
Preinspection	All Model Palletaization	30	4	120	
PT Opp	874W	35	12	420	
PT Opp	874W	35	3	105	
Dojo Left side	874W	35	7	245	
Sanding Booth Near	874W	35	2	70	
PT Oven Near	560B 16"	54	7	378	
PT line right	560B 16"	54	2	119	
Meeting Opp	874W & PY1B	35	7	245	
DM plant near	PY1B	54	3	162	
PT & Sanding Inbetween	PY1B	54	3	162	
PT & Sanding Inbetween	PY1B	54	2	108	
PT & Sanding Inbetween	PY1B	54	2	108	
PT & Sanding Inbetween	PY1B	54	2	108	
Powder oven bottom	665B	54	3	162	
Powder Booth Left side	665B	54	5	270	
Powder Booth Left side	665B	54	3	162	
Engg Testing back side	874W	35	7	245	
Total		834	76	3297	

Paint shop Wheel storage capacity - 3297no's



4C.Paint Shop Pattern Calculation Sheet

Paint Booth-2 Fresh Wheel Weekly Pattern Calculation Sheet

Colour	part NO	Weekly (Qty)	DC TIME (min)	Req Qty / day	C/T (sec)	Lot size	Cavity	KANBAN /HOUR	PRO HOUR (h)	DC+PRO HOUR (h)	1-(daily) 2-(1/2day) 3-(1/3day) 4-(1/4day) 6-(1/w) 12-(1/2w) 24-(1/M)	Qty / BIN	Safety stock (day)	Total no of KANBAN	Pattern no of Kanban	operation (H/1W)
	874	1890	8	310	30.0	155	1.0	120.00	1.3	1.4	0.50				155	17.10
	880	180	8	310	30.0	155	1.0	120.00	1.3	1.4	0.50	1	0.00	155	155	17.10
	880	180	8	310	30.0	155	1.0	120.00	1.3	1.4	0.50	1	0.00	155	155	17.10
	665B (B)	1980	8	310	30.0	155	1.0	120.00	1.3	1.4	0.50	1	0.00	155	155	17.10
			8	310	30.0	155	1.0	120.00	1.3	1.4	0.50	1	0.00	155	155	17.10
			8	160	30.0	80	1.0	120.00	0.7	0.8	0.50	1	0.00	80		
	16	660	30.0	330	30.0	330	1.0	120.00	2.8	2.9	0.50	1	0.00	330		
Total		13770	56	2370			W.H/D			W.D/W		W.H/W		EFF		129.7
							24			6		144.00		90%		

Customer Requirement Per Weekly

Model Wise Lot size standardized

Loading pattern chart prepared

Based on Customer req per day wise plan qty calculated

Booth-2 Process Efficiency Plan

Based on the customer weekly demand daily pattern may be change



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4D.Paint Shop Pre- Treatment Booth-2 Process Wise Kanban Sheet

PT Line Bottom Loading Pattern - Kanban

	Model	PY1B (B)	C-Gap	T00W (B)	C-Gap	665B (B)	C-Gap	32NA (B)	C-Gap	874W	C-Gap	32NA	C-Gap	LO2B & 560B-	C-Gap	PY1B (B)	C-Gap	T00W (B)	C-Gap	665B (B)	C-Gap	32NA (B)	C-Gap	874W	C-Gap	32NA	C-Gap	LO2B & 560B-	C-Gap	Direct	OP-3 Base	Colour Gap	Total
14 to 19 July-25	Plan Qty	155	15	155	15	155	15	155	15	158	15	80	15	220	15	155	15	155	15	155	15	155	15	158	15	80	15	440	15	1136	1240	210	2586
	Cycle time Min	70	8	70	8	70	8	70	8	72	8	36	8	99	8	70	8	70	8	70	8	70	8	72	8	36	8	198	8	568	620	105	1293

Powder Booth Loading Pattern - Kanban

	Model	PY1B (B)	C-Gap	T00W (B)	C-Gap	665B (B)	C-Gap	32NA (B)	C-Gap	874W	C-Gap	32NA	C-Gap	LO2B & 560B-	C-Gap	PY1B (B)	C-Gap	T00W (B)	C-Gap	665B (B)	C-Gap	32NA (B)	C-Gap	874W	C-Gap	32NA	C-Gap	LO2B & 560B-	C-Gap	Direct	In Dircet	Colour Gap	Total
14 to 19 July-25	Plan Qty	155	15	155	15	155	15	155	15	158	15	80	15	220	15	155	15	155	15	155	15	155	15	158	15	80	15	440	15	1136	1240	210	2586
	Cycle time Min	70	8	70	8	70	8	70	8	72	8	36	8	99	8	70	8	70	8	70	8	70	8	72	8	36	8	198	8	568	620	105	1293

Booth-2 loading pattern - Kanban

	Model	PY1B (B)	C-Gap	T00W (B)	C-Gap	665B (B)	C-Gap	32NA (B)	C-Gap	874W	C-Gap	32NA	C-Gap	LO2B & 560B-	C-Gap	PY1B (B)	C-Gap	T00W (B)	C-Gap	665B (B)	C-Gap	32NA (B)	C-Gap	874W	C-Gap	32NA	C-Gap	LO2B & 560B-	C-Gap	Direct	In Dircet	Colour Gap	Total
14 to 19 July-25	Plan Qty	155	15	155	15	155	15	155	15	158	15	80	15	220	15	155	15	155	15	155	15	155	15	158	15	80	15	440	15	1136	1240	210	2586
	Cycle time Min	70	8	70	8	70	8	70	8	72	8	36	8	99	8	70	8	70	8	70	8	70	8	72	8	36	8	198	8	568	620	105	1293

KANBAN Guideline :

- 1) PT line Bottom Hanger wheel Plan for Booth-2 (PT line Bottom Hanger plan for Fresh wheel).
- 2) Any KANBAN change means Communication to Department HOD or Pattern preparation team get approval (With out approval not change the pattern).
- 3) Number off Colour change & Major abnormalities point also write in remarks column.

