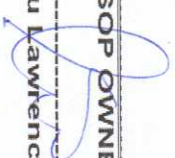




TOWER		ADMIX	
Dry Scrap Extraction Screw	Dry Scrap Slide Gate-Feedback Valve Not Running	BP extraction Belt	
Low pressure pump	Dry scrap blockage sensor		
	Run at 15% if ageing vessel discharge valve is closed		
HP Pump	Low pressure pump not running	BP extraction Belt	
	Oil Pump Feedback-Motor Not Running		
	Over Flow Water Pump-Feedback Motor Not Running		
	Decantation Water-Feedback Motor Not Running		
	Low Water Flow 1 HP Pump Water Circuit-Switch Alarm		
Oil Pump	Lubricant Oil Temp Below 65°C-Switch Alarm		
	Decantation Water Loop Temperature-Switch Alarm		
	Coarse Oil Filter HP Pump High DP-Switch Alarm		
	Fine Oil Filter HP Pump High DP-Switch Alarm		
	Lubricant Oil Pressure Above 2.5 Bar-Switch Alarm		
Air heater	Lubricant Oil Pressure Below 1.5 Bar-Switch Alarm		
AF Screw Conveyor	Exhaust fan is running	Sys716 - C60 CEA - Rotary Valve	System e-stop
Exhaust Fan	AF Screw Conveyor Low Speed-Switch Alarm	Sys719 - CMC - Screw Conveyor	Path Not Open
Airlift Filter Fan	Airlift screw blockage sensor	Sys751 - BH Base - Fan	System e-stop
Tower Belt Conveyor	Airlift Filter Fan Low Speed-Switch Alarm	Mixing Belt 1 - Conveyor	Mixing Belt 1 - Speed sensor -Lo Alarm
	Tower Belt Low Speed-Switch Alarm		Mixdrum Hopper - HH Level Sensor in Alarm
	Tower Belt Left Position-Switch Alarm		Mixing Belt 1 - Pos. sensor Left in Alarm
Tower Belt Scraper	Tower Belt Right Position-Switch Alarm	Mixing Belt 1 - Scraper	Mixing Belt 1 - Pos. sensor Right in Alarm
	Tower Belt Low Speed-Switch Alarm		System e-stop
	Tower Belt Left Position-Switch Alarm		Mixing Belt 1 - Conveyor not running

<b>SOP OWNER</b>  <b>Agbadu Lawrence</b>	<b>QA APPROVAL</b>  <b>Alawode Olujide</b>	<b>HSE APPROVAL</b> <b>NA</b>	<b>AUTHORISATION</b>  <b>Daramola Nadeeb</b>
<b>Date:</b> 11/05/2022	<b>Date:</b> 11/05/2022	<b>Date:</b>	<b>Date:</b>

**TOWER**

**ADMIX**

PWS Belt Conveyor	GR Separator Belt Right Pos-Switch Alarm
	GR Separator Belt Left Pos-Switch Alarm
	GR Separator Belt Low Speed-Switch Alarm
PWS Belt Scraper	GR Separator Belt Right Pos-Switch Alarm
	GR Separator Belt Left Pos-Switch Alarm
	GR Separator Belt Low Speed-Switch Alarm
PWS	PWS Limit Switches Open-Switch Alarm
Cyclone Rotary Valve	Cyclone 1 Rotary Valve Low Speed-Switch Alarm
	Cyclone 1 High-Switch Alarm
GS Rotary Valve	GR Separator Rotary Valve Low Speed-Switch Alarm
AF Rotary Valve	Gravity Separator High Level-Switch Alarm
	AF Rotary Valve Low Speed-Switch Alarm

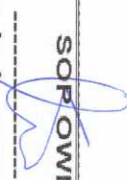


**ADMIX**

Perfumes - Dosing Pump	Mixdrum not running
	Mixdrum entrance - Pressure transmitter in HH Alarm
	Perfumes - Storing Tanks - Discharge Valves closed
Mixdrum	Perfumes - Storing Tanks - Low Level Alarm
	Mixdrum - door sensor in Alarm

