

‘Green Dye House Management’

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Anugraha Fashion Mill Private Limited

Tirupur - India

About Anugraha Fashion..

- Anugraha Fashion Mill P Ltd, Tiruppur, is One Of The Leading Manufacturer & Exporter Of Knitted Garments
- One Of The Vertically Integrated Setup from Spinning to Knitted Garments Export House With A Group Turn Over Of 250 Cr
- We are ISO 14001, OHSAS 18001, ISO 9001, SA 8000, SEDEX, WRAP, Oeko Tex & GOTS Certified Company
- Our Green Initiatives Are Wind Energy, Solar Energy & Zero Liquid Discharge, etc

About Our Dye House...

- **M/s. Freelook Fashions** – Dyeing Division Of Anugraha Fashion Started in 2007 @ SIPCOT - Perundurai
- One of the **ISO 14001 / OHSAS 18001** Certified Modern Dye House with a production capacity of 12 Tons / day for Knitted Fabric Processing
- Chemical Management System Implemented Dye House
- Our Average **Right First Time %** is **97.4%** and Average **Rework %** is **1.2%**

Dyeing Cost Contribution on a Garment..



Green Dye House Management is..

“ Green Dye House Management is the use of Process, Practices, Materials, Products and Energy that Avoid or Minimize the Creation of Pollutants and Wastes where Overall Risks to Human Health & Environment gets reduces “

Challenges in The Dyeing Industry..

- Technical Challenges
- Non Technical Challenges
- Commercial Challenges

Technical Challenges..

- Right First Time Dyeing / Blind Dyeing Concept
 1. Lab to Bulk
 2. Bulk to Bulk
- Shade Evaluation & Approval Process
- Handling Specialty Fabrics
- Selection of Dyes, Chemicals & Process – Based on Waste Water Treatment

Non Technical Challenges..

- Imbalanced Infrastructure
 - Machineries
 - Utilities
 - Waste Water Treatment
- Communication Gap / Understanding the Requirements
- Handling Social & Environmental Compliance
- Shorter Lead Times & Quicker Responses

Commercial Challenges...

- Raw Material Price Fluctuations – Cotton to Carton Box
- Competitive Market Price – Global Market
- Utilities Cost Control – Power / Fuel
- Water Treatment Cost Increased – No Direct Returns
- Man Power Cost Increase & Poor Efficiency – Need Automation Where Ever Possible

Our Formula For Green Dye House Management Is..

Little Drop of Water Makes a Mighty Ocean



Our Focus is on the below Areas..

1. Updating and Modifying of Equipments
2. Better Process Control & New Process Techniques
3. Onsite Recovery and Reuse
4. Good House Keeping
5. Go Green Initiatives

Updating and Modifying of Equipments...

- a. Flow Meters for Water & Steam @ Every Stage for better Measuring, Monitoring & Controlling
- b. Bulk Dispensing For Dyes & Chemicals
- c. Wood Boiler to Fully Atomized Coal Boiler & Fuel Handling System
- d. Modification Of Mechanical Evaporator

Flow Meters for Water & Steam @ Every Stage



Flow Meters for Water & Steam @ Every Stage

Eg: Finishing Water Consumption

Description	Values
Before Flow meter Installation	14,000 Ltrs/ Day
After Flow meter Installation	12,000 Ltrs/ Day
Water Saving/ Day	2,000 Ltrs
Water Saving/ Year	650 Cubic Meter

Overall Saving for Unit/ Year (Like above eg.)	11,375 Cubic Meter
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With this Saved Water, We could able to run our Dye House for 20 days in a year

Bulk Dyes & Chemicals Dispensing System..



Bulk Dyes & Chemicals Dispensing System..

- a. Unwanted Spillage Is Controlled Up to 2%
- b. Unwanted Water Utilization For Spillage Clearing Is Avoided
- c. Water Consumption For The Dyes & Chemicals Dissolving Is Only 50% When Compared To Manual Handling
- d. Making A Difference In Achieving RFT

Wood Boiler to Fully Automatic Coal Boiler...



Wood Boiler to Fully Automatic Coal Boiler...