4) Kanban loading Plan qty Vs FG qty details write Sheet Back side. If found gap means take countermeasure to achieve the plan target qty

- 5) Pattern loading planned qty not avilable means that model change to last .Don't distrub the pattern production loading plan.
- 6) Planned gap time ensure the line 2S and cleaning.



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4E.Paint Shop Pre- Treatment and Booth-1 Process Wise Kanban Sheet

Paint Booth-1 OP-3 & Dircet Wheel Weekly Pattern Calculation Sheet

Colour	Model	Weekly (Qty)	DC TIME (min)	Req Qty / day	C/T (sec)	Lot size	Cavity	KANBAN/ HOUR	PRO HOUR (h)	DC+PRO HOUR (h)	1- (daily) 2 - (1/2day) 3 - (1/3day) 6 - (1/w) 12 - (1/2w) 24 - (1/M)	Qty / BIN	Safety stock (day)	shot lot	Total no of KANBAN	Pattern no of Kanban	Operation (H/1W)
Top Coat	T00W (OP-3)	8676	8	1446	30	362	1.0	120.17	3.01	3.15	0.25	1.00	0.00	362			
	PY1B (OP-3)																
	665B (OP-3)																
	32NA (OP-3)																
	975W	1980	8	330	30.0	83	1.0	120.73	0.7	0.8	0.25	1	0.00	83			
	Reprocess	3216	8	536	30.0	134	1.0	120.00	1.1	1.3	0.25	1	0.00	134		134	30
Total		13872	24	2312	180		W.H/D			W.D/W		W.H/W		EFF			125.2
							24			6		144.00		87%			

Booth-1 Process Efficiency Plan

Pre - Treatment Line Botton Loading Pattern - Kanban

	Model	PY1B (OP-3)	T00W (OP-3)	665B (OP-3)	32NA (OP-3)	C-Gap	975W	C-Gap	Repr oces s	C-Gap	PY1B (OP-3)	T00W (OP-3)	665B (OP-3)	32NA (OP-3)	C-Gap	975W	C-Gap	Repr oces s	C-Gap	PY1B (OP-3)	T00W (OP-3)	665B (OP-3)	32NA (OP-3)	C-Gap	975W	C-Gap	Repr oces s	C-Gap	PY1B (OP-3)	T00W (OP-3)	665B (OP-3)	32NA (OP-3)	C-Gap	975W	C-Gap	Repr oces s	C-Gap	Direct	OP-3 Base	Colour Gap	Total
14 to 19 July-25	Plan Qty	90	90	90	90	15	83	15	134	15	90	90	90	90	15	83	15	134	15	90	90	90	90	15	83	15	134	15	90	90	90	90	15	83	15	134	15	868	1440	90	2398
	Cycle time Min	41	41	41	41	8	38	8	61	8	41	41	41	41	8	38	8	61	8	41	41	41	41	8	38	8	61	8	41	41	41	41	8	38	8	61	8	396	656	48	1100

Paint Booth-1 loading pattern - Kanban

	Model	PY1B (OP-3)	T00W (OP-3)	665B (OP-3)	32NA (OP-3)	C-Gap	975W	C-Gap	Repr oces s	C-Gap	PY1B (OP-3)	T00W (OP-3)	665B (OP-3)	32NA (OP-3)	C-Gap	975W	C-Gap	Repr oces s	C-Gap	PY1B (OP-3)	T00W (OP-3)	665B (OP-3)	32NA (OP-3)	C-Gap	975W	C-Gap	Repr oces s	C-Gap	PY1B (OP-3)	T00W (OP-3)	665B (OP-3)	32NA (OP-3)	C-Gap	975W	C-Gap	Repr oces s	C-Gap	Direct	OP-3 Base	Colour Gap	Total
14 to 19 July-25	Plan Qty	90	90	90	90	15	83	15	134	15	90	90	90	90	15	83	15	134	15	90	90	90	90	15	83	15	134	15	90	90	90	90	15	83	15	134	15	868	1440	90	2398
	Cycle time Min	41	41	41	41	8	38	8	61	8	41	41	41	41	8	38	8	61	8	41	41	41	41	8	38	8	61	8	41	41	41	41	8	38	8	61	8	396	656	48	1100

Pattern Guideline :

