

# GCB COCOA MALAYSIA SDN BHD– INTEGRATED MANUAL (formerly known as Kokobudi Sdn Bhd)

Doc. Title: <b>HAZARD ANALYSIS WORKSHEET</b>	Section No: IM-13	Page No.:	Page 1 of 33
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## A) HAZARD ANALYSIS – RAW MATERIAL/PACKAGING MATERIAL

Process Step	Potential Hazard State whether biological, chemical or physical.	Rationale for inclusion or exclusion as a Hazard.		What Preventive Measure or Controls can be applied to prevent this significant hazard?	Is this a Sensitive Raw Material/Packaging Material?					
		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical	Likely-hood	Severity	Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	(Yes / No)
Cocoa bean	B: Contamination of mould by mouldy beans from supplier or wet beans that promotes growth of mould	2	3	-Buy bean from approved suppliers -Sun dry wet cocoa bean or use it within 2 days -Conduct Incoming Test, reject if beans fail on mouldy bean criterion as per non-conforming procedure -Mould will be killed by sterilisation process at Roaster	N	-	-	-	-	No
	C: Contamination of heavy metals from cocoa beans	3	2	-Buy bean from approved suppliers -Send sample for testing on a yearly basis -No occurrence in past 10 years of operation	N	-	-	-	-	No
	C: Contamination of mycotoxins from cocoa beans	3	2	-Buy bean from approved suppliers -Send sample for testing on a yearly basis -No occurrence in past 10 years of operation	N	-	-	-	-	No
	C: Contaminated with pesticide from cocoa beans	3	2	-Buy bean from approved suppliers -Send sample for testing on a yearly basis -No occurrence in past 10 years of operation	N	-	-	-	-	No
	C: Contaminated with fumigant	4	2	-Use methyl bromide/aluminium phosphide for fumigation. -Send sample for testing on yearly basis -Methyl bromide is very volatile. Literature (Schumacher 1985) shown that the residue is only 1.7ppm on cocoa bean. (Malaysia residue limit is 500ppm, SIXTEENTH SCHEDULE (Regulation 41)) -Literature (Hackerberg U. 1972) states aluminium phosphide as a commonly used fumigants is free from toxic residues and leaves little residues on food grains.	N	-	-	-	-	No
	C: RADIOLOGICAL Contaminated with radiological hazard	3	2	-Buy bean from approved suppliers -Obtain radiation statement from approved suppliers -All cocoa beans must be free from radiological hazard	N	-	-	-	-	No
	P: Contaminated with stone, metal and other foreign material	2	4	-Buy bean from approved suppliers -To be separated during bean cleaning processes.	N	-	-	-	-	No



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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical	Likely-hood	Severity	Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	(Yes / No)
	<i>For Primary Packaging which will contact with cocoa, i.e. plastic liner, Jumbo bag, paper bag.</i>  P: Dust from the environment	3	2	-Ensure packaging materials are clean and wrapped properly	N	-	-	-	-	No
	<i>For Secondary Packaging which will not contact with cocoa, i.e. cartons</i>  B: Not identified	-	-	-	-	-	-	-	-	-
	<i>For Secondary Packaging which will not contact with cocoa, i.e. cartons</i>  C: Stain with lubricant chemical from supplier site	4	3	-Ensure packaging materials are clean and wrapped properly	N	-	-	-	-	No
	<i>For Secondary Packaging which will not contact with cocoa, i.e. cartons</i>  C: RADIOLOGICAL Contaminated with radiological hazard	3	2	-Buy from approved suppliers - Obtain radiation statement from approved suppliers -All secondary packaging material must be free from radiological hazard	N	-	-	-	-	No
	<i>For Secondary Packaging which will not contact with cocoa, i.e. cartons</i>  P: Dust from the environment	2	3	-Ensure packaging materials are clean and wrapped properly	N	-	-	-	-	No







