

SAUDI AMERICAN GLASS COMPANY
QUALITY CONTROL PLAN

SAGCO.QCP.01

Department: PRODUCTION		Section: GOODS RECEIVING		Doc. Ref. SAGPRD-01		Page 01
Operation	Description	Procedures / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
GOODS RECEIVING	Incoming materials glass	Check condition of boxes, straps Check delivery notes/packing lists	Visual Inspection Checking	None	Stock personnel / QC	No damages on boxes / crates
	Glass inspection	Check condition of stocks, visibility of moisture or damage	Visual Inspection	STR-P01-F03	Stock personnel / QC	No glass breakages No moisture
	Stock rotation	Observe utilization of stocks from old to new stocks	Checking	None	Stock supervisor	FIFO system and records
	Stocks issuance	Issue stocks with glass issuance form	Issuance	CUT-P01-F03	Stock supervisor	Inventory
	Stocks reporting	Submit reports to the concerned departments	Reporting	GRV / Delivery Notes	Stock supervisor	PO and Receiving documents
	Stocks updating	Update the Daily list of Stock Sheet Inventory Records of	Updating	None	Stocks Supervisor	GRV / Delivery Notes
	Monthly Inventory	Conduct montly inventory of glass stocks	Physical checking	Inventory list	Stocks Supervisor Other staff	Existing records and inventory
	Incoming materials - other supplies	Conduct inspection on the materials (specifications, quantity, condition shelf life)	Checking	STR-P01-F03	Storekeeper / QC	Purchase Order
	Materials quality	Check quality of incoming materials	Visual Inspection	STR-P01-F03	Storekeeper / QC	Suppliers specifications
	Inventory records	Update inventory of incomng materials and details	Computerization	Computer Records	Store Supervisor	Correct entries

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Operation	Description	Procedures / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
GOODS RECEIVING	Reports and records	Submit reports to the concerned departments	Submission	MRV / Delivery Notes	Store Supervisor	Correct documents
	Materials control	Arrange materials by type, category	Stock management	Inventory records	Store Supervisor	
	Materials identification	Arrange and identify all incoming materials as to system	Tags and labeling	Inventory records	Store Supervisor	Correct materials identification
	Materials issuance	Issue materials to the end users using the material issue voucher	Releasing	STR-P01-F01	Store Supervisor	Proper control & Inventory
	Materials rejections	Report and record materials rejections & complaints to concerned departments	Reporting	QMD-P04-F03	Store Supervisor	Products specifications

Department: PRODUCTION		Section: CUTTING		Doc. Ref. SAGPRD-02		Page 03
Operation	Description	Procedures / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
Cutting	Cutting tables	Check cleanliness	Visual	None	Supervisor/Operator	No glass fragments
	Daily glass orders	Check daily production schedule	Counter checking	PRD-P01-F12	Supervisor/Operator	Optimization data
	Glass type	Check tag specification	Counter checking	None	Supervisor/Operator	Labels and tags
		Check samples for thickness evaluation	Caliper	QMD-P11-F01	QC	JIS R3202/BSEN 572
	Glass side identification	Check the tin and atmosphere side of glass stocks	Visual	None	Supervisor/Operator	Supplier's identification
	Cutting parameters	Set machine cutting parameters	Computer set-up	None	Supervisor/Operator	Operators manual
	Glass quality	Inspect /Check glass quality	Visual Inspection	QMD-I-06	Supervisor/Operator	ASTM C1036-06 / BSEN 572
	Cutting edge quality	Inspect /Check edge quality	Visual Inspection	QMD-I-06	Cutting personnel/QC	ASTM C1036
	Glass dimension	Sizes & Diagonal dimension checking As per the works orders / labels	Measurement	CUT-P01-F05	Cutting personnel/QC	ASTM C1036 /
						BSEN 572
	Glass identification	Identify glass by labels	Visual Inspection	PRD-I-06	Cutting personnel	Correct labels
	Glass piling	Observe correct glass arrangement	Visual Inspection	Trolley list	Cutting personnel	PRD-I-06
	Glass protection	Secure glasses by security ropes	Visual Inspection	None	Cutting personnel	PRD-I-06
	Frames / racks	Check racks/frames status	Visual Inspection	None	Cutting personnel	PRD-I-06
	Racks / frames transfer	Observe correct transfer procedures	Visual Inspection	None	Cutting personnel	PRD-I-06
	Rejections	Raise replacements against rejections	Replacement codes	PRD-P01-F02	Supervisor/Operator	ASTM C1036/BSEN 572