- a. 15000 Tons Of Wood Consumption / Year Is Avoided
- b. Because Of The Fully Automatic Feeding System – 10% Efficiency Has Been Improved
- c. Fluctuation In The Temperature Is Avoided Which Helps In Minimising The Unutilized Energy In The Processing / Finishing Area

Modifications in the Mechanical Evaporator.



Old



New

Modifications in the Mechanical Evaporator..

Old MEE Steam, Coal & Power Consumption

Description	Kgs/Units	Coal/Day	Rate/Kg	Value
Steam Consumption per Day	56,000	11,429	4.75	54,286
Power Consumption per Day	1,600		7.15	11,440
		Total Expenses		65,725.71

New MEE Steam, Coal & Power Consumption

Description	Kgs	Coal/Day	Rate/Kg	Value
Steam Consumption per Day	42,000	8,571	4.75	40,714
Power Consumption per Day	1,200		7.15	8,580
		Total Expenses		49,294
		Per day Saving		16,431
		Per Month Saving		4,27,217
		Savings/Year		51,26,606

Better Process Control & Process Techniques..

- a. Our Average Right First Time is 97.5%
- b. 100% Working On Blind Dyeing Concept
- c. Encouraging Combination Processes Like..
 - Single Bath Dyeing
 - Combined H₂O₂ Killing & Bio Polish
 - Single Bath Bio Scour & Bio Polish Process
 - Single Pass Heat setting & Finishing for Y/D

Importance of Right First Time Dyeing..

Criteria	Rs / 100 Kg	Production T/day	Relative Cost
Blind Dyeing	3,000	1	100
Dyeing + Sampling (If Shade is OK)	3,145	0.92	105
Dyeing + 1 addition (Same Bath)	3,513	0.74	117
Dyeing + 1 addition (Fresh Bath)	4,000	0.63	134
Dyeing, Drying & Redyeing (Correction)	4,974	0.54	166
Dyeing, Stripping & Redyeing	5,658	0.53	189
Dyeing, Drying & Black Over Dyeing	6,500	0.45	217

Onsite Recovery and Reuse..

- a. Effluent Water Recovery & Reuse
- b. Salt Recovery & Reuse
- c. Heat Recovery from Processed Hot Water & Reuse

Effluent Water Recovery & Reuse..



Effluent Water Recovery & Reuse..

- Using Best Eco Friendly Techniques like Anaerobic & Ozone Treatment for Color Removals to Reduce the Solid Waste
- 3 Stages Reverse Osmosis with Ultra Filtration System is used for Best Water Recovery
- An ISO 14001-2004 Certified Company for maintaining the Best Environment Management System
- OHSAS 18001 Certified For Health & Safety

Salt Recovery & Reuse..



Salt Recovery & Reuse..

- Having Four Stage Multiple Effect Evaporator with Crystallizer for Better Salt Recovery
- **80% of Glauber's Salt** is being Recovered and Reused on a regular basis
- Forced Circulation Evaporator is incorporated to increase the efficiency and also to reduce the final waste

Heat Recovery Systems..



Heat Recovery Systems..

Fuel Savings Through Waste Water Heat Recovery System

Description	Values
Per day Hot effluent generated	400 KLD
Average Temp. of Effluent	60°C
Exchanging temperature to Fresh water	20°C
Total Calorific Value Saved	8 Million K/Cal
Boiler Efficiency	67%
Fuel Calorific Value (Coal)	4,500
Fuel Savings / Day (Kgs)	2,653
Steam Savings / Day (Kgs)	11,940

Good House Keeping & Waste Control..

- Leakages
- Spills
- Running Taps
- Over Head Tanks Overflows
- Regular Energy Audit
- Regular Waste Audit

Good House Keeping..



Regular Energy Audits



50% of the air in a process house is being utilized for cleaning purpose only

By adding a reducer at the edge of the cleaning hose, we could save 50% of the air which was wasted before

The saving due to that is around 2.5 laks / Year just by saving **100 to 150 Unit of Power in day.**

Regular Waste Audits

Yellow Marker Vs Heat Seal Stickers



Regular Energy & Waste Audits...