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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/OPRP
5c Store processing aid solution at solution tanks	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Not identified	-	-	-	-	-	-	-	-	-
1d Receive packaging material, e.g. plastic liner, carton, Jumbo bag, paper bag	<i>For Primary Packaging which will contact with cocoa, i.e. plastic liner, Jumbo bag, paper bag.</i>  B: Cross contamination of bacteria from workers at supplier site	3	2	-Buy from approved supplier -Conduct incoming testing for bacteria for surfaces in contact with cocoa, i.e. plastic liner, Jumbo bag, paper bag.	N	-	-	-	-	-
	<i>For Primary Packaging which will contact with cocoa, i.e. plastic liner, Jumbo bag, paper bag.</i>  C: Potential contamination from solvent residue or chemical hazard from primary packaging material.	4	2	-Buy from approved supplier -All primary packaging material must be Food grade, suitable for food contact application.	N	-	-	-	-	-
	<i>For Primary Packaging which will contact with cocoa, i.e. plastic liner, Jumbo bag, paper bag.</i>  P: Dust from the environment	3	2	-Ensure packaging materials are clean and wrapped properly	N	-	-	-	-	-
	<i>For Secondary Packaging which will not contact with cocoa, i.e. cartons</i>  B: Not identified	-	-	-	-	-	-	-	-	-
	<i>For Secondary Packaging which will not contact with cocoa, i.e. cartons</i>  C: Stain with lubricant chemical from supplier site	4	3	-Ensure packaging materials are clean and wrapped properly	N	-	-	-	-	-

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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
	<i>For Secondary Packaging which will not contact with cocoa, i.e. cartons</i>  P: Dust from the environment	2	3	-Ensure packaging materials are clean and wrapped properly	N	-	-	-	-	-
2d Store packaging materials	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Dust from the environment	2	3	-Clean the storage area as per cleaning program	N	-	-	-	-	-
1.Receive cocoa bean	B: Contamination of mould by mouldy beans from supplier or wet beans that promotes growth of mould	2	3	-Buy bean from approved suppliers -Sun dry wet cocoa bean or use it within 2 days -Conduct Incoming Test, reject if beans fail on mouldy bean criterion as per non-conforming procedure -Mould will be killed by sterilisation process at Roaster	N	-	-	-	-	-
	C: Contamination of heavy metals from cocoa beans	3	2	-Buy bean from approved suppliers -Send sample for testing on a yearly basis -No occurrence in past 10 years of operation	N	-	-	-	-	-
	C: Contamination of mycotoxins from cocoa beans	3	2	-Buy bean from approved suppliers -Send sample for testing on a yearly basis -No occurrence in past 10 years of operation	N	-	-	-	-	-
	C: Contaminated with pesticide from cocoa beans	3	2	-Buy bean from approved suppliers -Send sample for testing on a yearly basis -No occurrence in past 10 years of operation	N	-	-	-	-	-
	C: Contaminated with fumigant	4	2	-Use only methyl bromide for fumigation. -Send sample for testing on yearly basis -Methyl bromide is very volatile. Literature (Schumacher 1985) shown that the residue is only 1.7ppm on cocoa bean. (Malaysia residue limit is 500ppm, SIXTEENTH SCHEDULE (Regulation 41))	N	-	-	-	-	-



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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
	P: Contaminated with stone, metal and other foreign material	2	4	-Buy bean from approved suppliers <i>-To be separated during bean cleaning processes.</i>	N	-	-	-	-	-
2.Store cocoa bean at warehouse	B: Contamination of mould from wet cocoa bean that promotes growth of mould	2	3	-Sun dry wet cocoa bean or use it within 2 days  <i>-Mould will be killed by sterilisation process at Roaster</i>	N	-	-	-	-	-
	<i>For sun dry wet cocoa bean:</i>  B: Contamination of mould by mouldy beans if wet beans are not sun dried properly.	4	2	<i>-Wet beans will be sun dried to bring down moisture level to below 10%, i.e. around equilibrium moisture content of cocoa bean.</i> <i>-After sun dry, conduct bean testing, reject if dried beans fail on mouldy bean criterion as per non-conforming procedure</i> <i>-Mould will be killed by sterilisation process at Roaster</i>	N	-	-	-	-	-
	<i>For sun dry wet cocoa bean:</i>  C: Contaminated with grease/oil on floor	3	3	- When drying cocoa, place wet cocoa bean on cardboard. No direct contact with floor	N	-	-	-	-	-
	<i>For sun dry wet cocoa bean:</i>  P: Contaminated with sand/stone on floor	3	3	- When drying cocoa, place wet cocoa bean on cardboard. No direct contact with floor	N	-	-	-	-	-
	B: Contamination of pathogenic microbes (i.e; Salmonella and E.Coli) with bird dropping on cocoa	3	3	-Warehouse is screened with plastic curtains to prevent bird entrance <i>- Pathogenic microbes (i.e; Salmonella and E.Coli) will be killed by sterilisation process at Roaster</i>	N	-	-	-	-	-
	C: Contaminated with pesticide from fogging activities	3	2	-Pest control conducted by approved pest operator -Only approved pest chemical is used -Test for pesticide residue yearly	N	-	-	-	-	-