Department: PRODUCTION		Section: EDGING		Doc. Ref. SAGPRD-03		Page: 04
Operation	Description	Procedures / Criteria	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
Edging	Machines cleanliness	Ensure that machine rollers should be free from foreign materials	Visual Inspection	None	Supervisor/Operator	Operators manual PRD-I-19
	Water cleanliness	Check that water tanks are cleaned and replaced with fresh water	Visual Inspection	None	Supervisor/Operator	Operators manual PRD-I-19
	Castor tables	Check that castor tables are clean and free from abrasive materials	Visual Inspection	None	Edging personnel	Operators manual PRD-I-19
	Edgeworks / Details	Check the edgework requirements	Visual Inspection	None	Supervisor/Operator	Work orders
	Glass size	Check glass sizes and tolerances	Measuring tape	QMD-I-05	Edging personnel	ASTM C-1036
	Glass quality	Check for scratches and other surface defects	Visual Inspection	QMD-I-05	Supervisor/Operator/ Quality Control	ASTM C1036 / BSEN 572
	Edge quality	Check for the edge quality	Visual Inspection	QMD-I-05	Edging personnel/QC	ASTM C1036
	Glass dimension	Sizes & Diagonal dimension checking As per the works orders / labels	Measuring tape	EDG-P01-F02	Edging personnel/QC	ASTM C1036 BSEN 572
	Glass identification	Identify glass by labels	Visual Inspection	None	Edging personnel	Correct labels
	Glass piling	Observe correct glass arrangement	Visual Inspection	Trolley list	Edging personnel	PRD-I-19
	Glass protection	Secure glasses by security ropes	Visual Inspection	None	Edging personnel	PRD-I-19
	Frames / racks	Check racks/frames status	Visual Inspection	None	Edging personnel	PRD-I-19
	Racks / frames transfer	Observe correct transfer procedures	Visual Inspection	None	Edging personnel	PRD-I-19
	Rejections	Raise replacements against rejections	Replacement codes	PRD-P01-F02	Supervisor/Operator	ASTM C1036/BSEN 572

Department: PRODUCTION		Section: TEMPERING & HEAT STRENGTHENING		Doc. Ref. SAGPRD-04		Page: 05
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
	Machine / furnace	Ensure that the on-load section of the furnace is clean and free from any contaminant	Visual Inspection	None	Supervisor/Operator	Operators manual PRD-I-17
	Glass details	Check work order details and requirements / Check glass labels	Visual Inspection	None	Supervisor/Operator	Work Orders
	Glass quality	Check for scratches and other surface defects	Visual Inspection	QMD-I-04	Supervisor/Operator	ASTM C1036-06 / BSEN 572
Tempering and Heat Strengthening	Parameters settings	Set the parameters and settings as per the requirements	Visual Inspection	Computer set-up	Supervisor/Operator	Operators manual
	Dimension	Check diagonal dimension	Measuring tape	TMP-P01-F01	Tempering personnel	ASTM C-1036
	Tempering type	Identify the type of heat treatment as per the requirements	Checking	Work orders	Supervisor/Operator	PRD-I-17
	Glass position	Ensure that the glass is loaded with the width parallel to the roller if width is below 2440 mm	Visual Inspection	None	Tempering personnel	PRD-I-17
		Coated face should be on top of the furnace rollers	Visual Inspection	None	Tempering personnel	PRD-I-17
	Marking / logo	Stamp the glass with the correct logo & stamped on the proper location	Visual Inspection	None	Tempering personnel	BSEN 12150-1 / ASTM C 1048
		- left for coated glasses - right for the inner panel				PRD-I-17

