



Aagard Machine Serial Number	#120
Machine Type	RH KD Case Packer with Orienter
Aagard Quote Number	3307-02
Purchase Order #	70121618
Purchaser	General Mills, Inc
Machine Acceptance Date at Aagard	2/12/09
Machine Ship Destination	Buffalo, NY

1. PROJECT DESCRIPTION: Right hand Knock Down Case Packer with Orienter

System

- Light fixture inside panel
- Individual guard door sensors
- Quick disconnect sensors
- UL Certification
- Remote start button – on non operator side of system
- Tool-less changeover
- CAT 3 Compliance

Knockdown Case Packer

- Infeed conveyor
- 6' horizontal case blank magazine
- Case blank setup
- Product orientation
- Product loading
- Open flap detection
- Three sets of change parts

Case Orienter

- Open flap detection
- Case reject
- Case tip
- Case rotate

2. Final floor plan # 3383-05 R2 is attached. Includes location of main control panel, operator interface, and required air and power drops.
3. FACILITY REQUIREMENTS:
 - a. Ceiling height restrictions where equipment will be located: 9' 8"
 - b. Size restrictions (door and aisle openings into plant): Customer will lift machine into plant with a crane. Split Case Packer and Orienter modules for shipping.
 - c. Utility drops required at customer's facility:
 - i) Main electrical: 480 VAC, 3 Phase, 60 Amp
 - ii) Glue electrical: 240 VAC, 3 Phase, 30 Amp
 - iii) Network cable to HMI
 - iv) Vacuum (house vacuum requested by customer): 35 CFM, -25 Hg
 - v) Compressed air, clean and dry: 80 PSI, 15 CFM
(1) ("Clean/Dry" defined as air filtered to five microns or less and with a pressure dew point of 40°F or lower.)
4. CONDITIONS MACHINE WILL OPERATE UNDER:
 - a. Operating environment? Dry and Dusty, 72 degrees F
 - b. Number of shifts to run per day? Three shifts – 24 hours per day- 340 days per year.
5. INTEGRATION OF ADDITIONAL HARDWARE (i.e. labeler, printer, bar code scanner): N/A
6. INFEED:
 - a. Infeed height of equipment purchased: 38"
7. DISCHARGE:
 - a. Discharge height of equipment purchased: 16"
8. MAGAZINE STYLE AND DESCRIPTION:
 - a. Case Packer – 6' horizontal power fed magazine
9. PRODUCT DETAILS:
 - a. Production description: Sealed cartons of dry cereal – cartons received from customer's conveyer with the carton face up and the manufacture's joint on the trailing edge of the carton
 - b. Customer and Aagard agreed upon product tolerance (s): Carton quality as per GMI SOI guidelines
 - c. Product Temperature: Ambient
 - d. A product code identifier is included on the product specification chart. This identifier used for changeover, machine manual and on the HMI
 - e. Each product size to have the corresponding color code for change parts listed on the specification chart.

10. CORRUGATED DETAILS:

- a. Case style description: RSC knock down case
- b. Manufacturer's flap location in load station: Up and trailing
- c. Flap folding sequence: Vertical flaps then horizontal flaps
- d. Minimum/Maximum flap length: 3.5"/8.25"
- e. Flat blank size(s): (length, width, thickness dimensions): See case blank drawings on file from customer
- f. Purchaser's corrugated specification: See case blank drawings on file from customer
- g. Flute Type: B-Flute
- h. Weight:
- i. Finish: Kraft paper
- j. Customer and Aagard agreed upon finished case tolerance: ¼" maximum corner-to-corner skew

11. ADHESIVE REQUIREMENTS:

- a. Adhesive hot melt
 - i) Glue pattern - how many stripes per flap: Two
 - ii) Glue pattern and fiber tear per GMI SOI requirements
 - iii) Glue brand: Aagard will supply one box of HB Fuller Advantra #PHC-9254 adhesive for testing (equivalent/substitute for non-frozen applications is #PHC-9256). If you prefer to supply your own brand of adhesive, please advise your Aagard Project Manager. MSDS Sheets along with adhesive specifications such as set-up time, recommended temperature setting, etc. are required. Not all adhesives work for all applications – if there are any difficulties associated with utilizing your preferred adhesive Aagard will immediately purge the adhesive tank and replace the adhesive with our recommended brand. Upon your request, we will provide you the costs for further testing your preferred adhesive brand in Aagard's equipment.

