iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** III **Month of publication:** March 2023

DOI: https://doi.org/10.22214/ijraset.2023.49709

www.ijraset.com

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue III Mar 2023- Available at www.ijraset.com

A Novel Study of Hazard Identification and Risk Assessment in Textile Industry

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Abstract: ***The work environment of textiles is risky and portrayed by different simultaneous chemical, physical and mechanical hazard exposure, which would prompt wounds of textile labourers. Health risks from working in the textile industry. This manuscript contains the details on the hazards and risk level present in one of south India's leading textile industry. This study also briefs about the need, method and result of the HIRA technique. The HIRA technique is adopted in the old rotary printing department and dyeing department to assess the risk levels in terms of quantified values. The control measures were also developed for each area and activities identified with potential safety issues. It is found that the identified hazards majorly categorized under Physical, chemical, ergonomics, material handling, health and electrical hazards. The risk level is quantified for all the hazards in the printing and dyeing department by multiplying the values of severity and probability.***
Keywords: Risk, Hazards, textile, dyeing, health, severity

I. INTRODUCTION

Hazard Identification and Risk Assessment (HIRA) deals with the identification and quantification of risks that are exposed to, due to accidents resulting from the hazards present or handling of hazardous substances in the workplace.

This involves Hazard analysis which essentially is identification and quantification of the various hazards that are likely to occur in the industry as well as quantification of the consequences due to a particular hazard.

The risk analysis estimates the probability as well as severity of a particular hazard over an exposed group of people, plant equipment or both.

For any industry to be successful, it has to be safe, reliable, and sustainable in its operations. The industry has to identify the hazards and assess the associated risks and to bring the risks to tolerable level.

Hazard Identification and Risk Assessment (HIRA) is carried for identification of undesirable events that can lead to a hazard, the analysis of hazard of this undesirable event, that could occur and usually the estimation of its extent, magnitude, and likelihood of harmful effects.

It is widely accepted within industry in general that the various techniques of risk assessment contribute greatly toward improvements in the safety of complex operations and equipment.

The objective of this work of hazards and risk analysis is to identify and analyse hazards, the event sequences leading to hazards and the risk associated with hazardous events.

Many techniques ranging from the simple qualitative methods to the advanced quantitative methods are available to help identify and analyse hazards.

The use of multiple hazard analysis techniques is recommended because each has its own purpose, strengths, and weaknesses.

HIRA assists in identifying the most likely hazards which can have significant impact on workplace safety in an industry.

It helps in devising effective management measures as well as engineering measures for both preventive as well as post-disaster management.

II. HAZARD IDENTIFICATION AND RISK ASSESSMENT

Hazards are the sources or situations which have the potential to cause undesired events. Risks are the combination of likelihood which creates a chance for the undesired events. All industries and workplace consist of Hazards and Risks which creates and cause the chances of accidents. In order to reduce those hazards and risks, the hazard identification and risk assessment have to be performed periodically. Hazard Identification and Risk Assessment is a tool used by industries to identify the hazards and providing control measures as per the risk priorities of each hazard. After the hazards are identified the risks can be assessed by quantitative and qualitative method to determine whether the identified risks are significant or non- significant.

HIRA is a combination of deterministic, probabilistic, and quantitative method. The deterministic methods take into consideration of the products, the equipment and quantification of the various targets such as people, environment, and equipment. The probabilistic methods are based on the probability or requency of hazardous situation apparitions or on the occurrence of potential accidents. The uantitative methods analyse various data numerically. The steps involved in HIRA are

1) Classify Work Activities
2) Hazard Identification
3) Risk Assessment
4) Monitor and Review

III. PROCESS DESCRIPTION

Its yarn storage area,
Front pass of Yarn loading point ,
The different yarn is segregation,
The yarn box move to fabric knitting room by the help of vehicle.

A. Fabric Knitting Machine

Knitting machine process
Knitting is a process of using long needles to interlink or knot a series of loops made by one continuous thread. Each loop or knot connects to another one, and when enough loops have been made, the result is a flat piece of material called a textile
Type of knitting machine

1) *Circular Knitting Machine:* In this machine the needles are implanted on a circular cylinder, which when used creates a seamless tube of fabric, by joining the stiches from the needles.
2) *Single Jersey Machine:* As opposed to double jersey machine, the Single jersey machine has only one cylinder one which one set of needles and sinkers are placed on. The diameter of this cylinder is generally around 30 inch, which can vary according to the machines type and requirement. The fabric manufactured on a Single jersey machine is known as “Single jersey fabric”, they have a plain thickness, almost half if compared to the Double jersey fabric. Both front and back side of this fabric is visibly different
3) *Double Jersey Machine:* Double jersey machines have two sets of needles; one on dial and as well as on cylinder. There are no sinkers in double jersey machines. known as double jersey fabric
4) *Interlock Double Jersey Machine:* In this type of double jersey machines, the needles on the cylinder and the dial are placed opposite and alternatively. Interlock machine uses two types of latch needles instead only one type which is used generally in circular knitting machines.
5) *Terry Single Jersey Machine:* Terry fabrics are manufactured on Terry circular knitting machine using “Plush knitting technique”. In this technique generally—the one set of sinker loops are made longer than the ground fabric sinker loops this longer set of sinker loops form the velvet like pile on the fabric, both the threads, of pile and ground fabric are worked together to give a stable structure.

B. Dyeing Machine

The machine which is used to dyeing or coloring of materials like yarn, fabric, garments or any other materials is called dyeing machine. Dyeing machines come in all shapes and sizes to accommodate the various forms and quantities of textile materials
TYPES OF DYEING MACHINE

1) Soft Flow Dyeing Machine

In the soft flow dyeing machine water is used for keeping the fabric in circulation. The conception difference of this equipment from a conventional jets that operates with a hydraulic system is that the fabric rope is kept circulating during the whole processing cycle (right from loading to unloading).There is no stopping of liquor or fabric circulation for usual drain and fill steps. The principle working behind the technique is very unique.
There is a system for fresh water to enter the vessel via a heat exchanger to a special interchange zone. At the same time the contaminated liquor is allowed channel out through a drain without any sort of contact with the fabric or for that matter the new bath in the machine.

2) Jet Dyeing Machine

Jet dyeing machine is the most modern machine used for the dyeing of polyester fabric with disperse dyes. In these machines, both the fabric and the dye liquor are in motion, thereby facilitating a faster and more uniform dyeing. In jet dyeing machine, there is no fabric drive reel to move the fabric. The fabric movement by only force of water. It is economical, because of low liquor ratio. It is users friendly because comparison with long tube dyeing machine, to control the fabric movement four valves required. In jet dyeing machines and fabric dyeing machine, there is only one valve. Absent of reel, reduce connecting electric power, maintenance of two mechanical seal and breakdown time, if jet pressure and reel speed not synchronized.

In jet dyeing machines a strong jet of dye liquor is pumped out from an annular ring through which a rope of fabric passes in a tube called a venturi. This venturi tube has a constriction, so the force of the dye liquor passing through it pulls the fabric with it from the front to the back of the machine.

Thereafter the fabric rope moves slowly in folds round the machine and then passes through the jet again, a cycle similar to that of a winch dyeing machine. The jet has a dual purpose in that it provides both a gentle transport system for a fabric and also to fully immerse the fabric in liquor as it passes through it.

In all types of jet machines there are two principle phases of operation:

1) The active phase in which the fabric moves at speed, passing through the jet and picking up fresh dye liquor
2) The passive phase in which the fabric moves slowly around the system back to the feed-in to the jets

Jet dyeing machines are unique because both the dye and the fabric are in motion, whereas in other types of machine either the fabric moves in stationary dye liquor, or fabric is stationary and the dye liquor moves through it.

The design of the jet dyeing machine with its venturi means that very effective agitation between the fabric rope and the dye liquor is maintained, giving a fast rate of dyeing and good levelness. Although this design can create creases longitudinally in the fabric, the high degree of turbulence causes the fabric to balloon out and the creases disappear after the fabric leaves the jet. However, the rapid flow of the dye liquor can lead to a high degree of foaming when the machines are not fully flooded. The machines operate at low liquor ratios of about 10 : 1, so as with beam dyeing, exhaustion is good and water and energy consumption efficient.

C. Stenter Machine

Stenter machine is not only a dryer but also used for many other purposes. Here knitted and woven fabric in open width form is treated. This multipurpose machine is used for the following purposes:

1) Drying
2) Heat setting
3) Width control
4) Curing
5) Finishing chemical application
6) Selvedge printing
7) Uniform moisture control for pad batch dyeing
8) Loop control
9) Weft straitening
10) Pigment dye application
11) Any thermo fixation
12) Padding mangle

Here finishing like OBA treatment, dry-cross finish, moist cross finish, wrinkle free finish, easy care finish can be done along with width and shrinkage control.

WORKING PROCEDURE

Continuous drying is done in a stenter frame by convection. Blowers impinge hot air on both the top and bottom of fabric as the fabric passes through the chamber of the machine. Its frames are equipped with an endless chain on each side to grip the fabric by both selvages as it enters chamber.

The distance between the chains can be increased or decreased. In every chamber there are burners and blowers. The temperature of each chamber can be controlled individually. The fabric gripping in stenter, two systems are available:

a) Clip to grip coarse fabrics like twill fabric.
b) Pin to grip fine fabric.

D. Mechanical Finishing

A simple device which simulates the effects of calendaring is the domestic iron. Hot ironing makes garment smooth flat by removing its crinkles and creases. Besides making the fabrics free from creases by calendaring,

1) it is possible to raise the luster of the fabric,
2) make it compact by closing the threads,
3) impart a soft feel and 'thready' or
4) linen like appearance to it

It reduces the yarn slippage as well as thickness of the fabric by varying the calendaring operation.

The need of calendaring arises mainly because the fabric when it is wet processed and dried, is in the least lustrous state and its surface is not smooth because of presence of highly crimped and wavy threads. To meet this need the fabric is passed between the rollers or bawls of a machine termed 'Calender' and this mechanical process

a) Raising

Raising is a process of lifting of a layer of fibres from the surface of the fabric so as to form a hairy surface or pile. The process imparts a warm and soft handle to both on the woven and knitted fabrics; in fact, the formation of a pile on the fabric can make it exceptionally soft. The pile also includes a large amount of air and since air is a bad conductor of the heat, the raised fabrics feel vary warm as well assoft. In the early days, only cotton and woolen fabrics were raised, but now besides these fabrics, man-made fibre fabrics also raised. If the fabric contains a woven or coloured pattern, the weave and pattern get subdued on raising and various colour blends.It is easier to raise the fabric in the wet state than in dry state. Therefore, moist raising is most widely adopted.

b) Shearing

Shearing means removing or taking off fibre ends by cutting. It is carried out to cut fibres of random length to produce a level pile and prevent pilling in case of synthetic fibres by resulting of the height of the fibres particularly to produce clean staple fibre fabrics. Napped fabrics are mostly sheared.

Knitted fabrics are sheared on a machine having a single cutting head per unit where in case of woven fabrics multiple sheared are used. The pile heights are regulated by adjusting the distance between the cloth rest and rotary blade.

c) Sanforising

A method of producing unshrinkable cotton fabric is to give it a thorough wash in a washing machine so as to allow it to shrink freely and then dry and finish it without stretching. This method however is not reliable and not suitable for commercial production.

d) Napping

In napping the surface of the cloth is raised, cut even and smoothed by a napping machine known as planetary napper.

e) Sueding

When a vary mild effect of raising is required a special type of machine called sueding machine is used. This consists of a vertical set of small diameter rotating rollers covered with an abrasive surface such as sand paper or emery cloth. There is a rubber covered pressure roll which presses the fabric against the abrasive covered cylinder. The abrasion of the fabric surface takes place when the fabric is open width presses between the pressure roller and abrasive covered cylinder. A vary sort pile thus raised according to the pressure of the fabric against these rollers which rotate in a direction of opposite to that of the fabric.

f) Setting and Heat-setting

During manufacturing processes like spinning, weaving or knitting, the fabric is subjected to stresses and strains and release of these distortions in fabric leads to distortions in fabric structure and woven design and also uneven shrinkage. The purpose of the setting is to stabilize the woven structure of the fabric in a regular and permanent manner by relaxing the stresses. The effect is bought about by agencies like heat, moisture, and pressure and generally no chemicals are used in the process.

HIRA RISK
YARN GODOWN

MENAKA MILLS PRIVATE LIMITED UNIT - I (Textile Division)	Occupational Health & Safety Hazard Identification & Risk Assessment (HIRA) Study	Format No	EHS/YG/01
Page 1 of 1		Rev. No	01
		Rev. Date	15.11.2022

Department: YARN GODOWN	Area/line: YARN GODOWN	Dept. Doc No.:	Revn No./Revn Date:

SL.NO	TYPE OF OPERATION	OPERATION		IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	Condition			Concerns LC/BC/IPC	Current Controls					Pre risk					CONTROL MEASURE	Post risk					Remarks/ Control Ref
		ROUTINE	NON ROUTINE				N	A	E		Elimination	Substitution	Engineering Control	Administrative Control	Personal Protective Equipment (PPE)	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL		SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	
1	Electrical operation		N R	Electrical Shock.	Can cause pain and numbness.	Health hazard			I	LC			√		√	4	2	1	8	High Risk	To properly maintain earth level, Use proper insulated wiring with earthing, use the rubber mat						
		R		Chargeing of electrical vehicle battery. (may be short circuit of battery	May cause of fatal accident.	Health hazard	N			IPC				√	√	4	3	1	12	High Risk	Employee awareness to be given for proper charging , use ppe's and stand on rubber mat . Separated place for charging area.						
			N R	Fire due to short circuit.	Property damage.	Fire hazard			I	BC			√			3	2	1	6	High Risk	Follow the panel board check list and frequently cleaning Provide fire equipment such as somke detector, fire extingusher.						
2	Loading and unloading of box (or)bags	R		Lifting of over weight	Can cause back and joint pain	Ergonomic hazard / Health hazard			A	IPC			√	√		3	2	3	18	Medium Risk	As per standard lift upto 50kg for man and30kg for woman.						
3	Box storage	R		Improber box stacking	Can cause high injury of human	Ergonomic hazard / Health hazard			A	IPC			√	√		4	2	2	16	Medium Risk	Given awareness to employees to stacking method						
4	Electric vehicle and Trolly movement		N R	Electric vehicle and trolly may hit the person or porperty.	Crush injury or property damage or both may occur.	Ergonomics Hazard \ health hazard			A	BC				√		5	3	1	15	Medium Risk	Provide proper employee training on electric vehicle and trolly operation and usage.						We only use the electric vehicle and avoid using trolley
		R		Pushing and pulling of trolly.	Can cause back and joint pain.		N			IPC			√			3	2	1	6	Medium Risk	Use proper lifting equipments and operated by trained persons.						
		R		Improper handling of trolley or movement of trolley in ramp side	Can cause Cresh the figures and muscle				A	IPC			√		√	5	3	1	15	Medium Risk	Wear the PPE's (Safety shoe)						
5	Insufficient illumination		N R	Person are hit the materials and Falling objectives,	Can cause Eye strain and Head aches	Health hazard			I	IPC			√	√		2	2	1	4	Low Risk							
6	Electric fan operation	R		Entanglement of workers clothes and hairs due to	Can cause of injury of human	Health hazard			A	LC			√		√	4	2	1	8	Low Risk							
7	Cleaning process	R		Dust from the electric vehicle and atmospare air so dust is occupied in yarn box	1)Can cause respiratory problems 2)Property damage.	Health hazard	N			IPC					√	4	3	1	12	Medium Risk	To be provide climate sheet						
		R		Cobweb occupied in the switch box	1)Can leads to fire 2)Property damage.	Fire hazard			A	BC			√			4	2	2	16	High Risk	Improve the cleaning process. and properly follow cleaning sechdule						

- *Yarn Godown*

The proposed action for the Hazards in Yarn godown is to electrical hazards in textile operation maybe related to electrical vehicle charging materials. Accident related to improper handling electrical vehicle charging ,

Injuries from charging activities, maybe due to adapter problem or connecting terminal damage . To avoid those electrical rubber mat ,to avoid unauthorized persons are handling charging station, charging station handling should remain within restricted zone under supervision, with particular attention paid to proximity of electrical cables and equipment's. Locate machine tools at a safe distance from other work areas and from walkways.

