

Final Evaluation Report
On
EVALUATION STUDY

AT
MYSORE PAINTS AND VARNISH LTD.

(A Govt. of Karnataka Undertaking)
New Bannimantap Extension
Mysore - 570015

BY



NATIONAL PRODUCTIVITY COUNCIL

NATIONAL PRODUCTIVITY COUNCIL

(Ministry of Commerce and Industry, Govt. of India)

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Karnataka Evaluation Authority

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ACKNOWLEDGEMENT

We wish to place on record our sincere thanks to **The Principal Secretary**, Department of Public Enterprises, Government of Karnataka for having given us the opportunity to conduct an Evaluation study at M/s. Mysore Paints and Varnish Ltd., Mysore.

We are grateful to **The Chief Evaluation Officer**, Karnataka Evaluation Authority, Government of Karnataka for providing critical inputs for the Evaluation study.

We express our sincere thanks to **The Managing Director** and **The General Manager** of Mysore Paints and Varnish Ltd., Mysore for providing valuable inputs and timely coordination during the study.

We acknowledge the valuable time & effort spared and the timely provision of the information & data, by all the Officers and Staff of Mysore Paints and Varnish Ltd., Mysore during the study.

We also credit all the employees for their cooperation to the NPC team during the study.

Bangalore
27.10.2014

C. Narendra
Dy. Director and
Head, NPC, Bangalore

Reply to issues raised by the 13th Technical Committee meeting of Karnataka Evaluation Authority on the Evaluation of the performance of the Mysore paints and Varnish Ltd, Mysore.

Issue 1. Suggest Specific Recommendations for Replacement of Old Machines.

Reply 1

The machines mentioned in the Annexure I, are not in use due to obsolete technology or non-availability of spares or product obsolescence. Secondly, the machines/ equipments available for manufacture of paints in demand are not fully utilised. The following table shows the utilisation of machines/ equipments for the period April 2013 to December 2013.

No. of Batches produced in each Machine for April - December 2013							
Sl. No.	Equipment / Machine		Total of batches produced	Average no. of batches / Month	Min. no. of batches / Month	Max. no. of batches / Month	% Util.
1	Ball Mill-1		119	14	7	26	53%
2	Ball Mill-2		38	5	0	10	17%
3	Ball Mill-3		48	6	1	16	21%
4	Attritor Mill-1		45	5	2	9	20%
5	Attritor Mill-2		63	7	3	13	28%
6	Pot Mill-1		47	6	3	8	21%
7	Pot Mill-2		8	2	0	3	4%
8	Pot Mill-3		0	0	0	0	0%
9	Clear Coat (Manual Mixing)		14	2	0	7	6%
10	High Speed	Coal Tar Black	20	3	0	6	9%
11	Mixer	White	17	2	0	9	8%
Utilisation of Machine is based on the Calculation			(No. of Batches per Month) / (Total Shifts / (25 working days * 9 months) (considering 1 batch is produced in one man- shift))				

Therefore, it is recommended to first utilise the available machines and equipments to 75% or more before planning to purchase new machines. The company can purchase Attritor Mills based on the capacity and rating required, as these machines are more efficient.

Issue 2. Suggest Specific Recommendations for Marketing Aspects of the paints.

Reply 2.

1. The company sells most of its product as Institutional sales.
2. It has registered with itself as a Vendor with most of the customers such as Central & State Public Sector Undertakings viz., ASRTU-New Delhi, Rail wheel Factory, Yelahanka, BHEL, BEML, KSRTC, KAVIKA etc.
3. The company is also participating in the e-tendering process of various organisations through e-portal such as www.eproc.karnataka.gov.in, www.tenderwizard.com, www.ireps.gov.in, www.tenders.gov.in, **Error! Hyperlink reference not valid.** etc.
4. Product customisation has been a continuous process at MPVL,
5. The company is also maintaining a Regional Office at Bangalore and Sales Depot at Mysore and Madurai for retail sales and booking orders.
6. The business growth of company is achieved by increasing the target of sales turnover by 10% over previous year.
7. The data regarding the tenders for the above period for tenders not awarded to the MPVL were analysed and found that quality was not issue, however the price were 10 to 40 % more than the competitor (L1). The data collected for year 2012 - 13 is shown in Appendix – IX of the report

Therefore, it is recommended to that the company improve its market share by the following methods

1. Reduce the cost of the product through
 - a. Use of lean manufacturing techniques which basically helps in identifying the wastes in all activities of the company
 - b. Improve Man-Machine productivity through Productivity Study.
 - c. Involve Paint Technologist and improve R & D activities through engaging permanent Paint Technologist and R & D employees
2. To engage Marketing professionals and increase marketing team. The team may be provided with specific targets.
3. To the company may plan to increase yearly Sales Turnover by 15 % instead of the current practice of 10 %, which would be in line with the market growth.
4. To explore the possibility of re-entering the decorative paints segment, this has larger demand and higher profit margins compared to the Industrial paints segment.
5. To explore feasibility of online sales of paints.
6. To provide Total solutions to organisations and individuals consumers, from selection of paints, manufacture, supply of paints, painting at customer end and after sales services.
7. To retain clients from the neighbouring states on continual basis.
8. To conduct regular painters meet to appraise them of various paints products and develop loyalty to Mysore Paints
9. To build brand through advertisement and customer services.

Issue 3. Profitability of Industrial Paints and that of Indelible Ink needs to be detailed and analysed.

Reply 3.

The following table 1 gives details of the Cost at Sales and Net Sales Realisation for various Product Groups as provided by Cost Accountant to Mysore Paints and Varnish Ltd., Mysore in the year 2013.

Table 1 - Profitability Analysis as per Data provided by Cost Accountant						
Sl. No.	Product Group	Product Type	Quantity Sold	Rate Per Unit (Rs.)		
				Cost at Sales (2012-2013)	Net Sales Realisation (2012-2013)	Profit/ (Loss)
1	Paints and Varnishes	Acrylic Washable Distemper	2069 kgs.	112.27	37.01	(75.27)
2	Paints and Varnishes	Anti-Corrosive Bitumen, Insulating Varnish, Paints	290278.5 Ltrs.	164.37	151.65	(12.71)
3	Inks & Colours	Indelible Ink (Domestic)	6175.56 kgs.	11228.71	12402.61	1173.90
4	Inks & Colours	Indelible Ink (Export)	2908.01 kgs	11614.71	13966.27	2351.56
5	Colours, Dyes & Pigments	Aluminium Paste	81 kgs.	265.06	315.42	50.36
6	Plasters & fillers	Stiff Paste	11511 Kgs.	95.97	97.84	1.87
7	Wax & Wax Products	Sealing Wax	6480.54 Kgs.	243.68	303.44	59.77
8	Wax & Wax Products	Polish	377.5 Ltrs.	225.19	184.37	(40.83)
9	Misc. Chemicals Products	Thinners	83740 Ltrs.	141.01	99.76	(41.25)

The above table shows losses in the paint categories; therefore the product category must be sub-divided for costing. The Table 2 below is further analysis of the despatches using Cost Price given by cost accountant and Price list of Mysore Paints and shows that the trend of products giving profits.

Table 2 - Profitability Analysis for Despatch during April - December 2013

Sl. No.	Despatches during April 2013 - December 2013	UOM	Qty. / Pack	No. Of Packs	Total Sales Qty.	Selling Price (Rs.)	Sales Realisation (Rs.)	Cost of Sales per unit (Rs.)	Total Cost of Sales (Rs.)	Profit/ Loss (Rs.)	Profit/ Loss per unit (Rs.)
1	Indelible ink	cc	5	127907	639.535	90.00	11511630.00	57.10	7303489.70	4208140.30	32.90
2	Indelible ink	cc	10	426073	4260.73	142.00	60502366.00	114.20	48657536.60	11844829.40	27.80
3	Hardener for Polyurethane paints	Ltrs.	1	1739	1739	648.00	1126872.00	164.37	285839.43	841032.57	483.63
4	Mylac Polyurethane paints (Reds)	Ltrs	4	631	2524	2300.00	1451300.00	164.37	414869.88	1036430.12	410.63
5	Mylac Polyurethane paints	Ltrs.	1	14	14	543.50	7609.00	164.37	2301.18	5307.82	379.13
6	Mylac Polyurethane paints	Ltrs	4	1559	6236	2100.00	3273900.00	164.37	1025011.32	2248888.68	360.63
7	Silicon Aluminium Paint	Ltrs.	20	4	80	9980.00	39920.00	164.37	13149.60	26770.40	334.63
8	Clear Coat for PU paints and Metallic Paints	Ltrs.	1	10	10	400.00	4000.00	164.37	1643.70	2356.30	235.63
9	Clear Coat for PU paints and Metallic Paints	Ltrs	4	315	1260	1520.00	478800.00	164.37	207106.20	271693.80	215.63
10	Specialities	Ltrs	1	2	2	313.50	627.00	164.37	328.74	298.26	149.13
11	Sealing Wax - 1st Grade/ Schamic Green	Kgs	0.45	10340	4653	175.00	1809500.00	243.68	1133843.04	675656.96	145.21
12	Primer Surfacer Grey	Ltrs	4	377	1508	1220.00	459940.00	164.37	247869.96	212070.04	140.63
13	Primer Surfacer Grey	Ltrs.	1	14	14	305.00	4270.00	164.37	2301.18	1968.82	140.63
14	Mylac Cholorub Chemical Resisting Paint	Ltrs	20	2	40	5520.00	11040.00	164.37	6574.80	4465.20	111.63
15	Specialities	Ltrs.	4	270	1080	963.33	260099.10	164.37	177519.60	82579.50	76.46
16	Synthetic Enamel	Ltrs	0.5	2	1	116.50	233.00	164.37	164.37	68.63	68.63
17	Epoxy Paints	Ltrs.	4	63	252	921.00	58023.00	164.37	41421.24	16601.76	65.88

Contd..2

Table 2 - Profitability Analysis for Despatch during April - December 2013											
Sl. No.	Despatches during April 2013 - December 2013	UOM	Qty. / Pack	No. Of Packs	Total Sales Qty.	Selling Price (Rs.)	Sales Realisation (Rs.)	Cost of Sales per unit (Rs.)	Total Cost of Sales (Rs.)	Profit/ Loss (Rs.)	Profit/ Loss per unit (Rs.)
18	Brindavan General Purpose Synthetic Enamel	Ltrs	0.5	8	4	113.50	908.00	164.37	657.48	250.52	62.63
19	Specialities	Ltrs	20	15	300	4453.33	66799.95	164.37	49311.00	17488.95	58.30
20	Epoxy Paints	Ltrs	20	459	9180	4360.00	2001240.00	164.37	1508916.60	492323.40	53.63
21	Synthetic Enamel	Ltrs.	1	249	249	215.00	53535.00	164.37	40928.13	12606.87	50.63
22	Polyester Putty	Ltrs	1	3940	3940	210.00	827400.00	164.37	647617.80	179782.20	45.63
23	Brindavan General Purpose Synthetic Enamel	Ltrs.	1	614	614	204.50	125563.00	164.37	100923.18	24639.82	40.13
24	Aluminium Paints	Ltrs	4	194	776	770.00	149380.00	164.37	127551.12	21828.88	28.13
25	Thinner	Ltrs	4	501	2004	671.60	336471.60	141.01	282584.04	53887.56	26.89
26	Synthetic Enamel	Ltrs	4	3232	12928	751.50	2428848.00	164.37	2124975.36	303872.64	23.51
27	Brindavan General Purpose Synthetic Enamel	Ltrs	4	1794	7176	743.50	1333839.00	164.37	1179519.12	154319.88	21.51
28	Mylac Polyurethane paints (Hammer tone)	Ltrs.	20	16	320	3660.00	58560.00	164.37	52598.40	5961.60	18.63
29	Thinner	Ltrs.	1	23	23	158.00	3634.00	141.01	3243.23	390.77	16.99
30	Synthetic Enamel	Ltrs.	20	3328	66560	3510.00	11681280.00	164.37	10940467.20	740812.80	11.13
31	Aluminium Paints	Ltrs.	20	134	2680	3500.00	469000.00	164.37	440511.60	28488.40	10.63
32	Brindavan General Purpose Synthetic Enamel	Ltrs.	20	249	4980	3450.00	859050.00	164.37	818562.60	40487.40	8.13

Contd..3

Table 2 - Profitability Analysis for Despatch during April - December 2013											
Sl. No.	Despatches during April 2013 - December 2013	UOM	Qty. / Pack	No. Of Packs	Total Sales Qty.	Selling Price (Rs.)	Sales Realisation (Rs.)	Cost of Sales per unit (Rs.)	Total Cost of Sales (Rs.)	Profit/ Loss (Rs.)	Profit/ Loss per unit (Rs.)
33	Sealing Wax - Railway Grade	Kgs	2.25	720	1620	375.00	270000.00	164.37	266279.40	3720.60	2.30
34	Varnish	Ltrs	20	60	1200	3120.00	187200.00	164.37	197244.00	-10044.00	-8.37
35	Mylac Stiff Paste	Kgs	20	70	1400	1700.00	119000.00	95.97	134358.00	-15358.00	-10.97
36	Anti Corrosive Paints	Ltrs	4	361	1444	608.00	219488.00	164.37	237350.28	-17862.28	-12.37
37	Thinner	Ltrs	20	2155	43100	2516.00	5421980.00	141.01	6077531.00	-655551.00	-15.21
38	Anti Corrosive Paints	Ltrs.	20	893	17860	2820.00	2518260.00	164.37	2935648.20	-417388.20	-23.37
39	Brindavan Red Oxide Paint IS 123	Ltrs	4	10	40	528.00	5280.00	164.37	6574.80	-1294.80	-32.37
40	Brindavan Red Oxide Paint IS 123	Ltrs.	20	76	1520	2440.00	185440.00	164.37	249842.40	-64402.40	-42.37
41	Brindavan Red Oxide Steel Primer	Ltrs	1	52	52	108.00	5616.00	164.37	8547.24	-2931.24	-56.37
42	Metallic Paints	Ltrs	4	20	80	400.00	8000.00	164.37	13149.60	-5149.60	-64.37
43	Brindavan Red Oxide Steel Primer	Ltrs.	4	301	1204	390.00	117390.00	164.37	197901.48	-80511.48	-66.87
44	Brindavan Red Oxide Steel Primer	Ltrs	20	290	5800	1740.00	504600.00	164.37	953346.00	-448746.00	-77.37
45	Thinner 107 for PU paints/ primer	Ltrs	4	103	412	215.00	22145.00	141.01	58096.12	-35951.12	-87.26
46	Metallic Paints	Ltrs.	20	208	4160	1520.00	316160.00	164.37	683779.20	-367619.20	-88.37
47	Thinner 107 for PU paints/ primer	Ltrs.	20	362	7240	828.00	299736.00	141.01	1020912.40	-721176.40	-99.61

From Table-2 it could be analysed that the manufacturing of Indelible Ink is highly profitable, however the market depends on the no. of elections taking place in a year and orders placed by the Election Commission of India as private orders are for very small quantities.