12. SEQUENCE OF OPERATION:

Case Packer:

- The cartons are conveyed into the downstack station of the case packer, lying flat with the wide dimension leading (NOTE: Cartons will be face down on conveyor)
- After one layer of products is received (two cartons in the direction of travel), the down stacker flights move down one product height so that another layer can be received
- As the first carton of the next layer is being received, a spatula extends out over the existing layer to ensure that the leading edge of the incoming carton transfers over the seam between the two cartons below
- The spatula retracts before the second carton enters the down stacker
- When the stack is complete, the flights move down to the bottom of the stack chamber and another set of flights moves in to accumulate the next stack
- The complete stack is pushed out of the down stack chamber to the load station as the next stack is being built above
- A case is picked from the case magazine in an arc motion; opening the case
- Funnels are enabled on the load side of the case assisting in a smooth load transition
- The loader transfers the properly oriented cartons into the case
- While the case is leaving the load station the vertical flaps are tucked
- The case is transferred past the glue guns where glue is applied to the vertical flaps and a compression mechanism folds and compresses the horizontal flaps
- The previous case is pushed out of the compression area and onto the unitizer infeed conveyor
- The case packer continues to accumulate and stack cartons as cases are erected and loaded

Case Orienter:

- The sealed case is pushed out of the case packer by the lower flight chain
- Photo-eyes check for open flaps
- The case is rejected if open flaps are detected by a servo driven pusher
- The case is turned, tipped or conveyed into the proper orientation
- The case is discharged onto the customer's conveyor

13. SIZE RANGE FOR PRODUCT AND CASES:

Product and case sizes to be run at Purchaser's preshipment acceptance test at Aagard are shown in bold italic print.

CASE PACKER														
GMI Product ID for HMI and Manuals	Product Description	Max Product Rate Per Minute	Orientation of Cartons as Received			Pack Pattern (as loaded)			Case Dimension (O.D.)			Max Case Rate Per Minute	Change Part Group	
	Cartons		A=Parallel to Flow	B=Vertical or Height on Conveyor	C=Across Conveyor	L (Direction of Travel)	W (Height)	D (Across Machine)	L (Direction of Travel)	W (Height)	D (Across Machine)			
127/10	127 Carton	250*	6.313"	2.125"	9.438"	2*A	5*B	1*C	13.00"	11.50"	10.00"	25*	A	
144/10	144 Carton	250*	6.313"	2.125"	10.75"	2*A	5*B	1*C	13.063"	11.563"	11.438"	25*	A	
156/12	156 Carton	250*	7.65625"	2.00"	10.1875"	2*A	6*B	1*C	15.688"	12.875"	10.750"	20.83*	B	
172/12	172 Carton	250*	7.65625"	2.00"	11.25"	2*A	6*B	1*C	15.688"	12.875"	11.813"	20.83*	B	
191/16	191 Carton	250*	7.656"	2.297"	10.875"	2*A	8*B	1*C	15.75"	19.50"	11.625"	15.63*	C	
207/10	207 Carton	250*	7.65625"	2.406"	11.25"	2*A	5*B	1*C	15.688"	12.875"	11.813"	25*	B	
239/14	239 Carton	250*	7.65625"	2.641"	11.813"	2*A	7*B	1*C	15.75"	19.50"	12.50"	17.86*	C	
271/12	271 Carton	250*	7.65625"	3.094"	11.4375"	2*A	6*B	1*C	15.75"	19.50"	12.125"	20.83*	C	
303/12	304 Carton	250*	7.65625"	3.094"	12.813"	2*A	6*B	1*C	15.75"	19.50"	13.50"	20.83*	C	
304/12	304 Carton	250	9.50"	2.50"	12.813"	2*A	6*B	1*C	19.375"	15.875"	13.375"	20.83	?	
356/10	356 Carton	250*	9.50"	2.922"	12.813"	2*A	5*B	1*C	19.375"	15.375"	13.375"	25*	D	
Minimum Range			5.75"	2"	9.3125				12"	9.75"	9.75"			
Maximum Range			9.5"	3.1875"	13.5				19.5"	20.50"	14.25"			

- Flap length range = 3.5 to 8.25
- Minimum size case blank (in magazine) = 16.75w x 21.75h
- Maximum size case blank (in magazine) = 30.75w x 40h

Blue - Stout sizes ordered with Revival
Green - Project Revival sizes non-proven
Red - Project Revival sizes proven

*Machine is capable of 250 cartons/minute, but will be set up, tested and FAT proven at 200 cartons/minute.

NOTE: Machine speed and capability is not guaranteed when running cartons that have undergone design changes to accept premiums. The design of the carton with premium will need to be evaluated to discover any affect on machine speed and capability.