**GCB COCOA MALAYSIA SDN BHD– INTEGRATED MANUAL** (formerly known as Kokobudi Sdn Bhd)

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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical	Likely-hood	Severity	Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/OPRP
	P: Contaminated with pest	3	3	-Maintain effective pest control program	N	-	-	-	-	-
3.Transport cocoa bean to GCBCM factory	B: Contamination of mould from wet cocoa bean by rainwater that promotes growth of mould.	2	3	-Use box truck lorry or cover with canvas during transfer. <i>-Mould will be killed by sterilisation process at Roaster</i>	N	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contaminated with wooden piece from damages of pallet during transferring activities	2	4	-Train worker not to damage pallet by forklift <i>-To be separated by bean cleaning process</i>	N	-	-	-	-	-
4.Receive cocoa bean at GCBCM factory	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contaminated with pest	3	3	-Maintain effective pest control program	N	-	-	-	-	-
5.Dumping cocoa bean into line1 and line2	B: Contamination of pathogenic microbes (i.e; Salmonella and E.Coli) with bird dropping on cocoa	3	3	-Door is screened with plastic curtains to prevent bird entrance <i>- pathogenic microbes (i.e; Salmonella and E.Coli) will be killed by sterilisation process at Roaster</i>	N	-	-	-	-	-
	B: Staff: Cross contamination of bacteria from worker during handling	2	3	-Worker to follow personal hygiene <i>-Bacteria Count will be reduce to acceptable level by sterilisation process at Roaster</i>	N	-	-	-	-	-
	C: allergens: possible cross contamination with allergen if worker unaware of allergen control, bring food containing allergen into plant	3	2	- use our Allergen control procedure to brief all worker what is allergen, and this plant is a dedicated cocoa plant, and is free from all allergen material. - allergen control has been added into GMP training material to train all newly recruited worker, and also train repeatedly in annual refresher training - No food is allowed to bring into plant area. - No personal medicine is allowed to bring into plant.	N	-	-	-	-	-

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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
	P: Contamination of hook, wood, string and other foreign object during dumping	2	4	-Train worker not to contaminating cocoa bean dumped with foreign object <i>-To be separated during bean cleaning processes</i>	N	-	-	-	-	-
6. Transport cocoa bean to bean cleaning separator MTRB1.1, MTRB2.1, MTRB2.2 via bean silos	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contamination of metal caused by wear and tear of machinery	2	4	<i>- To be removed by magnets at magnet drum, Winnower, Liquor grinding section</i>	N	-	-	-	-	-
7. Remove foreign matter at MTRB1.1, MTRB2.1, MTRB2.2	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Dust, strings and other foreign matter from inadequate removing process	2	3	-Regular maintenance of machine according to maintenance program <i>-Can be removed at winnowing process</i>	N	-	-	-	-	-
8.Remove metal through magnet drum	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Metal contamination due to faulty magnet drum	2	3	-Regular maintenance of machine according to maintenance program <i>-To be removed by magnet at Winnower, Liquor grinding section</i>	N	-	-	-	-	-
9.Remove stone via destoner	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Stone if destoner malfunction	2	3	-Regular maintenance <i>-Stone will be trapped at LP grinder screen, if pass thru destoner</i>	N	-	-	-	-	-
10.Transport cocoa bean to pre-heating machine, i.e. Microniser (Line1) or IR (Line2)	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contamination of metal caused by wear and tear of machinery	2	4	<i>- To be removed by magnet bar at Winnower, Liquor grinding section</i>	N	-	-	-	-	-

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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical	Likely-hood	Severity	Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
11.Preheat cocoa bean at Microniser and IR	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contamination of loosen/broken machinery parts due to vibration and wear and tear.	2	3	-Regular maintenance of machine according to maintenance program <i>-Magnetised metal to be removed by magnet bar at Winnower, Liquor grinding section.</i> <i>-Others non magnetised object will be screened at winnower or trapped at LP grinder screen</i>	N	-	-	-	-	-
12. Break up cocoa bean into nibs and shell at bean crusher of Winnower 1.1&1.2 and Winnower 2.1&2.2 (With Pre-Sieve)	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contamination of metal caused by wear and tear of machinery	2	3	-Regular maintenance of machine according to maintenance program <i>-To be removed by magnet bar at Winnower, Liquor grinding section</i>	N	-	-	-	-	-
13.Separate nib and shell at winnowers	B: Contamination of pathogenic microbes (i.e; Salmonella and E.Coli) from shell due to inadequate separation process, i.e. suction and broken screen	2	3	-Checking "shell in nib" at Winnower every shift to ensure good operation condition <i>- Pathogenic Microbes (i.e: Salmonella and E.Coli) will be killed by sterilisation process at Roaster</i>	N	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contamination of shell, dust and other foreign matter from inadequate separation process, i.e. suction and broken screen	2	3	-Regular maintenance of machine according to maintenance program <i>-Checking "shell in nib" at Winnower every shift to ensure good operation condition</i> <i>-Other foreign matter which cannot be sucked out and pass thru winnower will be trapped at LP grinder screen</i>	N	-	-	-	-	-