Conduct regular inspection and repair of machine tools, in particular protective shield and safety devices/ equipment's. Use appropriate PPE (Personal Protective Equipment's) such as Helmets, Insulating gloves, safety shoes. Respiratory Hazards: Dust generated in textile includes corttonbox dusts, which are present in yarn godown,

The improper of cleaning process Incase of fire incident to indicate the fire alarm switch and automatically sense the smoke detector and additionally provide fire extinguisher.

- *Fabric Knitting*

The proposed action for the hazard in Fabric knitting is to electrical hazard and trolley movement, cleaning process in this operation maybe related to fabric machine. This machine due to create noise level .Its rotating parts maybe Entanglement of workers clothes and hairs due to rotating part, Finger or hand struck by in rotating parts.

The fabric due to shifting in fabric storage area by the help of trolley, Injury from the needle point changing and hot oil replacement shifting of materials maybe due to handling activity .to avoid those handling procedure given to the employees some materials handling only authorized person only should remain within restricted zone under supervision, with particular attention paid to proximity of electrical cables and equipment's. Locate machine tools at a safe distance from other work areas and from walkways. Conduct regular inspection and repair of machine tools, in particular protective shield and safety devices/ equipment's. Use appropriate PPE (Personal Protective Equipment's) such as ear plug, apron ,head cap .Respiratory Hazards: Dust generated in Fabric knitting machine includes yarn dusts, which are present in fabric knitting area.

KENAKA MILLS PRIVATE LIMITED UNIT - I (Textile Division)	Occupational Health & Safety Hazard Identification & Risk Assessment (HIRA) Study	Format No	EHS/FK/02
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		Rev. Date	15.11.2022

Department: FABRIC KNITTING | Area/line: FABRIC KNITTING | Dept. Doc No.: | Revn No./Revn Date:

SL.NO	TYPE OF OPERATION	OPERATION		IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	Condition			Gases - LC/IC/ PC	Current Controls					Pre risk					CONTROL MEASURE	Post risk					Remarks/Control Ref
		ROUTINE	NON ROUTINE				N	A	E		Elimination	Substitution	Engineering Control	Administrative Control	Personal Protective Equipment (PPE)	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSURE	ERI SCORE	RISK LEVEL		SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSURE	ERI SCORE	RISK LEVEL	
1	Electric operation		NR	Electrical Shock.	Can cause pain and numbness.	Health hazard			E	LC			√			4	2	1	8	High Risk	To poperly maintain earth level, Use proper insulated wiring with earthing, use the rubber mat						
			NR	Fire due to short circuit.	Property damage.	Fire hazard			E	BC			√			3	3	1	9	High Risk	Follow the panel board check list and frequently cleaning Provide fire equipment such as somke detector, fire extingusher.						
2	Noise level	R		Sound comes out of the machine	Can cause of ear problem	Health hazard		A		BC					√	4	1	5	20	Medium Risk	Use PPE (Ear plug) To properly maintain the noise level						
3	Machine operation (Rotating of parts and belt drive)	R		Entanglement of workers clothes and hairs	Can cause of injury of human	Health hazard	N			LC					√	4	2	1	8	Low Risk							
4	Technician operation	R	NR	1) Oil refilling, 2) Needle replace, 3)Hot surfaces in machine, Etc problem	1)Can cause falling objects. 2) Can cause injury of finger (or) body injury.	Health hazard		A	E	BC				√	√	2	2	1	4	Low Risk							
5	Sharp tools	R		1)Fabric cutting by the help of scissor. 2)Machine service tools.	Can cause falling scissor and other tools so borken the bone or damage the muscle.	Health hazard			E	BC			√	√		4	3	1	12	Medium Risk	Sharp tools should be tied and other machine (needle point aluminium rod) tools not be placed on machine top side and rotating parts.						
6	Fabric loading area	R		Lifting of over weight (yarn box)	Can cause back and joint pain	Ergonomic hazard / Health hazard		A		IPC			√			3	2	1	6	Low Risk							
		R	NR	Fabric only placed on Rack or Roll stand (Platform) Falling of stored Fabric	1)Can cause damage the Fabric 2)Can cause falling objects, 3) Can cause injury of human	Ergonomic hazard / Health hazard	N			BC			√			4	3	1	12	Medium Risk	Provide proper employee training on stacking methods.only follow by authorised person only						
		R		Cotton dust from the fabric	Can cause respiratory problems	Health hazard	N			IPC					√	2	2	1	4	Low Risk							
7	Trolly movement	R		Trolly may hit the person or porperty.	Crush injury or property damage or both may occur	Ergonomics Hazard \ health hazard		A		BC			√			4	2	1	8	Low Risk							
		R		Pushing and pulling of trolly.	Can cuase body and joint pain		N			IPC			√			4	3	1	12	Medium Risk	Use proper lifting equipments and operated by trained persons.						
		R		Improper handling of trolley or movement of trolley in ramp side	Can cause Cresh the figures and musele			A		IPC			√		√	5	3	1	15	Medium Risk	Wear the PPE's (Safety shoe)						
8	Inspection machine	R		1)Entanglement of workers clothes and hairs due to rotating part 2)Finger or hand struck by in rotating parts	Can cause injury of human	Health hazard		A	E	IPC					√	4	3	1	12	Medium Risk	Given awareness to employees to rotating pats and (PPE's)wear apron,head cap.						
		R	NR	Lighting Insufficient illumination	1) It cause eye sight problem 2) Machine parts can hit the human body	Health hazard	N			IPC			√			2	2	1	4	Low Risk							
		R		Continuous exposure to light	Eye stress, eye irritation and head aches	Ergonomic hazard / Health hazard	N			BC			√	√		4	2	1	8	Low Risk							
		R		Lifting of heavy fabric operation (Lifting machine collapse)	1) Property damage 2) Body parts caugth into the lifting machine.	Ergonomic hazard / Health hazard		A		IPC			√			3	3	1	9	Low Risk							
		R		Workers contacting with moving parts of machinery	Can cause of injury of human	Health hazard	N			IPC			√			4	2	1	8	Low Risk							
		R		Cotton dust from the fabric	Can cause respiratory problems	Health hazard	N			IPC					√	3	2	1	6	Low Risk							
		R		Long standing and continuous checking of fabric	Leg pain (varicose veins) and if the lux level is low it may cause eye problem	Ergonomic hazard / Health hazard	N			IPC			√			3	4	1	12	Medium Risk	Proper floor checking mat has to be given and proper lux level should be maintained						
		R		Long standing and continuous usage of wrist (Stickering operation)	Can cause Leg pain And wrist pain	Health hazard	N			IPC			√	√		3	4	1	12	Medium Risk	Proper must provide periodical interval.						
9	Cleaning procss	R		Dust from the machine cleaning and floor cleaning	Can cause respiratory problems	Health hazard	N			IPC					√	2	2	1	4	Low Risk							
		R		Machine not proper cleaning	Can leads to fire	Fire hazard		A	E	BC			√			4	4	1	16	High Risk	1)Given cleaning awareness and training to employees , 2)Machine service Should be properly maintain machine sechdule 3)Provide fire equipment such as somke detector, fire extingusher.						
		R		Cobweb occupied in the pannel and cable	1)Can leads to fire 2)Property damage.	Fire hazard		A	E	BC			√			4	3	1	12	High Risk	Improve the cleaning frequency						
9	Working operation			1) Yarn insert the stand. 2) Fabric tack down the machine. 3)Inspection the fabric 4)Pushing and pulling of trolly (Trolly may hit the person or porperty) 5)Storage the fabric	1)Can cause of injury of human 2)property damage. 3)Insufficient illumination	Health hazard										3	2		6	Low Risk	1)Awarness to be given for proper working instruction, 2)Provide proper lightning in the inspetion machine, 3)Provide employee awarness about rotarting parts and emergench Button	3	2		6	Low Risk	

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue III Mar 2023- Available at www.ijraset.com

- *Dyeing*

MENAKA MILLS PRIVATE LIMITED UNIT - I (Textile Division)	Occupational Health & Safety Hazard Identification & Risk Assessment (HIRA) Study	Format No	EHS/DY/03
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		Rev. Date	15.11.2022

Department: DYEING	Area/line: DYEING	Dept. Doc No.:	Revn No./Revn Date:

SL. NO	TYPE OF OPERATION	OPERATION		IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	Condition			Concerns LC/BC/IPC	Current Controls				Pre risk					CONTROL MEASURE	Post risk					Remarks/Control Ref
		ROUTINE	NON ROUTINE				N	A	E		Elimination	Substitution	Engineering Control	Administrative Control	Personal Protective Equipment (PPE)	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL		SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	
1	Electric operation		N R	Electrical Shock.	Can cause pain and numbness.	Health hazard			E	LC			√		√	4	2	1	8	High Risk	To poperly maintain earth level, Use proper insulated wiring with earthing, use the rubber mat						
			N R	Fire due to short circuit.	Property damage.	**Fire hazard**			E	BC			√			3	2	1	6	High Risk	Follow the panel board check list and frequently cleaning Provide fire equipment such as somke detector, fire extingusher.						
		R		Loose connection of Switching operation	Can cause of injury of human and pain.	Health hazard		A		IPC			√			4	3	1	12	Medium Risk	Provide proper employee training on switch handling procedure						
		R		Sensor problem or bypass the sensor	Can cause of injury of human and fabric materials damage	Health hazard		A		IPC			√	√		5	3	1	15	Medium Risk	Given awareness to employees to sensor details. Should not be bypass the sensor.						
2	Dying machine operation (TONY & AKMM)		N R	Confined space	Respiration problem	Health hazard		A	E	IPC			√	√	√	3	2	2	12	High Risk	Provide proper employee training on confined space , Authorised person only entry the confined space, We are entry the confined space wea the PPE's.						
		R		Pressure vessel	Can leads to explosion of pressure vessel.	Health hazard			E	BC			√	√		4	3	1	12	Medium Risk	1)Pressure gauge (or) pressure display and should have marking safe working . **2)Pressure should not greater than but unfortunately pressure increase at the time working for safety valve.** 3)Doors should be mulit bolted doors and should have **interlocking**						
		R		Pressure vessel doors	Dnot entry into the thies machine while at running condition.	Health hazard		A		IPC			√	√		4	4	1	16	Medium Risk							
		R		**Safety valve** due to no opeate in high pressure	Can leads to explosion of machine	Health hazard and **Property damage**			E	BC			√	√		5	2	2	20	High Risk	1)Given awareness to the employees to valve handling details. 2)Pressure should not greater than safe working pressure. **3)Regular maintance and regular inspection has been done by safety valve,drain & pressure valve functions** 4)Machine service Should be properly maintain machine sechdule **5) safety valve not function so (manual) to start the cooling pocess of the machine and immediately open pressure valve** next open drain valve						
		R		**Drain valve** (Auto / Manual function) not function	Can leads to explosion of machine	Health hazard and **Property damage**			E	BC			√	√		4	2	2	16	High Risk							
		R		**Pressure valve** due to no opeate in high pressure (AKMM machine only)	Can leads to explosion of machine	Health hazard and **Property damage**			E	BC			√	√		4	2	2	16	High Risk							
		R		Handling of door 1)Automatic (or) manuval function of Door ,not proper locking door. 2)By pass the door pisston's 3)machine run time door open	1)Can cause injury human injury 2)Can cause eye injury,	Health hazard	N	A		IPC			√	√	√	4	2	1	8	Low Risk							
	Dying machine operation (TONY & AKMM)	R		Hot water spillage / Hot objects	Can cause burn injury	Health hazard		A	E	IPC			√		√	4	3	1	12	Medium Risk	Provide proper training on pipe line handling insulation,hot surface pipe line work should be use Heat resistant gloves.						
		R	N R	Falling down due to obstacles (Trolley , Box,Can,Spillage of chemical etc)	Can cause heavy injury of human	Health hazard		A		IPC			√	√		3	2	1	6	Low Risk							
		R		Machine chemical storage tank (Manuval feeling of chemical)	Can cause silppery and may harmful the human.	Health hazard		A	E	IPC			√		√	4	3	1	12	Medium Risk	Provide proper training on chemical handling instruction,chemical handling for employee **wear the PPE's.**						
		R		Display handling (Malfunction of machine)	1)Can cause of explosion of machine, 2)Can cause injury of human, 3)Property damage.	Health hazard	N			BC			√	√		3	2	1	6	Low Risk							
		R		Unwanted sound and fitting damage of Feeding motor with rotating part	Can cause of high injury of human or may fatal accident	Health hazard		A	E	BC			√		√	4	3	1	12	High Risk	Machine service sechdule Should be properly maintain. All the polt nut proper torque						
3	Loading & Unloading for fabric	R		Lifting of over weight	Can Cause back and joint pain	**Ergonomics Hazard ** health hazard		A		IPC			√			4	2	1	8	Low Risk							
4	Trolly movement	R		Trolly may hit the person or porperty.	Crush injury or property damage or both may occur	**Ergonomics Hazard ** health hazard		A		BC			√			4	2	1	8	Low Risk							
		R		Pushing and pulling of trolly.	Can cuase body and joint pain		N			IPC			√			4	3	1	12	Medium Risk	Use proper lifting equipments and operated by trained persons.						
		R		Improper handling of trolley or movement of trolley in ramp side	Can cause Cresh the figures and musele			A		IPC			√		√	5	3	1	15	Medium Risk	Wear the PPE's (Safety shoe)						

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue III Mar 2023- Available at www.ijraset.com

Department: DYEING		Area/line: DYEING				Dept. Doc No.:									Revn No./Revn Date:													
SL. NO	TYPE OF OPERATION	OPERATION		IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	Condition			Concerns LC/BC/ IPC	Current Controls					Pre risk					CONTROL MEASURE	Post risk						Remarks/Control Ref
		ROUTINE	NON ROUTINE				N	A	E		Elimination	Substitution	Engineering Control	Administrative Control	Personal Protective Equipment (PPE)	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL		SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	
5	Steam line	R		Leakage of steam	Can cause burn injury	Health hazard		A	E	LC			√		√	4	2	1	8	Low Risk								
6	Chemical handling	R		Eye contact while during operation	Can Cause eye irritation	Health hazard		A		BC			√	√	√	4	3	2	24	High Risk	Given awareness to employees to **wear the PPE's. Authorised person** are only handle the chemical. Any irrutation of body and eyes we are use the **eye wash station and shower station.** All the chemical we are place only secondary container.							
		R		Inhalation of chemical	Can cause Respiratory problem	Health hazard		A		IPC			√	√	√													
		R		skin contact	Can cause skin allergy or skin irritation	Health hazard	N			IPC			√	√	√													
		R		Chemical storage place can spillage of chemicals	Can cause silppery and may harmful the human.	Health hazard	N	A		IPC			√	√	√													Use the spillage kit
7	Disposal of Dyeing fabric waste water	R		Wet floor & slippery surface	1)Can cause slippery and cause body injury,	Health hazard	N			IPC			√	√	√	3	2	1	6	Low Risk								
		R		Splashing in the eyes while washing chemical fabric or materials	Can cause eye injury,	Health hazard	N			IPC				√	√													
		R		Due to Dying fabric and waste water are generated.	It is not disposed and maintained properly it will cause contamination to the air,land and water	**Environmental hazard**		A		LC			√	√		5	3	1	15	Medium Risk	Collect **Waste Water** properly and **send to ETP.**							
8	Cleaning process	R		Dust from the machine cleaning and floor cleaning	Can cause respiratory problems	Health hazard	N			IPC			√		√	2	2	1	4	Low Risk								
		R		Machine not proper cleaning	can leads to fire	**Fire hazard**		A		IPC			√		√	4	4	1	16	High Risk	1)Given cleaning awareness and training to employees , 2)Provide fire equipment such as somke detector, fire extingusher.							
9	Hydro Extractor (Dyeing)	R		Handling of door (Automatic and manuval function of Door) (machine run time door open)	Can cause human injury	Health hazard	N			BC			√	√	√	4	2	1	8	Low Risk								
		R		Over loading of fabric	1)Can cause human injury 2)Property damage.	Health hazard		A		BC			√			3	2	1	6	Low Risk								
		R		Dnot hit the machine by the trolley and fabric box	1)Can cause human injury 2)Property damage.	Health hazard	N			IPC			√			3	2	1	6	Low Risk								
		R		Electric shock (due to wet hand not be opearte the panel board switching functions)	Can cause pain and numbness.	Health hazard		A		LC			√			3	2	1	6	Low Risk								
		R		Unloading water pipe line (Due to fabric Dyeing and washing the waste water are generated.)	It is not disposed and maintained properly it will cause **contamination to the air,land and water**	**Environmental hazard**		A		LC			√	√	√	5	3	1	15	Medium Risk	**Collect Waste Water properly and send to ETP.**							
		R		Entanglement of workers clothes and hairs due to Main motor and belt drive	Can cause of injury of human	Health hazard	N			IPC			√			4	2	1	8	Low Risk								
		R		Loose connection of Switching operation	Can cause of injury of human and pain.	Health hazard	N			IPC			√			4	2	1	8	Low Risk								