The Paints segments profitability, which has a constant market throughout the year and also year on year, can be categorised in the ascending order as follows.

1. Brindavan General Purpose Synthetic Enamel
2. Aluminium Paints
3. Epoxy Paints
4. Synthetic Enamel Paints
5. Mylac Cholorub Chemical Resisting Paint
6. Specialities
7. Silicon Aluminium Paint
8. Mylac Polyurethane paints
9. Mylac Polyurethane paints (Reds)

Apart from the above the following also provide profits to the organisation Sealing Wax - 1st Grade/ Schamic Green (0.450 Kgs./ pack), Primer Surfacer Grey, Clear Coat for PU paints and Metallic Paints.

Therefore, the Mysore Paints and Varnish can concentrate and strengthen its production and marketing activities for the above said PU Paints, Synthetic Enamel Paints, Aluminium Paints, Epoxy Paints, Primer Surfacer Grey, Indelible Ink and Sealing Wax – 1st Grade only.

1. Introduction

- 1.1. The company, Mysore Paints and Varnish Ltd., Mysore (MPVL) was established in 1937 by the Provincial Government of Mysore in the pre-independence era by the Maharaja of Mysore.
- 1.2. The organisation was converted to State Government Public Sector Undertaking in the year 1947 after independence.
- 1.3. The company produces various Industrial Paints such as Polyurethane Paints, Epoxy Paints, Chlorub and Chemical resistant Paint, Varnishes, Aluminium Paints, Anti-Corrosive Paints etc. It also produces Sealing waxes, Indelible inks etc., as per customer requirements.
- 1.4. The installed capacity of the plant is 1120 MT per annum. However due to presence of old and obsolete machineries the Capacity of the plant reduced to a great extent compared to reported capacity. The plant production for last three years is given in the table below:

Sl. No.	Product	UOM	Year		
			2010 – 2011	2011 – 2012	2012 – 2013
1	Acrylic Washable Distemper	Ltrs.	2716.000	2541.000	1312.000
2	Stiff Paste	Kgs.	12619.000	10646.000	7920.000
3	PU Putty	Kgs.	0.000	0.000	3408.000
4	Thinner	Ltrs.	91615.000	90347.000	84495.000
5	Sealing Wax	Kgs.	1099.950	5160.150	6370.200
6	Anti-Corrosive Bitumen	Kgs.	35608.000	39826.000	29082.000
7	Insulating Varnish	Ltrs.	1870.000	665.000	0.000
8	MYCEM	Kgs.	300.000	550.000	0.000
9	Aluminium Paste	Kgs.	80.000	150.000	81.000
10	Paints – PU, Incl. Coatings etc.	Ltrs.	209156.000	239717.000	258306.000

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Sl. No.	Product	UOM	Year		
			2010 – 2011	2011 – 2012	2012 – 2013
11	Polish	Ltrs.	0.000	892.500	377.500
12	BSC Ink	Ltrs.	1940.000	10940.000	0.000
13	Indelible Ink	CC	12642140.000	7530905.000	8097170.000

1.5. MPVL has been performing well and posting profits since 1991, the sales turnover for the last four years is as follows

Sl. No.	Item	Sales Turnover (Rupees in Millions)			
		2009 – 2010	2010 – 2011	2011 – 2012	2012 – 2013
1	Gross Turnover	158.104	167.058	166.21	189.265
2	Net Turnover (after Excise Duty Payment)	146.813	152.455	151.439	173.216

1.6. The main customers of the company in the **Paints** segment are

➤ **Government of India undertaking:**

- Bharat Earth Movers Ltd.,
- South Western Railways
- Tuticorin Thermal Power Station
- VISL (Vishweshwaraiah Iron and Steel Ltd.)
- Vignyan Industries Ltd.,
- BHEL (Bharat Heavy Electricals Ltd.,) etc.

➤ **Government of Karnataka undertaking:**

- KSRTC (Karnataka State Road Transport Corporation)
- KSRTC (Kerala State Road Transport Corporation)
- KPTCL (Karnataka Power Transmission Corporation Ltd.)
- KPCL (Karnataka Power Corporation Ltd.)
- MPM (Mysore Paper Mills Ltd.)
- HGML (Hutti Gold Mines Ltd.) etc.

- **Private undertaking:**
 - Automotive Axles
 - Sugar Factories in Karnataka
 - Falcon Tyres Ltd
 - Canara Workshop
 - Manipal Springs
 - J.K Tyres Ltd., etc.

1.7. The main customers of the company in the **Indelible Ink** segment are

- Election Commission of India
- Governments/ Election Commission of
 - Nepal
 - Cambodia
 - Turkey
 - Canada
 - South Africa
 - Nigeria
 - Ghana and others

1.8. The company has 60 permanent employees in various departments of Production, Quality, Materials, Finance, Marketing, Human Resources etc.; 20 -25 casual employees are deployed as per requirement during production and packing of indelible ink.

1.9. The Company has been certified for ISO 9000:2008 and ISO 14000:2004.

2. Summary of Evaluation

- 2.1.1. It is recommended to have detailed Productivity Improvement and Manpower Study for utilisation of the Manpower and the Production Norms, to find out effective utilisation of manpower and machines.
- 2.1.2. The rejects and reworks as well as quality complaints must be recorded with all details and analysed, appropriate action must be taken and recorded for future reference and non-occurrence.
- 2.1.3. Few substitutes are available which could be tried after evaluating it in terms of cost and quality.
- 2.1.4. The cost of the product is high as reflected in nearly 25 % of the tenders; hence efforts must be made to reduce cost by Cost Analysis, Lean Manufacturing Techniques, establishing R & D, developing vendors, improving Purchase system etc.
- 2.1.5. The newer market for Indelible Ink must be explored and newer products developed with lesser AgNO₃ content, as it will reduce the cost of the Ink product.
- 2.1.6. The prospect of Currency Printing Ink Manufacturing may be further explored, as it would require strong marketing network apart from the support from Government similar to Indelible Ink.
- 2.1.7. If the cost benefit analysis and legal aspect favour the development of indelible ink pen internally then it is highly recommended that the internal skill set must be nurtured and allowed to develop the pen to commercial stage. It is recommended to provide all necessary support to the team.
- 2.1.8. The Industrial Paints business will be growing at a rate of 12 to 15 % for the financial year 2015 – 2018, therefore it is recommended to plan strategy to increase the business by 12 to 15 % instead current strategy of yearly increase in

sales turnover by 10 %.

- 2.1.9. It is also recommended to purchase modern machines having better technology, which requires lesser resources such as manpower, energy etc. Also yield and quality would be better than the current machineries.
- 2.1.10. Currently, there are few Marketing Officers/ Staff, it is recommended to have bigger team so that they can scout for opportunities and convert the opportunities into business value. The marketing activity needs to have definite targets and if possible, this may be outsourced.
- 2.1.11. The organisation should also recruit adequate manpower at positions, where it's indispensable such as Paint Technology, Research and Development etc.
- 2.1.12. MPVL must try to enter new markets i.e., at National Level and also try to retain clients from the neighbouring states on continual basis. The major customers of MPVL are State Road Transport Corporation, this sector may be further tapped and build a brand image for MPVL.
- 2.1.13. MPVL need to explore the possibility of re-entering the decorative paints segment, which has larger demand and higher profit margins compared to the Industrial paints segment.

- 3. Issue 1: Detailed Study of Production Process with the objective of**
- **Reducing the Manufacturing Cycle time and Cost.**
 - **Improving Quality**
 - **Elimination of waste by use of substitute raw materials.**

3.1. Definition of the Issue

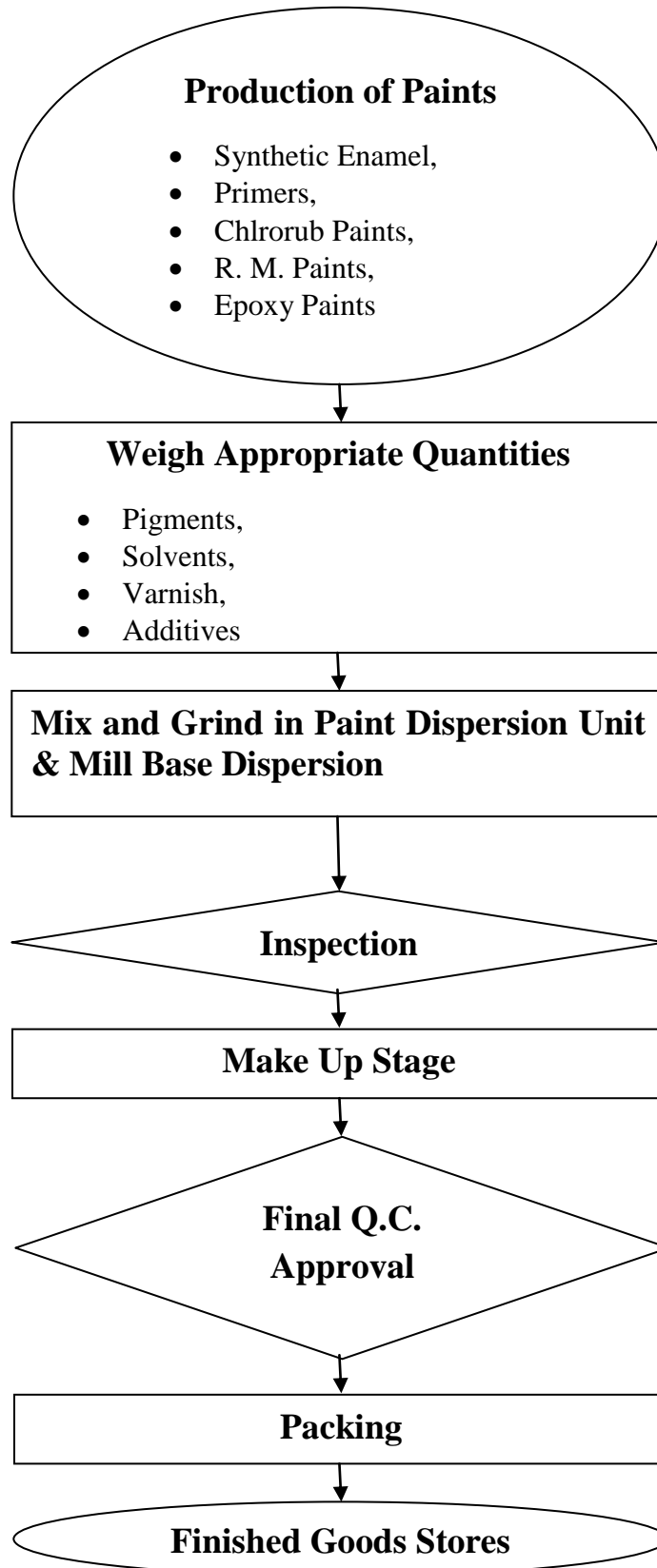
3.1.1. The production of Paints requires raw materials pigments, solvents, resins, and various additives. These provide various physical and chemical properties to paint. These are taken in the right proportions and are mixed in Paint Dispersion Unit such as Ball Mills, Dyno-Mill, Pot Mills, Attritor Mill, High Speed Mill etc. depending on the quality and quantity of paint to be produced. The paint thus produced is then sent to Quality Control for inspection. Based on the results, further additions are made to bring the Paint to desired quality. The final approved paint is then weighed and packed manually as per customer requirements in 0.5 L, 1 L, 4 L and 20 L packs. This is then transferred to finished goods stores for despatch.

3.1.2. The Indelible ink is manufactured manually by mixing right proportions of various chemicals such as Silver Nitrate and other ingredients and then stirred. This is tested for quality and packed manually using semi-automatic machines in vials and bottles.

3.1.3. The company being involved in Made-to-Order production process. The production of paints, varnish and inks requires strictly adhering to the customer specified quality. The bottom line (profits) of the company gets effected by the various cost involved in the process. The profits can also be improved by reducing waste terms of excessive transportation, movement, waiting, delays, over-production, rework, inventory etc.

3.1.4. Keeping view the above consideration, the detailed study of the various operation and equipments used was carried out. The time and motion study along with method study was carried out to identify the areas of improvement. A general flow process of paint production is given below.

3.1.5. Flow Process for Paint Production



The Current Status:

3.1.6. During the study it was observed that there are many machines available for production of paint, varnish and ink. It is observed that the most of the machines are old, few of them unserviceable and obsolete and the machines in working conditions are not utilised to their rated capacity due to various reasons. Some of the reasons cited by the production area team as follows

- Obsolete and non-refurbishable machines
- Difficult to maintain such as Non-availability of Spares etc.
- Obsolescence of Products
- Noise levels during the day time operation

The details of the machines and their working status are provided in Appendix - I

3.1.7. **Cycle Time:** A detailed time and motion study was carried out; it was found that the ball mill was operated only between 17.00 hours and 8.00 hours, though it was loaded during the day. The attritor mill (2 nos.) was not fully utilised due to non-availability of sufficient production orders. The sealing wax and indelible ink is produced only as per order. The table in Appendix II shows the time taken to complete the various production activities in paint section, sealing wax and packing of ink.