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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
	P: Contamination of loosen/broken machinery parts due to vibration and wear and tear.	2	3	-Metal to be caught by magnet at Winnower. Clean magnet every shift. <i>-For whatever not caught by Winnower magnet, magnetised metal to be removed by magnet bar at Liquor grinding section. Other non magnetised object will be trapped at LP grinder screen</i>	N	-	-	-	-	-
14. Transport and store nibs at nib silos	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contamination of metal caused by wear and tear of machinery	2	3	-Regular maintenance of machine <i>-To be removed by magnet bar at Liquor grinding section</i>	N	-	-	-	-	-
15. Transport nib to scale of nib reactor/roasters	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contamination of metal caused by wear and tear of pipe	2	3	<i>-To be removed by magnet bar at Liquor grinding section</i>	N	-	-	-	-	-
16. Alkalising nibs at nib reactor, with option to inject processing aid solution, steam, air and water	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Possible contamination with toxic chemical, such as heavy metal from direct injected steam	3	2	-Use only food grade chemical additive for boiler water -Use only SAJ water -Test heavy metal every year.	N	-	-	-	-	-
	P: Contaminated with dust from compressed air	3	3	-Install 0.01micron filter at compressed air line.	N	-	-	-	-	-
17. Roasting nibs at roasters, with option to inject processing aid solution and water	B: Contamination of pathogenic microbes (i.e; Salmonella and E.Coli) if sterilisation process is not performed during roasting	3	1	-Ensure sterilisation step is performed by monitoring for every roaster batch	Y	Y	Y	Y	Y	CCP1
	C: Possible contamination with toxic chemical, such as heavy metal from direct injected steam	3	2	-Use only food grade chemical additive for boiler water -Use only SAJ water -Test heavy metal every year.	N	-	-	-	-	-

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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
	P: Contaminated with dust from compressed air	3	3	-Install 0.01micron filter at compressed air line.	N	-	-	-	-	-
	P: Contamination of loosen/broken machinery parts due to vibration and wear and tear.	2	3	-Regular maintenance of machine according to maintenance program <i>-Magnetised metal to be removed by magnet bar at Liquor grinding section.</i> <i>-Others non magnetised object will be trapped at LP grinder screen</i>	N	-	-	-	-	-
18a. Filtered air	B: Cross contamination of bacteria from intake air for cooling	3	2	-Install bacteria filter (95% @ 1micron) at cooler -Regular maintenance of the bacteria filter according to maintenance program	N	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Not identified	-	-	-	-	-	-	-	-	-
18. Cooling nib in cooler	B: Cross contamination of bacteria from intake air for cooling	3	2	-Install bacteria filter (95% @ 1micron) at cooler -Regular maintenance of the bacteria filter according to maintenance program	N	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contamination of loosen/broken machinery parts due to vibration and wear and tear.	2	3	-Regular maintenance of machine according to maintenance program -Magnetised metal to be removed by magnet bar at Liquor grinding section. <i>-Others non magnetised object will be trapped at LP grinder screen</i>	N	-	-	-	-	-
19. Transport nib to LP hopper	B: Cross contamination of bacteria from intake air	3	2	-Install filter box with bacteria filter (Pre-filter, Bio-Cell, HEPA 99.99% @ 0.3micron) -Regular maintenance of the bacteria filter according to maintenance program	N	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contamination of metal caused by wear and tear of pipe	2	3	-To be removed by magnet bar at Liquor grinding section	N	-	-	-	-	-