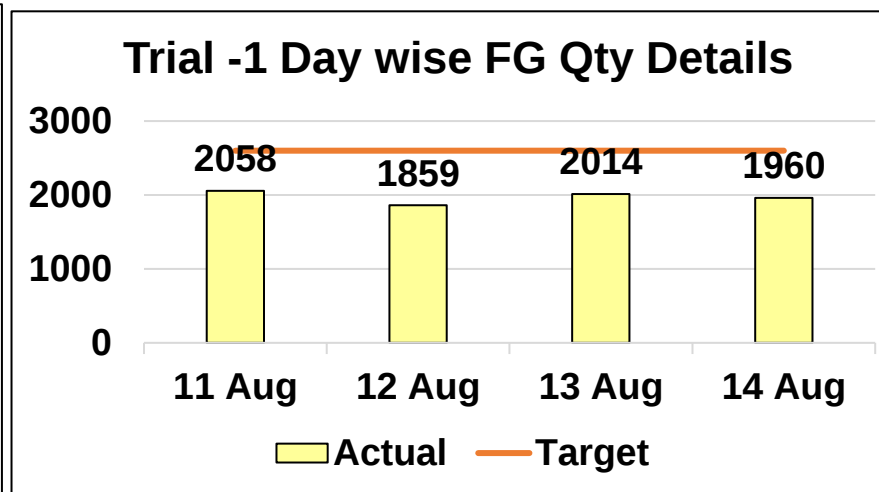
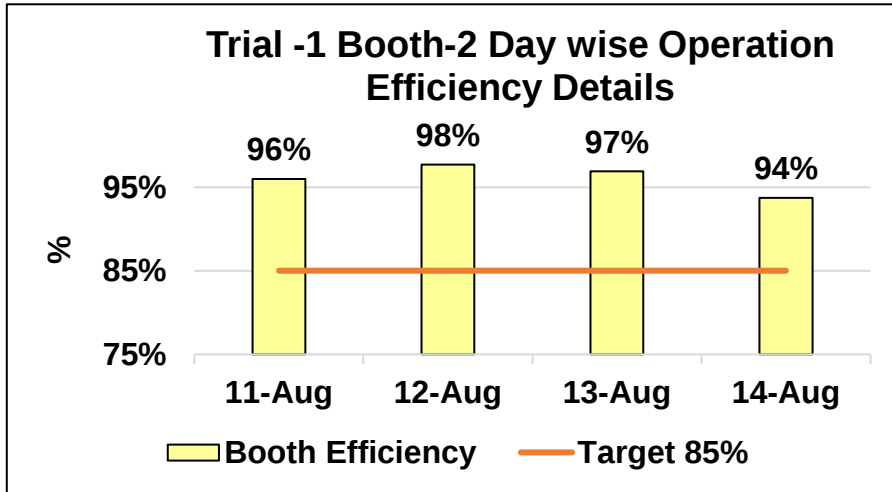
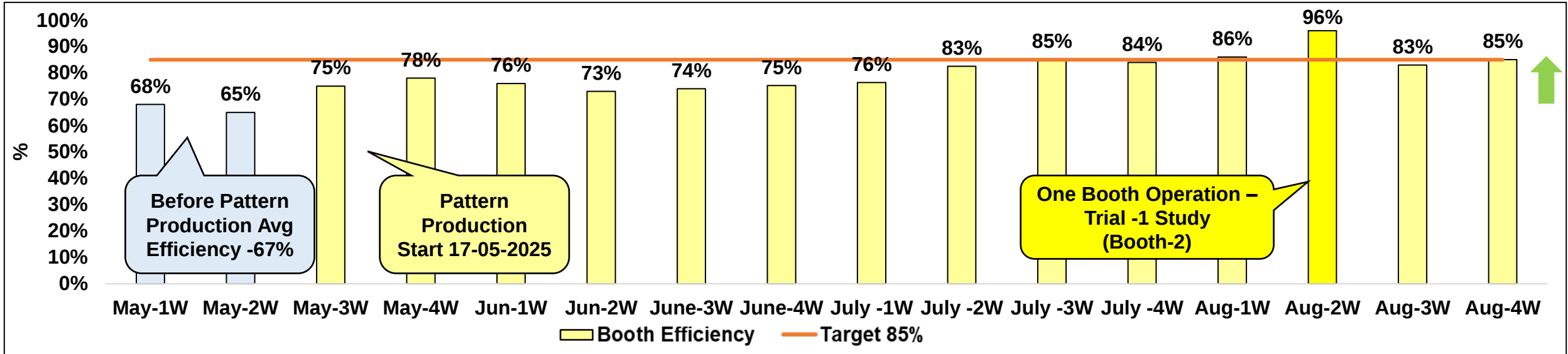
1) PT line Bottom Hanger wheel Plan for Booth-2 (PT line Bottom Hanger plan for Fresh wheel).
2) Any pattern change means Communication to Department HOD or Pattern preparation team get approval (With out approval not change the pattern).
3) Number off Colour change & Major abnormalities point also write in remarks

4)Sheet Back side write pattern loading qty Vs FG qty .If found gap means take countermeasure to achieve the plan target qty
5) Pattern loading planned qty not avilable means that model change to last .Don't distrub the pattern production loading plan.
6) Planned gap time ensure the line 2S and cleaning.