Department: DYEING		Area/line: DYEING				Dept. Doc No.:					Revn No./Revn Date:													
SL. NO	TYPE OF OPERATION	OPERATION		IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	Condition			Concerns LC/BC/ IPC	Current Controls					Pre risk					CONTROL MEASURE	Post risk						Remarks/Control Ref
		ROUTINE	NON ROUTINE				N	A	E		Elimination	Substitution	Engineering Control	Administrative Control	Personal Protective Equipment (PPE)	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL		SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	
10	Slit opener(Dyeing)	R		Rotating table Over loading of fabric and leg to touch the rotating plate	1)Can cause human injury 2)Machine rotating part damage.	Health hazard		A		IPC			√			3	2	1	6	Low Risk								
		R		Rope Squcer (Instert the fabric at the rotating parts)	1)Can cause fingers and hand injury	Health hazard	N			IPC			√			3	2	1	6	Low Risk								
		R		Amberla (Fabric insert)	1)Can cause fingers and hand injury	Health hazard	N			IPC			√	√		3	2	1	6	Low Risk								
		R		Fabric cutting by the help of Rotating sharp Blade (E+L blade) .	Can cause falling cutting tools so borken the bone or damage the muscle.	Health hazard		A	E	BC			√	√		3	3	1	9	Low Risk								
		R		Machine service tools and spare parts.																								
		R		Dnot hit the machine by the trolley and fabric box	1)Can cause human injury 2)Property damage.	Health hazard	N			IPC			√			3	2	1	6	Low Risk								
		R		Electric shock (due to wet hand not be opearte the panel board switching functions)	Can cause pain and numbness.	Health hazard		A		LC			√			3	2	1	6	High Risk	Use proper insulated wiring with earthing .							
		R		Fabric water unloading from mangel (Due to fabric water is drain)	It is not disposed and maintained properly it will cause contamination to the air,land and water	**Environmental hazard**		A		LC			√	√		5	3	1	15	Medium Risk	Collect **Waste Water** properly and **send to ETP**.							
		R		Entanglement of workers clothes and hairs due to Main motor and belt drive	Can cause of injury of human	Health hazard	N			IPC			√			4	2	1	8	Low Risk								
		R		Loose connection of Switching operation	Can cause of injury of human and pain.	Health hazard		A		IPC			√			4	2	1	8	Low Risk								

- *Dyeing*

The proposed action for the Hazards in dyes kitchen shop is to implement First and foremost, using a less toxic or environment friendly abrasive media will give less dominant after effects on the atmosphere. Water based blasting media may be preferred due to its dust reduction property.

The proposed action for the hazard in dyeing is to chemical handling ,confined space , electrical hazard and trolley movement, cleaning process in this operation maybe related to fabric machine. This machine due to create health .Its rotating parts maybe Entanglement of workers clothes and hairs due to rotating part, Finger or hand struck by in rotating parts. The fabric due to shifting in fabric storage area by the help of trolley,

Injury from the door handling ,maintain proper temperature and steam line handling and rejection water go to the etp collection tank maybe due to handling activity .to avoid those handling procedure given to the employees some materials handling only authorized person only should remain within restricted zone under supervision, with particular attention paid to proximity chemical explosion ,and the electrical cables and equipment's. Locate machine tools at a safe distance from other work areas and from walkways. Conduct regular inspection and repair of machine tools safety valve ,drain valve ,temperature maintain properly in particular protective shield and safety devices/ equipment's. Use appropriate PPE (Personal Protective Equipment's) such as PPE (The nitrigul glove and respiratory mask, gum boot, pvc apron) .Respiratory Hazards: Dust generated in chemical handling includes dyes formation of dusts, which are present in dyeing machine area.

- *Stenter*

MENAKA MILLS PRIVATE LIMITED UNIT - I (Textile Division)	Occupational Health & Safety Hazard Identification & Risk Assessment (HIRA) Study	Format No	EHS/ST/04
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		Rev. Date	15.11.2022

Department: Stenter | Area/line: Stenter | Dept. Doc No.: | Revn No./Revn Date:

SL.NO	TYPE OF OPERATION	OPERATION: ROUTINE	OPERATION: NON ROUTINE	IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	Condition: N	Condition: A	Condition: E	Concerns LC/BC/ IPC	Current Controls: Elimination	Substitution	Engineering Control	Administrative Control	Personal Protective Equipment (PPE)	Pre risk: SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	CONTROL MEASURE	Post risk: SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	Remarks/Control Ref
1	Electric operation		NR	Electrical Shock.	Can cause pain and numbness.	Health hazard			E	LC			√		√	3	2	1	6	High Risk	To poperly maintain earth level, Use proper insulated wiring with earthing, use the rubber mat						
			NR	Fire due to short circuit.	Property and machine damage	Fire hazard			E	BC			√			3	1	1	3	High Risk	Follow the panel board check list and frequently cleaning Provide fire equipment such as somke detector, fire extingusher.						
		R		Loose connection of Switching operation	Can cause fabric travel hot surface area			A		IPC			√			4	3	1	12	High Risk	To regularly check the swith and sensor ,should not be bypass the sensor and switching operation						
		R		Sensor problem or bypass the sensor	Can cause fabric travel hot surface area			A		IPC			√	√		4	4	1	16	High Risk							
2	Sewing machine operation	R		Needle and eye Guard (Needle can broken while during operation)	Can cause injury of eyes and fingures	Health hazard		A		LC			√	√	√	4	2	1	8	Low Risk							
		R		Entanglement of workers clothes and hairs due to main motor pully	Can cause injury of legs	Health hazard		A		IPC			√		√	4	4	1	16	Medium Risk	Provide proper employee awarness of needle guard and eyeguard,insert the motor cover properly. Machine service Should be properly maintain machine sechdule.						
		R		Entanglement of worker clothes or fingurs due to moving parts and rotating parts	Can cause injury of eyes and fingures	Health hazard		A		IPC			√		√													
		R		Machine oil cleaning and oil refiling (Hot oil)	Can cause burn injury	Health hazard	N			IPC			√	√	√	3	2	1	6	Low Risk							
		R		Machine run by the help of leg handle ,imporper condition of rupper mat	Electric shock	Health hazard	N			IPC			√			4	3	1	12	High Risk	Provide the electrical rubber mat ,frequently checking the rubber mat.						
		R		Yam cone fixed by the help of stand	Property damage.	Health hazard	N			IPC			√			3	2	1	6	Low Risk							
		R		Insufficient illumination of needle point	Can cause injury of eyes and fingures	Health hazard		A		IPC			√			3	2	1	6	Low Risk							
3	Stenter machine operation (Fabric curing)	R		(Mangle operation) 1)Finger or hand struck by in rotating parts. 2)Entanglement of workers clothes and hairs	1)Can cause of finger injury or hand injury 2)Can cause of injury of skin	Health hazard		A		IPC			√	√	√	4	2	2	16	Medium Risk	1)Awareness has given to the operators wear the PPES and rotating parts details, 2)Clean the floor properly after mixing the chemical, 3)Provie the machine cover (or)pull card switch.						
		R		(Mangle operation) 1)Chemical spilling on human body 2)Chemical spillage make slippery floor 3)Chemical spillage may chance to contaminate air	1)Can cause skin and eye irritation 2)Can cause risk of falling 3)Can cause respiratory problem	Environmental \ health hazard		A		LC			√	√	√	5	2	2	20	Medium Risk							
		R		(Fram operation -The fabric entry to rotating and platform) 1)Finger or hand struck by in rotating parts. 2)Entanglement of workers clothes and hairs	1)Can cause of finger injury or hand injury 2)Can cause of injury of skin or crush	Fire hazard		A		BC			√		√	4	2	2	16	High Risk	1)Given awareness to employees to machine handling procedure, and wear the PPE's(Heat resistive glove,apron,mask) 2)Provide fire equipment such as somke detector, fire extingusher.						
		R		(champer operation - Fabric entry to champer) Hot surfaces of the machine, Tempreature improper maintain, Door open for machine runing condition	Can leads to fire of fabric Can cause increase the body temperature or burning injury			A		BC			√	√	√	3	2	2	12	High Risk							
		R		(Cooling champer - Fabric rotating of cooling area) 1)Finger or hand struck by in rotating parts. 2)Entanglement of workers clothes and hairs	1)can cause skin and eye irritation 2)Can cause of finger injury or hand injury	Health hazard	N			IPC			√	√	√	5	2	2	20	Low Risk							
		R		(Oil pipe line - Hot oil fllow of pipe line) The leakage of oil	Can cause burn injury	Ergonomics Hazard \ Health hazard			E	BC			√		√	5	2	2	20	High Risk	1)Handling only authorised person, and wear the PPE's. 2)thermo back machine out let gate valve close and machine off.						
		R		(Plating and folding - Fabric go to pin) Workers contacting with moving parts of machinery	Can cause of injury of human	Health hazard	N			IPC			√			5	1	2	10	Low Risk							
		R		Workers continuously standing	Can cause of varicose veins	Ergonomics Hazard	N			IPC			√	√		4	2	1	8	Low Risk							
		R		Continuous exposure to light	Eye stress, eye irritation and head aches	Health hazard	N			IPC			√			4	2	1	8	Low Risk							

Department: Stenter		Area/line: Stenter				Dept. Doc No.:								Revn No./Revn Date:														
SL.NO	TYPE OF OPERATION	OPERATION		IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	Condition			Concerns LC/BC/ IPC	Current Controls					Pre risk					CONTROL MEASURE	Post risk						Remarks/Control Ref
		ROUTINE	NON ROUTINE				N	A	E		Elimination	Substitution	Engineering Control	Administrative Control	Personal Protective Equipment (PPE)	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL		SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	
4	Inspection machine	R		1)Entanglement of workers clothes and hairs 2)Finger or hand struck by in rotating parts	Can cause injury of human	Health hazard		A	E	IPC					√	4	2	1	8	Low Risk								
		R		Lighting Insufficient illumination	1) It cause eye sight problem 2)Moving parts can hit the human body	Health hazard	N			IPC			√			2	2	1	4	Low Risk								
		R		Continuous exposure to light	Eye stress, eye irritation and head aches	Health hazard	N			BC			√	√		4	2	1	8	Low Risk								
		R		Lifting of heavy fabric operation (Lifting machine collapse)	1) Property damage 2) Body parts caugth into the lifting machine.	Health hazard		A		IPC			√			3	3	1	9	Low Risk								
		R		Workers contacting with moving parts of machinery	Can cause of injury of human	Health hazard	N			IPC			√			5	2	1	10	Low Risk								
		R		Workers continuously standing	Can cause of varicose veins	Ergonomics Hazard	N			IPC					√	4	2	1	8	Low Risk								
		R		Dust (cotton dust from the fabric)	Can cause respiratory problems	Health hazard	N			IPC			√			3	2	1	6	Low Risk								
		R		(Plating and folding) Workers contacting with moving parts of machinery	Can cause of injury of human	Health hazard	N			IPC			√	√		4	2	1	8	Low Risk								
5	Insufficient illumination	R		Person are hit the materials and Falling objectives,	Can cause Eye strain and Head aches	Health hazard			E	IPC			√	√		5	2	1	10	Low Risk								
6	Trolly movement	R		Trolly may hit the person or porperty.	Crush injury or property damage or both may occur	Ergonomics Hazard \ health hazard		A		BC			√			4	2	1	8	Low Risk								
		R		Pushing and pulling of trolly.	Can cuase body and joint pain		N			IPC			√			4	3	1	12	Medium Risk	Use proper lifting equipments and operated by trained persons.							
		R		Improper handling of trolley or movement of trolley in ramp side	Can cause Cresh the figures and musele			A		IPC			√		√	5	3	1	15	Medium Risk	Wear the PPE's (Safety shoe)							
7	Loading & Unloading of fabric	R		Lifting of over weight	Can Cause back and joint pain	Ergonomics Hazard \ health hazard		A		IPC			√			5	4	1	20	Medium Risk	Pin and heavy fabric materials are handle only trolley							Man worker Only operate the trolley
8	Finished Fabric loading area	R		Fabric only placed on Pin only	1)Can cause damage the Fabric 2)Can cause falling objects, 3) Can cause injury of human	Health hazard		A		IPC			√	√		3	2	1	6	Low Risk								
		R		Cotton dust from the fabric	Can cause respiratory problems		N			IPC			√		√					Low Risk								
9	Chemical handling	R		Eye contact while during operation	Can Cause eye irritation	Health hazard		A		BC			√	√	√	5	2	1	10	Low Risk								
		R		Inhalation of chemical	Can cause Respiratory problem			A		IPC			√	√	√					Low Risk								
		R		skin contact	Can cause skin allergy or skin irritation		N			IPC			√	√	√					Low Risk								
		R		Chemical storage place can spillage of chemicals	Can cause silppery and may harmful the human.		N	A		IPC			√	√	√					Low Risk								
10	Disposal of chemical mixed fabric waste water	R		Wet floor & slippery surface	Can cause slippery and cause body injury,	Health hazard	N			IPC			√	√	√	5	2	1	10	Low Risk								
		R		Splashing in the eyes while washing chemical fabric or materials	Can cause eye injury,		N			IPC				√	√					Low Risk								
		R		Due to chemical mixed fabric waste water are generated.	It is not disposed and maintained properly it will cause contamination to the air,land and water	Environmental hazard		A		LC			√	√		5	3	1	15	Medium Risk	Collect Waste Water properly and send to ETP.							

Department: Stenter		Area/line: Stenter				Dept. Doc No.:				Revn No./Revn Date:													
		OPERATION					Condition				Current Controls					Pre risk						Post risk						
SL NO	TYPE OF OPERATION	ROUTINE	NON ROUTINE	IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	N	A	E	Concerns LC/ BC/ IPC	Elimination	Substitution	Engineering Control	Administrative Control	Personal Protective Equipment (PPE)	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	CONTROL MEASURE	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	Remarks/Control Ref
11	Thumble dryer	R		leakage of steam	Can cause burn injury	Health hazard			E	BC			√	√		5	3	1	15	Medium Risk	1) provide insulation of the steam line. 2)Regular maintance and regular inspection has been done. 3) Provide awarness about steam and its effect.						
		R		Handling of door (Automatic and manuval function of Door) (machine run time door open)	Can cause human injury	Health hazard		A		IPC			√	√		4	2	1	8	Low Risk							
		R		Fabric loading and unloading impropperly	Can Cause human injury Property damage.	Health hazard	N			IPC			√			4	2	1	8	Low Risk							
		R		Entanglement of workers clothes and hairs due to Main motor and belt drive	Can cause of injury of human	Health hazard	N			IPC			√		√	4	2	1	8	Low Risk							
		R		Loose connection of Switching operation	Can cause of injury of human and pain.	Health hazard		A		IPC			√			4	2	1	8	Low Risk							
12	Cleaning process	R		Dust from the machine cleaning and floor cleaning	Can cause respiratory problems	Health hazard	N			IPC			√		√	2	2	1	4	Low Risk							
		R		Machine not proper cleaning	Can leads to fire	Fire hazard		A		IPC			√		√	4	2	2	16	High Risk	1)Given cleaning awareness and training to employees , 2)Provide fire equipment such as somke detector, fire extingusher.						