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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical	Likely-hood	Severity	Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
	P: Contamination of loosen/broken machinery parts due to vibration and wear and tear.	2	3	-Metal will be removed by magnet after LF grinders. -Non-magnetize foreign matter will be trapped by subsequent liquor strainer	N	-	-	-	-	-
26. Liquor flow through cocoa mass trays and pump liquor thru liquor sump tanks	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Possible contamination of lubricant oil	3	3	- Use food grade lubricant only	N	-	-	-	-	-
	P: Not identified	-	-	-	-	-	-	-	-	-
27. Flow thru magnet bar/magnetic filter and store at LST tanks	B: Staff: Cross contamination of bacteria from worker during cleaning of magnet.	3	3	-Workers to follow personal hygiene -Sanitize magnet with sanitizer after cleaning	N	-	-	-	-	-
	C: allergens: possible cross contamination with allergen if worker unaware of allergen control, bring food containing allergen into plant	3	2	- use our Allergen control procedure to brief all worker what is allergen, and this plant is a dedicated cocoa plant, and is free from all allergen material. - allergen control has been added into GMP training material to train all newly recruited worker, and also train repeatedly in annual refresher training - No food is allowed to bring into plant area. - No personal medicine is allowed to bring into plant.	N	-	-	-	-	-
	P: Metal contamination from machines upstream.	3	2	-Clean magnet every shift -Further metal hazard protection with metal detector and magnet bar at subsequent processes, i.e. before packing for cocoa liquor, butter, cake, and powder.	N	-	-	-	-	-
28. Pump liquor to LCS tanks and preheat liquor at LCS tanks	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Possible contamination of lubricant oil	3	3	-Use food grade lubricant only	N	-	-	-	-	-

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Process Step	Potential Hazard State whether biological, chemical or physical.	Rationale for inclusion or exclusion as a Hazard.		What Preventive Measure or Controls can be applied to prevent this significant hazard?	Is this step a Critical Control Point?					
		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
	P: Contaminated with foreign matter from machinery at upper stream.	2	2	-Install liquor strainer to trap foreign matter -Check liquor strainer daily <i>-For cocoa cake, there is no further protection step for this hazard</i> <i>-For cocoa butter, there is polishing filter to address this hazard</i> <i>-For cocoa powder there is sifter and ACM classifier to address this hazard.</i>	Y	Y	Y	Y	Y	CCP2
29.Press out cocoa butter from cocoa liquor at cocoa press. Transport remaining cocoa mass, i.e. pressed cocoa cake to cake crusher.	B: Possible cross contamination of bacteria from environmental air	3	2	-Workers to follow personal hygiene -Clean press area as per cleaning program. <i>-The press body are always maintain above 80°C, not encourage growth for most bacteria</i> <i>-Exposure time is short and historical low microbe count for product from presses, i.e. cocoa cake and cocoa butter</i>	N	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contamination of loosen/broken machinery parts due to vibration and wear and tear.	2	3	-Protective plate installed to trap broken part, mostly is broken connecting rod. <i>-Magnet and metal detector at cocoa cake/cocoa powder packing will remove contaminated metal, if any</i> <i>-There is strainer, polishing filter and metal detector for the cocoa butter line to remove contaminated object.</i>	N	-	-	-	-	-
1g Receive butter block to be reworked	B: Cross contamination of bacteria from workers during handling of rejected butter, if butter carton leaks	2	3	-Worker to follow personal hygiene <i>- Bacteria count will be reduce to acceptable level at De-bacteria step</i>	N	-	-	-	-	-

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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
	B: Contamination of pathogenic microbes (i.e; Salmonella and E.Coli) from rework products.	3	3	- <i>Pathogenic microbes (i.e; Salmonella and E.Coli) will be killed by De-bacteria step</i>	N	-	-	-	-	-
	C: ALLERGENS Contamination if input contains allergens	4	3	-Only reject butter from GCBCM is allowed to input to remelt.	N	-	-	-	-	-
	P: Contamination of foreign object in rejected butter	2	4	-Reject butter if there is foreign object in carton -Install polishing filter to trap foreign object after melting	N	-	-	-	-	-
2g Melt butter block	B: Staff: Cross contamination of bacteria from workers during handling of rejected butter, if butter carton leaks	2	3	-Worker to follow personal hygiene - Bacteria count will be reduce to acceptable level at De-bacteria step	N	-	-	-	-	-
	B: Cross contamination of pathogenic microbes (i.e; Salmonella and E.Coli) if de-bacteria process not performed during melting	3	2	-Melt Cocoa Butter and ensure temperature at minimum 100°C and 10 minute is performed for every de-bacteria batch for reworked product before transferring. - <i>Pathogenic microbes (i.e; Salmonella and E.Coli) will be killed by De-bacteria step</i> -Low likelihood. No occurrence in past 10 years of operation -Low microbe risk due to low moisture in cocoa butter	N	-	-	-	-	-
	C: allergens: possible cross contamination with allergen if worker unaware of allergen control, bring food containing allergen into plant	3	2	- use our Allergen control procedure to brief all worker what is allergen, and this plant is a dedicated cocoa plant, and is free from all allergen material. - allergen control has been added into GMP training material to train all newly recruited worker, and also train repeatedly in annual refresher training - No food is allowed to bring into plant area. - No personal medicine is allowed to bring into plant.	N	-	-	-	-	-