Reference for Case Orienter (No Unitizer purchased)										
GMI Product ID for HMI and Manuals	Product Description	Max Case Rate Per Minute	Orientation of Product as Received			Slip Sheet Dim.	Cube Size			Max Pallet Rate Per Hour
	Case		Pattern	Cases Per Layer	Layers Per Slip Sheet		L (Direction of Travel)	W (Height)	D (Across Machine)	
127/10	127 Case	25*	4x3	12	5	42" x 50"	46.00"	50.00"	39.00"	12*
144/10	144 Case	25*	4x3	12	4	42" x 50"	46.250"	45.750"	39.188"	15*
156/12	156 Case	20.83*	3x3	9	4	42" x 50"	47.063"	43.00"	38.625"	16.67*
172/12	172 Case	20.83*	3x3	9	4	42" x 50"	47.063"	47.25"	38.625"	16.67*
191/16	191 Case	15.63*	3x2	6	4	42" x 50"	47.25"	46.50"	39.00"	18.75*
207/10	207 Case	25*	3x3	9	4	42" x 50"	47.063"	47.25"	38.625"	20*
239/14	239 Case	17.86*	3x2	6	4	42" x 50"	47.25"	50.00"	39.00"	21.42*
271/12	271 Case	20.83*	3x2	6	4	42" x 50"	47.25"	48.50"	39.00"	25*
303/12	304 Case	20.83*	3x2	6	3	42" x 50"	47.25"	40.50"	39.00"	33.33*
304/12	304 Case	20.83	3x2	6	3	42" x 50"	47.625"	40.125"	38.75"	33.33
356/10	356 Case	25*	3x2	6	3	42" x 50"	46.125"	40.125"	38.75"	40*
Maximum Range							50"	52"	41"	

* Machine is capable of 250 cartons/minute, but will be set up, tested and FAT proven at 200 cartons/minute.

- NOTE: Size 356 will be tipped up and rotated by the Case Orienter. Sizes 156, 172, 207 and 239 will be tipped up, but not rotated.

Added 304/12 Carton/Case size per Retrofit 120SRI 12/7/10 mau

Blue - Stout sizes ordered with Revival
Green - Project Revival sizes non-proven
Red - Project Revival sizes proven

14. MISCELLANEOUS:

- a. UL approval
- b. Wiring labels – Wire tags will be placed on all wire ends giving the wire designation as shown on the electrical schematics. These tags will be permanent and printed. Self-laminating labels will be used and will be wrapped correctly and not installed in a “flag” style on wires.
- c. An operating and maintenance manual including spare parts list provided. A disc will also be provided allowing purchaser additional copies as required.
 - i) Complete maintenance instructions for equipment
 - ii) System overview describing the function and operation of the equipment
 - iii) A complete bill of materials containing all components including vendor names and phone numbers.
 - iv) Operating instructions
 - v) Description of operations referencing device name and I/O address
 - vi) Wire diagrams and I/O identification
 - vii) Hydraulic and Pneumatic diagrams
 - viii) Data for timing charts
 - ix) Lubrication diagrams and frequency
 - x) Parts list referencing OEM part numbers
 - xi) OEM part manuals
 - xii) Change-over instructions (if required)
 - xiii) Preventive maintenance schedule
- d. Plastic name plates on equipment to be plastic, white surface with black lettering sealed to housing
- e. Drive sprockets shall be keyed and double set, or clamp mounted to shafts - taper lock bushings used where practical
- f. Keyways must be captured; open-ended key slots are not acceptable
- g. Single conductor control wire will be color coded as follows:

A – Black	AC power wire, circuit is only broken by Fuses/circuit breakers, 480- VAC power wiring
B – White	AC neutral wire
C – Red	AC control wire (non-interlock)
D – Yellow	AC interlock control wire, power originates at remote source
E – Blue	+DC supply wiring
F – Blue/White	DC common
G – Green or Green/Yellow	Earth Ground
- h. Conductors shall run continuous from terminal to terminal or from device to terminal without splices
- i. Wire nuts are to be used only to terminate leads of end devices
- j. No more than 2 conductors are allowed on any individual terminal
- k. Blown fuse indicators on all fuses with exception to the main disconnect
- l. Product funnels: design so they only can be installed one way
- m. Do not put exterior ducted fan in HMI enclosure
- n. **Ballooned assembly drawings in electronic dwg format**