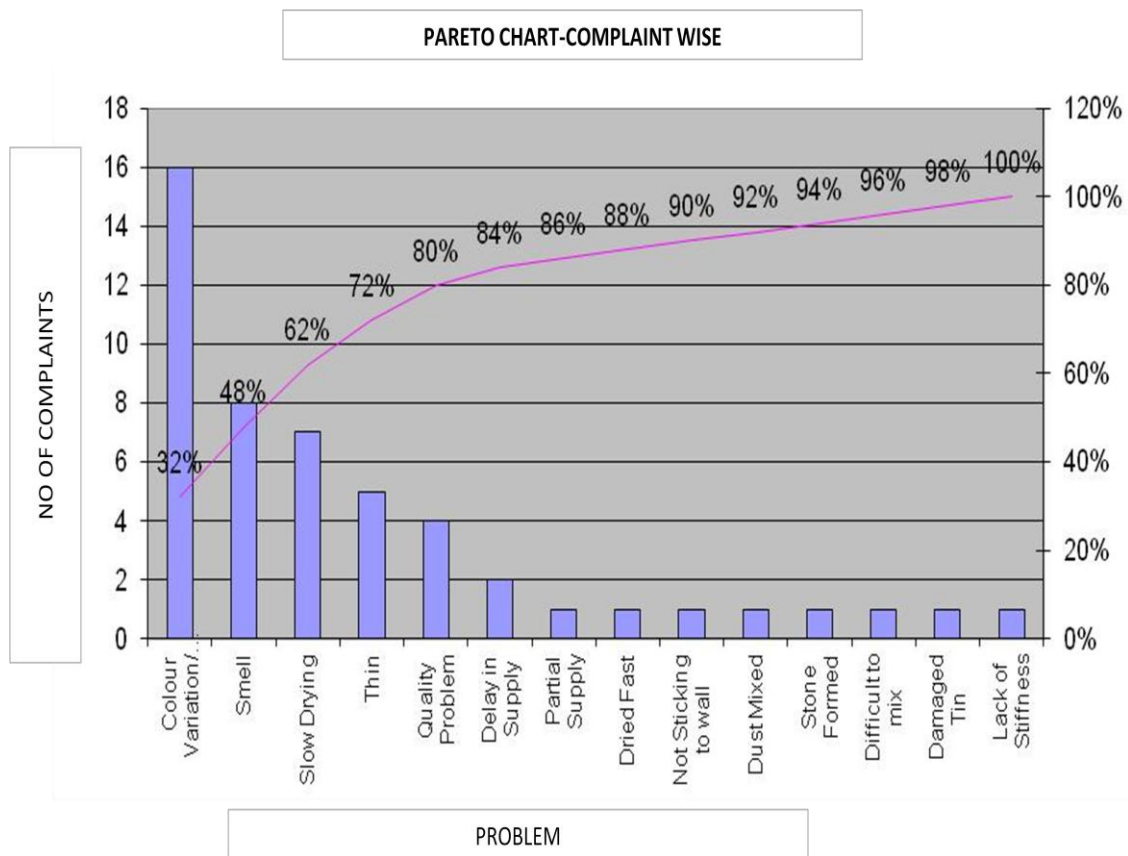
3.1.8. **Improving Quality:** It is observed that the number of quality problems recorded is very less i.e. 36 complaints were recorded from 2008 to 2013. The quality complaints were resolved by visiting the customer, inspecting the material supplied and providing appropriate solutions such as educating paint usage, replacement etc. The details of the Customer complaints are shown in Appendix III. Apart from this the Quality department uses very traditional testing equipments.

3.1.9. **Elimination of Waste by Substitution:** The possibility of using substitute materials was explored. It was informed that a Chennai based industry expert Mr. Vivek Bhat Kashi, has been appointed as advisor and is consulted whenever there is a problem and solutions have been suggested.

3.2. Evaluation Analysis:

3.2.1. **Cycle Time:** It was observed that all manual activities for producing paint in a shift were only between 1 and ¼ hours to 4 hours. Secondly, it was also observed that each activity such as Ball Mill, Attritor Mill, Packing, Sealing Wax etc. had different crew. Apart from this the machines were not fully utilised for want of Production Order for the day. The details are exhibited in Appendix – IV.

3.2.2. **Improving Quality:** During the study it was found that the quality problems were not recorded properly. The quality problems are for past five years (2008 – 2013) exhibited graphically as below



Sophisticated instruments are available in the market for testing paint quality, which will help the organisation to improve the quality, refer Appendix - V.

3.2.3. **Elimination of Waste by Substitution:** It was found that the paint industry have very few material substitutes. The various raw materials used in the paints were collected and ABC analysis was carried out. Substitutes for the A and B category material were searched. NPC consulted Paint Technologist for getting substitutes.

3.3. Recommendations:

3.3.1. It is recommended to have detailed Productivity Improvement and Manpower Study for utilisation of the Manpower and the Production Norms. The material for production could be so planned that the same could be brought and placed for in production shop on the previous day. Therefore same crew can operate Attritor Mill, Ball Mill and Packing. It also recommended that the Production Schedule for the month may be so planned that the no. of shifts are reduced and the manpower is utilised to produce other products such as Sealing Wax, Ink etc.

3.3.2. The format for collection of the rejection and rework is given in Appendix - VI. The equipment available for improved quality testing is given in Appendix - V.

3.3.3. **Elimination of Waste by Substitution:** The substitutes obtained for the raw materials used are listed in the table below, the organisation need to analyse the substitutes for their value, yield and paint quality.

Sl. No.	Material	Substitute
1	M.T.O	Slop Oil (Partly)
2	Alkyd Resin	1 st Quality – Linseed Oil or Long Oil based Resin 2 nd / 3 rd Quality - DCO monomer or RSO
3	TiO ₂ (Rutile)	Imported TiO ₂
4	Xylene	Toulene/ solvent CIX
5	TiO ₂ (Anatase)	Can substitute with lesser % (purity) TiO ₂ (Rutile) or imported Anatase.
6	Mild Chrome Yellow	Lemon Chrome with 0.2% Scarlet chrome or Synthetic Yellow Oxide and Pinch of Scarlet Chrome
7	PU Resin and Epoxy Resin	Equivalent Grades
8	Alkyd Resin-DCO monmeric	RCO/ RSO
9	Rectified Spirit	Iso-Propyl Alcohol
10	Dipentine	Pine Oil
11	ARLO	BFRLO

4. Issue 2: Benchmarking of Star Product in Paint Category for

- **Quality.**
 - **Price**
- with the best competitor in domestic market and identify areas for improvement.**

4.1. Definition of the Issue

4.1.1. The paint industry in India is a highly competitive market. Many large and small players are present in this arena. The Indian paint industry can be divided into decorative paints and industrial paints. The decorative paints have a market share of 72% and industrial paints 28% in the total paint industry. The major players in the Industrial Paints are Akzo-Nobel, Asian Paints, Shalimar Paints etc. and there are almost 2000 small and medium scale companies sharing the Indian market.

4.1.2. The company sells its products by participating in enquires and tenders floated by the procuring company, through competitive bidding. The quality of the paint is mostly specified by the procuring company, however when not specified it is produced as per BIS standard - IS 101. Therefore quality of the paint produced meets Customer requirements in almost 100% instances. The company's main concern is pricing as the success rate of the tender/ enquiry participation is approximately 60%. Thus, it is important to know the costing of the paint of the lowest bidder.

4.2. The Current Status:

4.2.1. Currently, no benchmark is available for the Price or Quality, the only information available percentage difference in price between the competitor (L1) and MPVL.

4.3. Evaluation Analysis:

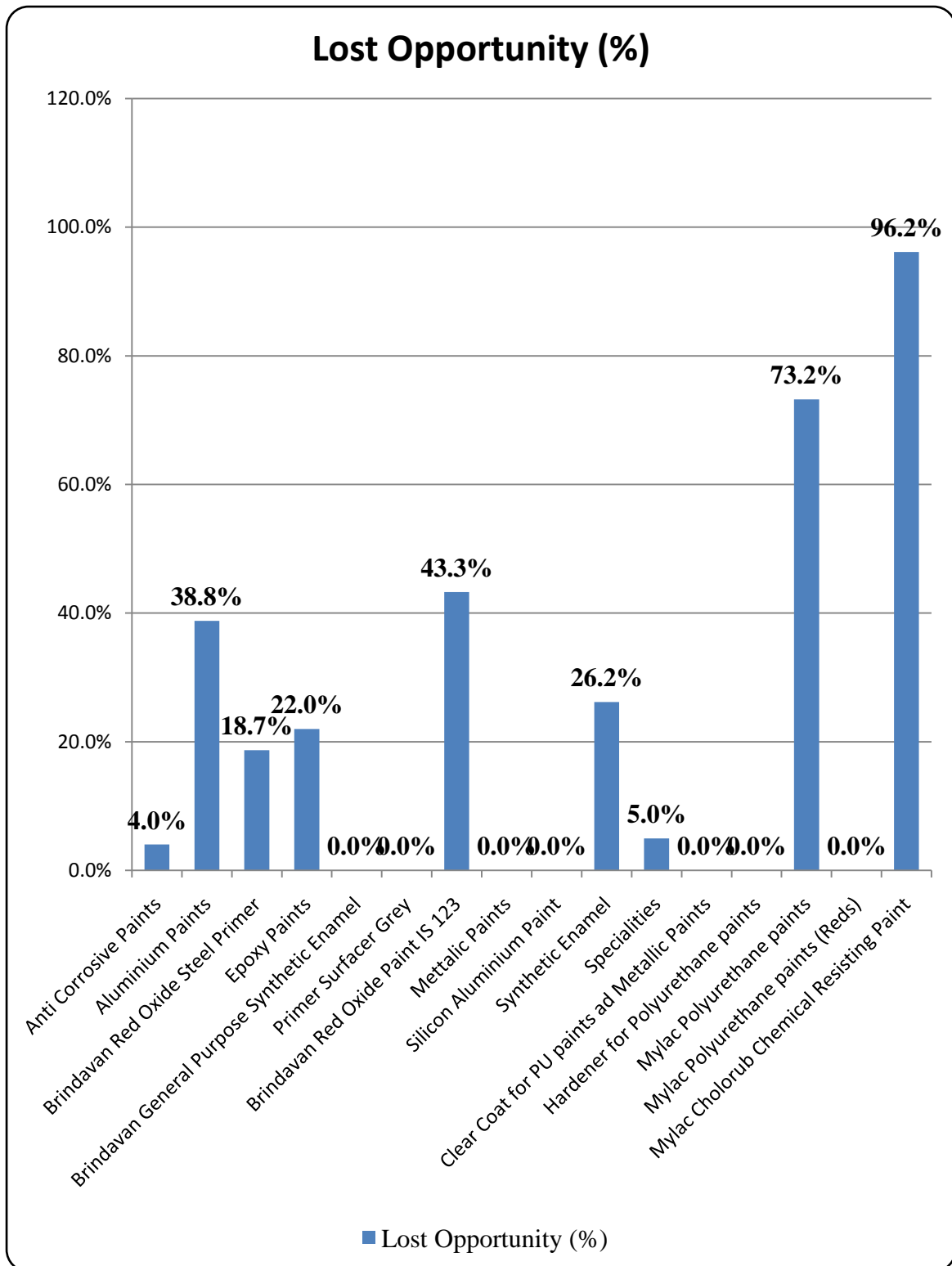
4.3.1. During the study, several attempts were made to collect the details of the quality, cost and price from various manufacturers, however none of the manufacturers

replied to our queries either by post or through telephonic enquires. All manufacturers ignored our request. The request sent out to the manufacturers is exhibited along with their addresses in Appendix – VII

- 4.3.2. The despatches during April 2013 and December 2013 were collected, these are tabulated in Appendix – VIII. The data regarding the tenders for the above period for tenders not awarded to the MPVL were analysed and found that quality was not issue, however the price were 10 to 40 % more than the competitor (L1). The data collected for year 2012 - 13 is shown in Appendix – IX.
- 4.3.3. It was observed during study that the cost analysis of the products is based on Groups, which does not represent the true picture of the cost of individual products.
- 4.3.4. The raw material is purchased based on the orders; therefore it is found that the company has to face large price fluctuations as well as material shortage due to delayed deliveries. These fluctuations are also because most of the materials are petroleum based products.
- 4.3.5. The products are manufactured and sold on basis of the quality specifications of the customers or as per BIS standards. Hence, the MPVL doesn't lose out tenders based on quality. All the tenders lost by MPVL are due to price. Considering that the quantity produced during 2012-13 is sold completely and the lost opportunity due to award of tender to competitors. It is observed that on an average 24.9 % of the tenders are lost due higher pricing of products by MPVL. This is tabulated and graphically shown below -

Year 2012-2013				
Product	Qty. Despatched (Ltrs.)	Lost Tender Qty. (Ltrs.)*	Total Qty. (Ltrs.)	Lost Opportunity (%)
Anti Corrosive Paints	19304	810	20114	4.0%
Aluminium Paints	3456	2190	5646	38.8%
Brindavan Red Oxide Steel Primer	7056	1620	8676	18.7%
Epoxy Paints	9432	2660	12092	22.0%
Brindavan General Purpose Synthetic Enamel	12774	0	12774	0.0%
Primer Surfacer Grey	1522	0	1522	0.0%
Brindavan Red Oxide Paint IS 123	1560	1190	2750	43.3%
Metallic Paints	4240	0	4240	0.0%
Silicon Aluminium Paint	80	0	80	0.0%
Synthetic Enamel	79738	28283	108021	26.2%
Specialities	19897	1040	20937	5.0%
Clear Coat for PU paints ad Metallic Paints	1270	0	1270	0.0%
Hardener for Polyurethane paints	1739	0	1739	0.0%
Mylac Polyurethane paints	6570	17980	24550	73.2%
Mylac Polyurethane paints (Reds)	2524	0	2524	0.0%
Mylac Chlorub Chemical Resisting Paint	40	1000	1040	96.2%
Grand Total	171202	56773	227975	24.9%

* Zero Value in the Lost Tender Column indicates that the no enquiry for the product



* Zero Value in the Lost Tender Column indicates that the no enquiry for the product

4.4. Recommendations:

4.4.1. Based on the above evaluation, it is recommended that the following steps to be taken to reduce the cost of the Paints and other products

- The above table and graph reveal that the tender lost in Synthetic Enamel and PU Paints is 26.2% and 73.2%, which forms the major share of the Paints sales in terms of volume, therefore special efforts have to be made to reduce the cost of these paints.
- Detailed cost analysis of the individual products for all inputs such as raw material, manpower, manufacturing cost, energy cost etc. must be carried out. The products then can be categorised into groups which are within $\pm 5\%$ cost value. This would help the management to focus on areas, where cost could be reduced.
- The management must introduce systems, which will motivate the employees to come up with suggestions to reduce cost, improve quality and manufacturing processes. It is also required to set R & D lab to improve quality and reduce cost of product by substitution.
- The purchase system and procedures need to be more efficient so that the raw materials are purchased in time and also at lower cost. It is also recommended to forecast the requirements for the year and develop vendors, who could supply the material at a short notice and without much fluctuation in prices.
- It is recommended to adopt ERP system suitable for small organisations for better control over the expenditures, consumptions, purchases etc.