- *Stenter Machine*

The proposed action for the hazard in stenter is to chemical handling and rotating parts, electrical hazard and trolley movement, hot surface machine, cleaning process in this operation maybe related to stenter machine. This machine due to create health .Its rotating parts maybe Entanglement of workers clothes and hairs due to rotating part, Finger or hand struck by in rotating parts .The fabric due to shifting in fabric storage area by the help of trolley,

Injury from the door handling ,maintain proper temperature and steam line handling and rejection water go to the etp collection tank maybe due to handling activity .to avoid those handling procedure given to the employees some materials handling only authorized person only should remain within restricted zone under supervision, with particular attention paid to proximity chemical explosion ,and the electrical cables and equipment's. Locate machine tools at a safe distance from other work areas and from walkways. Conduct regular inspection and repair of machine tools safety valve ,drain valve ,temperature maintain properly in particular protective shield and safety devices/ equipment's. Use appropriate PPE (Personal Protective Equipment's) such as PPE (The nitrigul glove and respiratory mask, gum boot, pvc apron) .Respiratory Hazards: Dust generated in chemical handling includes dyes formation of dusts, which are present in stenter machine area.

- *Mechanical Finishing*

The proposed action for the hazard in mechanical finishing is to drum rotating parts and knife or plate ,electrical hazard and trolley movement, hot surface machine ,cleaning process in this operation maybe related to mechanical finishing machine. This machine due to create health .Its rotating parts maybe Entanglement of workers clothes and hairs due to rotating part, Finger or hand struck by in rotating parts .The fabric due to shifting in fabric storage area by the help of trolley,

Injury from the drum rotating parts, knife handling and steam line handling , maybe due to handling activity .to avoid those handling procedure given to the employees some materials handling only authorized person only should remain within restricted zone under supervision, with particular attention paid to proximity electrical cables and equipment's. Locate machine tools at a safe distance from other work areas and from walkways. Conduct regular inspection and repair of machine tools in properly in particular protective shield and safety devices/ equipment's. Use appropriate PPE (Personal Protective Equipment's) such as PPE (The pvc apron, dust mask, ear plug) .Respiratory Hazards: Dust generated in machines includes dusts, which are present in mechanical finishing machine area.

MENAKA MILLS PRIVATE LIMITED UNIT - I (Textile Division)	Occupational Health & Safety Hazard Identification & Risk Assessment (HIRA) Study	Format No	EHS/MF/05
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		Rev. Date	15.11.2022

Department: MECHANICAL FINISHING	Area/line: MECHANICALFINISHING	Dept. Doc No.:	Revn No./Revn Date:

SL.NO	TYPE OF OPERATION	OPERATION		IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	Condition			Concerns LC/BC/ IPC	Current Controls					Pre risk					CONTROL MEASURE	Post risk						Remarks/ Control Ref
		ROUTINE	NON ROUTINE				N	A	E		Elimination	Substitution	Engineering Control	Administrative Control	Personal Protective Equipment (PPE)	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL		SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL		
1	Electric operation		NR	Electrical Shock.	Can cause pain and numbness.	Health hazard			E	LC			√		√	3	2	1	6	High Risk	To poperly maintain earth level, Use proper insulated wiring with earthing, use the rubber mat							
			NR	Fire due to short circuit.	Property damage.	**Fire hazard**			E	BC			√			3	2	1	6	High Risk	Follow the panel board check list and frequently cleaning Provide fire equipment such as somke detector, fire extingusher.							
		R		Loose connection of Switching operation (Drum roller and blade operation)	Can cause of injury of human and pain.	Health hazard		A		IPC			√			5	3	1	15	Medium Risk	To requlatly check the swith and sensor ,should not be bypass the sensor and switching operation							
		R		Sensor problem or bypass the sensor (Drum roller and blade operation).	Can cause of injury of human and fabric materials damage	Health hazard		A		IPC			√	√		5	3	1	15	Medium Risk								
2	Loading & Unloading for fabric	R		Lifting of over weight	Can Cause back and joint pain	Health hazard		A		IPC			√	√		3	2	1	6	Low Risk								
3	Trolly movement	R		Trolly may hit the person or porperty.	Crush injury or property damage or both may occur	**Ergonomics Hazard** \ health hazard		A		BC			√			4	2	1	8	Low Risk								
		R		Pushing and pulling of trolly.	Can cuase body and joint pain		N			IPC			√			4	3	1	12	Medium Risk	Use proper lifting equipments and operated by trained persons.							
		R		Improper handling of trolley or movement of trolley in ramp side	Can cause Cresh the figures and musele			A		IPC			√		√	5	3	1	15	Medium Risk	Wear the PPE's (Safety shoe)							
4	Fabric finishing machine operation 1)Raising machine, 2)Combing machine.	R		(Draft roller and Winder,Connective rod operation) 1)Entanglement of workers clothes and hairs 2)Finger or hand struck by in rotating parts	Can cause injury of human	Health hazard	N			IPC			√	√		4	2	1	8	Low Risk								
		R		(Drum roller operation) Finger or hand struck by in rotating parts	Can cause injury of human	Health hazard		A		IPC			√	√															
		R		(Plating and folding) Workers contacting with moving parts of machinery	Can cause of injury of human	Health hazard		A		IPC			√		√	4	2	1	8	Low Risk								
		R		(Dust collection pipe line) The chocking the pipe line due to Dust or cloath	Can lead to fire	**Fire hazard / Environment hazard**										5	4	1	20	High Risk	Every hours checking the Waste collection motor and pipe line (chocking of the waste cotton)							
		R		(Dust collector motor) The chocking the motor due to Dust or cloath					E	BC			√	√															
		R		Workers continuously standing	Can cause of varicose veins	**Ergonomics Hazard**	N			IPC			√			4	2	1	8	Low Risk								
		R		Loose connection of Switching operation	Can cause of injury of human and pain.	Health hazard	N			IPC			√			4	2	1	8	Low Risk								

Department: MECHANICAL FINISHING		Area/line: MECHANICALFINISHING				Dept. Doc No.:				Revn No./Revn Date:													
		OPERATION				Condition				Current Controls					Pre risk						Post risk						
SL.NO	TYPE OF OPERATION	ROUTINE	NON ROUTINE	IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	N	A	E	Concerns LC/BC/ IPC	Elimination	Substitution	Engineering Control	Administrative Control	Personal Protective Equipment (PPE)	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	CONTROL MEASURE	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	Remarks/ Control Ref
5	Shearing machine,	R		(Draft roller and Winder,Connective rod operation) 1)Entanglement of workers clothes and hairs 2)Finger or hand struck by in rotating parts	Can cause injury of human	Health hazard	N			IPC			√	√		4	2	1	8	Low Risk								
		R		(Blade operation) Finger or hand struck or cut by in rotating parts	Can cause injury of human	Health hazard			E	IPC			√	√	√	5	3	1	15	Medium Risk	Given awareness to employees to wear **Metal glove** and apron,head cap , 2)Provide proper cover.							
		R		(Plating and folding) Workers contacting with moving parts of machinery	Can cause of injury of human	Health hazard		A		IPC			√			4	2	1	8	Low Risk								
		R		(Dust collection pipe line) The chocking the pipe line due to Dust or cloath	Can lead to fire	**Fire hazard / Environment hazard**										4	4	1	16	High Risk	1)Provide proper training on waste collection method, 2)every hours checking the Waste collection motor and pipe line							
		R		(Dust collector motor) The chocking the motor due to Dust or cloath					E	BC			√	√														
		R		Workers continuously standing	Can cause of varicose veins	**Ergonomics Hazard**	N			IPC			√			4	2	1	8	Low Risk								
		R		Loose connection of Switching operation	Can cause of injury of human and pain.	Health hazard			E	IPC			√	√		4	2	1	8	Low Risk								

Department: MECHANICAL FINISHING		Area/line: MECHANICALFINISHING				Dept. Doc No.:								Revn No./Revn Date:												
		OPERATION					Condition				Current Controls					Pre risk						Post risk					
SL.NO	TYPE OF OPERATION	ROUTINE	NON ROUTINE	IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	N	A	E	Concerns LC/BC/ IPC	Elimination	Substitution	Engineering Control	Administrative Control	Personal Protective Equipment (PPE)	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	CONTROL MEASURE	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	Remarks/ Control Ref
6	Continus tumble dryer	R		(Oil pipe line) The leakage of oil	Can cause burn injury Oil affect the Land	Health hazard/ Environment hazard			E	IPC			√	√	√	4	2	2	16	Medium Risk	Machine service Should be properly maintain machine sechdule.						
		R		(champer operation) Hot surfaces of the machine, the sensor not proper function	Can cause increase the body temperature. Can cause fire of fabric	Fire hazard		A		BC			√	√	√	3	2	1	6	High Risk	Given awareness to employees to wear apron,mask and sensor information, Sensor value temperature sensor value should be known						
		R		(Plating and folding) Workers contacting with moving parts of machinery	Can cause of injury of human	Health hazard	N			IPC			√			4	2	1	8	Low Risk							
		R		Workers continuously standing	Can cause of varicose veins	Ergonomics Hazard	N			IPC			√	√		4	2	1	8	Low Risk							
7	Thumble dryer	R		Leakage of steam	Can cause burn injury	Health hazard			E	BC			√	√		4	3	1	12	Medium Risk	1) provide insulation of the steam line. 2)Regular maintance and regular inspection has been done. 3) Provide awarness about steam and its effect.						
		R		Handling of door (Automatic and manuval function of Door) (machine run time door open)	Can cause human injury	Health hazard		A		IPC			√	√		4	2	1	8	Low Risk							
		R		Fabric loading and unloading improperly	Can Cause human injury Property damage.	Health hazard	N			IPC			√			4	2	1	8	Low Risk							
		R		Entanglement of workers clothes and hairs due to Main motor and belt drive	Can cause of injury of human	Health hazard	N			IPC			√		√	4	2	1	8	Low Risk							
		R		Loose connection of Switching operation	Can cause of injury of human and fabric materials damage	Health hazard / Fire hazard		A		IPC			√			4	2	1	8	High Risk	To requlary check the switch opeation						
8	Cleaning procss	R		Dust from the machine cleaning and floor cleaning	Can cause respiratory problems	Health hazard	N			IPC			√		√	2	2	1	4	Low Risk							
		R		Machine not proper cleaning	Can leads to fire	Fire hazard		A		IPC			√		√	4	4	1	16	High Risk	1)Given cleaning awareness and training to employees , 2)Provide fire equipment such as somke detector, fire extingusher.						

- *Final Inspection*

MENAKA MILLS PRIVATE LIMITED UNIT - I (Textile Division)	Occupational Health & Safety Hazard Identification & Risk Assessment (HIRA) Study	Format No	EHS/F1/06
Page 1 of 4		Rev. No	06
		Rev. Date	15.11.2022

Department: FINAL INSPECTION | Area/line: FINAL INSPECTION | Dept. Doc No.: | Revn No./Revn Date:

SL.NO	TYPE OF OPERATION	OPERATION		IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	Condition			Concerns LC/BC/ IPC	Current Controls				Pre risk					CONTROL MEASURE	Post risk					Remarks/Control Ref
		ROUTINE	NON ROUTINE				N	A	E		Elimination	Substitution	Engineering Control	Administrative Control	Personal Protective Equipment (PPE)	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL		SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	
1	Electric operation		NR	Electrical Shock.	Can cause pain and numbness.	Health hazard			E	LC			√		√	3	2	1	6	High Risk	To poperly maintain earth level, Use proper insulated wiring with earthing, use the rubber mat						
			NR	Fire due to short circuit.	Property damage.	**Fire hazard**			E	BC			√			3	2	1	6	High Risk	Follow the panel board check list and frequently cleaning Provide fire equipment such as somke detector, fire extingusher.						
		R		Loose connection of Switching operation	Can cause of injury of human and pain.	Health hazard		A		IPC			√			4	2	1	8	Low Risk							
		R		Sensor problem or bypass the sensor	Can cause of injury of human and fabric materials damage	Health hazard		A		IPC			√	√		4	2	1	8	Low Risk							
2	Insufficient illumination		NR	Person are hit the materials and Falling objectives,	Can cause Eye strain and Head aches	Health hazard			E	IPC			√	√		2	2	1	4	Low Risk							
3	Trolly movement	R		Trolly may hit the person or porperty.	Crush injury or property damage or both may occur	**Ergonomics Hazard** / health hazard		A		BC			√			4	2	1	8	Low Risk							
		R		Pushing and pulling of trolly.	Can cuase body and joint pain		N			IPC			√			4	3	1	12	Medium Risk	Use proper lifting equipments and operated by trained persons.						
		R		Improper handling of trolley or movement of trolley in ramp side	Can cause Cresh the figures and musele			A		IPC			√		√	5	3	1	15	Medium Risk	Wear the PPE's (Safety shoe)						
4	Inspection machine	R		1)Entanglement of workers clothes and hairs 2)Finger or hand struck by in rotating parts	Can cause injury of human	Health hazard		A	E	IPC					√	4	2	1	8	Low Risk							
		R		Lighting Insufficient illumination	1) It cause eye sight problem 2) Moving parts can hit the human body	Health hazard	N			IPC			√			2	2	1	4	Low Risk							
		R		Continuous exposure to light	Eye stress, eye irritation and head aches	Health hazard	N			BC			√	√		4	2	1	8	Low Risk							
		R		Lifting of heavy fabric operation (Lifting machine collapse)	1) property damage 2) body parts caugth into the lifting machine.	Health hazard		A		IPC			√			3	3	1	9	Low Risk							
		R		Workers contacting with moving parts of machinery	Can cause of injury of human	Health hazard	N			IPC			√			4	2	1	8	Low Risk							
		R		Workers continuously standing	Can cause of varicose veins	**Ergonomics Hazard**	N			IPC					√	4	2	1	8	Low Risk							
		R		Dust (cotton dust from the fabric)	Can cause respiratory problems	Health hazard	N			IPC			√			3	2	1	6	Low Risk							
		R		Loading & Unloading of fabric (Lifting of over weight)	Can Cause back and joint pain	Health hazard	N			IPC			√	√		4	2	1	8	Low Risk							
5	Fabric packing machine Operation	R		1)Entanglement of workers clothes and hairs 2)Finger or hand struck by in rotating parts	Can cause injury of human	Health hazard	N			IPC			√	√	√	4	2	1	8	Low Risk							
		R		Doffer (Moving part hit the head)	Can cause head injury	Health hazard		A		IPC			√	√		5	3	1	15	Medium Risk	1)Given awareness to employees to Doffer function , 2)Daily check the limit switch function and emergency switch function						
		R		Loading & Unloading of fabric (Lifting of over weight)	Can Cause back and joint pain	Health hazard		A		IPC			√	√		4	2	1	8	Low Risk							
		R		Loading of fabric by the help of Pin	1)Can cause joint pain 2)Can cause head injury	Health hazard	N			IPC			√			5	3	1	15	Medium Risk	Proper handling of fabric						
		R		Lighting Insufficient illumination	1) It cause eye sight problem 2) Moving parts can hit the human body	Health hazard	N			IPC			√			2	2	1	4	Low Risk							
		R		Workers continuously standing	Can cause of varicose veins	**Ergonomics Hazard** / Health hazard	N			IPC			√	√		4	2	1	8	Low Risk							
6	Conveyor belt rolling weight machine	R		Lifting of fabric	Can Cause back and joint pain	**Ergonomics Hazard** / Health hazard	N			IPC			√	√		4	2	1	8	Low Risk							
		R		Conviyor belt (1)Entanglement of workers clothes and hairs 2)Finger or hand struck by in rotating parts)	Can cause injury of human	Health hazard	N			IPC			√	√		4	2	1	8	Low Risk							
		R		Sensor problem or bypass the sensor	Can cause of injury of human and fabric materials damage and other surface materias are damage	Health hazard / **Materials damage**		A		IPC			√	√		4	2	1	8	Low Risk							
		R		Lighting Insufficient illumination	1) It cause eye sight problem 2) Moving and rotating parts can hit the human body	Health hazard			E	IPC			√	√		3	2	1	6	Low Risk							
7	Cleaning process	R		Dust from the machine cleaning and floor cleaning	Can cause respiratory problems	Health hazard	N			IPC			√		√	2	2	1	4	Low Risk							
		R		Machine not proper cleaning	Can leads to fire	**Fire hazard**		A		IPC			√		√	4	4	1	16	High Risk	1)Given cleaning awareness and training to employees , 2)Provide fire equipment such as somke detector, fire extingusher.						

