PRO

PREPARED BY
Sahana I H
REVIEWED BY BRML
Vaibhav Bhosale
Rahul B
REVIEWED BY STRIDES PHARMA
APPROVED BY STRIDES PHARMA

Assessment reference:	16614	Number of operatives:
Type of machine:	Sachet Cartoning Machine	Number of shifts per week:
Machine location:	USA	Usage (hours per week):
Machine description:	Sachet Cartoning Machine	Operating manuals:
Machine manufacturer:	BAR	SOP's
Machine model:	p780	Operatives' training record:
Machine serial number:		Warning signs:
Modifications from 'as-supplied':	None	Raw materials:
Energy sources:	Electrical Power and Compressed Air	Maintenance manual:
Energy source ratings:	Electrical - 3phase, 480V 60Hz Pneumatic - Air @6bar.	Maintenance training record:
Safety measures:	(eg. PLd safety architecture)	Access by untrained visitors:
Assessment carried out by:	OB, RB	
Assessment date:	08.01.2024	
Assessment reviewed by:		
Assessment review date:		
Version:	1.0	

RML Assumptions: Machine has no electronic guarding at all at initial assessment, frame is present.

Keywords: See "Example Keywords" sheet for further keywords

LO (Likelihood of Occurrence)		
0.033	Almost impossible	Only in extreme circumstances
1	Highly unlikely	Though conceivable
1.5	Unlikely	But could occur
2	Possible	But unusual
5	Even chance	Could happen
8	Probable	Not surprising
10	Likely	To be expected
15	Certain	No doubt

FE (Frequency of Exposure)	
0.5	Annually
1	Monthly
1.5	Weekly
2.5	Daily
4	Hourly
5	Constantly

DPH (Degree of Possible Harm)	
0.1	Scratch or bruise
0.5	Laceration or mild ill-effect
2	Break of minor bone or minor illness (temporary)
4	Break of major bone or major illness (temporary)
6	Loss of one limb, eye, hearing (permanent)
10	Loss of two limbs or eyes (permanent)
15	Fatality

NP (Number of Persons at ris	
1	1-2 persons
2	3-7 persons
4	8-15 persons
8	16-50 persons
12	50+ persons

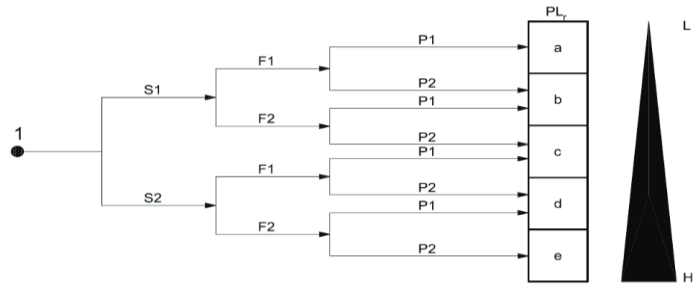
No.	Assembly	Machine Location	Type of Hazard	Potential consequences

No.	Assembly	Machine Location	Type of Hazard	Potential consequences
2	Main Drive Assembly	1. Driver Pully Assembly 2. Driven Pully Assembly 3. Main Drive Belt Guide &Dogs	Kinetic energy (Drawing in Nip Points/Crushing Shearing)	Injuries include amputations, lacerations, contusions crushing of tissues and bones, and broken bones.
		Motor And Gearbox Assembly	Thermal Energy	1. The winding insulation & bearing deteriorates 2. Increases in the temperature of an electric motor reduce its lifespan (Motor Ambient working temperature <=60 deg celcius) (Gearbox Ambient temperature <= 80 deg celcius)
		1. driver Pully Assembly 2. Driven Pully Assembly 3. Motor And Gearbox Assembly	1. Noise 2.Vibration	Vibration can cause changes in tendons,muscles,bones and joints ,and can affect the nervous system.collectively,these effects are known as Hand-Arm Vibration Syndrome (HAVS). Workers affected by HAVS commonly report 1.Attacks of whitening (blanching) of one or more fingers when exposed to cold 2.Tingling and loss of sensation in the fingers 3.Pain and cold sensations between perodic white fingers attacks 4.Loss of grip strength & Bone cysts in fingers and wrists 5.Noise may damage hearing - Stress - Hypersensitivity to noise - Increased blood Pressure Increased heart rate -
		Motor Assembly	EMF/ Electro static	Electrostatic sparks may have enough energy to produce electric shocks, cause electronic damage, spoil mechanical components
			Parts becoming live under fault conditions / Short-circuit / Overload	Burn
				Electrocution
				Motor Overload may cause overheating of the motor and damage the windings of the motor

TOCOL APPROVAL

DESIGNATION	SIGNATURE AND DATE
Automation	
DESIGNATION	**SIGNATURE AND DATE**
Automation	
Design	
DESIGNATION	**SIGNATURE AND DATE**
DESIGNATION	**SIGNATURE AND DATE**