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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
30.2b Pump fine butter back for adding at LP	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Not identified	-	-	-	-	-	-	-	-	-
30.2.1 Butter flow thru magnetic filter & polishing filter	B: Staff: Cross contamination of bacteria from worker during cleaning of magnet	3	3	-Workers to follow personal hygiene -Sanitize magnet with sanitizer after cleaning	N	-	-	-	-	-
	C: allergens: possible cross contamination with allergen if worker unaware of allergen control, bring food containing allergen into plant	3	2	- use our Allergen control procedure to brief all worker what is allergen, and this plant is a dedicated cocoa plant, and is free from all allergen material. - allergen control has been added into GMP training material to train all newly recruited worker, and also train repeatedly in annual refresher training - No food is allowed to bring into plant area. - No personal medicine is allowed to bring into plant.	N	-	-	-	-	-
	P: Contaminated with foreign matter from machinery at upper stream.	2	2	-Install polishing filter to trap foreign matter -Check polishing filter as per schedule for every Batch of liquid butter loading	Y	Y	Y	Y	Y	CCP9
	P: Metal contamination	3	1	-Clean magnet as per schedule for every Batch of liquid butter loading	Y	Y	Y	Y	Y	CCP 10
30.2.2 Loading tanker	B: Staff: Cross contamination of bacteria from worker during loading	2	3	-Workers to follow personal hygiene -hoses shall be cleaned and sanitised -use only steam cleaned tanker -filling head always protected when not in use.	N	-	-	-	-	-



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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
	P: Contamination of foreign object	4	1	-Check daily the pressure of polishing filter. Change filter if the pressure reach 6 bar -Report if find polishing filter damages. -Change polishing filter every week, no matter what is the pressure.	Y	Y	Y	Y	Y	CCP3
30.4 Pump butter thru HE & buffer tank	B: Contaminated with water, which could contains bacteria, if Heat exchanger leaks	4	2	-Proper maintenance of machines as per maintenance program <i>-Butter side pressure is higher than water-side in heat exchanger. Chances are butter leak into water, instead of water leak into butter, if there is a leakage.</i>	N	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Not identified	-	-	-	-	-	-	-	-	-
30.5 Cool butter with butter coolers	B: Contaminated with water, which could contains bacteria, if Heat exchanger leaks	4	2	-Proper maintenance of machines as per maintenance program <i>-Butter side pressure is higher than water-side in heat exchanger. Chances are butter leak into water, instead of water leak into butter, if there is a leakage.</i>	N	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Possible contamination of metal caused by wear and tear of machines	4	2	-Proper maintenance of machines as per maintenance program <i>-Metal detector at packing will remove the contaminated metal if any for 25kg-cocoa butter</i>	N	-	-	-	-	-
30.6 Pack, label & palletize cocoa butter	B: Staff: Cross contamination of bacteria from worker during packing	3	2	-Workers to follow personal hygiene -Clean packing room as per cleaning program -Environment microbe monitoring for packing room as per WI-QA-004	N	-	-	-	-	-

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Process Step	Potential Hazard State whether biological, chemical or physical.	Rationale for inclusion or exclusion as a Hazard.		What Preventive Measure or Controls can be applied to prevent this significant hazard?	Is this step a Critical Control Point?					
		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical	Likely-hood	Severity	Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
	C: allergens: possible cross contamination with allergen if worker unaware of allergen control, bring food containing allergen into plant	3	2	- use our Allergen control procedure to brief all worker what is allergen, and this plant is a dedicated cocoa plant, and is free from all allergen material. - allergen control has been added into GMP training material to train all newly recruited worker, and also train repeatedly in annual refresher training - No food is allowed to bring into plant area. - No personal medicine is allowed to bring into plant.	N	-	-	-	-	-
	C: Potential contamination from solvent residue or chemical hazard from primary packaging material.	4	2	-Buy from approved supplier -All primary packaging material must be Food grade, suitable for food contact application.	N	-	-	-	-	-
	P: Possible contamination of metal from upstream process if polishing filter torn or magnet damaged	3	1	-Daily verification of metal detector -Quarantine products if find metal detector malfunction -Verify product once again with good condition metal detector.  Control measure of Rejecter: -Product rejected by rejecter at this step, either under weight/metal reject, shall be verified. -For metal rejected product, metal piece shall be found, and investigate the source of contamination. -Confirmed rejected products by rejected, will be sold as off grade.	Y	Y	Y	Y	Y	CCP4