- *Ware House*

MENAKA MILLS PRIVATE LIMITED UNIT - I (Textile Division)	Occupational Health & Safety Hazard Identification & Risk Assessment (HIRA) Study	Format No: EHS/WH/07
Page 1 of 3		Rev. No: 07
		Rev. Date: 19.11.2022

Department: WARE HOUSE | Area/Sites: WARE HOUSE | Dept. Doc No.: | Rem No./Rem Date:

SL.NO	TYPE OF OPERATION	OPERATION: ROUTINE	OPERATION: NON ROUTINE	IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	CONDITION: N	CONDITION: A	CONDITION: E	CONCERN No LC/RC/ IPC	CURRENT CONTOLS: ELIMINATION	CURRENT CONTOLS: SUBSTITUTION	CURRENT CONTOLS: ENGINEERING CONTROL	CURRENT CONTOLS: ADMINISTRATIVE CONTROL	CURRENT CONTOLS: PERSONAL PROTECTIVE EQUIPMENT(PPE)	Pre risk: SEVERITY SCALE	Pre risk: LIKELIHOOD SCALE	Pre risk: EXPOSER	Pre risk: RISK SCORE	Pre risk: RISK LEVEL	CONTROL MEASURE	Post risk: SEVERITY SCALE	Post risk: LIKELIHOOD SCALE	Post risk: EXPOSER	Post risk: RISK SCORE	Post risk: RISK LEVEL	REMARKS/CONTROL REF
1	Electric operation		NR	Electrical Shock.	Can cause pain and numbness.	Health hazard			E	LC			√		√	3	2	1	6	High Risk	To poperly maintain earth level, Use proper insulated wiring with earthing, use the rubber mat						
			NR	Fire due to short circuit.	Property damage.	Fire hazard			E	RC			√			3	2	1	6	High Risk	Follow the panel board check list and frequently cleaning Provide fire equipment such as somke detector, fire extinguisher.						
		R		Loose connection of Switching operation	Can cause of injury of human and pain.	Health hazard		A		IPC			√			4	2	1	8	Low Risk							
		R		Chargeing of electrical vehicle battery.	May cause of fatal accident.	Health hazard		A		IPC			√	√		3	2	1	6	Low Risk							
2	Insufficient illumination	R		Person are hit the materials and Falling objectives,	Can cause Eye strain and Head aches	Health hazard			E	IPC			√	√		2	2	1	4	Low Risk							
3	Fork lift movement	R		May hit the person or property(Scarb).	Crush injury or property damage or both may occur	Health hazard			E	RC			√	√	√	4	2	1	8	Low Risk							
		R		Handle damage or handle locking problem	May cause of fatal accident And property damage				E	RC			√	√	√	4	1	4	16	High Risk	Use proper lifting equipments and operated by trained persons.						
		R		Wheel damage					E	RC			√	√	√												
		R		Piston or hydrolic pressure					E	RC			√	√	√												
		R		Switching problem					E	RC			√	√	√												
4	Rack	R		Beam pending	May cause of fatal accident And property damage	Health hazard			E	RC			√		√	4	2	2	16	High Risk	Periodically checking frequency increase						
		R		Fitting damage					E	RC			√		√												
		R		Loose connection of polt and nut					E	RC			√		√												
5	Inspection machine	R		1)Entanglement of workers clothes and hairs 2)Finger or hand struck by in rotating parts	Can cause injury of human	Health hazard		A	E	IPC			√		√	4	2	1	8	Low Risk							
		R		Lighting Insufficient illumination	1) It cause eye sight problem 2) Moving parts can bit the human body	Health hazard	N			IPC			√			2	2	1	4	Low Risk							
		R		Continuous exposure to light	Eye stress, eye irritation and head aches	Health hazard	N			RC			√	√		4	2	1	8	Low Risk							
		R		Lifting of heavy fabric operation (Lifting machine collapse)	1) property damage 2) body parts caught into the lifting machine.	Health hazard		A		IPC			√			3	3	1	9	Low Risk							
	Inspection machine	R		Workers contacting with moving parts of machinery	Can cause of injury of human	Health hazard	N			IPC			√			4	2	1	8	Low Risk							
		R		Workers continuously standing	Can cause of varicose veins	Ergonomics Hazard	N			IPC					√	4	2	1	8	Low Risk							
		R		Dust (cotton dust from the fabric)	Can cause respiratory problems	Health hazard	N			IPC			√			3	2	1	6	Low Risk							
		R		Loading & Unloading of fabric (Lifting of over weight)	Can Cause back and joint pain	Health hazard	N			IPC			√	√		4	2	1	8	Low Risk							
6	Weight and Fabric roll traveling machine	R		Lifting of fabric	Can Cause back and joint pain	Health hazard	N			IPC			√			4	2	1	8	Low Risk							
		R		Conviyor belt (1)Entanglement of workers clothes and hairs 2)Finger or hand struck by in rotating parts)	Can cause injury of human	Health hazard	N			IPC			√		√	4	2	1	8	Low Risk							
		R		Sensor problem or bypass the sensor	Can cause of injury of human and fabric materials damage and other surface materias are damage	Health hazard / Materials damage		A		IPC			√	√	√	4	2	1	8	Low Risk							
		R		Lighting Insufficient illumination	1) It cause eye sight problem 2) Moving parts can bit the human body	Health hazard		A		IPC			√			2	2	1	4	Low Risk							
7	CWR machine	R		Hot surfaces of the machine	1)can cause increase the body temperature. 2) can cause Respiratory problem	Health hazard			E	IPC			√	√	√	3	2	1	6	Low Risk							
		R		Eye contact while during operation (Chemical handling)	Can Cause eye irritation	Health hazard		A		IPC			√	√	√	5	2	2	20	Medium Risk	Flush eyes with water and give awareness to wear goggles and face sheild mask.						
		R		Inhalation of chemical (Chemical handling)	Can cause Respiratory problem	Health hazard	N			IPC			√		√						Given awareness to employees to wear mask,apron, safety gloves.						
		R		Skin contact (Chemical handling)	Can cause skin allergy or skin irritation	Health hazard	N			IPC			√		√												
		R		Chemical use the machines (Spillage of chemicals or foam)	Can cause of falling of human	Health hazard	N			IPC			√		√						secondary container has been provided.						
		R		leakage of steam (Steam line)	can cause burn injury	Health hazard			E	LC /IC			√	√	√	3	2	1	6	Medium Risk	1) provide insulation of the steam line. 2)Regular maintance and regular inspection has been done. 3) Provide awarness about steam and its effect.						
		R		Splashing in the eyes while washing chemical fabric or materials	Can cause eye injury,	Health hazard		A		IPC			√		√	4	2	1	8	Low Risk							
		R		Trolly may hit the person or property.	Crush injury or property damage or both may occur	Health hazard		A		RC			√			4	2	1	8	Low Risk							
		R		Pushing and pulling of trolly.	Can cause body and joint pain	Health hazard	N			IPC			√			3	2	1	6	Low Risk							
8	Cleaning process	R		Dust from the machine cleaning and floor cleaning	Can cause respiratory problems	Health hazard	N			IPC			√		√	2	2	1	4	Low Risk							
		R		Machine not proper cleaning	can leads to fire	Fire hazard		A		IPC			√		√	4	1	4	16	High Risk	1)Given cleaning awareness and training to employees , 2)Provide fire equipment such as somke detector, fire extinguisher.						

Ware House

The proposed action for the hazard electrical hazard and physical hazard , fork lift and trolley movement ,cleaning process in this operation maybe related to ware house. The fork lift due to create health hazard .Its rotating 360* stacker and fork lift any materials or human or rack parts maybe kit the person or fatal accident create the fork lift, so will be followed in ware house safety procedure, pins are insert and remove by the help of stacker machine ,the stacker machine charging place separate place

Injury from the fork lift driver or other person and fork lift handling of maybe due to handling activity .to avoid those all process fully knowledge and trained person and handling procedure given to the employees some materials handling only authorized person only should remain within restricted zone under supervision, with particular attention paid to proximity electrical cables and equipment's. Locate rack tools at a safe distance from other work areas and from walkways. Conduct regular inspection and repair of fork lift machine tools in properly in particular protective shield and safety devices/ equipment's. Use appropriate PPE (Personal Protective Equipment's) such as PPE (The safety jacket or safety apron, safety helmet, safety goggle, safety shoe) .Respiratory Hazards: Dust generated in fabric and atmospare air includes fork lift movements, which are present ware house area.

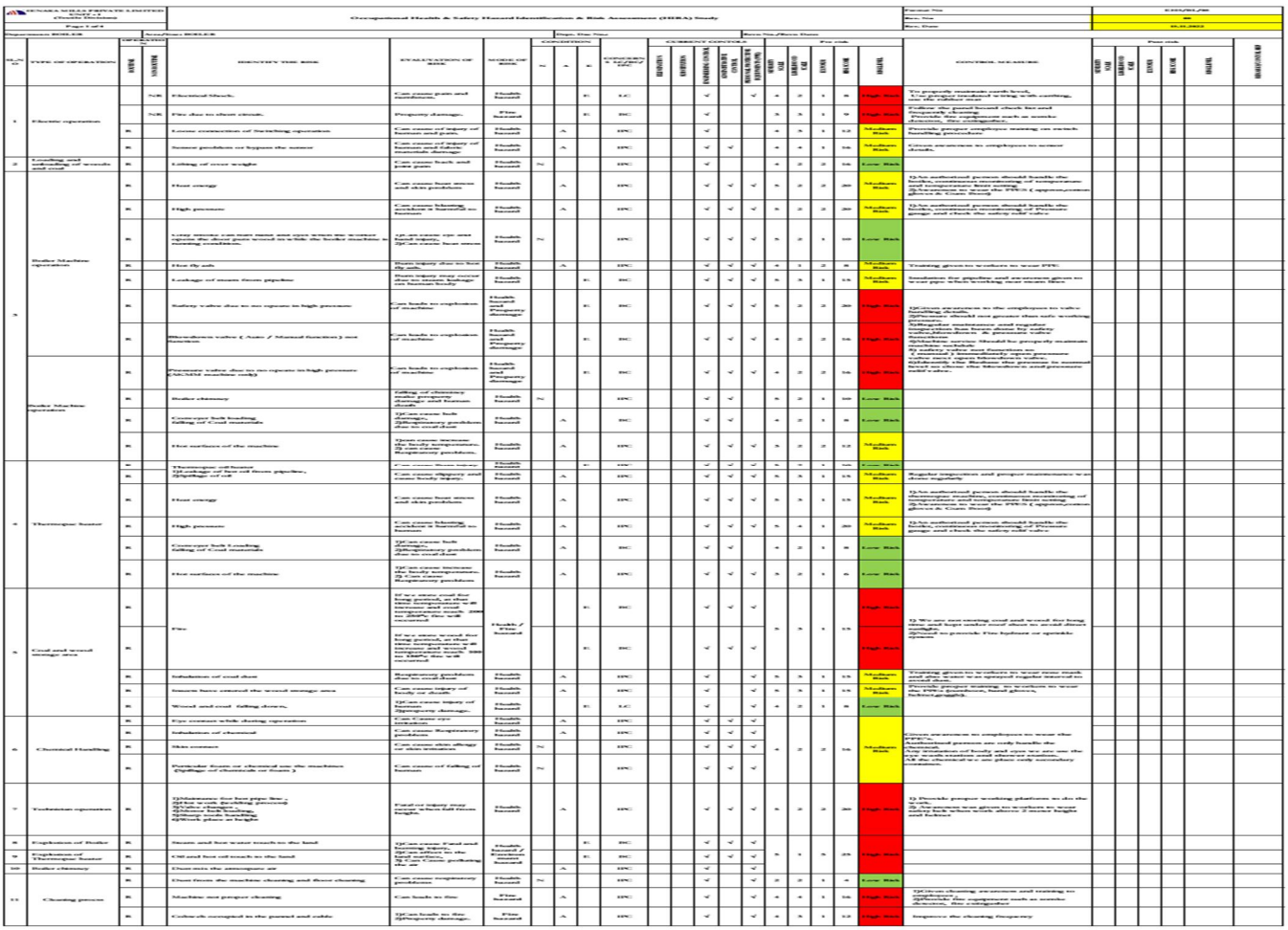
- *Boiler*

The proposed action for the Hazards in boiler and thermo back is to implement Position yourself so that you are not hit by objects moving down the conveyor. Ensure that you can see the conveyor system when you are at the operating controls. Ensure that guards are in place for all moving parts of the drive system and in all zones where hazards such as in-running friction burns or boiler ire process entry are present (includes above, sides, and below the conveyor). Guard all pinch points between the conveyor system and fixed objects. Locate guardrails around low level conveyors and areas where conveyors pass through the floor/ceiling. Locate emergency stop cut-off switches near the operator and along the length of the conveyor at approximately 30 metres (100 feet) apart (or closer). Ground belts on belt conveyors to prevent static build-up.

The proposed action for the Hazards in wood and coal storage is to implement by conducting pressure test for the steam and oil pipeline and automated and manual valves are strategically placed along the pipeline route to enable the pipeline to shut down immediately and sections can be isolated quickly as and when required.

The proposed action for the hazard in boiler and thermo back machine is to hot surface area, wood and coal handling, hot oil chamber, steam line ,electrical hazard and trolley movement ,cleaning process in this operation maybe related to boiler and thermo back machine. This machine due to create health .Its rotating parts maybe Entanglement of workers clothes and hairs due to rotating part, Finger or hand struck by in rotating parts .The wood due to shifting in fabric storage area by the help of trolley,

Injury from the steam line and oil pipe line, maybe due to handling activity .to avoid those insulate and cover the steam and oil pipe line handling procedure given to the employees some materials handling only authorized person only should remain within restricted zone under supervision, with particular attention paid to proximity electrical cables and equipment's. Locate machine tools at a safe distance from other work areas and from walkways. Conduct regular inspection and repair of machine tools in properly in particular protective shield and safety devices/ equipment's. Use appropriate PPE (Personal Protective Equipment's) such as PPE (The heat resistive glove and leather apron, goggle and safety shoe ,safety helmet, dust mask) .Respiratory Hazards: Dust generated in boiler machines includes dusts, which are present boiler and thermo back machine area.