Department: PRODUCTION		Section: TEMPERING & HEAT STRENGTHENING		Doc. Ref. SAGPRD-04		Page 06
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
	Hot fans	Check / inspect the hot fans periodically	Gauge/Indicators	TMP-P01-F08	Supervisor/Operator	Operators manual
	Gas flow	Check / inspect gas flow periodically	Gauge/Indicators	TMP-P01-F09	Supervisor/Operator	Operators manual
	Impact test	Conduct impact test when required by a certain project	Impact test facility		QMD/Tempering personnel	ANSI Z97.1-2009
	Zebra measurement	Check glass distortion	Visual Inspection	None	Tempering Personnel	No significant deviation
Tempering	Break pattern	Test sample for fracture count	Pointed stick Break table	TMP-P01-F01	Tempering Personnel	BS EN 12150-1
	Roller wave	Measure the roller wave as per the procedures	Roller wave measurement	TMP-P01-F03	Supervisor/Operator	BS EN 12150-1 ASTM C 1048
	Bow	Measure the overall bow as per the procedures	String measure	TMP-P01-F01	Supervisor/Operator	BS EN 12150-1 ASTM C 1048
	Strength measurement	Determine the glass strength as per the instrumentation procedures	GASP	TMP-P01-F03	Supervisor/Operator	ASTM C 1048
Heat Strengthening	Break pattern	Test sample for fracture count	Pointed stick Break table	TMP-P01-F01	Tempering Personnel	BS EN 1863-1
	Roller wave	Measure the roller wave as per the procedures	Roller wave measurement	TMP-P01-F03	Supervisor/Operator	BS EN 1863-1 ASTM C 1048-04
	Bow	Measure the overall bow as per the procedures	String measure	TMP-P01-F01	Supervisor/Operator	BS EN 1863-1 ASTM C 1048
	Strength measurement	Determine the glass strength as per the instrumentation procedures	GASP	TMP-P01-F03	Supervisor/Operator	ASTM C 1048

Department: PRODUCTION		Section: TEMPERING & HEAT STRENGTHENING		Doc. Ref. SAGPRD-04	Page: 07	
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
	Glass sizes	Check glass sizes against the labels	Measuring tape	None	Tempering personnel	Work order
	Glass identification	Identify glass by labels	Visual Inspection	None	Tempering personnel	Correct labels
	Glass piling	Separate glass by coating type, heat treatment type & application	Visual Inspection	Trolley list	Tempering personnel	PRD-I-17
	Glass protection	Secure glasses by security ropes	Visual Inspection	None	Tempering personnel	PRD-I-17
	Frames / racks	Check racks/frames status	Visual Inspection	None	Tempering personnel	PRD-I-17
	Racks / frames transfer	Observe correct transfer procedures	Visual Inspection	None	Tempering personnel	PRD-I-17
	Rejections	Raise replacements against rejections	Replacement codes	PRD-P01-F02	Supervisor/Operator	ASTM C1036/BSEN 572

Department: PRODUCTION		Section: HEAT SOAKING		Doc. Ref. SAGPRD-05		Page 08
Operation	Description	Procedures / Criteria	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
Heat Soaking	Glass details	Check work order details and labels	Visual Inspection	None	Operator	Work order
	Glass quality	Check the edgeworks for shells, and sharp edges	Visual Inspection	QMD-I-04	Operator	ASTM C1036 /
		Check the surface for any glass defects	Visual Inspection	QMD-I-04	Operator	BSEN 572
	Machine setting	Start the machine as per the manufacturer's operating manual	Visual Inspection	Computer set-up	Operator	Operators Manual
	Glass stacking	Load the glasses in a trolley at a distance of about 20 mm between separators	Use required stand spacer	None	Operator	BSEN 14179-1
	Temperatures	Input the required parameters and temperature settings	Temperature plotter	Heat Soak with temp graph profile	Operator	BSEN 14179-
	Glass identification	Secure glasses by security ropes	Visual Inspection	HST-P01-F01	Heat Soaking personnel	Correct labels
	Glass protection	Check racks/frames status	Visual Inspection	None	Heat Soaking personnel	PRD-I-19
	Racks / frames transfer	Observe correct transfer procedures	Visual Inspection	None	Heat Soaking personnel	PRD-I-19
	Rejections	Raise replacements against rejections	Replacement codes	PRD-P01-F02	Supervisor/Operator	ASTM C1036/BSEN 572

Department: PRODUCTION		Section: COATING		Doc. Ref. SAGPRD-06		Page 09
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
Coating	Machine cleanliness	Ensure that the machine is clean before the start of the operation	Visual Inspection	None	Coating personnel	Operators manual PRD-I-13
	Hagar	Re-set the Hagar every before the start of the operation	Visual Inspection	None	Coating personnel	Operators manual PRD-I-13
	Inficons	Check the pressure measurind instrument ans re-set to zero	Visual Inspection	None	Coating personnel	Operators manual PRD-I-13
	Glass quality	Check glass for any type of surface defects	Visual Inspection	QMD-I-08	Coating personnel	ASTM C1036-06 / BSEN 572
	Gas cylinders	Open the gas cylinders for Argon, Oxygen & Nitrogen before production starts	Gauge / indicators	None	Supervisor/Operator	PRD-I-13
	Detergent pump	Check the pump ensuring correct setting of flowrate - 20 ml per min	Gauge / indicators	None	Supervisor/Operator	PRD-I-13
	Glass details	Check work order details & coating types Counter-ckeeck the labels	Visual Inspection	None	Coating personnel	Work Orders Labels
	Shaped glass	Check the glass against the work order or tremplate	Visual Inspection	Templates	Coating personnel	PRD-I-13
	Separator marks	Remove all separator marks on the glass before loading	Visual Inspection	None	Coating personnel	PRD-I-13
	Logo position	Ensure that the logo is on top position - coating position	Visual Inspection	None	Coating personnel	PRD-I-13