5. Issue 3: Benchmarking of Ink Product with Global Supplier for

- **Quality & Variety.**
 - **Price**
- and identification of new markets like currency printing ink etc.**

5.1. Definition of the Issue

5.1.1. MPVL is currently authorised supplier of Indelible Ink to Election Commission of India, as it has exclusive manufacturing licence from National Physical Laboratory. The Indelible Ink is also being exported to nearly 25 countries for conducting fair elections. It also supplies the ink for various elections of associations, local bodies etc. The main ingredient in the Indelible Ink is Silver Nitrate (AgNO_3), which is a very costly ingredient. The Indelible Ink used by Election Commission of India contains 23.6% of AgNO_3 . The Industrial standards is to have AgNO_3 content from 5% to 18% in indelible ink, however maximum allowed is 25%. The company is looking beyond the monopolistic market and would like to be an international player, in case the Election Commission prefers multi-supplier purchases. Secondly, it is required to explore the opportunities in view of threats from present market, with regard to current products profile.

5.1.2. The company currently supplies the entire requirements of the Election Commission of India on single party tender/ enquiry basis. It also sells its product through competitive bidding by participating in enquires and tenders floated by the Companies. The AgNO_3 content in the solution and quality of the Indelible Ink is specified by the procuring company. Therefore quality of the Indelible Ink produced meets Customer requirements in almost 100% instances.

5.1.3. The company currently wants to enter ink markets which are hitherto protected to a large extent and requires various security features such as currency printing ink.

5.2. The Current Status:

5.2.1. Currently, no benchmark is available for the Price or Quality. Secondly the product – Indelible Ink is a proprietary product, which currently manufactured under the licence of National Physical Laboratory and exclusively supplied to Election Commission of India. The Ink in small quantities is supplied to other Private and Public Customers, with the required permissions.

5.2.2. The Indelible Ink for purposes other than the Election in India, are manufactured by other companies such as Rayudu Chemicals and Kores India. The MPVL has to compete in this market. It also has to compete with the private players, if it plans to market and sell its Ink in foreign markets other than those, which are obtained on nomination basis.

5.3. Evaluation Analysis:

5.3.1. During the study, several attempts were made to collect the details of the quality, cost and price from various manufacturers of Indelible Ink, who are mostly foreign companies except for Kores India and Rayudu Chemicals. However none of the manufacturers replied to our queries either by post or mail. All manufacturers ignored our request. The request sent out to the manufacturers along with list of manufacturers is exhibited in Appendix – X.

5.3.2. MPVL currently is having old machines and technology, to enter into security printing inks it would be required to purchase new equipments/machines such as Triple Roll Mill, Heavy Duty Twin Shaft Mixer, Gravimetric filling System, Automatic Tub & Drum Cleaning System etc. and technology. It will also require a strong R & D to support this endeavour.

5.4. Recommendations:

5.4.1. The evaluation of the current situation provides the insight into the ink market, which is used in various fields such as elections, medical sciences such as

marking the pulse polio recipient, surgery area on human body etc. The recommendations are the outcome of these requirements of the market.

- It is recommended to have strong R & D, which could develop the indelible inks for various purposes depending on the usage and dyeing requirements and its longevity.
- The content of the Silver Nitrate (AgNO_3), which is the main constituent and also the costliest, needs to be reviewed and quantity reduced from current composition of 23.6%, based on the requirements of the customer. This will reduce the cost and support increasing the market share.
- The prospects of exporting the Indelible ink to other countries on a continually basis must be explored through Election Commission of India and Govt. of India.
- The prospect of Security Ink manufacturing may be further explored, as it would require strong marketing network apart from the support from Government similar to Indelible Ink.

6. Issue 4: Feasibility analysis for production of Indelible Ink marker pens with specific focus on technology and equipment requirements.

6.1. Definition of the Issue

6.1.1. The company is currently producing the Indelible Ink and packing the same in vials, 10 ml, 60 ml and 80 ml bottles. The material handling of the Ink vials and bottles has to be done with utmost care to avoid spillage or breakage. The spillage of Ink may pose hazard to the handler as well as the user, due to presence of Silver Nitrate. This will also result in loss of high cost material. Last but not least the Ink quantity per person required is also higher.

6.1.2. Therefore, MPVL has already started exploring feasibility of using marker pens as carrier of indelible ink for marking during the elections. This type of marker pens is currently produced by few companies and is used by certain agencies such as UNICEF etc. The advantages of the indelible marker pen are that packing, material handling is easier and more people can be marked per millilitres of ink.

6.2. The Current Issue:

6.2.1. The indelible ink is currently manufactured under the license from National Physical Laboratory through the Election Commission of India. The company through its own initiative has developed and conducted feasibility studies for indelible marker pens. It has also carried trial productions and has supplied the product. The product has been satisfactorily accepted by the consumer.

6.3. Evaluation Analysis:

6.3.1. It has been found that many companies such as Kores India have developed the indelible marker pens and used for purposes other than Elections in India. These types of pens are available in international markets. During the discussion with

the Managing Director and Quality Head, it was clear that the indelible marker pen has been successfully developed in-house and requires further developments and modifications to commercially produce the same. The Quality Head assured and showed immense confidence that the product could be commercially successful, if needed support is provided to the department. MPVL also has a proposal to get the product developed by National Physical Laboratory. It is therefore required to analyse further the following factors

- Cost Benefits Analysis
- Manufacturing Facilities requirement
- Systems and Procedures
- Legal aspects such as patenting, revenue sharing etc.
- Acceptability by various agencies.

6.4. Recommendation:

- 6.4.1. If the cost benefit analysis and legal aspect favour the development of pen internally then it is highly recommended that the internal skill set must be nurtured and allowed to develop the pen to commercial stage. It is recommended to provide all necessary support to the team.

7. Issue 5: Business Forecast and strategy for next 5 years.

7.1. Definition of the Issue

7.1.1. The company sells most of its products through institutional sales. It has registered with itself as a Vendor with most of the customers such as Central & State Public Sector Undertakings viz., ASRTU-New Delhi, Rail wheel Factory, Yelahanka, BHEL, BEML, KSRTC, KAVIKA etc.

7.1.2. The company is also participating in the e-tendering process of various organisations through e-portal such as www.eproc.karnataka.gov.in, www.tenderwizard.com, www.ireps.gov.in, www.tenders.gov.in, **Error! Hyperlink reference not valid.** etc.

7.1.3. Product customisation has been a continuous process at MPVL, the products in vogue are produced and obsolete products are discontinued for example – PU coatings are included in product list and Powder distemper has been discontinued. This is done through market research and customer requirement surveys.

7.1.4. The company is also maintaining a Regional Office at Bangalore and Sales Depot at Mysore and Madurai for retail sales and booking orders.

7.1.5. The business growth of company is achieved by increasing the target of sales turnover by 10% over previous year.

7.1.6. Therefore, it imperative to provide the company with realistic growth plan which should match with the projected growth of national Industrial Paint consumption. It also provides the company with a vision to achieve newer planes and target for higher growth rates.

7.2. The Current Issue:

7.2.1. MPVL is currently operating in the competitive market, though being a government enterprise it has to compete against the private players. There is no price protection or preference offered by the government or government entities such as State or Central PSUs.

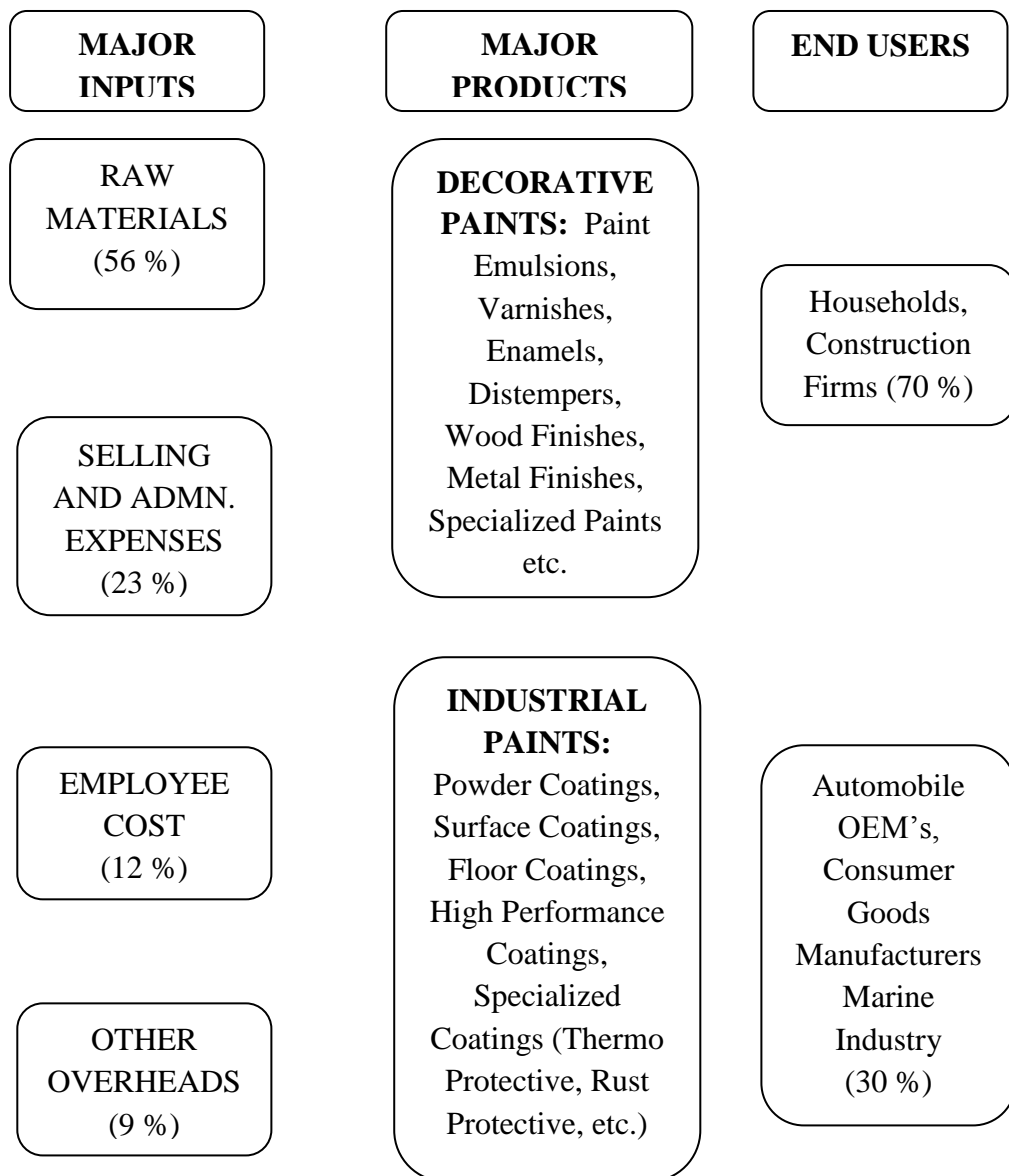
7.2.2. National Productivity Council, during the study discussed with the Management team and tried to carry out SWOT analysis. SWOT analysis is a tool that identifies the strengths, weaknesses, opportunities and threats of an organisation. This is a simple tool which provides a great insight to the organisational preparedness to face competition/ change. Based on the analysis, the organisation can develop its strengths and offset it against the weaknesses. It can make necessary system and procedural changes to overcome the weaknesses. The company can gear up to seize all opportunities and prepare it itself to fend off the threats. The SWOT of MPVL is as shown in table below:

Table: SWOT ANALYSIS OF MPVL		
	POSITIVE	NEGATIVE
INTERNAL FACTORS	STRENGTHS <ul style="list-style-type: none"> - Good Infrastructure - Transparency - Accountability - Profit Making - Self Sufficient - Cash Rich 	WEAKNESSES <ul style="list-style-type: none"> - Old & Traditional Equipments - Low Plant Utilisation - Limited Marketing Network - Slow/Long Decision Process
EXTERNAL FACTORS	OPPORTUNITIES <ul style="list-style-type: none"> - Quality Product - Govt. Undertaking - Market Demand 	THREATS <ul style="list-style-type: none"> - Competition - Manpower Attrition - Stiff Pricing - Raw material Price Fluctuations

7.3. Evaluation Analysis:

7.3.1. The paint industry is expected to grow at 12 – 15 % annually over the next five years from Rs. 280 billion in financial year 2013 to around Rs. 500 billion in financial year 2018 though the markets are subdued. The growth seen in previous years is nearly 15 %. In this 30% market share is of Industrial paints i.e. Rs. 84 billion for year 2013. The MPVL caters to this segment.