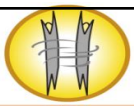
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5. Pattern Production Performance Study



Trial-1 Pattern production Result			
Model Details	Expected	Avg Actual	Status
Booth-1 Performace	Not Running		
Booth-1 Performace	85%	96%	✓
Fg qty	2600	1972	✗

Pattern trial-1 performance study calculated to maintain booth efficiency 85% to 96%
Customer demands could not meet, due to Booth-1 not utilized

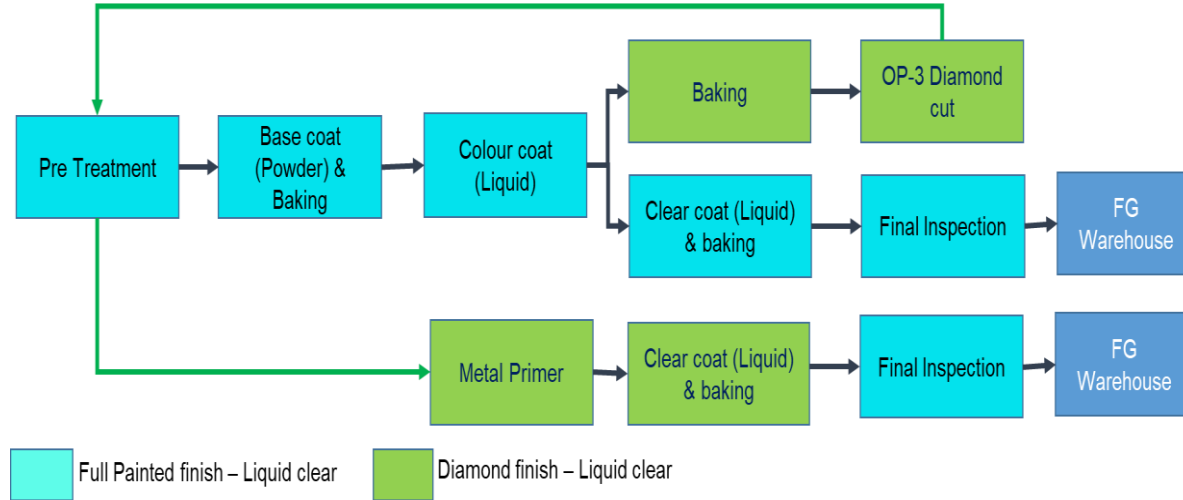


6A.IMPROVEMENT ACTION - 1

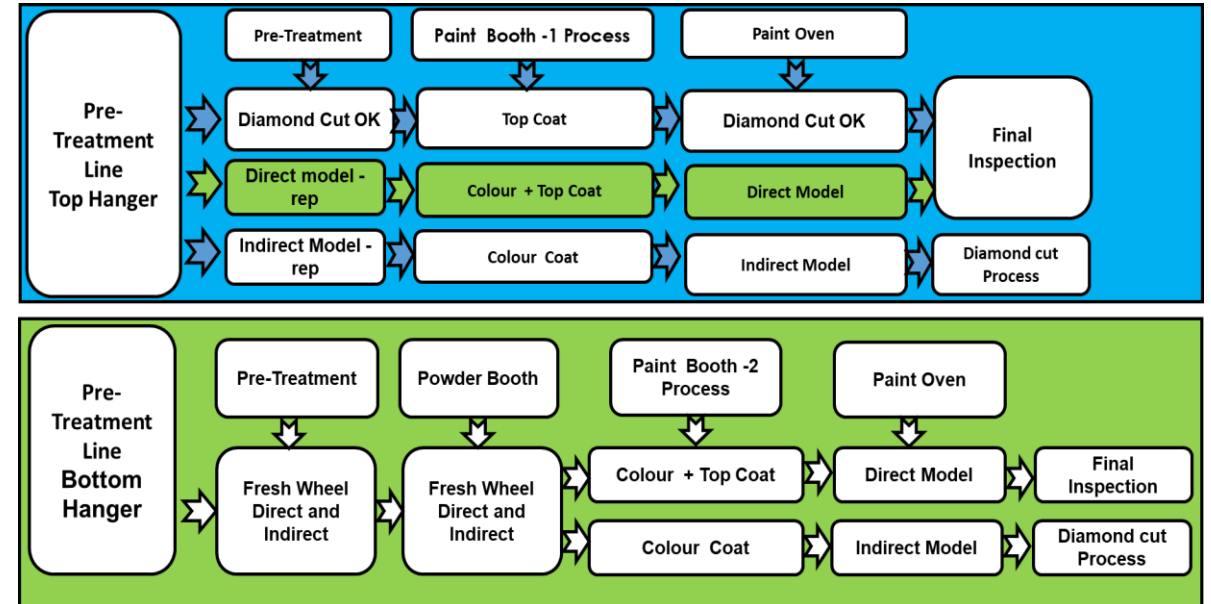
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THEME : Paint shop wheel process flow need to standardized (Direct and Indirect model)

BEFORE CONDITION



AFTER CONDITION



GAPS/PROBLEMS :

1. Direct and Indirect Model painting process flow not standardized booth wise
2. So Loading and unloading operator facing more fatigue increase

KAIZEN :

- 1) Pre-treatment to Painting process Fresh wheel Direct and Indirect model process standardized.
- 2) Reprocess wheel process easy to identified.
- 3) Loading and Unloading operator fatigue reduced