Department: PRODUCTION		Section: COATING		Doc. Ref. SAGPRD-06		Page 10
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
Coating	Coating sample	Run a sample on clear glass for identification of the coating parameter	Production sample run Transmission/Reflection Measurement	None	Coating personnel	Color specs guide
	Abrasion test	Perform the abrasion test for solar control coating Periodic cheking of the abrasion test done to check the transmission of the coating	Machine measurement	CTG-P01-F13	Operator	BSEN 1096
	Cathodes	Perform regular inspection on the cathodes to check signs of arcing, debri or build up of material on the floor	Visual Inspection	None	Coating personnel	PRD-I-13
	Low-E coated glasses	Ensure that the washer is dry & the top section lifted so the glass is not in contact with the water or brushes of the water For normal coatings, washer should be set at the same height of the glass thickness	Visual Inspection	None	Coating personnel	PRD-I-13
	Glass inspection	Check the glasses on the inspection room identifying rejections	Visual Inspection	QMD-I-08	Coating inspector	BSEN 1096

Department: PRODUCTION		Section: COATING		Doc. Ref. SAGPRD-06		Page 11
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
Coating	Glass reflection	Check the glass for reflection readings on glass and film side	Spectrophotometer	None	Operator	BSEN 1096
	Glass size	Check the glass dimensions and identify with the labels	Measuring tape	None	Coating personnel	Work orders/labels
	Glass quality	Check the glass for any type of defects	Visual Inspection	QMD-I-08	Coating personnel	BSEN 1096
	Glass piling	Arrange the glasses in frames & protect with separator (polyfoam or pads) Use lucite powder for soft coated glasses and stock sheets Separate glasses for double glazing and direct packing	Visual Inspection	Trolley list	Coating personnel	PRD-I-13
	Glass protection	Secure glasses by security ropes	Visual Inspection	None	Coating personnel	PRD-I-13
	Frames / racks	Check racks/frames status	Visual Inspection	None	Coating personnel	PRD-I-13
	Racks / frames transfer	Observe correct transfer procedures	Visual Inspection	None	Coating personnel	PRD-I-13
	Rejections	Raise replacements against rejections	Replacement codes	PRD-P01-F02	Supervisor/Operator	ASTM C1036/BSEN 572

Department: PRODUCTION		Section: LAMINATING		Doc. Ref. SAGPRD-07		Page 12
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
Laminating	Glass schedule	Check available glass for processing	Visual Inspection	PRD-P01-F12	Supervisor / Operator	Work Orders
	Glass protection	Check that glasses are protected	Visual Inspection	None	Laminating personnel	PRD-I-05
	Quality inspection	Check glass, separators and labels Check each glass for presence of any defect	Visual Inspection	QMD-I-01	Supervisor / Operator Laminating personnel	ASTM C1036-06 / BSEN 572
	Coating face identification	Check supplied glasses	Visual Inspection	None	Operator	PRD-I-05
	Washing machine water tanks	Clean and replaced with fresh water at the start of shift	Visual Inspection	None	Operator	Operators manual PRD-I-05
	Washer water tanks	Ensure that washer water tanks are clean, dust free and to the desired temperature	Visual Inspection	LAM-P01-F01	Operator	Operators manual PRD-I-05
	Blower filters	Clean and replace if necessary	Visual Inspection	None	Maintenance personnel	PRD-I-05
	PVB Storage	PVB rolls should be stored in air conditioned room Return all PVB rolls to storage and completely sealed	Visual Inspection	None	Laminating personnel	Supplier data sheet PRD-I-05
	Lay-up room	Ensure that machine is clean and dust free Control lay-up room conditions	Visual Inspection	None	Operator	Operators manual
		Temperature - Below 30 C Humidity - 24-32 C	Thermohygrometer	LAM-P01-F07	Operator	PRD-I-05