7.3.2. The broad working of the paint industry can be pictorially depicted as below –



- 7.3.2.1. Raw materials almost constitute on average 56 % of the total expenditure. There are nearly 300 different materials out of which titanium dioxide forms the major component. Any price fluctuations in its cost have direct and substantial impact on the cost of production. Petroleum derivatives are the other major materials and have similar impact.
- 7.3.2.2. End-user of industrial segment products finds use in automotive industry, consumer durables industry and other OEMs. Any change in the market demand for these products effects the consumption of the paint. In recent times the slump in the manufacturing sector has affected the industrial paint industry to similar extent.
- 7.3.3. The industrial paint can be analysed based on the Porter's 5 Forces Analysis. The model for the same is shown in the diagram below:



Michael Porter's Five Forces Analysis Model

7.3.3.1. **Bargaining Power of Suppliers:** The bargaining power of suppliers is also described as the market of inputs and the potential factors are

- Supplier switching costs relative to firm switching costs
- Degree of differentiation of inputs
- Impact of inputs on cost or differentiation
- Presence of substitute inputs
- Strength of distribution channel
- Supplier concentration to firm concentration ratio
- Employee solidarity (e.g. labour unions)
- Supplier competition: the ability to forward vertically integrate and cut out the buyer.

7.3.3.1.1. The Paints industry is a raw-material intensive industry with more than 300 products going into the manufacture of the final products. The raw materials can be classified as pigments, additives, solvents, binders etc. Titanium dioxide (TiO₂) is a key ingredient and supplier of TiO₂ has a higher bargaining power. The other raw materials used are petroleum derivatives and therefore their prices are subject to market fluctuations, which in turn affect the industry's profits. Thus the power of suppliers is **Medium**. The MPVL due to its purchase practices have to some times have to pay a higher price for the raw material purchases.

7.3.3.2. **Bargaining Power of Buyers:** The bargaining power of customers is also described as the market of outputs and the potential factors are

- Buyer concentration to firm concentration ratio
- Degree of dependency upon existing channels of distribution
- Bargaining leverage, particularly in industries with high fixed costs
- Buyer switching costs relative to firm switching costs
- Buyer information availability
- Force down prices
- Availability of existing substitute products
- Buyer price sensitivity
- Differential advantage (uniqueness) of industry products
- The total amount of trading

7.3.3.2.1. The industrial paint segment is a low-margin high revenue business and the

buyers of these segments are knowledgeable, price comparison is done effectively by the consumers, as this is a regular expenditure for this segment. Due to this expertise, the bargaining power of the buyer is **Medium**.

7.3.3.3. **Availability of substitutes:** The existence of products other the common products increases the tendency of customers to switch to alternatives.

- Buyer inclination to substitute
- Relative price performance of substitute
- Buyer switching costs
- Perceived level of product differentiation
- Number of substitute products available in the market
- Ease of substitution
- Substandard product
- Quality depreciation

7.3.3.3.1. There are not negligible substitutes to industrial paints. Therefore, the availability of the substitutes in the Indian Industrial Paint industry is **Low**.

7.3.3.4. **Threat of New Entrants:** Profitable markets that yield high returns will attract new firms. The following factors can have an effect on how much of a threat new entrants may pose:

- The existence of barriers to entry (patents, rights, etc.)
- Government policy
- Capital requirements
- Absolute cost
- Cost disadvantages, independent of size
- Economies of scale
- Economies of product differences
- Product differentiation
- Brand equity
- Switching costs or sunk costs
- Expected retaliation
- Access to distribution
- Customer loyalty to established brands

- Industry profitability (the more profitable the industry the more attractive it will be to new competitors)

7.3.3.4.1. The Paint market in India dominated by few established players, hence competition is high. However, established foreign players may pose a threat to the Indian Industries due to their expertise and knowledge. The threat of new entrant is **Medium**.

7.3.3.5. **Competitive Rivalry:** For most industries the intensity of competitive rivalry is the major determinant of the competitiveness of the industry.

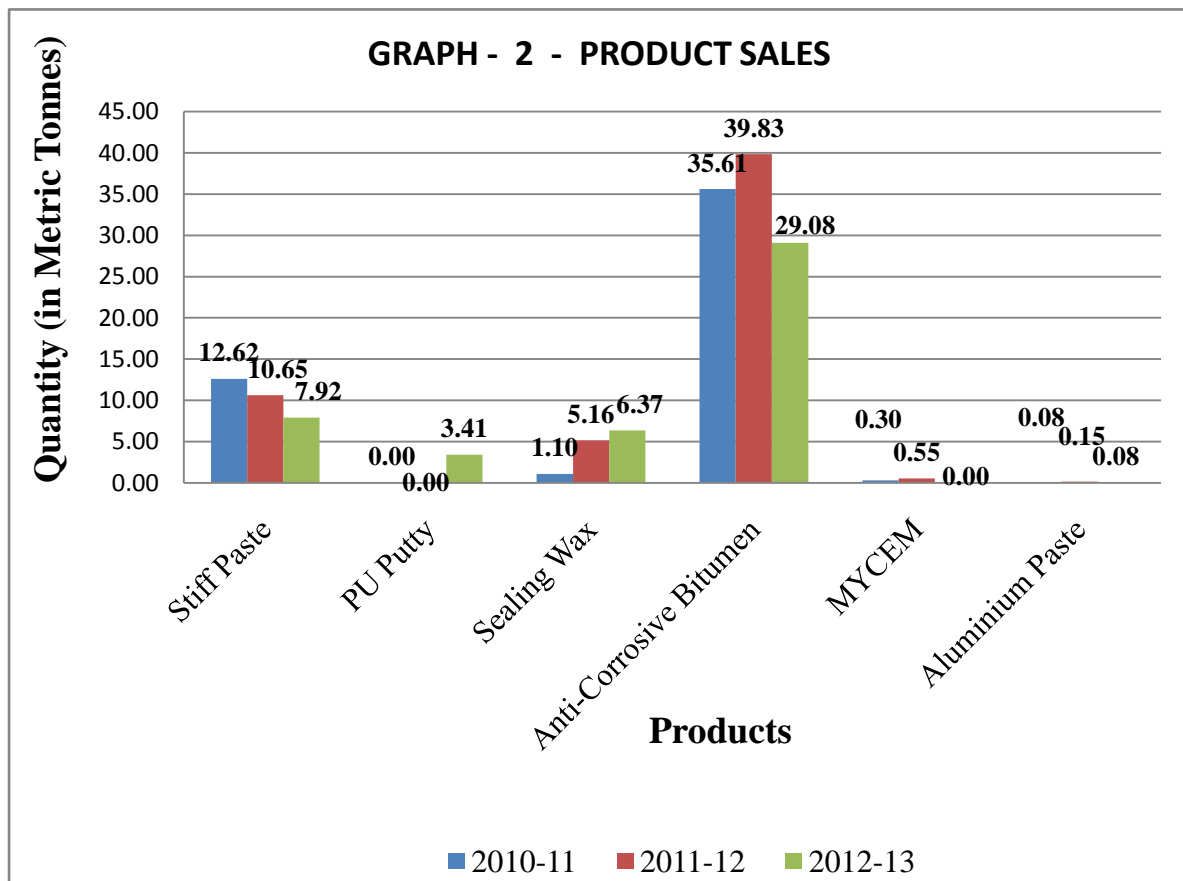
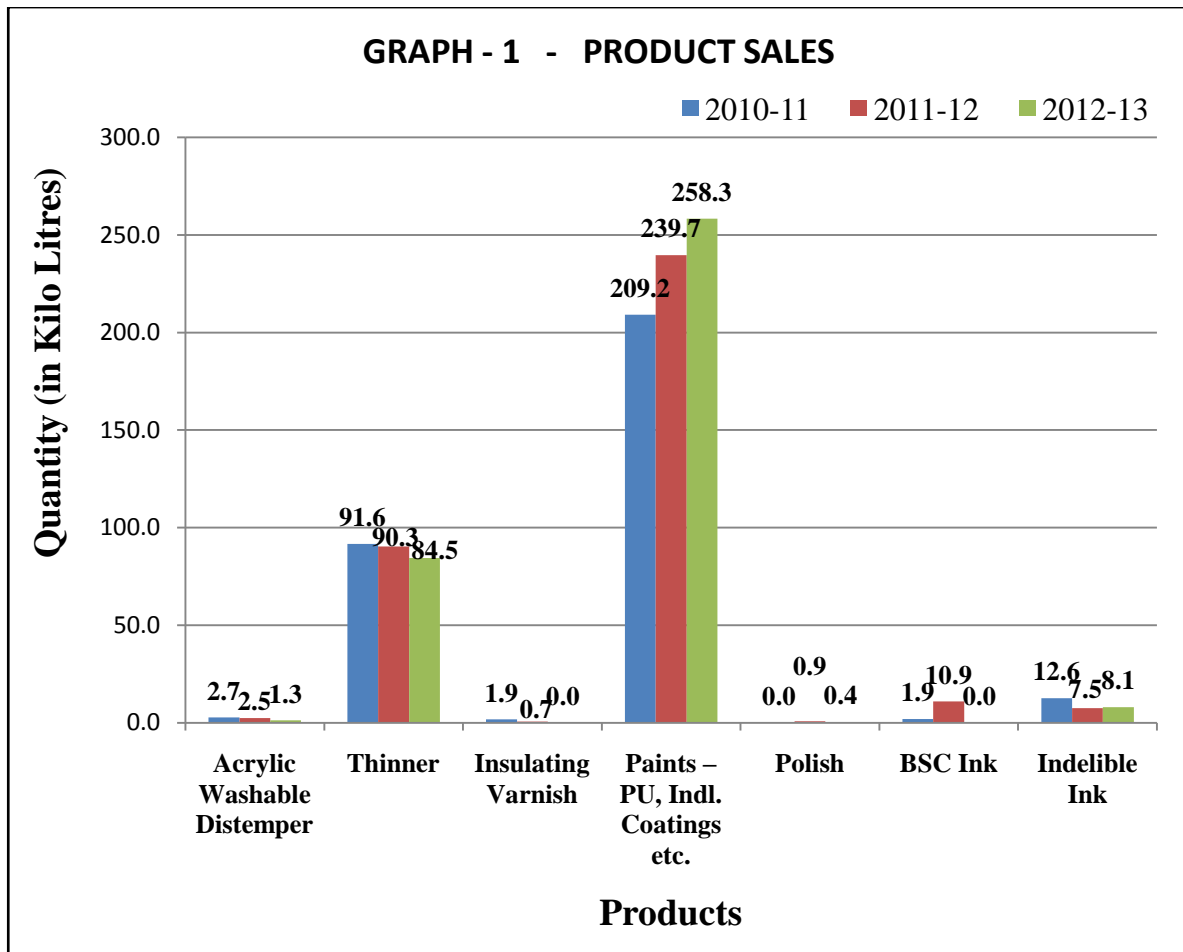
- Sustainable competitive advantage through innovation
- Competition between online and offline companies
- Level of advertising expense
- Powerful competitive strategy
- Firm concentration ratio
- Degree of transparency

7.3.3.5.1. Almost 80% of the organised market is catered by the top five companies, Asian Paints, Kansai Nerolac, Berger Paints, Akzo Nobel and Shalimar Paints. Though the market is saturated there are prospects for growth and smaller players to eat into the market share of the large players. Thus, on the whole competitive rivalry for the Indian paint industry is **Low to Medium**.

7.3.4. The prospects for the paint market in India looks to be positive paint market in India is expected to grow at 1.5 to 2 times GDP in next five years.

7.3.5. Apart from the above analysis and the market to which MPVL caters the threat to MPVL can be perceived between Low and Medium.

7.3.6. The analysis of the trends for the products can be seen in the graph 1 & 2 below. The graph shows that the product growth don't behave in a particular trend. There is fluctuation in demands for the products.



7.4. Recommendations:

- 7.4.1. From the above analysis and the data available, the inferences drawn have helped to develop the following recommendations.
- 7.4.1.1. The Industrial Paints business will be growing at a rate of 12 to 15 % for the financial year 2015 – 2018, therefore it is recommended to plan strategy to increase the business of 12 to 15 % instead current strategy of yearly increase in sales turnover by 10 %.
- 7.4.1.2. The capacity of the Plant is determined by the available plant and machinery, where in few of them are unserviceable and obsolete, it therefore recommended to scrap these machinery. The machines available are old and traditional. It also recommended increasing the utilisation of the current usable machinery as mentioned in section 3.2.1. It is also recommended to purchase modern machines having better technology, which requires lesser resources such as manpower, energy etc. Also yield and quality would be better than the current machineries.
- 7.4.1.3. It is recommended to implement Lean Manufacturing Techniques, to help organisation identify waste and improve the processes. It is also recommended to carry out detailed Productivity Improvement and Manpower Assessment Study. These initiatives will help to reduce the cost of manufacturing, therefore making the product cheaper and more competitive.
- 7.4.1.4. As the Porters Five force Analysis, the threat to the business is low to medium, therefore it is imperative on part of the organisation to enhance and utilise all its strengths and convert all opportunities into business.
- 7.4.1.5. Currently, there are only few field staff, it is recommended to have bigger team so that they can scout for opportunities and convert the opportunities into business value. The marketing activity needs to have definite targets and if possible, this may be outsourced.

- 7.4.1.6. The organisation needs to recruit adequate manpower at positions, where it's indispensable such as Paint Technology, Research and Development etc.
- 7.4.1.7. MPVL may try to enter new markets i.e., at National Level and also try to retain clients from the neighbouring states on continual basis. The major customers of MPVL are State Road Transport Corporation, this sector may be further tapped and build a brand image for MPVL.
- 7.4.1.8. MPVL need to explore the possibility of re-entering the decorative paints segment, which has larger demand and higher profit margins compared to the Industrial paints segment.