RESULT : Direct and Indirect model process flow easy to understand operator

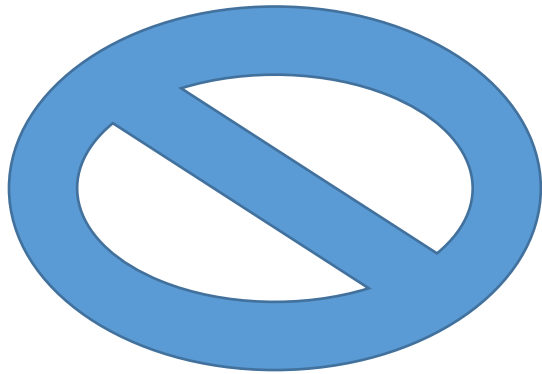


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6B.IMPROVEMENT ACTION - 2

THEME : Paint shop wheel storage capacity increased

BEFORE CONDITION

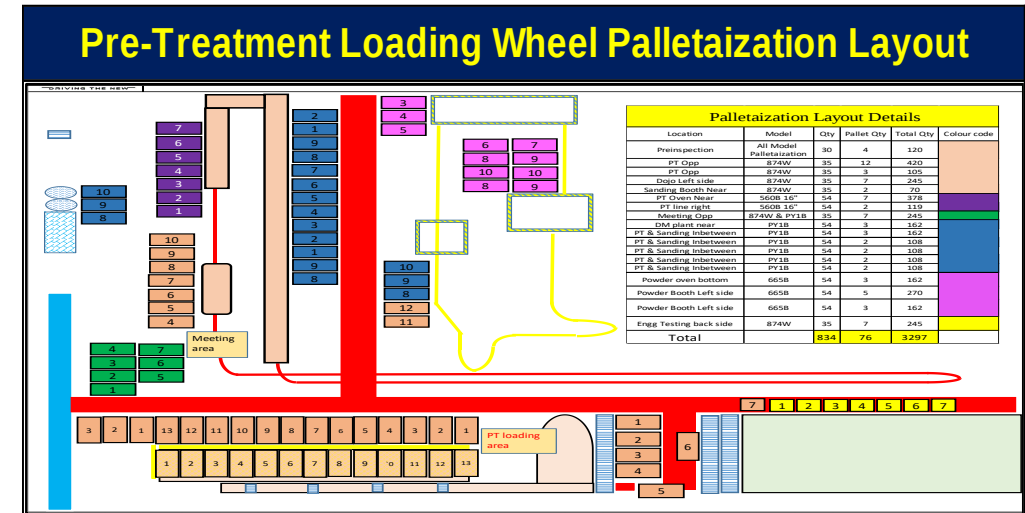


Model wise location not defined

GAPS/PROBLEMS :

- 1.Paintshop wheel Storage capacity 580nos.
- 2.Wheel storage layout not defined .So operator difficult to understand the wheel storage location

AFTER CONDITION



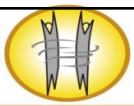
Model wise layout location standardized

KAIZEN :

- 1) Paint shop wheel storage capacity increase 580 to 3297nos
- 2) Paint shop inside model wise wheel storage layout display. So operator easy to understand the wheel storage location

RESULT : 1.Operator fatigue reduced.

2. Paint shop empty space utilization improved



6C.IMPROVEMENT ACTION - 3

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THEME : Painting Production lot size improvement

BEFORE CONDITION

Model Wise Masking summary

Model	Masking Type	Per wheel Masking requireme	Masking Available qty	Number of wheel Possible
874W	Big	5	900	180
T00W	Tapper	4	825	206.25
PY1B	Small	4	984	246
665B	Big	4	1160	290
32NA	Tapper	4	1120	280
L02B	Small	4	1160	290
560B 16	Big	5	1300	260

AFTER CONDITION

Model Masking Summary

Model	Masking Type	Per Wheel masking requireme	Masking Available qty	Number of wheel possible to paint	New Masking Purchased
874W	BIG	5	2065	413	
T00W (B)	Tapper	4	2056	514	
PY1B	SMALL	4	1856	464	
665B	BIG	4	2065	516	
32NA OP-3	Tapper	4	1850	462	
32NA Direct	Tapper	4	1790	447	
L02B	SMALL	4	1856	464	
560B-16	BIG	5	2065	413	

GAPS/PROBLEMS :

1.Avg painting qty lot size 265nos

KAIZEN :

1) Avg painting qty lot size increased 445nos

RESULT : 1.Masking material shortage elimination.
2.Lot size increase 265 to 445



THEME : Pattern Kanban system implemented to increase production

BEFORE CONDITION

[illegible]