Department: PRODUCTION		Section: LAMINATING		Doc. Ref. SAGPRD-07		Page 13
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
Laminating	Lay-up room	Conduct hourly monitoring of temperature and humidity	Thermohygrometer	LAM-P01-F07	Operator	PRD-I-05
	PVB requirements	Check work order details and requirements, type, thickness	Visual Inspection Measure	None	Supervisor / Operator	Work orders
	Pressing requirements	Set the pressing parameters as required by the process	Machine gauges	None	Operator	Operators manual PRD-I-05
	Glass inspection	Check each glass for presence of any defect	Visual Inspection	QMD-I-01	Laminating personnel	ASTM C1036-06 / BSEN 572
	Glass cleaning	Clean the glass using 50% DI water & 50% alcohol applied on the laminated surface of the glass	Visual Inspection	None	Laminating personnel	PRD-I-05
	Nip rollers	Check pressure according to manufacturer's operating procedures	Machine gauges	None	Laminating personnel	Operators manual PRD-I-05
	Glass temperature	Monitor the temperature of the laminated glass at the center - should be 60 C minimum	Raytek Infrared thermometer	LAM-P01	Laminating personnel	Operators manual PRD-I-05
	De-airing	Set the parameters according to the process requirements	Machine gauges	None	Supervisor / Operator	Operators manual PRD-I-05
	Oven temperature	Set the parameters according to the manufacturer's operating procedures	Machine gauges	Operating manual	Supervisor / Operator	Operators manual PRD-I-05

Department: PRODUCTION		Section: LAMINATING		Doc. Ref. SAGPRD-07		Page 14
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
Laminating	Evaporation process	Conduct the evaporation process as per the schedule	Machine gauges	LAM-P01-F04	Supervisor / Operator	Operators manual PRD-I-05
	Autoclaving	Check each glass for presence of any defect Secure the glass onto A-frame	Visual Inspection	QMD-I-01	Supervisor / Operator	Operators manual PRD-I-05
	Seal area	Check the seal area for traces of contamination before closing the door	Visual Inspection	None	Supervisor / Operator	Operators manual PRD-I-05
	Curved glass laminated	Clean the glass by Windex and then by alcohol and perform visual inspection for glass defects	Visual Inspection	QMD-I-01	Supervisor / Operator	Operators manual PRD-I-05
	Vacuum	Check the trimming of PVB to be sufficient to prevent the air being trapped during hot vacuum cycle Conduct the hot and cold vacuum process as per procedures	Visual Inspection	None	Supervisor / Operator	Operators manual PRD-I-05
	Glass quality	Clean the glass and inspect for defects before autoclave process	Visual Inspection	QMD-I-01	Laminating personnel	EN 12543-6
	Autoclave profile	Monitor the heating & pressurization of the process Prepare the autoclave monitoring profile	Machine gauges	LAM-P01-F03	Supervisor / Operator	Operators manual PRD-I-05

Department: PRODUCTION		Section: LAMINATING		Doc. Ref. SAGPRD-07		Page 15
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
Laminating	Laminated glass quality	Check each glass for presence of any defect	Visual Inspection	QMD-I-01	Supervisor/Operator	EN 12543-6
	Glass identification	Identify glass by labels	Visual Inspection	None	Laminating personnel	Correct labels
	Glass protection	Secure glasses by security ropes	Visual Inspection	None	Laminating personnel	PRD-I-05
	Frames / racks	Check racks/frames status	Visual Inspection	None	Laminating personnel	PRD-I-05
	Racks / frames transfer	Observe correct transfer procedures	Visual Inspection	None	Laminating personnel	PRD-I-05
	Rejections	Raise replacements against rejections	Replacement codes	PRD-P01-F02	Supervisor/Operator	ASTM C1036/BSEN 572

Department: PRODUCTION		Section: INSULATING GLASS UNIT		Doc. Ref. SAGPRD-08		Page 16
Operation	Description	Procedures / Criteria	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
IGU	Glass type / size	As per work order requirements (normal, stepped units, required spacers, sealant type) Check availability of outer and inner panel ensuring that the glasses are paired correctly	Visual Inspection	Work orders Labels	Supervisor / Operator	Work Orders
	Quality inspection	Check glass, separators and labels	Visual Inspection	None	Supervisor / Operator	ASTM C1036-06 / BSEN 572
	Coating face identification	Check supplied glasses Check with coating detector	Coating detector	None	Supervisor / Operator	PRD-I-04/PRD-I-20
	Coated glass quality	Check glass quality	Visual Inspection	None	Supervisor / Operator	BSEN 1096
	Edge deletion	No traces of coating on deleted width requirement	Machine settings	None	Supervisor / Operator	Work Orders
	Resistivity	Check resistivity	Multimeter	QMD-P11-F05	QC	All coating removed
	Low-E glass handling	Use surgical and cotton gloves when handling soft coated glass	Visual Inspection	None	IGU Personnel	PRD-I-04/PRD-I-20
	Edge deletion requirement	As per the work order details	Machine sensor Measuring tape	None	Supervisor / Operator	PRD-I-04/PRD-I-20
	Brush condition	Soft brushes must be installed for coated glasses. Brushes must be clean and without contamination	Visual Inspection	None	Supervisor / Operator	Operators manual PRD-I-04/PRD-I-20
	Water condition	As per machine requirements and set-up instructions	Flow gauge	None	Supervisor / Operator	Operators manual PRD-I-04/PRD-I-20