APPENDIX – I

Sl. No.	Machine Details	Machine Capacity	Rating (hp)	Usage	Working Status
Ball Mills					
1	Ball Mill No. 1	200-800 Ltrs.	5	All Colours & Primers	Working
2	Ball Mill No. 2	200-800 Ltrs.	5	Black	Working
3	Ball Mill No. 3	200-800 Ltrs	5	Red oxide	Working
4	Ball Mill No. 4	200-800 Ltrs	5	-	Not in Use (non-availability of spares)
Pot Mills					
5	Pot Mill No. 1	30-100 Ltrs.	1	All Colours	Working
6	Pot Mill No. 2	30-100 Ltrs.	1	All Colours	Working
7	Pot Mill No. 3	30-100 Ltrs.	1	All Colours	Working
Attritor Mills					
8	Attritor Mill No. 1	300-500 Ltrs.	15	All Colours	Working
9	Attritor Mill No. 2	300-500 Ltrs.	-	White	Working
10	Horizontal Mixer	200 Ltrs.	15	Coal Tar, White	Working
11	Horizontal Mixer (2 nos.)	-	-	-	Obsolete
12	Triple Roller	-	-	-	Not in Use
13	Uni-roller	-	-	-	Obsolete
14	Sand Mill	20 Ltrs.	16	-	Not in Use
15	Tin Cap Removal	-	-	-	Not in Use
16	1 Lt. Cap Tightening	-	Manual	-	Not in Use
Equipments and Machine near Sub-station Area					
17	Horizontal Mixer	-	-	-	Obsolete
18	Triple Roller	-	12	-	Working
19	Vertical Mixer	-	-	-	Working (Rarely used)
20	Mixer Grinder	-	-	-	Working
21	Edge Runner	300 kg	-	-	Working
Inside Room					
22	Indelible Ink Filling Machine (5 nos.)	-	-	-	Working
23	Varnish Filter Press	-	-	-	Working (Rarely Used)
24	Polish Filter Press	-	-	-	Working
PCDP					
25	Triple Roller	-	-	-	Not in Use
26	Edge Runner	300 kg	-	-	Not in Use
27	Indelible Ink Filling Machine (4 nos.)	-	-	-	Working
28	Edge Runner	300 kg	-	-	Working
29	Ball Mill	400 Kg	15	-	Requires Modification
30	Ball Mill	200 Kg	5	-	Requires Modification

APPENDIX – II

WLS - Prodn-1					
WORK LOAD DETAILS SHEET					
Department:		Production	Section:		Paint
Work Centre:		Ball Mill	No. of Working Shift/ day:		1
Designation:		Operator			
Job Summary:		Bring the material, load in the mill, operate the mill, and unload after grinding. Clean the mill			
Sl. No.	Activity Description	Crew	Time / Occasion (in mins.)	Freq./ Shift	Man-mins. / Shift (in mins.)
Raw Material Shifting					
1	Bring the raw materials (Barrels) from stores to paint section (~ 63 meters)	1	4.40	1	4.40
2	Move to stores from painting section, Load the raw materials (kept ready by stores persons as per Production slip)	1	4.50	1	4.50
3	Bring the raw materials (Powders/Solids/Cans) from stores to paint section by trolley (~81 meters)	2	4.00	1	8.00
4	Bring the resin barrels from storage area to paint section	1	1.30	1	1.30
5	Clean the ball mill with chemical and drain the solution before starting the new batch	2	5.00	1	10.00
6	Measure, take and dump the raw materials into the ball mill as per sequence	2	25.00	1	50.00
7	Close the ball mill, run the mill, observe the running condition like sound, leakage etc, correct if required and stop the mill	2	3.00	1	6.00
8	Machine cycle time (Evening 17:00 to 8:00)		900.00		
9	Stop the mill, collect the sample, check the quality before unloading	2	2.00	1	4.00
10	Add the chemicals into the ball mill	2	5.00	1	10.00
11	Run the mill to mix the chemicals	2	5.00	1	10.00
12	Move the empty tank near the ball mill to unload	2	2.00	1	4.00
13	Open the ball mill and unload the content (through filter) into the tank, Open the ball mill, add thinner to clean the mill and drain the wash solution	2	30.00	1	60.00
14	Clean the filter used for filtering with thinner	1	9.00	1	9.00
15	Bring the chemicals(base) from the stores to paint section	2	5.00	1	10.00
16	Return the empty can/barrels back to stores	1	3.00	1	3.00

Contd...

APPENDIX – II

WLS - Prodn - 1						
WORK LOAD DETAILS SHEET						
Department:		Production		Section: Paint		
Work Centre:		Ball Mill		1		
Designation:		Operator				
Job Summary:		Bring the material, load in the mill, operate the mill, and unload after grinding. Clean the mill				
Sl. No.	Activity Description		Crew	Time / Occasion (in mins.)	Freq./ Shift	Man-mins. / Shift (in mins.)
17	Keep the paint in tank to check whether sedimentation forms or not (Parallel QC test will be performed)		1	1440.00	1	
18	Perform other miscellaneous activities assigned by production supervisor/Manager etc					30.00
A Basic Workload (in man-mins.)						224.20
B Relaxation Allowance		15 %	Contingency Allowance		2%	38.11
C Present Standard Workload (in man-mins.)						262.31
D Net Available Man -mins. / shift						480.00
E Present Manpower / shift						3
F Present Manpower Utilization (%) (C/(D X E))						18.22%
REMARKS: Average 1 Batch per day						

APPENDIX – II

WLS - Prodn - 2						
WORK LOAD DETAILS SHEET						
Department:		Production		Section: Paint		
Work Centre:		Paint Section		No. of Working Shift/ day: 1		
Designation:		Tinter				
Job Summary:		Prepare the paint by mixing additives with grinded materials				
Sl. No.	Activity Description		Crew	Time / Occasion (in mins.)	Freq./ Shift	Man-mins. / Shift (in mins.)
1	Mix the paints, perform the viscosity, weight check and collect samples (before sediment period)		1	5.00	2	10.00
2	Paint Tinting Activity		1	45.00	2	90.00
3	Mix the paints, perform the viscosity, weight check and collect samples (after sediment period)		1	5.00	2	10.00
4	Perform other miscellaneous activities assigned by production supervisor/Manager etc					30.00
A Basic Workload (in man-mins.)						140.00
B	Relaxation Allowance	15%	Contingency Allowance	2%		23.80
C Present Standard Workload (in man-mins.)						163.80
D Net Available Man -mins. / shift						480.00
E Present Manpower / shift						1
F Present Manpower Utilization (%) (C/(D X E))						34.13%
REMARKS: Average 2 Batches (1 Ball Mill + 1 Attritor Mill) per day						

APPENDIX – II

WLS - Prodn - 3					
WORK LOAD DETAILS SHEET					
Department:	Production	Section:	Paint		
Work Centre:	Attritor Mill	No. of Working Shift/ day:	1		
Designation:	Operator				
Job Summary:	Bring the material, load in the mill, operate the mill, and unload after grinding. Clean the mill				
Sl. No.	Activity Description	Crew	Time / Occasion (in mins.)	Freq./ Shift	Man-mins. / Shift (in mins.)
Raw Material Shifting					
1	Bring the barrel/drum from stores to paint section (~63 meters)	2	4.40	1/2	4.40
2	Unload liquid chemicals from barrel to bucket and dump into mill	2	7.00	1/2	7.00
3	Move to stores from painting section, load the raw materials (kept ready by stores persons) as per Production		4.50	1/2	0.00
4	Bring the raw materials (Powders/Solids/Cans) from stores to paint section by trolley (~ 81 meters)	2	4.00	1/2	4.00
Production					
5	Add thinner, wipe, clean and drain the wash solution, before starting the new batch	2	2.60	1/2	2.60
6	Add raw materials in the mill for the new batch	2	2.20	1/2	2.20
7	Start the mill, run for 1-2 mins, stop and clean the spattered points mill inside walls, rods with thinner brush	1	11.50	1/2	5.75
8	Machine Cycle time		120.00		
9	Stop the mill, take sample and check the quality	1	2.00	1/2	1.00
10	Place the empty tank under attritor mill to collect the milled product (with filter)	2	1.00	1/2	1.00
11	Drain the milled product through filter and collect in tanker, clean the mill inside	1	17.50	1/2	8.75
12	Clean the filter with thinner thoroughly	1	3.00	1/2	1.50
13	Move the tank to tinting area	2	2.00	1/2	2.00
14	Add medium and makeup the solution	2	4.50	1/2	4.50
15	Keep the paint in tanker to check whether sedimentation forms or not (Parallel QC test will be performed)		1440.00		

Contd...

APPENDIX – II

WLS - Prodn - 3							
WORK LOAD DETAILS SHEET							
Department:	Production		Section:	Paint			
Work Centre:	Attritor Mill		No. of Working Shift/ day:	1			
Designation:	Operator						
Job Summary:	Bring the material, load in the mill, operate the mill, and unload after grinding. Clean the mill						
Sl. No.	Activity Description			Crew	Time / Occasion (in mins.)	Freq./ Shift	Man-mins. / Shift (in mins.)
16	Perform other miscellaneous activities assigned by production supervisor/Manager etc			1			30.00
A	Basic Workload (in man-mins.)						74.70
B	Relaxation Allowance	15%	Contingency Allowance	2%			12.70
C	Present Standard Workload (in man-mins.)						87.40
D	Net Available Man -mins. / shift						480.00
E	Present Manpower / shift						2
F	Present Manpower Utilization (%) (C/(D X E))						9.10%
REMARKS:							

APPENDIX – II

WLS – Prodn-4					
WORK LOAD DETAILS SHEET					
Department:		Production		Section: Paint	
Work Centre:		Paint Filling		No. of Working Shift/ day: 1	
Designation:		Operator			
Job Summary:		Fill the paint into 20 Ltrs. Can			
Sl. No.	Activity Description			Crew	Time / Occasion (in mins.)
1	Activities Performed before start filling				
	Filter the paint from one tanker to another before packing to remove the sediment/particle etc. (100 litres.)			2	15.00
	Clean the filter with thinner after filtration			1	10.00
	Bring the empty can from stencilled area to near packing area(3 cans moved at a time)			1	0.11
2	Operator- 1				
	Take and place the empty can on the top of table for paint filling			1	0.75
3	Operator- 2				
	Take the paint from tanker using mug and pour it in (20 lit) can			1	0.62
	Remove the Filled 20 lit can and keep the empty 20 lit can for filling			1	0.13
4	Operator-3				
	Bring the cap, newspaper, cap tightener, chair to near the packing area			2	2.00
	Take the cap(2 nos.) and newspaper, place on the can and close, Tighten the cap using tightener, Push the can to next stage			1	0.72
5	Operator-4				
	Paint the top cap using paint brush for identification of inside material			1	0.48
6	Collect the last qty., Clean the tanker after packing with thinner			1	10.00
	Cycle time per Can			4	4.36
	Move & Bring the empty can from packing material stores to paint section(~58 metres)			2	0.10
	Shift the packed cans to finished goods storage using trolley (~34 meters)			1	0.30
A	Basic Workload per can (drum) (in man-mins.)				4.76
B	Relaxation Allowance	15%	Contingency Allowance	2%	0.809
C	Present Standard Workload (in man-mins.)				5.57
REMARKS:					

APPENDIX – II

WLS – Prodn - 5					
WORK LOAD DETAILS SHEET					
Department:		Production		Section: Paint	
Work Centre:		Paint section		No. of Working Shift/ day: 1	
Designation:					
Job Summary:		Fill the paint into respective tins - 4 Ltrs.			
Sl. No.	Activity Description			Crew	Time / Occasion (in mins.)
1	Activities Performed before Filling				
	Filter the paint from one tanker to another before packing to remove the sediment/particle etc. (100 ltrs.)			2	15.00
	Clean the filter with thinner after filtration			1	10.00
2	Operator- 1				
	Take and place the empty can on the top of table for paint filling			1	0.25
3	Operator-2				
	Take the paint from tanker using mug and pour it inside the empty can(4 Ltrs.), Remove the Filled can(4 Ltrs.) and keep the empty can(4 Ltrs.) on the table for filling			1	0.25
4	Operator-3				
	Take the filled can, keep the cap & rubber mat, Place the unit under the machine and tighten the cap, Keep the capped unit on the floor			1	0.22
5	Collect the last qty., Clean the tanker after packing with thinner			1	10.00
	Primary Packing				
6	Move & Bring the empty can from packing material stores to paint section			1	0.10
7	Bring the can from near supervisor room to packing area, Open the cover, remove the thread			1	0.05
8	Paste the batch number, date sticker on the individual can outside			1	0.19
	Secondary Packaging				
9	Bring the corrugated carton from packing material store to paint section			1	0.05
10	Fold and prepare the outer corrugated carton, paste cello tape at the bottom			1	0.25
11	Move the folded corrugated box from supervisor area to packing area(5 cartons at a time)			1	0.09
12	Take the carton, open and Place the filled cans inside and fold the carton (4 Ltrs. * 4 Can per Carton) and paste			1	0.28
13	Shift the packed cans to finished goods storage using trolley			1	0.20
A	Basic Workload per tin (in man-mins.)				2.850
B	Relaxation Allowance	15%	0.485	2%	0.204
C	Present Standard Workload per tin (in man-mins.)				3.054
REMARKS:					

APPENDIX – II

WLS - Prodn - 6						
WORK LOAD DETAILS SHEET						
Department:	Production		Section:	Wax		
Work Centre:	Wax Melting & Moulding		No. of Working Shift/ day:	1		
Designation:						
Job Summary:	Add the required material, heat, pour in die and prepare the required wax sticks					
Sl. No.	Activity Description		Crew	Time / Occasion (in mins.)	Freq./ Shift	Man-mins. / Shift (in mins.)
1	Bring the raw materials from the room to near the work area and start-up the stove for heating		1	10.00	1	10.00
2	Add raw materials in the heating pan and place it on the heating media(stove) and remove the cooked batch from media(stove)		1	0.54	42	22.70
3	Remove the bur from the wax sticks and place the wax sticks aside		1	0.68	42	28.50
4	Take the die from water tank, open and remove the wax sticks (24 nos. / Die)		1	1.17	42	49.27
5	Clean the die with chemical cloth and close the nut of the die		1	0.54	42	22.70
6	Pour the heated/melted liquid into the die		1	1.58	42	66.17
7	Remove the extra/spillage on the die and put back in the heating pan for next batch		1	0.38	42	15.94
8	Shift end activities like switch off the stove, keep the heating pan aside, discussing with the supervisor etc					30.00
A	Basic Workload (in man-mins.)					245.28
B	Relaxation Allowance	18%	Contingency Allowance		2%	49.06
C	Present Standard Workload (in man-mins.)					294.33
D	Net Available Man -mins. / shift					480.00
E	Present Manpower / shift					1
F	Present Manpower Utilization (%) (C/(D X E))					61.32%
G	Proposed Manpower / shift					1
H	Proposed Manpower Utilization (%) (C/(D X G))					61.32%
REMARKS: Target - 50 Pockets / person. 24 Sticks/ Die						