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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
	P: Possible metal contamination if metal detector malfunction	3	1	-Daily verification of metal detector -Quarantine products if find metal detector malfunction -Verify product once again with good condition metal detector.	Y	Y	Y	Y	Y	CCP4
30.7 Transfer & store cocoa butter at warehouse	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Pest contamination at warehouse	3	3	-Maintain effective pest control program	N	-	-	-	-	-
	P: Pest cross contaminated by transport lorry that carrying bean	3	3	-Use only lorry that carrying finished product, prohibit use of lorry carrying bean to transfer products.	N	-	-	-	-	-
	P: Dust from transfer vehicle	2	4	-Ensure cleaning of transfer vehicle, record in external warehouse transfer form	N	-	-	-	-	-
30.8 Deliver cocoa butter	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Residue Fumigant for empty container	4	3	-Product is well protected by sealed plastic liner and external layers -Fumigant is safely released before stuffing product into container. <i>-Residue of methyl bromide is low according to literature, as mentioned in step 1</i>	N	-	-	-	-	-
	P: Damaged carton or liner during stuffing	2	4	-Check for damaged carton during stuffing. Remove damaged carton and record in stuffing checklist. <i>-Damaged carton is obvious defect, which can be easily detected during stuffing and also at customer site when the customer processes the cocoa product into final consumer product. Risk to final consumer is minimum.</i>	N	-	-	-	-	-

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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/OPRP
31a. Filtered air	B: Contamination of bacteria from intake air for transport cake	3	2	-Install filter box with bacteria filter (Pre-filter, Bio-Cell, HEPA 99.99% @ 0.3micron) for transport blower -Check filter regularly as per maintenance program	N	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Not identified	-	-	-	-	-	-	-	-	-
31. Crushing pressed cocoa cake into kibble cake at cake crusher, transport cake with flow thru magnet to cake silos	P: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contamination of metal caused by wear and tear of cake crusher	3	2	<i>-Clean bullet magnet every shift</i>	N	-	-	-	-	-
32. Store cocoa cake at cake silos	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Not identified	-	-	-	-	-	-	-	-	-
33. Pass thru magnet bar at jumbo station	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Possible metal contamination	3	1	-Check and clean magnet bar daily, when there is packing activities	Y	Y	Y	Y	Y	CCP5
33.1 Pack, label, palletize cocoa cake at jumbo station	B: Staff: Cross contamination of bacteria from worker during packing	3	2	-Workers to follow personal hygiene -Seal the packing opening when there is no packing activities <i>- Historical low microbe count for cocoa cake Jumbo product</i>	N	-	-	-	-	-



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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical			Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
33.3 Deliver cocoa cake Jumbo	C: Residue Fumigant for empty container	4	3	-Product is well protected by sealed plastic liner and external layers -Fumigant is safely released before stuffing product into container. <i>-Residue of methyl bromide is low according to literature, as mentioned in step 1</i>	N	-	-	-	-	-
	P: Damaged jumbo bag during stuffing	2	4	-Check for damaged bag during stuffing. Remove damaged bag and record in stuffing checklist. <i>-Damaged bag is obvious defect, which can be easily detected during stuffing and also at customer site when the customer processes the cocoa product into final consumer product. Risk to final consumer is minimum.</i>	N	-	-	-	-	-
34a. Filtered air	B: Contamination of bacteria from intake air	3	2	-Install filter box with bacteria filter (Pre-filter, Bio-Cell, HEPA 99.99% @ 0.3micron) -Regular maintenance of the bacteria filter according to maintenance program	N	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Not identified	-	-	-	-	-	-	-	-	-
34. Transfer cake from cake silo to ACMG	B: Contamination of bacteria from intake air of transport system	3	2	-Install filter box with bacteria filter (Pre-filter, Bio-Cell, HEPA 99.99% @ 0.3micron) for transport air -Check filter regularly as per maintenance program	N	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Not identified	-	-	-	-	-	-	-	-	-
34.1 Grinding cake at ACMG from cake silos	B: Staff: Cross contamination of bacteria from worker when doing cleaning of ACMG	3	2	-Workers to follow personal hygiene -Sanitize magnet with sanitizer after cleaning	N	-	-	-	-	-