Department: PRODUCTION		Section: INSULATING GLASS UNIT		Doc. Ref. SAGPRD-08		Page 17
Operation	Description	Procedures / Criteria	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
IGU	DI water	As pe the defined requirements Observe DI settings and configuration	Flow gauge	None	Supervisor / Operator	Operators manual PRD-I-04/PRD-I-20
	Washing machine	As per manufacture's recommendations	Visual Inspection	None	Supervisor / Operator	PRD-I-04/PRD-I-20
	Water tanks	Clean and replaced with fresh water at the start of shift	Visual Inspection	None	Operator	Operators manual PRD-I-04/PRD-I-20
	Blower filters	Clean and repalce if necessary	Visual Inspection	None	Maintenance personnel	PRD-I-04/PRD-I-20
	Vacuum pump	Check that vacuum pump functions properly - refer to manufacturer's manual	Visual Inspection	None	Operator	Operators manual PRD-I-04/PRD-I-20
	Washer operations	Glass panels should not remain static inside the washing machine	Visual Inspection	None	Supervisor / Operator	Operators manual PRD-I-04/PRD-I-20
	Glass quality	Check each glass for presence of any defect	Visual Inspection	QMD-I-02	Supervisor / Operator	ASTM C1036-06 / BSEN 572
	Spacer requirements	Check type, color, width as per the order requirements	Visual Inspection	None	Operator	Work Order
	Spacer identification	Provide customer name, WON & item no.	Visual Inspection	None	Operator	Work Order
	Dessicant	Check temperature change Above 28 C	Machine set-up	IGU-P01-F02	Operator / QC	Suupliers data sheet

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Operation	Description	Procedures / Criteria	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
IGU	Dessicant filling	Adjacent sides of bendable spacer Longer sides of cut spacers	Machine set-up	None	Operator	PRD-I-04/PRD-I20
	Airspacer control	Spacers not to be placed on the floor to eliminate dust accumulation	Visual Inspection	None	Operator	PRD-I-04/PRD-I20
	Ambient control	Temperature to be below 25 C Humidity to be 24-32 %	Thermohygrometer	None	Operator	Suppliers material requirements
	Primary seal & butyl application check	Polyisobutylene - PIB Check process requirements 2-2.5 grams per linear mete in one side Butyl application must be contineous consistent and without any break	Weighing	IGU-P01-F11	Operator / QC	PRD-I-04/PRD-I20
	Spacer control	Put spacers in the carousel, no contact with any object to keep free from dust and / or finger prints	Visual Inspection	None	Operator	PRD-I-04/PRD-I20
	Spacer assembly	Refrain from touching the coating during assembly to the glass pane	Visual Inspection	None	Operator	PRD-I-04/PRD-I20
	Glass checking	Ensure that glasses are checked against the work order, patterns and templates for shapes	Visual Inspection	None	Operator	Work orders

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Operation	Description	Procedures / Criteria	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
IGU	Glass assembly Stepped units	Check stepping details for stepped units, settings, sealant depth and pressing pressure	Visual Inspection	None	Operator	Work orders
	Inner glass pane	Inner pane is to be loaded first-checking cleanliness, surface contamination, adhesives, separator marks and other surface defects	Visual Inspection	None	Operator	PRD-I-04/PRD-I20
	Outer glass pane	Assemble the spacer and conduct glass quality inspection Glass labels should be attached to the inner pane (Face-4) before the pressing section	Visual Inspection	None	Operator	PRD-I-04/PRD-I20
	Glass inspection	Check the glasses for defects, correct sealant depth, stepped unit details, labels, butly continuity and surface defects	Visual Inspection	QMD-I-02	Operator	BSEN 1096 BSEN 1036 Work orders
	Glass labeling	Separate the inner labels for barcoding and final label references	Visual Inspection	None	IGU personnel	Correct labels
	IGU identification	Separate glasses of different sealant types to avoid wrong sealing	Visual Inspection	None	IGU personnel	Work orders
	Argon gas filling	Set up the gas filling machine as per the instruction manual	Manual filling	QMD-P11-F06	IGU personnel	SOP-FM-26