15. MECHANICAL CONSTRUCTION CRITERIA:

<u>Item</u>	<u>Deviation from Standard</u> (must be approved by Aagard and may incur additional costs)
AC Gearboxes	
Aluminum Parts Finish	
Bearings (lube for life where possible)	
Chain	
CRS (cold rolled steel) Parts Finish	
Device Labels	
Fasteners	
Frame (6" +2"/-4" floor clearance)	
Frame Legs	
Guarding	
Indicators (adjustment)	
Key stock (captured where possible)	
Linear V-track Rails (hardened)	
Lube Components	Copper clad tubing 3/16" (if needed)
Placards (adjustment)	Standard placards on adjustments. Special placards on electrical devices, in addition to the standard electrical device labels. The special electrical device placards include a simple description/name with the device #, such as "SM20 Upper Compression". All devices receive the special placards except guard door switches, filter/regulators, and cylinder switches, which receive standard placards instead.
Product Contact Surfaces	
Rod Ends	
Round Linear Shafts (i.e. Thomson)	
Servo Gearboxes	
Shaft Collars	
Sprockets (keyed and double set or clamp/taper lock bushing where practical)	
Shaft Collars	
Spline Shafts, Hubs, and Adjusting Screws	
Torque Limiters and Clutch Brakes	

16. ELECTRICAL CONSTRUCTION CRITERIA:

<u>Item</u>	<u>NEMA 12 - protection against dirt, dust and non-corrosive liquids</u>	<u>GMI, not dependent on construction type (only noted if unique)</u>
AC/DC Motors	TEFC	
Adhesive System	non-washdown	
Clutches, Brakes, etc.	non-washdown	
Cords	as purchased with single or multi-port cord grip with sealing washer or Meyers hubs	
DC and Servo Motors	as purchased	
Electrical Cabinets and Wire Way	cold rolled steel NEMA 12 with steel-it gray powder coat to match the frame	
External Electrical Components	NEMA 12 or IP51 rated	
Junction and Push Button Boxes	plastic or cold rolled steel NEMA 12 with factory finish	No conduit or cords exiting top of junction boxes where product can build up

17. SAFETY CATEGORY:

<u>Standard Aagard CAT 1</u>	<u>Optional Aagard/GMI CAT 3</u>
Safety rated parts of a machine control system and their protective equipment, components are designed, constructed, selected, assembled and combined with well tried safety components and safety principles	Includes CAT 1 and designed so a single fault in any part of its parts does not lead to a loss of safety function
When a fault occurs it may lead to a loss of safety function	The loss of a safety function is detected by a check - when a single fault occurs the safety function is always performed
Single channel safety inputs	Dual channel safety inputs
No monitoring of components driven from the outputs of the safety relay	Most of the components driven from the safety outputs of the relay are monitored via the safety relay
Standard Allen-Bradley 100-C and 100-M power contactors	Standard Allen-Bradley 100-C and 100-M power contactors
Sentrol 115-7Y-12K single channel guard door switch	Sensaguard (A-B) RFID dual channel guard door switch, PN 440N-Z21SS2HN

MECHANICAL CONSTRUCTION COMPONENTS:

Aagard's Engineering Department has the capability to substitute a component of equal value, based on specific application requirements. Purchased components will have their standard manufacturer's finish.		
	<u>Standard</u>	<u>Deviation from Standard</u> (must be approved by Aagard and may incur additional costs)
Air Clutches	Nexen	
Air Cylinders	Bimba SMC	
Bearings	Dodge – sealed for life	
Bearings (Linear and Slide)	Hepco Thompson	
Chain (Drive and Flight)	UST or Whitney	
Digital Indicators	Elsa	
Fabricated Parts	Painted, nickel plated, anodized aluminum or stainless steel	
Gear Boxes (gear boxes are supplied with the mfg's std. lubricant)	Alpha, Dodge, Motovario, Cone Drive, Stober	
Motors	Reliance or Leeson, TEFC	
Vacuum	Pump: Rietschle (oil type) Venturi: Vaccon	House vacuum; no vacuum pump required. (Leave filter and vacuum switch.)