Mixing Belt 2 - Conveyor	System e-stop
	Mixing Belt 2 - Speed sensor -Lo Alarm
	Mixdrum Hopper - HH Level Sensor in Alarm
	Mixing Belt 2 - Pos. sensor Left in Alarm
	Mixing Belt 2 - Pos. sensor Right in Alarm
Mixing Belt 2 - Scraper	System e-stop
	Mixing Belt 2 - Conveyor not running
Mixing Filter - Fan	System e-stop
	Mixing dust filter - Explosion Membrane
	Level Switch Hi Alarm at Destination
Mixing Filter - Rotary Valve	System e-stop
	Mixdrum Hopper - HH Level Sensor in Alarm
	SEA feeder in alarm
SEA LIW	Mixing belt 2 not running
	Mixdrum Hopper - HH Level Sensor in Alarm
	Mixing Filter - Motor not running
Triblend LIW	Triblend feeder in alarm
	Mixing belt 2 not running
	Mixdrum Hopper - HH Level Sensor in Alarm
	Mixing Filter - Motor not running

<b>SOP OWNER</b> ----- Agbadu Lawrence Date: <i>11/02/22</i>	<b>QA APPROVAL</b> ----- Alawode Olujide Date: <i>11/02/22</i>	<b>HSE APPROVAL</b> ----- NA Date:	<b>AUTHORISATION</b> ----- Daramola Nadeeb Date: <i>11/02/22</i>
---	---	---	---

TOWER		ADMIX	
Mixdrum - Perfume - Inlet Valve	Mixdrum not running	Sulphate LIW	
Perfume1 Storing Tank - Discharge Valve	Discharge Valve: Perfume2 or 3 Storing Tank not closed		
Perfume2 Storing Tank - Discharge Valve	Discharge Valve: Perfume1 or 3 Storing Tank not closed		
Perfume3 Storing Tank - Discharge Valve	Discharge Valve: Perfume1 or 2 Storing Tank not closed	AC base LIW	
FP reblend LIW	FP reblend feeder in alarm		
	Mixing belt 2 not running		
	Mixdrum Hopper - HH Level Sensor in Alarm	Br15 LIW	
	Mixing Filter - Motor not running		
	MCAS feeder in alarm		
MCAS LIW	Mixing belt 2 not running	TAED LIW	
	Mixdrum Hopper - HH Level Sensor in Alarm		
	Mixing Filter - Motor not running		
	CMC feeder in alarm	HepMC LIW	
CMC LIW	Mixing belt 2 not running		
	Mixdrum Hopper - HH Level Sensor in Alarm		
	Mixing Filter - Motor not running		
	BH Base feeder in alarm		
BH Base LIW	Mixing belt 2 not running		
	Mixdrum Hopper - HH Level Sensor in Alarm		
	Mixing Filter - Motor not running		




<b>SOP OWNER</b>  <b>Agbadu Lawrence</b> <b>Date:</b> <i>11/02/24</i>	<b>QA APPROVAL</b>  <b>Alawode Olujide</b> <b>Date:</b> <i>11 Feb 2024</i>	<b>HSE APPROVAL</b> <b>NA</b> <b>Date</b>	<b>AUTHORISATION</b>  <b>Daramola Nadeeb</b> <b>Date:</b>
---	--	---	---