Department: PRODUCTION		Section: INSULATING GLASS UNIT		Doc. Ref. SAGPRD-08		Page 20
Operation	Description	Procedures / Criteria	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
IGU	Gas filling procedure	Place the glass in the frame in a vertical position Fill the unit with Argon until the Argon gauge detects the IG unit is filled	Argon gas filling machine / Argon gas content detector	QMD-P11-F06	Supervisor / Operator Quality Control	SOP-FM-26
	Sealant type	Identify secondary sealant type requirements	Visual Inspection	None	Supervisor / Operator	Work order
	Ambient conditions	Temperature - Below 25 C Humidity - 24-32 %	Thermohygrometer	None	Supervisor / Operator	Supplier requirements
	Process tests	Conduct the following sealant tests				
	Flow rate Check	Conduct the following sealant test	Reading parameters	IGU-P01-F01	QC	Supplier data sheet
	Butterfly Check	Conduct the following sealant test	Visual Inspection	IGU-P01-F03	QC	Supplier data sheet
	Snap Time Check	Conduct the following sealant test	Visual Inspection	IGU-P01-F03	QC	Supplier data sheet
	Color Check	Conduct the following sealant test	Visual Inspection	IGU-P01-F03	QC	Supplier data sheet
	Adhesion Test	Conduct the following sealant test	Visual Inspection	IGU-P01-F03	QC	Supplier data sheet
	Shore 'A' Test	Conduct the following sealant test	Measuring instrument	IGU-P01-F04	QC	Supplier data sheet
	Mixed Ratio Test	Conduct the following sealant test	Weighing / Mixing	IGU-P01-F07/F08	QC	Supplier data sheet
				IGU-P01-F17/F18	QC	Supplier data sheet
	IGU quality	Check units ensuring that no void spaces all throughout the edges	Visual Inspection	None	Sealing personnel	
	Glass stacking	Stand the units down onto A-frame ensuring protection between each unit	Visual Inspection	None	Sealing personnel	Work instruction
	IGU equalization	Equalize units - drill hole on one side allowing the pressure to equalize	Equalizing instrument	None	Sealing personnel/QC	Gap should be equal to the airspace

Department: PRODUCTION		Section: INSULATING GLASS UNIT		Doc. Ref. SAGPRD-08		Page 21
Operation	Description	Procedures / Criteria	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
IGU	IGU identification	Attach the final glass label to each unit	Visual Inspection	Computer barcoding	Sealing personnel	Correct labels
	Glass protection	Secure glasses by security ropes	Visual Inspection	None	Sealing personnel	Work instruction
	Frames / racks	Check racks/frames status	Visual Inspection	None	Sealing personnel	Work instruction
	Racks / frames transfer	Observe correct transfer procedures	Visual Inspection	PRD-I-04	Sealing personnel	Work instruction
	Rejections	Raise replacements against rejections	Replacement codes	PRD-P01-F02	Supervisor/Operator	ASTM C1036/BSEN 572

Department: PRODUCTION		Section: SCREEN PRINTING		Doc. Ref. SAGPRD-09		Page 22
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
Screen Printing	Glass requirements	Check glass type, sizes & labels	Visual inspection Measure	PRD-I-12	SCR personnel	Work Orders
	Glass quality	Check glass quality	Visual Inspection	QMD-I-03	Operator	ASTM C1036-06 / BSEN 572
	Room conditions	Ensure that the following are monitored Temperature - below 25 C Humidity - 30-60 %	Thermohygrometer	QMD-P01	Operator	Suppliers data sheet
	Silk screen pattern	Check the screen pattern as per the order requirements and quality	Visual inspection	QMD-P03	Operator	Work Orders / screen requirements
	Print set-up	Set-up the machine as per the manufacturer's operating procedure	Visual inspection	Operating manual	Operator	Operators manual PRD-I-12
	Set-up table	Ensure that the printing table is clean and free from splinters of glass and other foreign materials	Visual inspection	None	Operator	Operators manual PRD-I-12
	Blades position	Set-up the blade as per the operating instructions	Machine gauge	Operating manual	Operator	Operators manual PRD-I-12
	Pressure settings	Set the pressure of the squeegee blade as per the requirement	Machine gauge	None	Operator	Operators manual PRD-I-12
	Paint specifications	Prepare and maintain the mixing ration of paints for every batch based on the approved sample	Weighing / measuring	SCR-P01-F03	Operator	Suppliers data sheet