APPENDIX – II

WLS - Prodn - 7					
WORK LOAD DETAILS SHEET					
Department:		Production		Section: Ink	
Work Centre:		PDCP Room		No. of Working Shift/ day: 1	
Designation:					
Job Summary:		Fill the indelible ink in the phials and pack it			
Sl. No.	Activity Description			Crew	Time / Occasion (in mins.)
	Ink Filling - 10 CC				
	Operator-1				
1	Fill the ink into the phials(10 CC) arranged in the wooden tray by holding semi-automatic filling machine and transfer the wooden tray to packing persons			1	0.050
	Operator-2				
2	Take, place the inner cap on the phials and hit the cap using wood stick to tighten			1	0.08
	Operator-3				
3	Take, Place the outer/top cap and close the phials by hitting with wooden stick			1	0.08
	Operator-4				
4	Paste the product label sticker on individual phials			1	0.08
	Operator-5				
5	Place the instruction slip and phials inside the primary package(individual carton box)			1	0.12
	Operator-6				
6	Place the stick, Close the primary package, and arrange them in secondary package(medium carton box- 40 vials/Secondary package)			1	0.12
7	Close and paste cello tape on the secondary package			1	0.01
8	Arrange the secondary package into tertiary package and close			1	0.007
9	Fold and prepare the primary package(carton box)			1	0.12
10	Fold and prepare the secondary package(carton box)			1	0.02
11	Fold and prepare the primary package(carton box)			1	0.003
12	Arrange the phials into wooden trays from covers			1	0.05
13	Bring the vials, primary package materials, caps, sticks from stores to ink filling area			1	0.005
A	Basic Workload per vial (in man-mins.)				0.74
B	Relaxation Allowance	15%	Contingency Allowance	2%	0.111
C	Present Standard Workload (in man-mins.)				0.85

APPENDIX – III

Date	Product	Problem I	Problem II	Organisation
03/01/2013	Silver paint	Gloss shining not there		
12/12/2008		Thin, so required 4 coating		NWKSRTC
13/09/2013	Hardener for Paint	Smell Problem		KSRTC
13/09/2013	PU thinner	Smell Problem		KSRTC
13/09/2013	Surface Primer	Smell Problem	Difficult to mix	KSRTC
06/04/2013	Aluminium Paint	Partial Supply		KPCL
08.06.2013	Bituminous black paint	Smell Problem-bad odour		Canara Workshop Ltd
08.06.2013	Bituminous black paint	Delayed supply		Canara Workshop Ltd
10.04.2013	Sky Blue Enamel	Poor finishing		NWKSRTC
25.09.2012	Synthetic Enamel Golden Yellow	Shade Variation	Very Thin	KSRTC, Mandya
25.09.2012	Synthetic Enamel Ivory	Shade Variation	Very Thin	
25.09.2012	Tin Container	Defective		
25.09.2012	2 K PU putty	Matt Finish (Req. nice finish)		
23.08.2013	2 K PU paints-Blue& off white	Smell Problem	Slow drying, No coverage	KSRTC, Mysore
18.12.2010	Stiff Paste	Lack of stiffness & brightness		Lakshmi Metals, Coimbatore
3.5.2011	2K PU Pint-Crimson red	Surface fading		KSRTC Workshop, Davangere
Sep-11	Synthetic Enamel-Sky blue, satin blue	Shade variation	Fading	Andhra Power Gen Corpn.
Sep-11	Chlorub Paint	Shade variation	Fading	Andhra Power Gen Corpn.
Oct-11	Zinc Chrome Red oxide steel primer	Smell Problem	Slow drying	KSRTC, Kengeri
12.12.2008	2 K PU Deep cream metal	Defects		NWKSRTC
09.04.2009	2 K PU paint	Smell Problem	Delay in supply	KSRTC Mandya
2.12.2009	2 K PU putty	Quality Problem		KSRTC
11.07.2011	Enamel paints	Thin		NWKSRTC, Belgaum

Contd..

APPENDIX – III

Date	Product	Problem I	Problem II	Organisation
03.05.2011	2 K PU Red	Dull Colour		KSRTC, Davangere
03.12.2009	2 K PU putty	Qty Problem		NWKSRTC, Hubli
3.12.2011	PU paints- Off white, deep orange	Slow drying	Dull colour	NWKSRTC
27.12.2011	SE- White, Red, PO red, Silver, pale cream	Qty Problem		KSRTC, Hassan
13.09.2011	SE- Sky Blue, Satin blue	Shade fading		AP Power gen Corpn. Ltd, Kadappa
30.08.2011	SE- Grey	Colour Variation	Slow drying, Smell Problem	MEI, Bangalore
14.05.2011		Shining gone		KSRTC
10.01.2011	Stiff Paste	Dried	Stone form	Sundar Industries
22.12.2009	GPSE Gulf red	Shade not matching		KTMS
20.10.2008	2K Polyester putty	Slow drying		KSRTC, Hassan
12.04.2008	AWD-pale cream	not sticking to the wall		Dalmia Magnesite Corpn.
22.04.2008	Anti-Corrosion Bituminous black paint	Slow drying		Sales depot, Madurai
14.05.2008	Zinc chromite red oxide Metal primer	Slow drying		KSRTC, Kengeri
6.02.2008	Red oxide metal primer	Product mixed with oil, black particles so not usable		

APPENDIX – IV

No. of Batches produced in each Machine per Month												
Month	Ball Mill-1	Ball Mill-2	Ball Mill-3	Attritor Mill-1	Attritor Mill-2	Pot Mill-1	Pot Mill-2	Pot Mill-3	Clear Coat (Manual Mixing)	High Speed Mixer		Edge Runner
										Coal Tar Black	White	
Apr-13	18	0	6	2	8	7	1	0	0	1	2	3
May-13	12	5	5	3	5	3	3	0	0	2	0	0
Jun-13	15	4	6	5	3	5	0	0	1	4	0	0
Jul-13	26	10	16	5	7	8	0	0	1	6	0	2
Aug-13	7	1	6	8	8	4	0	0	7	0	2	0
Sep-13	8	7	4	2	4	7	0	0	0	2	0	0
Oct-13	14	4	0	6	6	5	1	0	1	0	1	0
Nov-13	9	2	1	9	9	3	3	0	1	3	9	0
Dec-13	10	5	4	5	13	5	0	0	3	2	3	0
Total	119	38	48	45	63	47	8	0	14	20	17	5
Average	14	5	6	5	7	6	2	0	2	3	2	1
Min	7	0	1	2	3	3	0	0	0	0	0	0
Max	26	10	16	9	13	8	3	0	7	6	9	3
% Util.	53%	17%	21%	20%	28%	21%	4%	0%	6%	9%	8%	2%
Utilisation of Machine is Calculated as					Total Shifts / (25 working days * 9 months) (considering 1 batch is produced in one man- shift)							

APPENDIX – V

1. Quality Testing Equipments for Paint Industry:

1.1. Coating Thickness

1.1.1. Instrument Name: Paint Inspection Gauge

This destructive thickness gauge uses a tungsten carbide cutting tool to measure coating thickness on plastics, wood, aluminium, steel, concrete, glass etc.



Features

- For coatings up to 1250 μm
- The total thickness as well as individual coating thicknesses can be measured.
- Complies with ASTM D 4138 method A.

1.1.2. COLOUR:

1.1.2.1. Instrument Name: Option -1: LICO 150 Colour Measurement



Measurement of five colour scales on-site

- Simple: large touch screen with intuitive user guidance
- Error-safe: reference beam technology and cuvette identification
- Reliable: automatic calibration reminder and self-testing
- Portable: optional battery allows the colorimeter to be used anywhere

Assured colour quality in production environments. Reproducible colour values are an important factor in quality assurance, e.g. dye, paint industries and the petrochemical sector. LICO 150 is a portable colorimeter. Its high quality optical system ensures exact and reproducible measured values. Once a value has been measured on site, it can be called up at any time in all five ISO/ASTM colour scales.

It performs well even in difficult conditions. The colorimeter is designed to offer maximum handling in production environments. With intuitive input via a touch screen, calibration memory for every type of cuvette, and data storage capacity for 200 measurements. LICO 150 can be fitted with a powerful lithium battery for on-site use.

1.1.2.2.LICO 500 Colour Measurement



Professional colour measurements

- Reliable operation through intuitive menu guidance and archival user profiles
- All important colour scales included
- Correct measurement results thanks to automatic cuvette identification
- High level of measurement reliability through a comprehensive set of test aids
- Only 7 seconds per measurement

The LICO 500 offers simple handling and fast results with unsurpassed measurement reliability.

Latest technology

LICO 500 is a safe investment, as its 22 integrated colour scales cover all requirements: - Conventional scales such as iodine, Hazen (Pt Co), Gardner, Pharm. Eur. and - Specific scales such as Saybolt or ASTM. One important benefit is LICO's high level of flexibility in quality control: measured values can be evaluated in all scales, also after the event with archived spectral data.

1.1.3. Drying Time Recorder

1.1.3.1. Instrument Name: Drying Time Recorder



A reliable apparatus to test the drying time or gelation behaviour of many paints and coatings, applied onto a glass strip of 300 x 25 mm (12" x 1") by means of our cube applicator.

Features

- 3 standard models available:
 - BK3: 6 tracks, 3 selectable speeds: 6, 12 or 24 h.
 - BK6: 6 tracks, each pair of tracks is driven by an Independent motor, this allows different test start times. 1 speed: 12 h.
 - BK10: 10 tracks, same as BK6, 1 speed: 12 h.
- Special speed combinations with 6, 12, 24, and 48 h. also possible, to be specified when ordering
- Optional 6 x 5 g. brass weights to increase test pressure
- Simple maintenance & easy to clean
- Standard delivery: recorder, set of 6 (or 10) needles, pack of 6 (10) glass strips
- 240 V/50 Hz or 110 V/60 Hz*Hemispherical needles travel on these test tracks, over a selected time: 6, 12 or 24 h.

The drying time stages can be easily assessed with the graduation scale (according to traverse speed configuration):

1. Evaporation of solvent: deep pear-shaped impression
2. Sol-gel transition: continuous track
3. Surface dry: interrupted track
4. Final dry time, the needle no longer penetrates the film

1.1.4. Density (through Viscosity)

1.1.4.1. Instrument Name: Stormer-Type Viscometer - Digital KU-2

Conforms to ASTM D 562

The Stormer-Type Viscometer - Digital KU-2 provides a direct digital reading in Krebs units (KU), centipoises, and grams (gm). This simplifies an established test procedure providing an immediate calculation of the viscosity value. The viscometer automatically starts or stops by lowering or raising the viscometer. The KU-2

automatically establishes the correct rotational speed to comply with ASTM method D 562.

- Easy to use – no weights or stroboscopic timing attachment
- Switch selectable LED digital display of Krebs units or grams or centipoises
- Allows for rapid and easy measurement of samples
- Parallel printer output for test documentation
- Instrument base fits standard pint, 1/2 pint and quart cans
- Traceable to NIST

The Stormer-Type Viscometer - Digital KU-2 can be equipped with an air purge that allows the interior of the instrument to be pressurized with air or inert gas.

1.1.5. 'Wet Film Thickness' Gauge

Wet Film Thickness Gauges are designed to quickly and easily measure the thickness of coatings immediately after they have been applied to a substrate. These gauges are also commonly known as: Combs, MIL Gauges, Step Gauges and Notched Gauges. The gauges incorporate a series of notches cut into their sides much like the teeth on a comb. The wet film thickness of most organic coatings including paints, resins, lacquers, varnishes, gel coat, etc. may be measured. The thickness of powder type coatings may also be measured before curing.

1.1.5.1. Instrument Name: Wet Film Thickness Wheel

It's an accurate gauge to check the wet film thickness of paint film.

A calibrated wheel with an eccentric rim is rolled across the applied wet film to determine thickness.



APPENDIX – VI

ANALYSIS OF QUALITY							
Sl. No.	Product / PO Details/ Despatch Details	Reject Quantity & Cost		Rework/ Salvaged Quantity & Cost		Reasons for Rejection & Rework	Action taken
		UOM	(Rs.)	UOM	(Rs.)		
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

APPENDIX – VII

Dear Sir/Madam,

Sub: Data required to evaluate Productivity- Reg.

Warm Greetings,

We would like to introduce ourselves, **National Productivity Council (NPC)** a premier national level organization to promote Productivity in India. Established in 1958 by **Government of India**, it is an autonomous, not for profit organization. NPC provides training, consultancy and undertaking research in the area of Productivity. The Mission of NPC is Development, Dissemination and Application of knowledge and experience in productivity, for promoting consciousness and improvement in productivity.

NPC along with **Department of Public Enterprises (DPE), Government of Karnataka (GoK)** is evaluating the Productivity and Profitability of many sectors of which Industrial Paint& Coatings industry is one. For our evaluation, NPC is sending the questionnaire to various industry leaders to collect the data regarding productivity & quality levels.

We are glad to inform that we have found that your organization is one of the best performing organization in Industrial Paints and Coatings sector in this country. We request you to provide the information as per the enclosed Annexure. The information provided by you will be kept confidential, strictly and used only for evaluation purpose.

We had sent the post copy to you on 13-jan-2014, hope you would have received by this time. However we request you to kindly send the information through e-mail by 22-Jan-2014.

Thanking you in anticipation of your support.

Yours truly,

(K.P. Ashwin)
Dy. Director
For Regional Director

Encl: a/a

Contd...

Annexure

Product	Synthetic Enamels Paints	Epoxy Paints	PU Paints
PRICE*(in Rupees/ Litre)			
Material Cost			
Direct Employees			
Production Over Heads (Energy & Maint.)			
Other Overheads (Administration, Sales, Distribution ,R&D)			
Packing Cost			
Quality Parameters			
Consistency			
Density			
Drying Time			
1.Surface drying			
2.Tack Free			
3.Hard Dry			
Shade			
Adhesion			
Settling Test			

Contd...