AFTER CONDITION

Booth Wise Pattern Calculation Sheet

Paint Booth-2 Fresh Wheel Pattern Calculation Sheet																	
Colour	part NO	Weekly	DC TIME (min)	Req'd day	C/T (sec)	Quantity	1 - (part) 2 - (12345) 3 - (12345) 6 - (12345) 12 - (12345)	Q/BIN	Safety stock (lbs)	PRO HOUR (h)	DC+PRO HOUR (h)	lot size	shot lot	KANBAN HOUR	Total no of KANBAN	Pattern no of Kanban	opp (H/W)
	874W	1980	8	315	30.0	1.0	0.5	1	0.00	1.3	1.4	158	158	120.38	158	158	17.4
	700W (S)	1980	8	310	30.0	1.0	0.5	1	0.00	1.3	1.4	155	155	120.00	155	155	17.1
	PY19 (S)	1980	8	310	30.0	1.0	0.5	1	0.00	1.3	1.4	155	155	120.00	155	155	17.1
	663B (S)	1980	8	310	30.0	1.0	0.5	1	0.00	1.3	1.4	155	155	120.00	155	155	17.1
	32NA (S)	1980	8	310	30.0	1.0	0.5	1	0.00	1.3	1.4	155	155	120.00	155	155	17.1
	32NA Direct	960	8	160	30.0	1.0	0.5	1	0.00	0.7	0.8	80	80	120.00	80	80	9.6
	LR25 & 568B %	3600	8	660	30.0	1.0	0.5	1	0.00	2.8	2.9	330	330	120.00	330	330	34.6
	Total	13770	56	2375	150.0					W/H	W/D	W/H/W		EFF			130.0
										24	6	144.00		90%			

Updated KANBAN Sheet

PT Live Bottom Loading Pattern

Time	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Start	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
End	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Unit	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Unit	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Unit	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Unit	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Unit	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Unit	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Unit	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Unit	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
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Unit	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Unit	Unit	1																		

GAPS/PROBLEMS :

1.Paint shop day wise production plan released monthly once.

KAIZEN :

1) Based on monthly production plan. Weekly and Day wise production pattern sheet prepared.

RESULT : 1.Paint shop efficiency improved 67% to 85%
2. Paint unwanted Muda activity reduced



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6E.IMPROVEMENT ACTION - 5



THEME : Reduce the paint sludge generation

BEFORE CONDITION

Paint Sludge cost details Apr to May-25

Process Details	Nos	Unit
Apr to May 25 paint Sludge generated	14800	KG
Based on Fg %	13	%
Sludge disposal cost paying to vendor per kg - 11Rs	162800	Rs
Sludge disposal Avg cost per month	81400	Rs

AFTER CONDITION

Paint Sludge cost details Jun to Nov-25

Process Details	Nos	Unit
Apr to May 25 paint Sludge generated	28367	KG
Based on Fg %	7.9	%
Sludge disposal cost paying to vendor per kg - 11Rs	312037	Rs
Sludge disposal Avg cost per month	52006	Rs

GAPS/PROBLEMS :

- 1.Due to color change frequency high paint wastage increase.
- 2.Operator awareness need to improve.

KAIZEN :

- 1) Color change frequency reduced 34 to 14nos
- 2) Paint wastage reduced 13% to 7.9%
- 3) Sludge disposal cost saving per month –Rs 29400
- 4) Sludge disposal cost saving per year –Rs 352800

RESULT : 1.Paint sludge generated reduced 13% to 7.9%
 2.Paint cost saving Rs29400 per month
 3.CO2 generation reduces