18. ELECTRICAL CONSTRUCTION COMPONENTS:

Aagard's Engineering Department has the capability to substitute a component of equal value, based on specific application requirements. Purchased components will have their standard manufacturer's finish.		
	<u>Standard</u>	<u>Deviation from Standard</u> (must be approved by Aagard and may incur additional costs)
Adhesive System	Nordson ProBlue 240V-3-PH-60Hz (separate power drop required, disconnect provided)	
Air Valves	SMC (Mac for hot melt adhesive)	
Barcode Readers	Microscan -Sick (Allowable option on case packers and palletizers)	
DC Power Supply	Sola or Puls	
Disconnect (adhesive system)	Siemens	
Disconnect (main power supply)	Allen-Bradley	
Enclosure/Panel	Hoffman (Steel-It Gray epoxy powder coat finish)	Light fixture provided in panel
Guard Door Interlocks	Sentrol Magnetic Safety Switches	Individual guard door sensors, Sensaguard (A-B) RFID dual channel guard door switch, PN 440N-Z21SS2HN
HMI	Beckhoff 15" Color Touchscreen	
Limit Switches	Microswitch or Allen-Bradley	
Machine Controller	Beckhoff TwinCAT NC - PC based control with Sercos Communications	OPC Communications
Motor Starters	Allen-Bradley	
Operator Interface	Aagard software with "Microsoft Visual Studio.NET" editing	
PC	Beckhoff C6920 Solid State	
Photo Controls	Sick – quick disconnect	
Proximity Switches	Sick – quick disconnect	
Push Buttons and Pilot Lights	Allen Bradley – 800T one system level 3- button station on HMI is included (E-stop, Cycle Stop, Start/Reset)	E-stops to have a yellow background around device One remote start, cycle stop, and e-stop button on non-operator side
Relays	Allen-Bradley 700-HLT	
Servo Drive	Indramat	
Servo Motor	Indramat	
Terminal Blocks	Allen-Bradley 1492-J4	
Tower Light	Allen-Bradley 855, 3-color Red – Machine Stop Amber – Warning Green – Machine Run	Allen-Bradley 855, 4-color Red – machine is in fatal state requiring operator intervention Amber – a downstream unit operation is stopped to the point that no discharging can occur Blue – low material supply Green – machine running in automatic
Tower Horn	Federal	
VFD	Allen-Bradley Power Flex 4	
Machine Voltage (standard)	480V-3Ph-60Hz, 24V DC	

Note: The electrical and mechanical extent of supply is limited to the machine system generally as detailed. Electrical power supply (ies) provided by purchaser and terminated within the main electrical control cabinet (s). An Aagard technician completes all internal wiring and connection between main cabinet and machine. Compressed air supply provided by purchaser and terminated at ½" NPT connection on machine-mounted air set.

19. MACHINE ACCEPTANCE CRITERIA:

- a. Machine efficiency guarantee: 97%
- b. Aagard will demonstrate the capabilities of the equipment at our facility; the pre-shipment acceptance test demonstrates the functional and operational capability of the equipment. Pre-shipment acceptance of the equipment at The Aagard Group facility will consist of two, three-minute runs on each product specified on the attached product specification chart.
- c. No equipment malfunctions will be accepted. Should a malfunction occur, corrective actions (s) will be performed and the acceptance run will resume. A malfunction due to faulty corrugated or product will cause the test to be continued from the stoppage. A team decision (Purchaser and Aagard's) will be made to run any additional tests.
- d. The agenda for the acceptance test will be as follows:
 - ◆ Cycle the equipment without product to familiarization purchaser with operation.
 - ◆ Randomly run product through the equipment so a clear understanding of the equipment is established.
 - ◆ Start the designated acceptance test as defined above by loading the infeed conveyor with product. Start the equipment and run for agreed upon period at the specified speed.
 - ◆ Jam test the equipment with any purchased detections or rejections activated, clearing jams, restarting the equipment, etc.
 - ◆ Demonstrate machine change over within the specified time range which is approximately 10 minutes for one Aagard Technician (s).

Final equipment acceptance will take place at the Purchaser's facility. Prior to Aagard's Service Technician leaving your facility after the initial start up of the equipment, we ask you to sign off indicating you are satisfied with the equipment and have accepted the equipment. As the Purchaser you may request a Factory Acceptance Test if you require Aagard to demonstrate further that the equipment is running at the agreed upon efficiency (total machine available time). This acceptance test is typically for an eight-hour period as defined below. The Aagard Service Technician will be responsible for beginning and performing the trial. The final equipment acceptance is not to exceed thirty days from shipment.

Equipment status	Machine running on day shift
Set-up time	1-2 hours to allow machine to be correctly set by technician
Performance trial	One 8-hour shift (this is a pre-designated shift)

20. MACHINE MANUAL – One hard copy of operator manual provided complete with programming code (complete manual and documentation also provided on compact disk). Original copies of purchased component documentation also included.

Operations Manual & Spare Parts List Shipping address:

Al Hammer
 General Mills, Inc.
 54 S Michigan Ave.
 Buffalo, NY 14203

Bill Fox (Project Contact)
 General Mills, Inc.
 JFBTC 9000 Plymouth Ave N
 Golden Valley, MN 55427-3870
 #763.293.3834