Addresses of Paint Companies	
<p>Mr. B. Ramakrishnan Managing Director Akzo Nobel Coatings India Pvt. Ltd. Plot No.62 P, 62 A,62 B,43 E, Hoskote Industrial Area Bangalore - 562 114 Karnataka Tel : 080-27971306</p>	<p>Mr. A S Gandotra Managing Director Gem Paints Limited #490/H, IVth Phase Peenya Industrial Area Bangalore 560 058 Karnataka Tel: 080-28360918</p>
<p>Mr. V K Ramachandran Manager-Sales & Marketing MRF Corp Limited Tarapore Towers, V Floor 826,Anna salai Chennai 600 002 Tamilnadu Tel : 044-28521033</p>	<p>Mr M Hemant Khincha Managing Director Monarch Paints (India) Private Ltd. No. 422,11th Cross 3rd Main,4th Phase,2nd Stage Peenya Industrial Area Bangalore 560 058, Karnataka Tel : 080-28360103</p>
<p>Mr. Sudhir Peter, Chief Executive Officer Sheenlac Paints Corp No.57,McNichols Road Chetpet Chennai 600 031 Tamilnadu Tel: 044-26413204</p>	<p>Mr. Sameer Nagpal Managing Director & CEO Shalimar Paints Limited Village Gonde, Nashik Mumbai Road, Igatpuri, Nashik – 422403, Maharashtra Tel: 02553-225002</p>
<p>Mr. Jagadish Acharya Chief Executive PPG Asian Paints Private Limited Address: 158, Vidyanagari Marg, CST Road, Dani Wooltex Compound, Kalina, Santacruz (East) Mumbai - 400098. India. Tel: 022 - 3056 8700 / 8800</p>	

APPENDIX – VIII

Despatches during April 2013 - December 2013				
Paint/ Ink/ Wax	Quantity (Ltrs.)			
	Govt. Sector	Private Sector	SRTC*	Total
Thinner 107 for PU paints/ primer	0.0	0.0	7652.0	7652.0
Anti Corrosive Paints	2220.0	10144.0	6940.0	19304.0
Aluminium Paints	1552.0	1904.0	0.0	3456.0
Brindavan Red Oxide Steel Primer	6524.0	530.0	2.0	7056.0
Epoxy Paints	2488.0	1680.0	5264.0	9432.0
Brindavan General Purpose Synthetic Enamel	3447.0	5063.0	4264.0	12774.0
Primer Surfacer Grey	0.0	28.0	1494.0	1522.0
Indelible ink	7697.8	2.468	0.0	7700.3
Brindavan Red Oxide Paint IS 123	1560.0	0.0	0.0	1560.0
BSC ink	900.0	0.0	0.0	900.0
Metallic Paints	540.0	800.0	2900.0	4240.0
Silicon Aluminium Paint	60.0	20.0	0.0	80.0
Synthetic Enamel	14652.0	170.0	64916.0	79738.0
Mylac Stiff Paste	0.0	1400.0	0.0	1400.0
Turpentine	500.0	0.0	0.0	500.0
Thinner	15521.0	5205.0	33496.0	54222.0
Varnish	1040.0	160.0	0.0	1200.0
Sealing Wax - 1st Grade/ Schamic Green (kgs.)	4608.9	0.0	44.1	4653.0
Sealing Wax - Railway Grade (kgs.)	1122.8	497.3	0.0	1620.0
Specialities	19882.0	15.0	0.0	19897.0
Clear Coat for PU paints ad Metallic Paints	0.0	0.0	1270.0	1270.0
Hardener for Polyurethane paints	0.0	26.0	1713.0	1739.0
Mylac Polyurethane paints	0.0	140.0	6430.0	6570.0
Mylac Polyurethane paints (Reds)	0.0	0.0	2524.0	2524.0
Mylac Chlorub Chemical Resisting Paint	0.0	0.0	40.0	40.0
Polyester Putty	0.0	0.0	3940.0	3940.0
Grand Total	84315.5	27784.7	142889.1	254989.3
% Share of Despatch	33.07%	10.90%	56.04%	

*State Road Transport Corporation

APPENDIX – IX

PRICE ANALYSIS SHEET (2012 – 13)							
Sl. No.	Company Name	Tender Details		Qty (Ltrs.)	MPVL Price (`)	Competitor's Price	REMARKS
		Enquiry No. & Date	Product				
1	India Sugars and Refineries Ltd.	Email: 22.03.2013	Graphited Boiler Paint	60	147.00	10 to 15 % less	Lesser Price than MPVL
			Thinner	80	103.00		
			Enamel PO Red	20	166.00		
2	Gentech Global	Email: 21.03.2013	SE Paints Group – II	240	149.40	18 to 22 % less	Lesser Price than MPVL
			Chlororub CR Paint	80	248.40		
			HR Black Paint	160	140.40		
			Red-oxide Primer	80	78.30		
			ZC Red-oxide Primer	80	139.50		
			GP Thinner	200	92.70		
3	Jamkhandi Sugars	ADM/PUR/12-13/ 04.04.2013.	Red-oxide Metal Primer	600	87.00	25 to 30 % Less	Lesser Price than MPVL
			Epoxy Paint	900	292.00		
			Epoxy Thinner	700	134.00		
			Linseed Oil	400	176.00		
			SE Dark Green	200	166.00		
			SE Golden Yellow	220	179.00		
			SE White	240	179.00		
			SE PO Red	200	166.00		
			Aluminum Paint	500	170.00		
			SE Dark Grey	400	166.00		
			SE Light Grey	260	166.00		
			SE Thinner	400	103.00		

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APPENDIX – IX

PRICE ANALYSIS SHEET (2012 – 13)							
Sl. No.	Company Name	Tender Details		Qty (Ltrs.)	MPVL Price (`)	Competitor's Price	REMARKS
			Product				
3	Jamkhandi Sugars		Epoxy Thinner	900	212.00	25 to 30 % Less	Lesser Price than MPVL
			SE Deep Blue	200	166.00		
4	Davangere Sugars Co. Ltd.	DSCL/AGM/E.632/12-13/ 26.03.2013	Epoxy Paint	460	233.89	28 to 30 % Less	Lesser Price than MPVL
			ZC Red-oxide Primer (Epoxy)	460	169.81		
			Epoxy Thinner	300	104.95		
			Chlororub CR Paint	320	221.08		
			ZC Primer	300	118.64		
			Chlororub Thinner	240	101.82		
			Red-oxide Primer	500	69.69		
			GP Thinner	400	87.00		
			Aluminum Paint	300	136.57		
5	Gem Sugars	Email: 24.04.2013	HR Black Paint	150	156.00	Not Available	MPVL rates very high
			Red-oxide Primer	250	87.00		
			Epoxy Paint	600	292.00		
			Epoxy Thinner	600	134.00		
6	Satish Sugars	SSL/Enq/MFG/Pur/13-14/ 75/ 19.06.2013	Chlororub CR Paint	600	221.07	25 to 30 % Less	Lesser Price than MPVL
			Epoxy Paint	360	233.89		
			Epoxy Coal Tar Black Paint	240	120.15		
			Aluminum Paint	120	144.18		
			SE Black Paint	60	147.74		

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APPENDIX – IX

PRICE ANALYSIS SHEET (2012 – 13)							
Sl. No.	Company Name	Tender Details		Qty (Ltrs.)	MPVL Price (`)	Competitor's Price	REMARKS
			Product				
7	Parrys Sugars	Email: 21.06.2013	Aluminum Paint	410	136.17	30 % Less	Lesser Price than MPVL
			SE Thinner	570	87.08		
			SE Smoke Grey	860	132.96		
			Red-oxide Steel Primer	1020	73.56		
			SE Golden Yellow	280	143.38		
8	Ankidyne, Chennai	Email enquiry dtd: 17.07.2013	PU Surface Thinner	300	338.20	40 % Less	Lesser Price than MPVL
			PU Thinner	240	173.55		
			PU Golden Yellow, Green, Black etc.	200	446.77		
9	Karnataka Seeds Corporation		Sealing Wax	4400	480.00	229.00	Lesser Price than MPVL
10	KSRTC, Trivandrum	SRA4/015249/12/BB/17.12.12	SE BK Green	3200	166.00	147.00	Lesser Price than MPVL
		SRA4/008855/13/BB/25.10.12	SE PO Red	16000	133.50	132.50	
		SRA4/015242/27.07.12	2K PU Chassis Coat Paint	48000	341.60	40 to 45 % Less	
		SRA4/015243/26.07.12	PU Metal Primer	1500	325.00		
		SRA4/015241/19.10.12	PU Zinc Primer	9200	321.00		
11	BHEL, Bangalore	6000056475/14.12.2013	Aluminum Paint	600	151.30	5 % Less	Lesser Price than MPVL
		6000056100/02.12.2013	Epoxy Primer (Zn Phosphate)	100	511.53	40 % Less	
		6000055734/18.11.2013	Thinner	100	91.67	12 % Less	

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APPENDIX – IX

PRICE ANALYSIS SHEET (2012 – 13)							
Sl. No.	Company Name	Tender Details		Qty (Ltrs.)	MPVL Price (₹)	Competitor's Price	REMARKS
12	BEML, Bangalore	BR01/RMS/8404100401/ 13.11.2013	OBD Distemper (in kgs.)	1000	41.00	12 % Less	Lesser Price than MPVL
		BR01/RM4/1200107690/ 21.10.2011	SE Dove Grey	303	129.80	20 % Less	
13	BEML, KGF, Kolar	KR02/RQM/1200135053/23.08.13	SE White	600	140.90	18 % Less	Lesser Price than MPVL
			PU Golden Yellow	860	393.15		
		KE01/EMC/1200119916/16.02.2013	PU Thinner	820	152.72		
			PU Primer	1420	290.00		
14	Andhra Pradesh Power Generation Corpn. Ltd.	1220320/13-14/CE/O & M/KTPS/P22/ EM. B/D. No. 2212 /13/20.07.2013	Aluminum Paint	200	185.00	7 to 10 %	Lesser Price than MPVL
			SE Light Grey	200	179.75		
			SE Opaline Green	240	179.75		
			SE Smoke Grey	640	179.75		
			SE Bus Green	300	166.00		
15	KSRTC, Thiruvanantha - puram	SRA4/009203/13/BB/30.10.2013	Lemon Green	1000	187.88	Under Process	Lesser Price than MPVL
		SRA4/009203/13/BB/30.10.2013	Black Mat Finish	5000	142.38	Under Process	
		SRA4/009200/13/BB/20.08.2013	White Under Coat	5000	147.95	Quality (Not as per their specification)	
		SRA4/009200/13/BB/20.08.2013	Cream Undercoat	2000	149.88		
		SRA4/009199/13/BB/16.08.2013	Deep Cream	10000	194.26		
16	South Western Railway, Mysore	03/LP/Stock/NS/LT//1235/09.12.13	Aluminium Paint	60	194.65	157.60	Lesser Price than MPVL
		06131532/07.10.2013	SE Golden Yellow	500	174.20	166.20	
		06131533/08.10.2013	Ready mixed Red oxide paint	360	161.56	148.50	

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APPENDIX – IX

PRICE ANALYSIS SHEET (2012 – 13)							
Sl. No.	Company Name	Tender Details		Qty (Ltrs.)	MPVL Price (`)	Competitor's Price	REMARKS
	South Western Railway, Mysore	06131535/08.10.2013	Zinc Chrome Primer	200	150.85	136.00	Lesser Price than MPVL
		03/LP/Stock/NS/LT/0968/05.10.13	SE Black Paint	1000	159.65	20% Less	
		03/LP/Stock/NS/LT/0873/17.09.13	Anti-Corrosive Black	440	151.80	28% Less	
		03/LP/Stock/NS/LT/0876/17.09.13	SE Golden Yellow	820	174.20	166.20	
		03/LP/Stock/NS/LT/0665/21.08.13	SE Smoke Grey	1000	158.88	129.30	
		03/LP/Stock/NS/LT/0080/25.04.13	SE Lemon Yellow	300	174.20	166.20	

APPENDIX – X

Dear Sir/Madam,

Warm Greetings,

We would like to introduce ourselves, **National Productivity Council (NPC)** a premier national level organization to promote Productivity in India. Established in 1958 by **Government of India**, it is an autonomous, not for profit organization. NPC provides training, consultancy and undertaking research in the area of Productivity. The Mission of NPC is Development, Dissemination and Application of knowledge and experience in productivity, for promoting consciousness and improvement in productivity.

NPC along with **Department of Public Enterprises (DPE), Government of Karnataka (GoK)** is evaluating the Productivity and Profitability of many sectors of which Indelible Ink is one. For our evaluation, NPC is sending the questionnaire to various industry leaders to collect the data regarding productivity & quality levels.

We are glad to inform that we have found that your organization is one of the best performing organization in Indelible Inks sector in the world. We request you to provide the information as per the enclosed Annexure. The information provided by you will be kept confidential, strictly and used only for evaluation purpose.

We had sent the post copy to you on 13-jan-2014, hope you would have received by this time. However we request you to kindly send the information through mail by 22-Jan-2014.

Thanking you in anticipation of your support.

Yours truly,

(K.P. Ashwin)
Dy. Director

Encl : a/a

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Annexure

Product	Indelible Ink
PRICE*(in \$ / Kg)	
Material Cost	
Direct Employees	
Production Over Heads (Energy & Maintenance.)	
Other Overheads (Administrative, Sales, Distribution, R&D)	
Packing Cost	
Quality Parameters	
Specific Gravity	
Performance Test	
Drying Time	

List of Companies for Indelible Inks

1. Kores India - response@kores-india.com
2. Rayudu Chemicals - info@rayuduchemlabs.com
3. Fuzhou Obooc Technology Co., Ltd., China
4. MARKEM-IMAJE, USA
5. Intequip Ltd, USA - intequip@btconnect.com
6. J.M. McLaren & Sons Ink Company Ltd., Canada
7. Lantrade Global Supplies Ltd, UK - global@lantrade.com