1
Supplied
As required, per post assembly Hazop.
As required, per post assembly Hazop.
Supplied
Operators & maintenance to be trained upon installation
Prohibited



Key

1 starting point for evaluation of safety function's contribution to risk reduction
L low contribution to risk reduction
H high contribution to risk reduction
PL$_r$ required performance level

Risk parameters:

S severity of injury
S1 slight (normally reversible injury)
S2 serious (normally irreversible injury or death)
F frequency and/or exposure to hazard
F1 seldom-to-less-often and/or exposure time is short
F2 frequent-to-continuous and/or exposure time is long
P possibility of avoiding hazard or limiting harm
P1 possible under specific conditions
P2 scarcely possible

HRN	Risk
0-5	Negligible
5-50	Low, significant
50-500	High
Over 500	Unacceptable

HRN = LO x FE x DPH x NP

Comments	Initial assessment						Action required	Re-assessment after taking action				
	LO	FE	DPH	NP	HRN	Risk level		LO	FE	DPH	NP	HRN

Comments	Initial assessment						Action required	Re-assessment after taking action				
	LO	FE	DPH	NP	HRN	Risk level		LO	FE	DPH	NP	HRN
Hazards - drawing in of operator getting caught in belt/tangled with power belt. **Why is the hazard there** - Conveyor running at linear speed >500mm/s. **What drives the hazard** - Servo Motor. **How could harm be caused** - Operator hand/clothing/hair becoming caught in Belt. **Why would the hazard occur** - Operator intervention or inspection around the conveyor **Potential occurrence of hazard** - Even Chance **Possible harm** -Bruising, Lacerations., Break Minor Bone	2	4	2	1	16	Low, significant	Operator / Maintenance Staff Awareness Nip Point Warning Signs	2	4	2	1	16
Hazards - 1. Burns due to contact with hot Surface of the motor and Gearbox, 2. Motor Insulation an get melted and can cause short circuits and permanent damage to the motor. **Why is the hazard there** - Motors with a gearbox combination drives the conveyor and tend to heat (extensive temperatures >60 deg celcius can be hazardus) **What drives the hazard** -Servo Motor **How could harm be caused** - Operator in contact with hot motor and gearbox Surface. **Why would the hazard occur** - Operator intervention or inspection around the machine, intervention by maintenance personnel. **Potential occurrence of hazard** - Constantly. **Possible harm** - Minor burns.	8	4	0.5	1	16	Low, significant	Operator / Maintenance Staff Awareness Hot Surface Warning Signs	**5**	4	0.5	1	10
Hazards -vibrate and generates excessive force in the bearing area and reduces the life of the machine **Why is the hazard there** - Electric Motor drives the belt regardless of any minute missalignment which may further cause vibration. **What drives the hazard** - Electrical Energy. **How could harm be caused** - Operator in contact with motor and gearbox Surface.. **Why would the hazard occur** - Operator intervention or inspection around the machine, intervention by maintenance personnel. **Potential occurrence of hazard** - Constantly. **Possible harm** -1.Vibration can cause changes in tendons,muscles,bones and joints . (the highest around 8-16 Hz (Hertz or cycles per second)) 2.Noise may damage hearing (Permissible limit is 75 dB for daytime and 70 dB at night from 1m Distance)	1.5	5.0	2.0	1.0	15.0	Low, significant	Operator / Maintenance Staff Awareness	5.0	1.5	2.0	1.0	4.5
Hazards - electrical shock, fire and arc flash. **Why is the hazard there** - When power up the Electric Motor & Its power cables are open and fed up floor **What drives the hazard** - Electrical Energy **How could harm be caused -** Operator in contact with hot motor and gearbox Surface. **Why would the hazard occur** - Operator intervention or inspection around the machine, intervention by maintenance personnel. **Potential occurrence of hazard** - Constantly. **Possible harm** - Minor burns , Electrocution	0.033	4	15	1	**1.98**	Negligible	Use best practice design	0.03	4	15	1	**1.8**
	0.033	4	0.5	1	**0.066**	Negligible	Use best practice design	0.03	4	0.5	1	**0.06**
	0.033	4	0.5	1	**0.066**	Negligible	Use best practice design	0.03	4	0.5	1	**0.06**
	0.033	4	15	1	**1.98**	Negligible	Use best practice design	0.03	4	15	1	**1.8**

		Componets/Instruments might Damage				
Risk level	Residual Risk Action Required	Componets/ Instruments Details	LO	Critical Spare	Recommened Spare	Remarks

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		Componets/ Instruments Details	LO	Critical Spare	Recommened Spare	
Low, significant	Operator / Maintenance Staff Awareness and Training	1.Drive Belt	2	--	✓	
Low, significant	Operator / Maintenance Staff Awareness and Training	2.Gearbox	2	--	✓	
Negligible	Regular Maintenance	3.Proximity Sensor	5	--	✓	
		4.Photoelectric Sensor	8	✓	--	
Negligible	Operator / Maintenance Staff Awareness and Training	5.Encoder	2	--	✓	
Negligible						
Negligible						
Negligible						