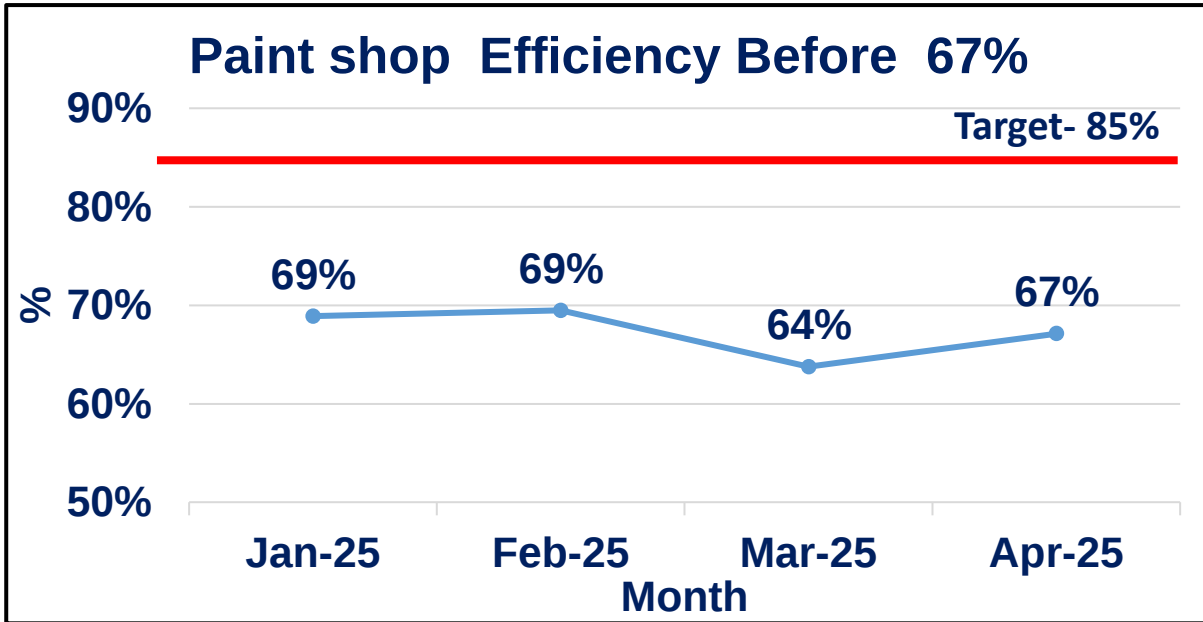


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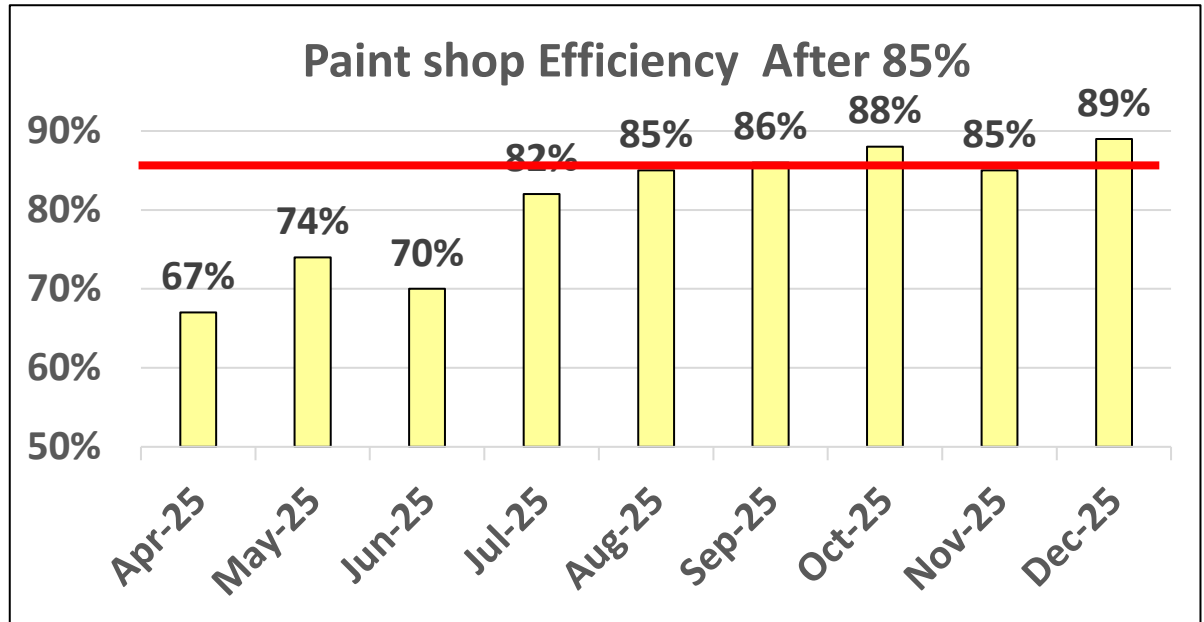
6F.IMPROVEMENT ACTION - 6

THEME : Paint shop efficiency improvement

BEFORE CONDITION



AFTER CONDITION



GAPS/PROBLEMS :

- 1) Color change frequency high.
- 2) Paint wastage increase
- 3) Booth efficiency not achieve

KAIZEN :

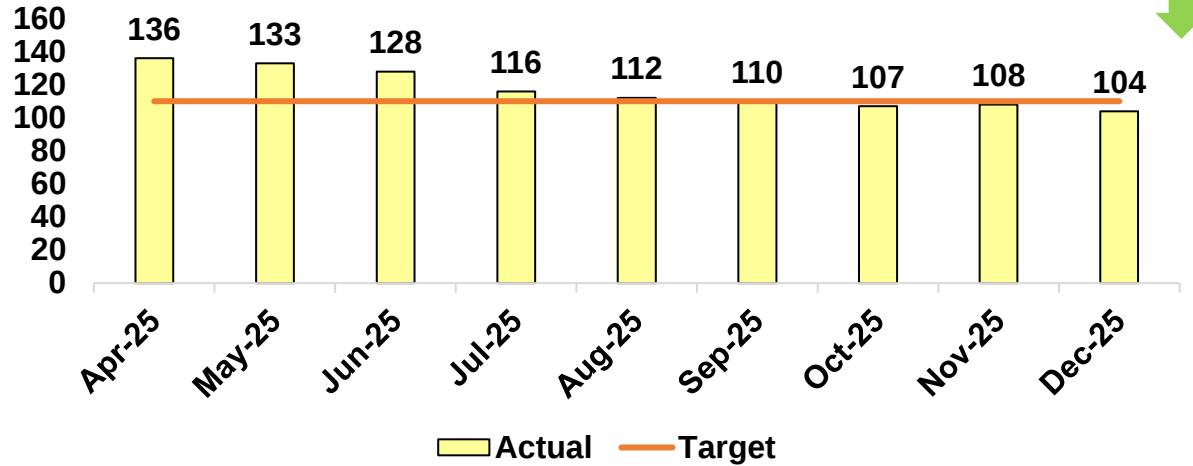
- 1) Paint shop booth efficiency increase
- 2) Paint cost per wheel reduce
- 3) Color change frequency reduce

RESULT : Paint shop efficiency avg increased 67% to 85% and paint cost per wheel reduced