**TOWER**

**ADMIX**

AEIS LIW	AEIS feeder in alarm	Percarbonate feeder in alarm
	Mixing belt 2 not running	Mixing belt 2 not running
	Mixdrum Hopper - HH Level Sensor in Alarm	Mixdrum Hopper - HH Level Sensor in Alarm
	Mixing Filter - Motor not running	Mixing Filter - Motor not running
	Green Soap rings feeder in alarm	Stainzyme feeder in alarm
Green Soap rings LIW	Mixing belt 2 not running	Mixdrum Hopper - HH Level Sensor in Alarm
	Mixdrum Hopper - HH Level Sensor in Alarm	Enzymes Filter - Motor not running
	Mixing Filter - Motor not running	Preferenz feeder in alarm
	Mixdrum Hopper - HH Level Sensor in Alarm	Mixdrum Hopper - HH Level Sensor in Alarm
	Mixing Filter - Motor not running	Enzymes Filter - Motor not running
BP weigh belt	Mixing belt 1 not running	Calypso feeder in alarm
	BP extraction Belt - Scraper: Interlock detected	Mixdrum Hopper - HH Level Sensor in Alarm
	BP weigh belt Alarm Active	Enzymes Filter - Motor not running
	BP extraction Belt - Scraper: Motor not running	
	Mixdrum Hopper - HH Level Sensor in Alarm	
BP reblend weigh belt	Mixing Filter - Motor not running	
	Mixing belt 1 not running	
	BP reblend extraction Belt - Scraper: Interlock detected	
	BP reblend weigh belt Alarm Active	
	BP reblend extraction Belt - Scraper: Motor not running	

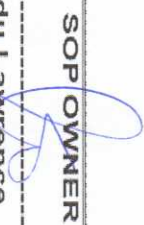


<b>SOP OWNER</b>  Agbadu Lawrence	<b>QA APPROVAL</b>  Alawode Olujide	<b>HSE APPROVAL</b> NA	<b>AUTHORISATION</b>  Daramola Nadeeb
Date: 11/01/2020	Date: 11/01/2020	Date:	Date:

Crutcher




ODOS

Order of addition	As per phase manager
Steam Injection	Slurry temperature at 80°C
Slurry transfer at end of batch	After 2 minutes of last material addition

Pre-startup interlocks	No Formula Card
	HLAS in Manual Mode
	Caustic in Manual Mode
	PID HLAS is OFF
	PID Caustic is OFF
	HLAS Setpoint Out of Limits
	Caustic Setpoint Out of Limits
	Slurry Low Flow
	Low Viking Pressure
	Low Uraca CV/ RPM
	High Pressure in HLAS Line
	High Pressure in Caustic Line
	Pumping stopped
	Failure of HLAS pump
	Failure of HLAS dosing valve
	Failure of Caustic pump
	Failure of Caustic dosing valve
	Low Level in HLAS Day Tank
	Low Level in Caustic Day Tank
	ODOS in Volumetric Mode
	ODOS in Manual Mode
	Communication Failures - PLC...

<b>SOP OWNER</b>  Agbadu Lawrence Date: <i>11/07/2022</i>	<b>QA APPROVAL</b>  Alawode Olujide Date: <i>11/07/2022</i>	<b>HSE APPROVAL</b> NA Date:	<b>AUTHORISATION</b>  Daramola Nadeeb Date:
---	---	------------------------------------	---

ODOS		ODOS	
Running interlocks	Low Level in drop tank	Running interlocks	HLAS system in MANUAL mode
	Low Pressure in Viking		Zero flow in HLAS FM
	Low Pressure in URACA		Overflow HLAS FM
	Deviation of HLAS-Caustic Ratio		Caustic Dosing pump Failure
	Failures of Communications - PLC		Motor protection of Caustic pump tripped
	Failures FLEX I/O		Safety disconnect Caustic dosing pump
	Pumping Stopped		Failure injection valve Caustic
	HLAS dosing Fail		Low low flow of Caustic
	Motor protection of HLAS pump tripped		High high flow of Caustic
	Safety disconnect HLAS dosing pump		High Pressure in Caustic Dosing
	Failure of VSD on HLAS pump		Caustic Start up time exceeded
	Failure injection valve HLAS		Caustic setpoint out of limits
	Low low flow of HLAS		Caustic PID is OFF
	Low level in HLAS Day tank		Caustic system in MANUAL mode
	High Pressure in HLAS Dosing		PID Caustic OUT in MAX
	HLAS Start up time exceeded		Error Caustic FM
	HLAS setpoint out of limits		Zero flow in Caustic FM
	HLAS PID is OFF		Overflow Caustic FM