Energy Consumption Yarn to Finished Fabric

Description	Consumption	Cost (Rs)
Power Requirement for Per Kg Yarn in Spinning	4 Units	26.00
Power Requirement for Per Kg of fabric in Knitting	0.04 Units	0.26
Power Requirement for Per Kg of fabric in Dyeing	1.25 Units	8.13
Steam Requirement for Per Kg of fabric in Dyeing	6 Kgs	5.70
Total Energy Cost per Kg of Fabric		40.09

Savings Through Waste Auditing

Description	Values
Savings in 25 Kgs of one roll	55 Gms
Savings in a day for 10 Tonnes Capacity	22 Kgs
Cost of 1 Kg of Dyed Fabric	Rs.350/-

Solar & Wind for Power Generation



Using this 1 MW Solar & Wind Plant – We could able to get 12000 Units / Day

Bio Gas for the Canteen



‘ Zero Defect – Zero Effect Module ’

The Story Of A Garment..!!!

A Visual On Food Wastage..



Day-1



Day-21-30



Day-100



Day-120



Day-122



Day-130



Day-132



Final



We can throw away food in a minute but it takes months and years to grow the food we eat.

Think before you throw food away.

Like This We Have A Story

Behind Every Garment..!!!



LAND PREPARATION - DAY 1



SEED SOWING - DAY 15



GROWTH – DAY 30 (One Month)



GROWTH – DAY 45



GROWTH – DAY 60 (Two Months)



GROWTH – DAY 90 (3 Months)



GROWTH – DAY 120 (4 Months)



GROWTH – DAY 150 (5 Months)



MANUAL PICKING – DAY 150 TO 180

GINNING - DAY 200



COTTON TRANSPORTATION - DAY 210



SPINNING – DAY 230



KNITTING – DAY 240



PROCESSING - DAY 250



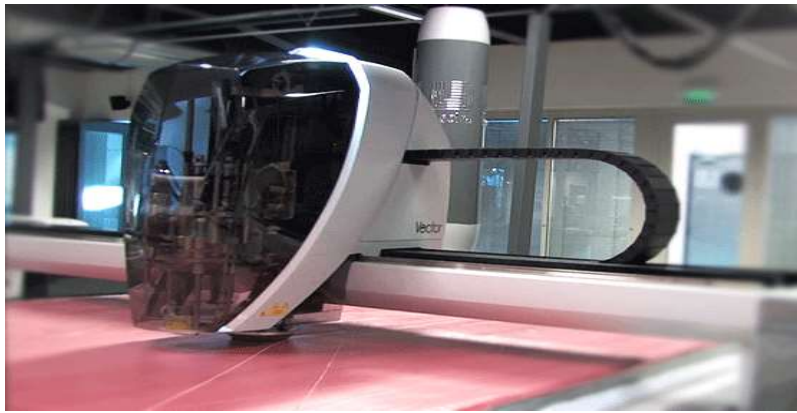
ROTARY PRINTING – DAY 260



FABRIC INSPECTION – DAY 270



SPREADER - DAY 280



CUTTING – DAY 280



CUT PANELS – DAY 290



SEWING – DAY 300

Case study

Spindles	18000	
Average Count	34s	
Production/Day	7000	Kgs
Garment Weight	0.2	Kgs
Garments/Day	35000	Pieces
Raw Cotton Required	9500	Kgs (75% Realization)
Raw Cotton / Day	60	Bales
Kappas Required / Day	30000	Kgs
	(78% Seed & 22% Cotton)	
Area Required	24	Acres
	(1200 Kgs	

Case Study Continues...

Manpower Requirement	Nos	
Agriculture	125	(300 Kg/day/person)
Ginning	25	(6 ginning machines needed)
Spinning	240	
Knitting	60	
Dyeing	260	
Inspection & Cutting	125	
Others	40	
Total Man Power	875 - 900	Persons For A Day
Total Travel Distance	2500	Kilo Meters
Water Consumption	2700	Litres/T Shirt
Carbon Foot Print	10.75	Kgs/T Shirt

Finally An End Product With Defect..!



SKIP STITCH



Attitude Change..

- **Change From Inside to Out**

“ If Everyone Start Understanding The Human Efforts Involved In Making A Garment From The Beginning Then Skilling Them Would Be Much Easier & Effective ”

Let Us Get Ready For CHANGE..!!!

Our Journey Towards Green Continues...

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Thank You