Department: PRODUCTION		Section: SCREEN PRINTING		Doc. Ref. SAGPRD-09		Page 23
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
Screen Printing	Paint application	Ensure that there is sufficient paint to cover the width of the coating blade	Visual Inspection	None	Operator	PRD-I-12
	Printing	Follow the procedures in the work instructions	Visual Inspection	None	Operator	PRD-I-12
	Glass quality	Check the quality of the painted glasses after printing	Visual Inspection	SCR-P01-F03	Operator	QMD-I01
	Glass stacking	Arrange the printed glasses in the trolley laying them out in a horizontal position or in a vertical position for glasses not fully painted	Visual Inspection	None	SCR personnel	PRD-I-12
	Trolley	Check trolley status	Visual Inspection	None	SCR personnel	PRD-I-12
	Rejections	Raise replacements against rejections	Replacement codes	PRD-P01-F02	Supervisor/Operator	ASTM C1036/BSEN 572

Department: PRODUCTION		Section: PACKING		Doc. Ref. SAGPRD-10		Page 24
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
PACKING	Packing glass schedule	Check available glass for packing	Checking	Finished Goods data	Supervisor	Work Orders
	Boxes preparation	Check glass sizes ready for packing Check bar coding reports from the previosu departments Prepare the boxes according to the schedules fpor packing and delivery Secure end caps/ boxes with plastic and fiber board	Checking	Work orders	Supervisor	PRD-I-10
			Checking	Bar coding reports	Supervisor	
			Visual Inspection	None	Packing personnel	
			Visual Inspection	None		
	Glass quality	Check glass quality	Visual Inspection	QMD-I-07	Supervisor	ASTM C1036-06 / BSEN 572
	Packing frames	Check packing frames Provide rubber on bases and vertical members	Visual Inspection	None	Packing personnel	PRD-I-10
	Glass separator	Provide jiffy foam separators between glasses	Visual Inspection	None	Packing personnel	PRD-I-10
	Steel frame assembly	Provide plastic cover and strap to the	Visual Inspection	None	Packing personnel	PRD-I-10
	Glass details	Prepare the packing list and submit to the Despatch department	Checking	PKG-P01-F02	Supervisor	Work Orders
	Delivery vehicles	Check the status of delivery vehicles	Visual Inspection	None	Supervisor	Manager's approval
	Glass loading	Secure loading of boxes/end caps or packing frames	Checking / Inspection		Supervisor	PRD-I-10
	Rejections	Raise replacements against rejections	Replacement codes	PRD-P01-F02	Supervisor/Operator	ASTM C1036/BSEN 572

Department: PRODUCTION		Section: DESPATCH		Doc. Ref. SAGPRD-11		Page 25
Operation	Description	Procedures / Criteria / Instruction	Evaluation Method	Documents/ Files/Records	Responsibility	Acceptance Criteria
DESPATCH	Delivery schedule	Check the control for status of glass ready for delivery and provide the list to the packing department Receive schedules and advises from Planning / Production departments	Checking	Finished goods data	Supervisor	Work orders
	Products details	Receive bar coding reports / ad glass labels from concerned departments	Checking	Barcoding / Labels	Supervisor	Work orders
	Data control	Encode data into Despatch note workbook file database	Encoding		Supervisor	Packing reports
	Delivery notes	Prepare delivery notes based on the details provided by the concerned departments	Checking	Packing lists / Barcodes	Supervisor	Work orders
	Loaded glasses	Check the condition of the loads and vehicles despatch	Visual Inspection	TPT-P01-F08	Supervisor Packing personnel	PRD-P02
	Delivery documents	Provide the driver with the delivery documents and information related to customers and locations	Presentation	TPT-P01-F03	Supervisor	PRD-P02 Work orders
	Gate pass	Prepare a gate pass for every delivery and despatch of other items	Checking Inspection	SAGCO-P01-F02	Supervisor	Delivery documents
	Delivery transmittal	Submit the signed delivery details to the Accounts department	Checking	TPT-P01-F06	Supervisor	PRD-P02 Delivery notes
	Records updating	Update reports records of deliveries	Upadating	TPT-P01-F04	Supervisor	Work orders
	Problem concerns	Raise problems regarding deliveries thru Customer Service/QMD	Issuance	QMD-P04-F03	Supervisor	Procedures