<b>SOP OWNER</b>  Agbadu Lawrence Date: 11/01/22	<b>QA APPROVAL</b>  Alawode Olujide Date: 11/01/22	<b>HSE APPROVAL</b> NA Date:	<b>AUTHORISATION</b>  Daramola Nadeeb Date: 11/01/22
--	--	------------------------------------	--



ATTACHMENT 5



UGEE CHEMICALS

## LIST OF PROCESS EQUIPMENT

Below is the list of key process equipment used dry laundry production process at Ibadan plant -

**Crutcher** – This is a vessel where all the solid and liquid materials (capable of withstanding high temperatures) are mixed together to form a homogenous Crutcher mix / Slurry.

**Drop Tank / Ageing Vessel** – This tank serves as a holding tank or a buffer tank between the batch crutching and continuous spraying. It also ensures a homogenous mix between Crutcher batches. It has a capacity that is about 2.5 times the size of the Crutcher.

**Low Pressure Pump** – This pump is also called Booster pump and its main function is to provide a minimum inlet pressure of 3 to 5 bars to the high-pressure pump to prevent cavitation.

**Magnetic Strainer** – This is designed to catch metals and prevent the booster pump from being blocked or damaged.

**ODOS System** – Also known as One Degree of Separation, it is used to add HLAS and Caustic Soda directly to the slurry line. Its benefits are reduced water load in the tower and increased tower capacity and reduction in energy.

**Rietz Filter** – Also known as slurry disintegrator, the mill in the rietz breaks the lumps from the crutcher mix into small sizes and pushes it through a basket with mesh sizes smaller than that of the tower nozzles.

**High Pressure Pump** – This pump increases the slurry pressure to the range of 70 to 90bars to allow for proper atomization of the slurry in the tower.

**Air Injection System / IKA Mixer** – Its basic function is for density control. Air is injected into the slurry prior to the slurry being fed to the tower to control density of BG. The IKA mixer serves to mix the air injected into the slurry line with the slurry to form a mixture before the slurry is fed into the tower.

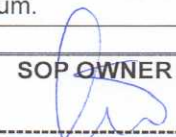

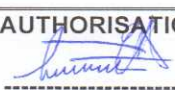
**Spray Drying Tower** – The spray drying tower consists mainly of: tower nozzles for the atomization of the slurry to form tiny droplets in the tower, air heater for drying of the tiny droplets of atomized slurry from the tower nozzles, and tower belts to collect the dried slurry droplets or base powder from the spray drying process and transfer it to the next stage.

**Air Lift** – It performs several functions among which are lifting the powder from the tower belts to the top of the process, cooling the blown powder and classifies the large particles which fall out as wet scrap.

**Parallel Wire Screen** – Its main function is to separate the oversize particles from good quality powder.

**Low-In-Weight Feeders** – This is a device used for the accurate feeding of powdered materials into the mix drum. There are different types of LIW feeders such as *belt feeders*, *screw feeders* and *vibratory tray feeders*, and its application is based on the property of the material to be handled by the feeder.

**Mix Drum** – The mix drum is a closed rotating drum and its main function is to mix the blown powder with the dry add materials and liquid spray on to give a homogenous mix. The powder also cools while mixing is going on in the drum.

SOP OWNER	QA APPROVAL	HSE APPROVAL	AUTHORISATION
 Agbadu Lawrence	 Alawode Olujide	-----NA-----	 Daramola Nadeeb
Date: <u>11/02/2022</u>	Date: <u>11/Feb/2022</u>	Date:	Date: <u>11/2/22</u>