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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical	Likely-hood	Severity	Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
	C: allergens: possible cross contamination with allergen if worker unaware of allergen control, bring food containing allergen into plant	3	2	- use our Allergen control procedure to brief all worker what is allergen, and this plant is a dedicated cocoa plant, and is free from all allergen material. - allergen control has been added into GMP training material to train all newly recruited worker, and also train repeatedly in annual refresher training - No food is allowed to bring into plant area. - No personal medicine is allowed to bring into plant.	N	-	-	-	-	-
	P: Contamination of metal from upstream and metal caused by wear and tear of machinery	2	3	-Install metal rejecter before ACMG to remove metal from upstream <i>-Metal caused by wear and tear will be removed by another metal detector at packing</i>	N	-	-	-	-	-
34.2 Stabilise cocoa powder at stabilising silo with sifter	B: Mould growth at external of machine if condensation occurs when insulation broken plus air conditioner break down	2	4	-Proper maintenance of insulation -Proper maintenance of air conditioner -If there is condensation, clean and sanitise surface of machine. <i>-Product is enclosed inside machine and piping, risk of contamination is low</i>	N	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contamination of metal caused by wear and tear of machinery	2	2	-Check and clean rotary magnet daily, when there is packing activities	Y	Y	Y	N	-	OPRP 1
	P: Contamination of foreign object	3	1	-Inspect sifter screen -If sifter broken, quarantine the product	Y	Y	Y	Y	Y	CCP8
34.3 Pack, label cocoa powder	B: Staff: Cross contamination of bacteria from worker during packing	3	2	-Workers to follow personal hygiene -Clean packing room as per cleaning program -Environment microbe monitoring for packing room as per WI-QA-004	N	-	-	-	-	-





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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical	Likely-hood	Severity	Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/OPRP
	P: Pest contamination at warehouse and cross contaminated by transport lorry that carrying bean	3	3	-Maintain effective pest control program -Use only lorry that carrying finished product, prohibit use of lorry carrying bean to transfer products.	N	-	-	-	-	-
	P: Dust from transfer vehicle	2	4	-Ensure cleaning of transfer vehicle, record in external warehouse transfer form	N	-	-	-	-	-
34.6 Deliver cocoa powder	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Residue Fumigant for empty container	4	3	-Product is protected by packaging materials. -Fumigant is safely released before stuffing product into container. <i>-Residue of methyl bromide is low according to literature, as mentioned in step 1</i>	N	-	-	-	-	-
	P: Damaged cocoa bag during stuffing	2	4	-Check for damaged bag during stuffing. Remove damaged bag and record in stuffing checklist. <i>-Damaged bag is obvious defect, which can be easily detected during stuffing and also at customer site when the customer processes the cocoa product into final consumer product. Risk to final consumer is minimum.</i>	N	-	-	-	-	-
35 Pump butter through polishing filter 816A	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contaminated with filter sock if broken	2	3	-Buy filter from approved supplier -Proper maintenance of filter as per maintenance program <i>- Any foreign object pass thru will be trapped by polishing filter at step 30.3</i>	N	-	-	-	-	-



**GCB COCOA MALAYSIA SDN BHD– INTEGRATED MANUAL** (formerly known as Kokobudi Sdn Bhd)





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		Likely-hood	Severity		Decision Tree					
No. Input / Output	B: Biological; C: Chemical; P: Physical	Likely-hood	Severity	Control Measures / Justification	Q1	Q2	Q3	Q4	Q5	CCP/ OPRP
35.1 Deodorize butter at Deodorizer 822QE, with option to inject sparging steam, under vacuum	B: Growth of mould if product is cool and the injected steam condensed into water	3	2	-Conduct in-process and final product testing for moistures, reject if find moisture higher than 0.3%. <i>-High vacuum and High temperature, facilitate removal of moisture and volatile components at vessel 822QE</i> <i>-Low occurrence of moisture failure.</i>	N	-	-	-	-	-
	C: Possible contamination with toxic chemical, such as heavy metal from direct injected steam	3	2	-Use only food grade chemical additive for boiler water -Use only SAJ water -Test heavy metal every year.	N	-	-	-	-	-
	P: Not identified	-	-	-	-	-	-	-	-	-
35.2 Pass deodorised butter through Polishing filter 816B	B: Not identified	-	-	-	-	-	-	-	-	-
	C: Not identified	-	-	-	-	-	-	-	-	-
	P: Contaminated with filter sock if broken	2	3	-Buy filter sock from approved supplier -Proper maintenance of butter filter as per maintenance program <i>- Any foreign object pass thru will be trapped by polishing filter at step 30.3</i>	N	-	-	-	-	-

Signed:   
**Name & Position: Koo Chee Khoon / Food Safety Team Leader**  
**HACCP Review Date: 12-SEPTEMBER-2022**

**Date: 12-SEPTEMBER-2022**

Food Safety Team member:

			
Yau Tee Wan	Ting Bing Keh	Tenh Swee Kheng	Ravindran Kumar Mahalingam