International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue III Mar 2023- Available at www.ijraset.com

- *ETP & RO PLANT*

SENAKA MILLS PRIVATE LIMITED UNIT - I (Textile Division)				Occupational Health & Safety Hazard Identification & Risk Assessment (HIRA) Study																	Format No	EHS/ETP/09					
																					Rev. No	09					
Page 1 of 2																					Rev. Date	19.11.2022					
Department: ETP			Area/Line: ETP							Dept. Doc No:						Revn No./Revn Date:											
		OPERATION					CONDITION				CURRENT CONTOLS					Pre risk						Post risk					
SL.NO	TYPE OF OPERATION	ROUTINE	NON ROUTINE	IDENTIFY THE RISK	EVALUATION OF RISK	MODE OF RISK	N	A	E	CONCERNS LC/BC/IPC	ELIMINATION	SUBSTITUTION	ENGINEERING CONTROL	ADMINISTRATIVE CONTROL	PERSONAL PROTECTIVE EQUIPMENTS (PPE)	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSURE	RISK SCORE	RISK LEVEL	CONTROL MEASURE	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSURE	RISK SCORE	RISK LEVEL	REMARKS/CONTROL REF
1	Electric operation		NR	Electrical Shock.	Can cause pain and numbness.	Health hazard			E	LC			√		√	3	2	1	6	High Risk	To properly maintain earth level, Use proper insulated wiring with earthing, use the rubber mat						
			NR	Fire due to short circuit.	Property damage.	Fire hazard			E	BC			√			3	2	1	6	High Risk	Follow the panel board check list and frequently cleaning Provide fire equipment such as somke detector, fire extinguisher.						
		R		Loose connection of Switching operation	Can cause of injury of human and pain.	Health hazard		A		IPC			√			4	2	1	8	Low Risk							
		R		Sensor problem or bypass the sensor	Can cause of injury of human and fabric materials damage	Health hazard		A		IPC			√	√		4	2	1	8	Low Risk							
2	Chemical Handling	R		Eye contact while during operation	Can Cause eye irritation	Health hazard		A		BC			√	√	√	5	2	2	20	Medium Risk	Given awareness to employees to wear the PPE's. Authorised person are only handle the chemical. Any irritation of body and eyes we are use the eye wash station and shower station. All the chemical we are place only secondary container.						
		R		Inhalation of chemical	Can cause Respiratory problem	Health hazard		A		IPC			√	√	√												
		R		Skin contact	Can cause skin allergy or skin irritation	Health hazard	N			IPC			√	√	√												
		R		Perticular chemical use the machines (Spillage of chemicals or foam)	Can cause of falling of human	Health hazard	N	A		IPC			√	√	√												
3	Filter operation	R		Pressure vessel	Can leads to explosion of pressure vessel.	Health hazard and			E	BC			√	√	√	5	4	1	20	High Risk	1)Pressure gauge (or) pressure display and should have safety valve and/or bursting disc. 2)Pressure should not greater than safe working pressure.						
4	ETP tank cleaning	R		Respiratory Problem and risk of falling (wet floor & slippery surface)	Can cause health problem	Health hazard		A		IPC			√	√	√	5	2	2	20	Medium Risk	Advised to use the confined space S.O.P properly and advised to use proper ppe's						
5	Ro water tank cleaning	R		Falling hazard (wet floor & slippery surface)	Can cause injury of human	Health hazard	N			IPC			√		√	5	2	2	20	Medium Risk							
6	Waste water collection tank	R		1)Spillage of chemical waste water to generate the contaminate the air & land	1) Can cause respiratory problem 2)Earth contamination	Health hazard /Environmental hazard	N			IPC			√		√	5	3	1	15	Medium Risk	1)Awareness has to given the operator to wear respiratory mask and pipe lines are properly connected with the tank 2)Avoid over flow of the waste chemicals						
7	Waste disposal tank	R		Sludge waste improper of collection & handling	1)Can cause health problem 2)Can cause contamination of land	Health hazard / Environmental hazard			E	BC			√	√	√	5	3	1	15	Medium Risk	1)Awareness has to be given to collect the waste properly and dispose it to the Authorized person,and wear suitable ppe's 2)ETP waste should be in seprate place and entry should be restricted						
8	Mixing channel (Water treatment of chemicals adding)	R		Chemical content exceed above the permissible limit	Can cause contamination of water	Environmental hazard	N			IPC			√	√	√	5	3	1	15	Medium Risk	To check the treated water as per TNPCB Requirements						
		R		1)Chemical spilling on human body 2)Chemical spillage make slippery floor 3)Chance to contaminate air	1)Can cause skin and eye irritation 2)Can cause risk of falling 3)Can cause respiratory problem	Environmental hazard		A		IPC			√	√	√	5	2	1	10	Low Risk							
		R		Workers continuously standing	Can cause of varicose veins	Ergonomics Hazard	N			IPC			√	√	√	4	2	1	8	Low Risk							
		R		Worker working in top side	Can cause falling objects	Health hazard			E	LC			√	√	√	4	2	1	8	Low Risk							
9	Evaprator	R		4th ro water rejection water convert to the stone process in evaprator	1) Can cause respiratory problem 2)Earth contamination	Health hazard / Environmental hazard		A		LC			√	√	√	4	2	1	8	Low Risk							
		R		Hot surfaces of the machine	1)Can cause increase the body temperature. 2) Can cause Respiratory problem	Health hazard		A		IPC			√	√	√	3	2	1	6	Low Risk							
		R		Leakage of steam	Can cause burn injury	Health hazard			E	IPC			√	√	√	3	2	1	6	Low Risk							
10	Technician operation	R		1)Maintance for pipe line & hot pipe line, 2)Hot work (welding process) 3)Valve changes , 4)Motor drive problem, 5)Rotating part problem 6)Sharp tools handling 7)Work place at height 8)Tank damage	Fatal or injury may occur when fall from height.	Health hazard			E	BC			√	√	√	5	2	2	20	High Risk	1) Provide proper working platform to do the work. 2) Awareness was given to workers to wear safety belt and helmet when work above 2 meter height and below the tank						

ETP and RO Plant

The proposed action for the hazard sludge waste collection ,chemical handling, collection of waste water tank, processing tank ,electrical hazard and trolley movement ,cleaning process in this operation maybe related to Etp and Ro plant. This ETP waste due to create health hazard .Its rotating drum parts maybe in clothes and hairs Finger or hand struck by in rotating parts .The sludge waste proper segregation and sludge waste are compressed machine. this machine will be great the air this air affect the human and air pollution.

Injury from the waste water and waste disposal handling of maybe due to handling activity .to avoid those all process fully knowledge and trained person and handling procedure given to the employees some materials handling only authorized person only should remain within restricted zone under supervision, with particular attention paid to proximity electrical cables and equipment's. Locate machine tools at a safe distance from other work areas and from walkways. Conduct regular inspection and repair of machine tools in properly in particular protective shield and safety devices/ equipment's. Use appropriate PPE (Personal Protective Equipment's) such as PPE (The pvc apron, glove, safety helmet, gum boot, goggle) .Respiratory Hazards: Dust generated in ETP plant includes sludge waste, which are present ETP and RO plant machine area.

- *Power House*

NAKA MILLS PRIVATE LIMITED UNIT - I (Textile Division)	Occupational Health & Safety Hazard Identification & Risk Assessment (HIRA) Study	Format No	EHS/PH/10
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SL. NO	TYPE OF OPERATION	OPERATION		IDENTIFY THE RISK	EVALUVATION OF RISK	MODE OF RISK	CONDITION			CONCERNS LC/BC/IPC	CURRENT CONTOLS				Pre risk					CONTROL MEASURE	Post risk						REMARKS/CONTROL REF
		ROUTINE	NON ROUTINE				N	A	E		ELIMINATION	SUBSTITUTION	ENGINEERING CONTROL	ADMINISTRATIVE CONTROL	PERSONAL PROTECTIVE	SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL		SEVERITY SCALE	LIKELIHOOD SCALE	EXPOSUR	RISK SCORE	RISK LEVEL	
1	Electric operation		NR	Electrical Shock.	Can cause pain and numbness.	Health hazard			E	LC			√		√	3	2	1	6	High Risk	To poperly maintain earth level, Use proper insulated wiring with earthing, use the rubber mat						
		R		Fire due to short circuit.	Property damage.	Fire hazard	N			IPC				√	√	3	2	1	6	High Risk	Follow the panel board check list and frequently cleaning Provide fire equipment such as somke detector, fire extingusher.						
			NR	Loose connection of Switching operation	Can cause of injury of human and pain.	Health hazard			E	BC			√			4	2	1	8	Low Risk							
2	Panel board operation	R		1)Indication lamp not function, 2)Handle working condition 3)Meter not function, 4)Problem of earth leakage 5)Relay function	May cause of fatal accident And property damage	Health hazard and fire hazard			E	BC			√	√	√	5	2	2	20	High Risk	1)Awarness to be given proper handling ,use ppe's and stand on rubber mat 2)Use proper insulated wiring with earthing and install proper circuit bracker 3)Authorized person only operate the panel						
3	UBS battery	R		1)Terminal short circuit, 2)Low level of water 3)Teminal corrosion 4)Battery terminal improper connection and explosion of battery	May cause of fatal accident And property damage	Health hazard and Fire hazard			E	BC			√	√	√	5	3	1	15	High Risk	1) Awarness to be given proper handling of battery and authorised person only maintain , 2)Regular check list follow up						
4	Transformer	R		1)Magnetic flux 2)Increase in temperature 3)Not working Meter, 4)Not working tripping circuit, 5)Not maintain oil level, 6)Service of transformer or maintace work ,failure of transformer.	1)can affect electronic material 2)chances of blasting 3)live lines can harm ful 4)Proper earthing for transformer discharging	Health hazard and Fire Hazard			E	LC			√	√	√	5	2	2	20	High Risk	1)Awareness to avoid electronic material 2)Required to maintain the level of the cooling oil 3)Provide barricade for transformer area,danger sign board display 4)Awareness to be given for proper handling ,use ppe's and to use rubber mat						
5	Genset	R		1)High noise 2)Vibration 3)Smoke 4)Spillage of diesal 5)Check the diesal tank leakage 5)Maintain ratiator water level 6)Service of generator or maintace work ,failure of Generator.	1)can cause of earing loss 2)can cause numdness 3)can cause respiratory problem 4)may cause fire accident and property damage or fatal accident 5)Power supply off and not in auto mode,	Health hazard,Fire Hazard and Environmental Hazard			E	LC			√	√	√	5	3	1	15	High Risk	1)Provide aquastic and ear muff if the noise level goes beyond 80 db 2)Install genset with proper bed to avoid vibration ,preventive maintenance chart is required 3)Awareness to wear proper respiratory and check emission to minimize harmful particles 4)Awareness to handling diesal and follow the filling procedure, storage container should be in seprate place with secondary container,to avoid over flow provide level indicater on storage tank, 5) Awareness to be given for proper handling ,use ppe's and rubber mat if it is necessary						
6	Electrical waste	R		If it is not disposed properly it will cause contamination to the land	Earth contamination	Environmental Hazard		A		LC			√	√	√	4	2	1	8	Medium Risk	Awareness has to be given to collect the waste properly and dispose it to the Authorized person						
7	Compressor	R		1)High noice 2)Vberation 3)Rotating part 4)Air receiver tank make high pressure 5)Drain valve 6)Safety valve	1)can cause of earing loss 2)can cause numbness 3)can harmful for human body 4)can create blasting accident	Health hazard			E	LC			√	√	√	5	4	1	20	High Risk	1)provide aquastic and ear muff give to electrican the noice above 80 db 2)compressor install with proper bed to avoid vibration ,preventive maintanaince chart is require 3)Proper pully guard to be provided 4)Properly maintain the safety valve and pressure on the tank 5) Awarness to be given proper handling ,use ppe's and stand on rubber mat 6) separated from the production area with required barrygation and danger symbols.						
8	lift operation	R		1)Damaged rope and excessive weight 2)electrical fire	1)can cause risk of falling injury 2)can cause property damage and human loss	Health hazard and Fire Hazard			E	BC			√	√	√	5	2		0	High Risk	1)Properly maintained and shall be thoroughly examined by competent person atleast once in every period of six month. allow only limited weight . lift should be in ground level at the time of maintenance.						
9	Drilling machine	R		1)Improper Handling of machine 2)Improper material Fixing 3)Damage or Broken condition (up and down) Handle 4)Broken condition of bottom plate 5)Improber connection of drill bit	1)can cause risk of falling injury 2)can cause property damage and human loss	Health hazard		A		IPC			√	√	√	5	4	1	20	Medium Risk	Awarness to be given proper drilling machine handling, and wear the PPE.						
10	Cutting machine	R		1)Improper Handling of machine 2)Improper material Fixing 3)Damage or Broken condition (up and down) Handle 4)Improber connection of Cutting tools	1)can cause risk of falling injury 2)Can cause injury of hand 3)Can cause of earing loss 4)Can cause property damage and human loss	Health hazard		A		IPC			√	√	√	5	4	1	20	Medium Risk	Awarness to be given proper cutting machine handling, and wear the PPE.						
11	Welding machine	R		1)Improper wire connection 2)Improper earth wire and rod connection 3)Damage the welding handle 4)Not use welding goggles 5)Damage the switching	1)Can cause of electric shock 2)Can cause of eye iritattion	Health hazard			E	IPC			√	√	√	5	3	1	15	Medium Risk	Authorized person only allowed, proper covered in welding area, Advised to use the confined space S.O.P properly and advised to use proper ppe's						
12	Formation of Electrical waste	R		1) Generation of E.waste 2) Generation of used battries 3)Usage of diesel	1) Can Cause polluting the Land	Environmental hazard		A		LC			√	√	√	5	3	1	15	Medium Risk	if it is not disposed /maintained properly it will cause contamination to the land. should be disposed off properly through authorized recycler						

Power house

Proper management of the risks associated with aboveground storage tanks is essential. Everyone who works on or around the equipment or the fuel storage locations should be trained to identify and eliminate risks. They should also know how to conduct routine inspections of fuel storage containers, dispense fuel and operate pump shutoffs properly.