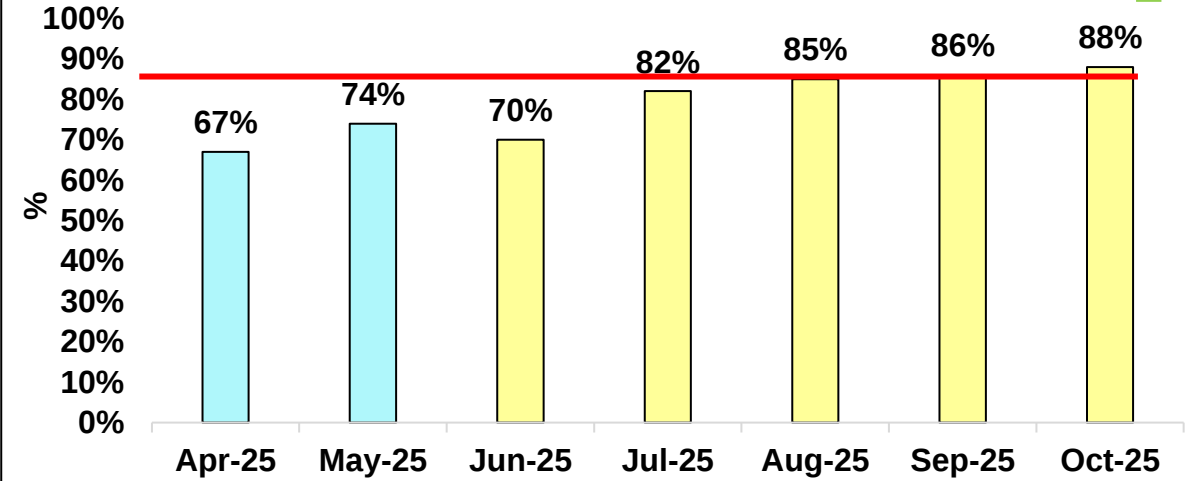


7. Pattern Production Benefits point

Paint Cost Per Wheel Month wise



Paint Shop Efficiency Month Wise Target – 85%



Pattern Production Expected Benefits

S.No	Activity Details	Expected	Actual	Result
1	Lot Production to reduce color change frequency	Paint consumption reduce	Color change frequency Redued 17 litters (1liter = Rs386) of paint wastage saved per day Cost saving of Rs. 6,562 per Day	✓
2	Paint shop efficiency improve from 67%	Target - 85%	Paint Shop Efficiency achieve improved	✓
3	Reprocess % reduce	Target -9%	Over all paint reprocess reduced from 15% to 12%	⚠
4	Stop and Start time operator engagement improve	TPM activity improve	During start up and shut down no Break down	✓



8. Sustenance

Permanent & Systematic action for Prevention

- ☐ Every Monday, Weekly pattern production plan is released based on customer requirements
- ☐ Every Monday, Wheel storage layout is reviewed, modified as per the plan & displayed on the line
- ☐ Paint shop booths 1 and 2 are planned to run six days a week as per the weekly schedule.



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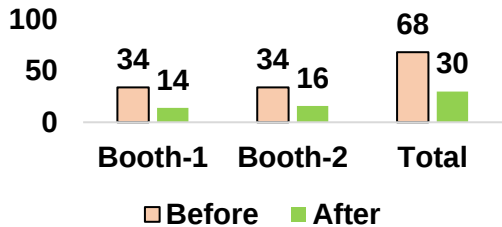
Kaizen Presentation

Benefits

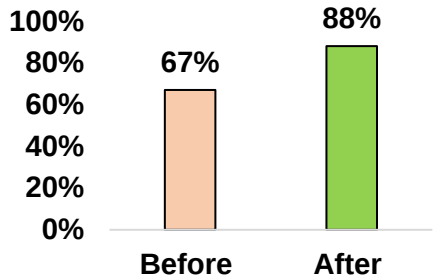
Pls tick ✓ the benefits in below heads

Productivity up %				Quality			Cost Saving In Rs/month		Delivery			EHS			
Process	Material yield improvement	Space saving (sq. ft.)	Other	Rejection reduction (%)	Poka yoke	Others	Direct	Notional	Lead Time reduction	Customer delivery rating improvement	Others	Effect on Environment	Human Safety	Machine safety	Others
✓							✓			✓		✓			

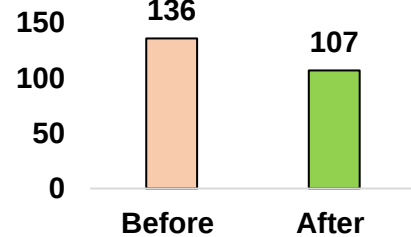
Reduce color change frequency



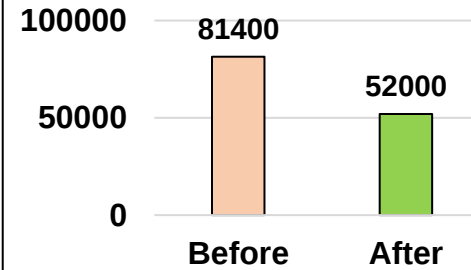
Paint Shop Efficiency



Wheel Per Paint Cost



Sludge generation



Cost Saving

- Cost saving of Rs. 1,87,080 per Month
- Cost saving of Rs. 22,44,960 per year

Result:

- Paint shop process strengthen to achieve the customer requirement
- Paint sludge generation reduced
- LPG consumption reduced by utilized the booth efficiency

Horizontal Deployment

- Pattern production system needs to be implemented in the casting and machining areas.
- Casting and machining area process flow needs to be standardized based on GDC and flow forming techniques to ensure quality and efficiency.



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Kaizen Presentation

THANK YOU