The generator machine run at the generate the noise so wear the ear muff,generator is automatically run by the power cut time, generator handle good knowledge electrical person only allowed, the transformer is high voltage so any body circuit open or close wear the ppe and good handling electrical person only applicable. The transformer oil or other problem we are atten this person wear the ppe and proper earthing for transformer, panel board handling or breaker handling and really circuit person only knowledge electrical person only allowed, the E-waste are disposed in only authorized person , all the machine and panel board connect proper double earthing

- *Key Performance Indicator*

KPI table

S.NO	KPI	KPI Details	Requirements	Target
1	Legal documents	Fire safety license	Cross verification process by one year	100%
2	Test certificate (Boiler,Dying,,ETP,Forklift operator)	Medical checkup (Cancer & DNA test,Lung test,Eye test)	Cross verification process by 6month	100%
3	License Holder	Electrician, fork lift operator, bus drivers	Cross verification process by 6month	100%
4	Transportation vehicles	Ensure safety condition and fire extinguisher	All the workers using transportation vehicles	100%
5	New employees	Fire & Safety details and E&D point details,	As company requirments	100%
6	Employee special training	Fire Fighting trainer , First aid trainer ,	External program conducting by one year	100%
7	Fire safety trainer	10% to 15% of the total employee in the company should be in fire safety training	Internal program conducting by six month	100%
8	First aid trainer	2% to 5% of the total employee in the company should be in fire safety training	Internal program conducting by six month	100%
9	PPE training	PPES using methods	Internal training conducting by one month	100%
10	Chemical training	Chemical handling and Spill kid training	Internal training conducting by one month	100%
11	Health & safety committee meeting	AS concerned persons only	Internal committee meeting by two month	100%
12	Chemical details	List of chemical,All chemicals MSDS and SDS,chemical pictogram inculding transported sub 7chemical box,	Cross verification process by one month	100%
13	Drinking point	Is it 8compatible with t9he working place (falling hazard)	Cross verification process by one weekly	100%
14	Conduct a Risk assessment once in 6 months	New layout changes, Process changes	Maintain post risk score below 10 points	100%
15	Incident details	small injury - , major - , death - ,	Maintain the record in department and nurse	100%
16	Accident details	minor ,major, death.	Maintain the record in department and nurse	100%

17	Fire safety equipments	Fire pump room ,fire hydrant,fire extinguisher,Fire alarm switch.	Good working condition at any time	100%
18	PPES	Maintain minimum stock level of concerned department	Above 20-25% from the required stock	100%
18.1	PPES	Monitoring of PPEs condition	Cross verification process by one month	100%
19	Risky machine	Ensure the safe condition of risky machine (Equipments details :- Lift,fork lift , generator ,compresssor,dying machine ,stenter machine, chain pully, sensor , door safety limit switch,emergency switch)	Preventive Maintenance schedule & routine	100%

Table – KPI Report schedule

S.No	Document Name	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Remarks
1	Eyewash station inspection report	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	
2	Lifting equipment's (Forklift and Stacker) should be maintain	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	
3	Drinking point	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	
4	List of risky machines & Inspection record (Sensors, Emergency stop button, Door sensors, Lift chain pulley, Forklift, Pallet truck & Lift)	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	
5	Environmental impact check list	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	
6	Gentral health and Safety awareness report	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	
7	Chamical handling and spillage kit tarining	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	
8	Electrical panel board inspection report	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	
9	Boiler inspection report	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	
10	PPE issue & Stock record	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	
11	PPE verification record (inspection of PPEs condition)	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	
12	Fire Extinguisher inspection report	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	
13	Emergency light Inspection report	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	
14	Fire alarm Inspection report	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	
15	Smoke detector Inspection report	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	

16	Incident and accident, near miss report	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	If any reportable accidents occur need to update and submit to Inspector of factories within 48 Hours
17	ERT training record		-X-		-X-		-X-		-X-		-X-		-X-	
18	Fire drill		-X-		-X-		-X-		-X-		-X-		-X-	
19	Risk Assessment						ü						ü	Updatting If Layout changes or New machine installation
20	Medical checkup for following operator (Boiler,Dying,,ETP,Forklift operator)						ü						ü	
21	First aid trainer						ü						ü	
22	Firefighting training						ü						ü	
23	Test certificate (Boiler,Dyeing,ETP,Forklift operator)						ü						ü	
24	License Holder						ü						ü	
25	Legal documents		üü											
26	Transportation vehicles		üü											

Table – KPI Report schedule

xxxx	Weekly updating
xxx	15days updating
xx	Monthly updating
-X-	Two months updating
Ü	once in 6 month
üü	once in year

Table –Daily walk on field observe

Menaka Mills Pvt Ltd						
WALK ON FIELD OBSERVE						
Responsible person:		Inspection Date:			Next Due Date:	
SL.NO	DETAILS	CHECKING DETAILS	OK	NOT OK	NOT APPLICABLE	IF FOUND ANY DEVIATION (UPDATE IN DECATHLON FORMAT)
1	First aid box	Clearly visible				
		Easily accessible				
		Medicine available				
2	Fire extinguisher	Clearly visible				
		Easily accessible				
		Available operating instruction				
3	Fire alarm switch	Clearly visible				
		Easily accessible				
		Available operating instruction				
4	Smoke sensor	Clearly visible				
		Check the function				
5	First aid and Fire fighter list	Available of trainer person list				
		Check the training skill				
6	PPE Box	Clearly visible				
		Easily accessible				
		PPE available				
		Condition of PPE				
7	Drinking point	Stand condition				
		Spillage of water				
		Condition of water				
		Condition of Water can				
8	Exit and emergency exit door	Sign board clearly Visible				
		No blockage of exit and emg exit door				
9	Emergency exit light	Sign is clearly visible				
		Two light available				
10	Passage way	Clearly visible				
		Easy to evacuate				
		No block any objects				
11	Evacuation plan	Clearly visible				
		Mention machine and fire equipment's details				
		Check if any update				
12	Evacuation Details	Available of Emergency evacuation procedure				
		Available of Emergency response team chart				
13	Evacuation	Clearly visible				

	routs Board	Check the route direction				
		Check the board Damages				
14	Assembly point	Worker knowledge of Assembly point				
		Assembly point location and number				
15	PPE	PPE instruction Board				
		Consult dpt wear the PPE's				
		Identify the damage				
16	Sharp tool	Tied the sharp tools,				
	(Trimmer or scissor)	Check the condition Trimmer or scissor ,				
		Verify the accountability check list				
17	Emergency Switch	Check the condition of Emergency switch				
		Worker knowledge of emergency switch				
		Operator which condition Operate emergency switch				
18	Needle guard	Condition of Needle guard and eye guards				
		Identify the damage				
		Worker use the Needle & eye guard				
19	Pulley Guard	Condition of pulley guard				
		Identify the damage				
		Maintain cleaning of motor				
20	Motor coupling guard	Condition of guard				
		Identify the damage				
21	SSB panel board	No damage Switches				
		No dust				
		Cleaning of panel board condition				
		Indication lamp condition				
		Warning sign				
22	LDB Panel board	No damage Switches				
		No dust				
		Cleaning of panel board condition				
		Any Dummy apply the gap				
		Warning sign				
23	Machine Panel board	No damage Switches and indicating lamp, display				
		No dust				
		Cleaned condition of panel board				
24	Rubber mat	Available of electrical rubber mat				

		Identify the damage				
25	Wiring	Identify the damage wire				
		Loose wire				
		Identify Removing wire				
		Proper insulation				
26	Machine	Function of Door sensor				
		Function of Temperature sensor				
		Unwanted sound and vibration				
		Check the safety valve and pressure valve				
		Function of drain valve				
27	Combustible storage area	Danger symbol mention				
		MSDS Detail				
		Handling time wear the PPES				
		Use proper secondary container				
28	Trolley and hydraulic trolley	Trolley only placed on inside the yellow marking				
		Free of passage				
29	Forklift and Stacker machine	Only Authorized person operate				
		Check the driving licence				
		Check the battery condition				
		Check the oil & Diesel or water leakage				
30	Chemical storage area	Check the compatibility chart				
		Warning Sign Display				
		Wear the PPE				
		All the Chemical & dyes use GHS symbols				
		Spill kid use instruction				
		MSDS Detail in all the chemical and dyes				
		Use proper secondary Secondary container				
		Identify any combustible material				
31	Chemical and dyes using area	All the Chemical & dyes use GHS symbols,				
		Wear the proper PPE				
		Identify any combustible material				
32	Eye wash station and eye wash bottle	Clearly visible				
		Easily accessible				
		Available operating instruction				
33	Storage area Stacking method	Check the warning sign				
		Proper stacking materials				
		Material stacking only inside of yellow marking				
		Free of passage				

Table – 23 Monthly walk on field observe

Menaka Mills Pvt Ltd						
WALK ON FIELD OBSERVE						
Responsible person:		Inspection Date:		Next Due Date:		
SL.NO	DETAILS	CHECKING DETAILS	OK	NOT OK	NOT APPLICABLE	IF FOUND ANY DEVIATION (UPDATE IN DECATHLON FORMAT)
LEGAL AUTHORIZATION AND PERIDICAL CHECK						
1	Electrical installation	Loose wire,				
		Burning wire,				
		Multi looping,				
		Damage wire,				
		Improper jointing wire,				
		Identify Melting & over heating.				
2	Elecal warning Sign	Danger Symbol,				
		HV / LT mention.				
3	Electrical rubber mat	Available of electrical rubber mat,				
		Identify the rubber mat damage,				
4	Legal doc	Available of Boiler test certificate				
		Available of compressor and presser vessel tank test certificate,				
		Available of Generator (emission) test Certificate,				
		Available noise and lux test certificate,				
5	Boiler Safety	Check the Safety valve,				
		Check the Pressure release valve,				
		Check the working condition of pressure gauge,				
		Check the Botton valve.				
		Check cut off / on,				
		Boiler max pr 7.5KG,				
6	Dyeing Safety	Check the Safety valve,				
		Check the Pressure release valve,				
		Check the pressure gauge,				
		Check the drain valve auto function.				
		Check the temperature sensor,				
7	Valid persion only	Check the Electrician license,				
		Check the fork lift operator license,				
		Check the Boiler operator certificate,				
8	Machine service	Work permit follow,				
		LOTO follow,				
		Wear proper PPE,				
		Apply Warning sign board,				
		Check the Preventive maintaince details.				
		Accident and incident report,				

9	Work place safety	Near miss report,				
10	Installation	New electrical installation,				
		New machine Installation,				
		New building construction,				
RISK & SAFETY MANAGEMENT						
11	Pregnant worker(PW) & Breast feeding worker(BFW)	Identify the Pregnant worker and breast feeding worker,				
		Availability of caretaker,				
		No allowed heavy load work and don't entry hazards area ,				
		No allowed in over time,				
		No allowed night shift,				
		Proper break time and extant the break time,				
		Regular update of PW & BFW,				
		Allowed in medical leave (Emergency time),				
		Ensure work place risk in PW & BFW.				
12	Risk Assessment	Available of Risk assessment,				
		Ensure all the department Risk Assessment (Updating If Layout changes or New machine installation),				
		Ensure environmental hazard and ergonomic hazard, fire hazard.				
13	PPE'S (e.g. engineering controls, reduce exposure time, insulation wall)	Sufficient level of PPE stock,				
		Free cost of replace the PPE's,				
		Check the PPE condition,				
		Check the PPE box condition,				
		Find the improper PPE wearing person,				
		To reduce exposure to noise use to proper PPE's				
		Identify the Dpt wise PPE's warning sign board fixed,				
14	First aid box	Ensure all the production building fix the first aid box,				
		Clearly visible FAB,				
		Easily accessible FAB,				
		Medicine available FAB,				
		No blockage of FAB,				
15	Electrical Risk	Work permit s/m followed,				
		LOTO procedure followed,				
		Wear the proper PPE,				
		Use the warning sign board,				
		Identify the Loose wire, Burning wire, Multi looping, Damage wire, Improper jointing wire, Identify Melting & over heating.				
		Available of electrical rubber mat, Identify the rubber mat damage.				
		All the SSB,DP,LDP proper wire insulate				

		and proper dummy provide, cable are covered by pvc pipe or other relevant materials.				
		Check the earth value monthly once,				
		Check the preventive maintaince schedule,				
		Accident report (major, minor, medium).				
		Near miss report.				
		Work permit report.				
		Noise report.				
16	Record	H&S committee meeting report,				

CHEMICAL MANAGEMENT SYSTEM						
		List of Chemical,				
		List of MSDS,				
		Sufficient level of secondary container,				
		Sufficient level of FE,				
		Availability of FAB and medicine,				
		Availability of spill kit,				
		Available of emergency evacuation procedure,				
		Available of emergency chart,				
		Available of evacuation map,				
		Available of FF & FA trainer,				
		Availability of eye wash station,				
		Availability of humidity meter,				
17	Chemical Storage area	Available of warning sign board,				
		Available of PPE sign board,				
		Check the condition of secondary container,				
		Identify the damage and spillage ,				
18	Secondary container	Regular inspection of secondary container.				
		Clearly visible of spill kit,				
		Easily accessible,				
		Available of spill kit materials,				
19	Spill kit	Available of Spill kit operating instruction,				
		MSDS & SDS there are should be following details are verified :				
		Product Name,				
		Manufacturing Address,				
		Effect the chemical,				
		Human Health affect,				
		Pictogram symbols,				
		Suggestion PPES,				
		MSDS & SDS full update version,				
20	MSDS and SDS	Version 3 years once reverse the MSDS,				
		The employees should be knowledge of the MSDS information.				
		PPE using awareness,				

21	Awareness	Spill kit Awareness,				
		Eye wash and shower station Awareness,				
		General health and safety Awareness,				
		Fire drill awareness,				
		Fire fighting training,				
		First Aid training,				
22	Eye wash and shower station	Available of operating instruction,				
		Easy Access able,				
		Check the valve,				
		Sufficient level of water and water pressure,				
23	PPE & PPE box	Check the condition of PPE box,				
		Check the condition of PPE,				
		Find the improper PPE wearing person,				
		Availability of PPE,				
24	Empty can and box	Proper segregation of waste can & carton box storage area,				
		Chemical can after clean then can move to empty can storage area,				

FIRE SAFETY EVACUTION						
25	Building	Clear visible of exit and Emg exit door,				
		Clear visible of exit and emg exit board,				
		Clear visible of Yellow line and red arrow making,				
		Clear visible of evacuation map,				
		Clear visible of Fire safety equipment,				
		Clear visible of first aid box,				
		Applicable centralized fire alarm system,				
26	Stair case	No Object storage(Waste materials, chemical, carton box)				
		Steps start and end zebra marking,				
		Availability of Hand dill,				
27	Exit and Emg exit	No close the exit and emg exit door (including break and lunch time period, same as night duty lunch time),				
		No blockage of exit and emg exit rounds (free from obstacles),				
		No automatic door,				
		No flammable material stored in rounds and door,				
		Clear visible of Exit and emg exit Sign board,				
		Emg exit width 80 cm ,				
28	Emergency light	Clear visible of exit light sign,				
		Check the Doom light direction,				
		Check frequently Battery back up (Update check list),				
29	Yellow and red marking	Clear visible of yellow line mark and red arrow marking,				
		Identify any defect of marking,				
		Centralized fire alarm s/m,				
		All the building Sufficient level of fire alarm s/m,				

		All the worker Identify the FA,				
		Clear visible of Fire alarm s/m,				
		Available of operating instruction,				
		Available of hammer,				
		Free from obstacle,				
		Evacuation of worker Minimum 5 mit of working ,				
30	Fire alarm system	Available of UBS battery backup,				
		All the building Sufficient level of sound,				
		Its different Sound easy identify the worker.				
		Evacuation of worker Minimum 5 mit of working,				
31	Fire alarm Sound	Employee how to operate FA.				
		Update check list,				
32	Fire alarm Test	All time working condition with maintaince and service of FA,				
		The building Sufficient level of fire extinguisher,				
		Clear visible of fire extinguisher,				
		Easy accessible of fire extinguisher,				
33	Fire equipment	Available of operating instruction board,				
		Yearly once Refilling FE,				
		Monthly once checking of FE,				
		Update the FE card,				
		Update the check list,				
34	Fire extinguisher	Employee how to operate FE,				
		Building Sufficient level of smoke detector,				
		different Sound easy identify the worker,				
35	Smoke detector	**Frequently check the battery.**				
36	Smoke detector test	Update check list				
		First aid trainer - 2% of worker,				
		Fire fighting trainer - 10% of worker,				
		Available FA & FE certificate,				
37	Trained person	The building FE & FA mention				
		Drill Awareness of worker,				
		Drill conducted by two month once				
		(Crosse verification of record),				
38	Evacuation Drill	This drill applicable for Buyer and visitor and other worker				
		(Factory inside of all the people applicable).				
		Everyone knows with our Assembly point num,				
		Line followed by the Assembly point				
39	Assembly point	Head counting Authorised person only,				
LIVING ENVIRONMENT						
		Availability of transport vehicle,				
		Driver only applicable for valid license holder,				
		Available of medical certificate in driver,				
		Check the vehicle live (FC),				
		Check the Preventive maintaince details,				

		Available of first aid box and Medicine,				
		Available of fire extinguisher,				
		Check the break condition,				
40	Transport	Check the light condition,				
		Check the neatness of rest room,				
		Availability of cleaning materials,				
		Available of continuous water				
		Per day 3 time of cleaning,				
		Cleaning time wear the PPES,				
		Clear visible of MSDS,				
41	Toilet	Available of restroom check list,				
		Clear visible of sign board,				
		Availability of drinking water,				
		Check the Stand condition				
		No Spillage of water				
		Check the Condition of water				
42	Drinking point	Check the Condition of Water can,				
		Work place H&S environment,				
		Proper ventilation,				
		Proper illumination,				
		Acceptable temperature,				
		Free access the toilet,				
		Free access the drinking point,				
		Free of use transport,				
		Proper wear the PPE'S				
43	Employee work place	Proper cleaning maintain,				
		Available of Employee medical certificate,				
		Available drinking point,				
		Available hand washing place,				
		Available of first aid box and Medicine,				

44	Canteen	Available of fire extinguisher,				
		Available of fire alarm switch,				
		Available of ERT chart and emergency procedure,				
		Available of Evacuation map,				
		Sufficient shitting table,				
		Only allowed in Responsible person,				
		Available of toys,				
		No allowed in sharp toys,				
		Available of drinking water,				
		Available of toilet,				
45	Crèche room	Ensure the inside no chemical.				
		Treatment only Responsible person (Doctor and Nurse),				
		Available of Doctor and Nurse,				
		Available of bed,				
		Available of Medicine,				

46	First aid room	Proper waste disposal and record,				
		Available of drinking water,				
		Available of toilet,				
		Identify the hygienic cleaning,				
47	Cleaning	All ways maintain Factory neat and clean,				
		Availability of dustbins,				
		Regular cleaning of dustbins,				
		Keep always dry condition of floor,				
48	Waste storage area	proper segregation of waste storage area				
		(E waste, Oil waste, machine waste, chemical waste, fabric waste),				
		Identify factory Inside the if any unnecessary place storage of waste,				
		Check the Waste disposal record,				
		Identify the GCT approval person is Waste collected				

MENAKA MILL PVT LTD UNIT – I

Fire Extinguisher Monitoring - Inspection Log

Responsible person: Inspection Date: Next Due Date:

S. No	Location	Checking parameters											If Found Any Deviation (Update in DECATHLON format)
		Type	Capacity	Clamp Condition to Hang	Easy accessible	Pressure level	Hose Condition	Safety Pin & seal provided	Physical apperiance	If CO2 - Check Weight	Inspection Tag Provided	Operating Instruction	
				(Ok / Not Ok)	(Yes / No)	(Low/Normal /High)	(Good/Bad)	(Yes / No)	(Good/Damaged)	(Below/Normal)	(Yes/ No)	(Yes/ No)	

Fire extinguisher monitoring inspection log

Table -25 Emergency light monitoring inspection log

MENAKA MILL PVT LTD UNIT - I

Emergency Light Monitoring - Inspection Log

Responsible person: Inspection Date: Next Due Date:

S. No	Location	Checking parameters									If Found Any Deviation (Update in DECAT
		Type	Battery Condition	Display signs worki	Switch working	Doom Light Direction	Light Working condition	Duriation of Light working	Physical appearance	Damaged Wires	

				ng											HLON format)
			Good/ Bad	Working / Not working	Good / Damaged	(Yes/ No)	Good Working	Fuse not working	Bulb not working	Below 5 Min	Between 5 to 8 Min	Above 8 Min	(Good/ Damaged)	(Yes/ No)	

Table -26 Fire alarm switch (or) Manual call point monitoring inspection log

MENAKA MILL PVT LTD UNIT - I									
Manual Call Point Monitoring - Inspection Log									
Responsible person: Inspection Date: Next Due Date:									
S.No	Location	Checking parameters							If Found Any Deviation (Update in DECATHLON format)
		Easy accessible	FLB Connectivity - Check By Removing Glass	Glass Condition	Hammer availability	Physical appearance	Wire Condition	Operating Instruction	
		(Yes/ No)	(Working/ Not working)	(Good/ Damaged)	(Good/ Damaged)	(Good/ Damaged)	(Good/ Damaged)	(Yes/ No)	

Table -27 Smoke detectors monitoring inspection log

MENAKA MILL PVT LTD UNIT - I							
Smoke Detectors Monitoring - Inspection Log							
Responsible person: Inspection Date: Next Due Date:							
S.No	Location						If Found Any Deviation (Update in DECATHLON format)
		FLB Connectivity check with smoke	Physical appearance	Wiring condition	Blinking light	Cobweb / Dust particles clean	
		(Working/ Not working)	(Good/ Bad)	(Good/ Damaged)	(Yes/ No)	(Yes/ No)	

Table -28 Fire hydrant monitoring inspection log

MENAKA MILL PVT LTD UNIT - I																
Fire Hydrant Monitoring - Inspection Log																
Responsible person:					Inspection Date:								Next Due Date:			
S. No	Location	Availability			Checking parameters											If Found Any Deviation (Update in DECATHLON format)
		Hose Box Key Provided	Nozzle - 1 No's	Hose Real - 2 No's	Easy accessible	Phyical apperiance of Hose Box	Nozzle to Hose Coupling connected	Hose to Hydrant Head Coupling connected	Gate valve wheel rotation	Hose Condition (Leakages)	Pressure level			Operating Instruction	
		(Yes/ No)			(Yes/ No)	(Good/ Damaged)	(Yes/ No)	(Yes/ No)	(Easy/ Hard)	(Good/ Damaged)	Low	Normal	High	(Yes/ No)	

Table -29 Fire hose reel monitoring inspection log

MENAKA MILL PVT LTD UNIT - I												
Fire Hose reel Monitoring - Inspection Log												
Responsible person:				Inspection Date:					Next Due Date:			
S.No	Location	Easy accessible	Phyical apperiance of Hose reel drum	Nozzle Condition (Easy Twisting)	Hose Drum rotation	Gate valve condition	Hose Condition (Leakages)	Pressure level			Operating Instruction	If Found Any Deviation (Update in DECATHLON format)
		(Yes/ No)	(Good /Damaged)	(Good /Damaged)	(Easy/ Hard)	(Good/ Bad)	(Good /Damaged)	Low	Normal	High	(Yes/ No)	

Table -30 Eye wash station monitoring inspection log

MENAKA MILL PVT LTD UNIT - I									
Eye wash and showe station Monitoring - Inspection Log									
Responsible person:	Inspection Date:	Next Due Date:							
									If Found Any
					sufficient	Nozzle	fitting	Operating	

S.No	Location	Easy accessible	Hand valve	Foot valve	Shower valve	water pressure	condition	damage or water leakage	Instruction	Deviation (Update in DECATHLON format)
		(Yes/ No)	(Easy/ Hard)	(Easy/ Hard)	(Easy/ Hard)	(Yes/ No)	(Good /Damaged)	(Yes/ No)	(Yes/ No)	

Table -31 Drinking point monitoring inspection log

MENAKA MILL PVT LTD UNIT - I									
Drinking point station Monitoring - Inspection Log									
Responsible person:	Inspection Date:	Next Due Date:							
S.No	Location	Easy accessible	Dinking valve	sufficient level of water	Nozzle condition	fitting damage or water leakage	Rubber mat condition	Check the water taste	If Found Any Deviation (Update in DECATHLON format)
		(Yes/ No)	(Easy/ Hard)	(Yes/ No)	(Good /Damaged)	(Yes/ No)	(Good /Damaged)	(Ok / Not ok)	

Table -32 Air receiver tank monitoring inspection log

MENAKA MILL PVT LTD UNIT - I																	
Air receiver tank Monitoring - Inspection Log																	
Inspection Date:								Next Due Date:									
Sl. no	Pressure vessel detail	Location	Serial number	Name and address of manufacturer	Nature of process	Year on manfacturing	CAP/VOLUME	Condition of the tank	Air leakage for tank	All drains handle easily accessiable	Is the drain pipe line valve installed on the lowest point of the compressor tank	Safety valve easily accessiable	Is the in coming and out going pipe line valve installed on the top and lowest point of the compressor	Pressure gauge	MAX.WORK. PR	Current pressure of the tank	Maximum allowable storage tank working pressure

Table -33 Environmental impact monitoring inspection log

MENAKA MILL PVT LTD UNIT - I																			
Environmental Impact Check List																			
Responsible person: Inspection Date: Next Due Date:																			
Sl.No	Location	Material Stored	Materials are Labeled Properly		Secondary Container Available in proper condition		Any Leakage / Spillage found		Material containers are closed properly		Materials stored under Closed roof & in Ventilated condition		Any Flammable things stored near		MSDS & Spill Control Procedure Displayed		Using PPEs while Handling the materials		If Found Any Deviation (Update in DECATHLON format)
			Ok	Not Ok	Ok	Not Ok	Ok	Not Ok	Ok	Not Ok	Ok	Not Ok	Yes	No	Yes	No	Yes	No	

Table -34 Electrical panel board monitoring inspection log

Menaka mills pvt ltd unit-1														
Electrical panel board inspection -log														
Responsible person: Inspection Date: Next Due:														
Sl. No.	Location	PANEL NO	Cleaning condition	Phyical apperiance Indication lamp	Indication lamp Working condition			Phyical apperiance Switch	Switch working condition	Loose wire	Heat Leakage	Proper closing door	Warning signs (danger and voltage sign)	Electrical rubber mat condition	If Found Any Deviation
					R	Y	B								
			OK / NOT OK	(Good/ Damaged)	OK / NOT OK			(Good/ Damaged)	OK / NOT OK	OK / NOT OK	Yes / No	Yes / No	Yes / No	(Good/ Damaged)	

Table -35 Safety equipments – corrective action report

MENAKA MILL PVT LTD UNIT - I

SAFETY EQUIPMENTS - CORRECTIVE ACTION REPORT

Inspection Done By:		Date of Inspection:		Name of the Equipment:	
SL	Deviation Found	Corrective Action	Completion Date	Responsible person	Verified by person

Table -36 work permit system

WORK PERMIT DESCRIPTION						
1)Date:		Time start:		Time end:		
2)Job Location:						
3)Job Description:						
4)Associated work permit (if any):						
Type	Permit No	Type	Permit No	Type	Permit No	

HAZARDS AND PRECAUTION			
Hazards	PPE	Electrical Isolation	Authorised ELE Incharge
Falling Objects Fall from height Overhead Danger Moving machine Auto start equipment Traffic movement HV / LV / Line near by Other	Safety helmet Safety shoe Safety Harness Gloves Life line Face sheld Other	LOTO Done Isolator put off & Locked Test for non operative	
		Service Isolation	Authorised MNT Incharge
		Depressurised Valve closed & Tagged Line blanked	
	OTHER PRECAUTIONS	Process Isolation	Authorised opeator
	Safety Net Scaffolding Crawl Board Signage Barrication	Valve closed & Tagged Line blanked Line disconnected	

PERMIT ISSUE AND ACCEPTANCE		
Permit Requestor I understand the work scope,Hazards,Precautions to be tacken and ensure compliance. I will conduct a safety talk in this regard to the personnel and record on the back side of this permit.		
Name	Sign	Date & Time

Permit Authoriser I have reviewed the work scope,Hazards and pecautions and authorise for proceeding the work Name Sign Date & Time						
ENDORSEMENTS FOR EXTENSION / CANCELLATIONS						
Date	Time (AM / PM)	Valid upto	Requestor	Authoriser	After hour Authoriser	Operator
PERMIT CLOSURE						
Permit Requestor						
The job described in this permit has been completed ,all safety devices put back,area cleared and person on the job. withdrawn Name Sign Date & Time						
Permit Authorisr						
I have reviewed the work site,satisfied and accept for closing this permit Name Sign Date & Time						

SAFETY TALK

i have beeen explained on the content of this work permit (work scope, hazard precautions) and provided necessary ppe's .i shall strictly follow and will be held responsible or any deviations.

Table – 36.1 safety talk worker details

Sl.no	Name	Signature

IV. CONCLUSION

Hazard Identification and Risk Assessment (HIRA) study were made on the textile and various hazards of different process and their associated equipment's were found. Recommendations are provided to reduce high level risk to low level. . Noise level is measured in various areas of the industry and suitable control measures are suggested. In textile industries, the working environment is high in temperature and hence heat stress, chemical handling index is calculated for the workers working in the Boiler and Dyeing area, ETP & RO plant suitable preventive measures are given. Health hazards associated with each process are found and suitable mitigation measures are given for safe handling of the chemicals.

The KPI (KEY PERFORMANCE INDICATPOR) ,its new implementation of MENAKA MILLS UNIT-1 PVT LTD .the factory new update version of KPI table format and KPI schedule, sop o safety and health, list of deviation and monitoring inspection log ,list o PPE's tabulated department wise , transport safety, key person, daily and monthly on field observe ,work permit system.

The KPI and HIRA assessment details and schedule should be correctly followed and give to working awareness then successive run by factory.

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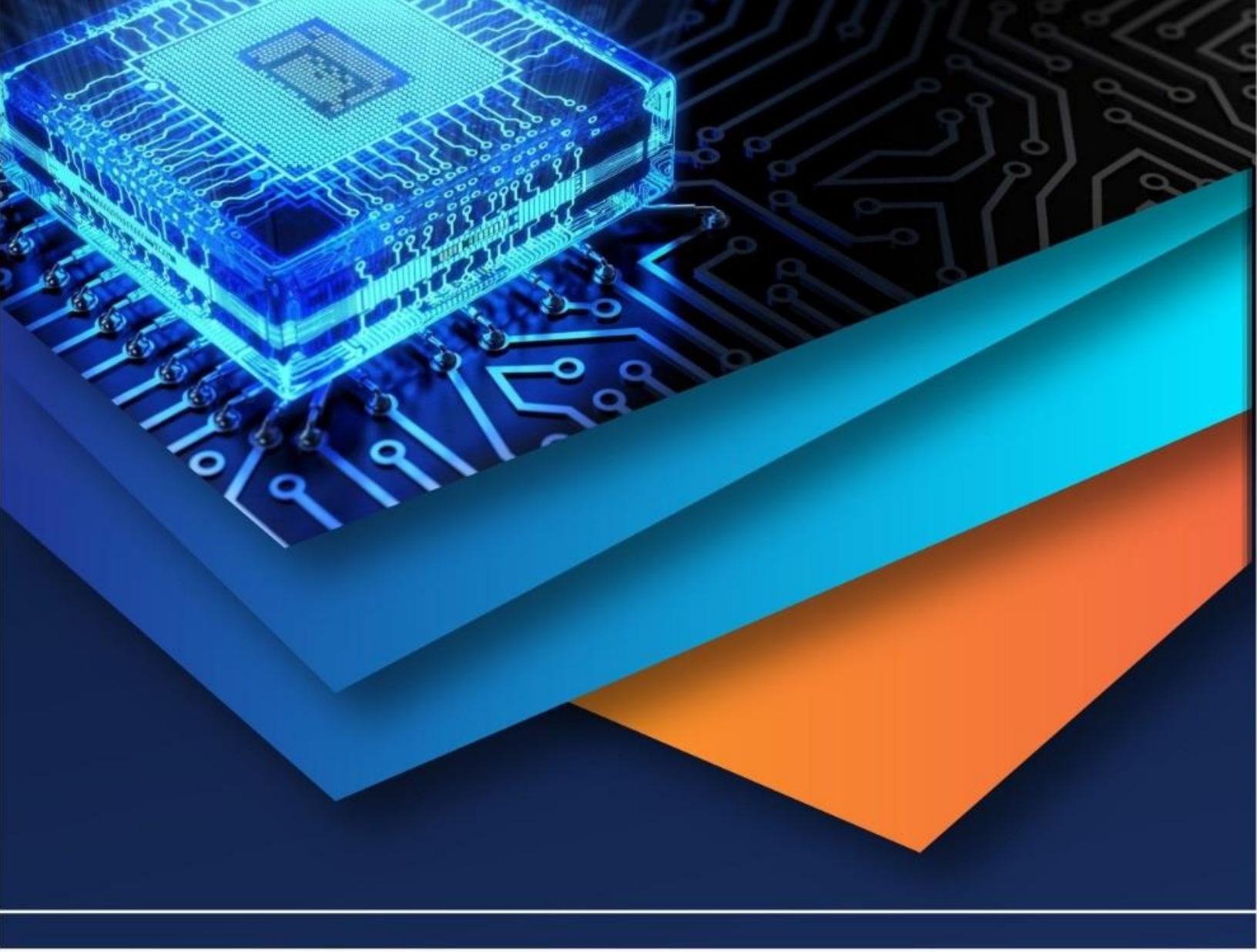

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