



# EQUIPMENT MANUFACTURING SPECIFICATIONS



1881 West North Temple  
Salt Lake City, UT  
84116 U.S.A.

☎ 801 536-0453  
☎ 801 363-7830  
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Page 1 of 50  
Latest Revision: April 7, 2009

## TABLE OF CONTENTS

### **1. General**

- 1.1. Definitions
- 1.2. Scope
- 1.3. Terms and Conditions of Sale
- 1.4. Data Request Form
- 1.5. Concurrent design/build
- 1.6. Order delivery scheduling
- 1.7. STONEPAK responsibilities
- 1.8. Responsibilities of Purchaser

### **2. Applicable Codes/ Tests and Inspections**

- 2.1. OSHA compliance
- 2.2. Quality control
- 2.3. Customer inspections
- 2.4. Applicable standards/inspections by independent inspection agencies
- 2.5. STONEPAK testing of third-party vendor purchase part items

### **3. Documentation Submission and Approval**

- 3.1. Units of measure
- 3.2. Typical documentation provided by STONEPAK with an order
- 3.3. Certified (“as-built”) documentation
- 3.4. Spare parts listing
- 3.5. Documentation that is not available and/or not included with an order

### **4. Electrical Design and Construction Requirements**

- 4.1. Area classification and hazardous area construction specifications
- 4.2. Power supply
- 4.3. Machine controls
- 4.4. Conduit system
- 4.5. Wiring
- 4.6. Enclosures
- 4.7. Marking of electrical enclosures and components
- 4.8. Grounding
- 4.9. Standard electrical purchased components



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## 5. Structural Design and Construction Requirements

- 5.1. Materials of fabrication
- 5.2. Standard welding procedures
- 5.3. Surface preparation and painting
- 5.4. Pneumatic control
- 5.5. Lubrication
- 5.6. Standard mechanical purchased components

## 6. Shipping Arrangements and Procedures

- 6.1. Disassembly, crating, corrosion protection
- 6.2. Equipment serial number tagging
- 6.3. Shipping documentation for domestic shipments

## 7. Equipment Installation, Start-Up, Training, Performance Acceptance

- 7.1. Equipment installation
- 7.2. Equipment start-up (commissioning)
- 7.3. Training
- 7.4. Equipment performance expectation, acceptance, and guarantee
- 7.5. Warranty and corrective work (repair)

## 8. Exceptions

This Exceptions Section includes a listing of special manufacturing specifications required by the Purchaser that are different from STONEPAK's standard offering. Where an order requirement listed in the Exceptions Section conflicts with the standards listed elsewhere in these Equipment Manufacturing Specifications, the wording in the Exceptions Section shall prevail. In the case that a manufacturing requirement that has not been previously quoted is to be included into the Exceptions Section, STONEPAK reserves the right to adjust any pricing and delivery quotations accordingly.

## 9. Reference

- 9.1. STONEPAK quality control
- 9.2. "Mild steel product contact surface" materials
- 9.3. Explanation of STONEPAK method of providing distributed modularized controls for major pieces of packaged equipment
- 9.4. Explanation of STONEPAK method of concurrent design/build
- 9.5. Results of STONEPAK unofficial in-house blower noise level testing
- 9.6. Results of STONEPAK unofficial in-house Ultrasonic Sealer noise level testing



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## 10. Options – (alternative methods of equipment construction included as a reference only)

This Options Section is not a formal part of the Equipment Manufacturing Specifications; it is compiled as part of this document for convenience and for reference purposes only. The alternative methods of construction listed in this Options Section are not necessarily part of the equipment specifications for the equipment being offered. If the Purchaser prefers one of the Options Section alternatives, that option must be agreed-to between STONEPAK and the Purchaser and be incorporated into the Exceptions Section of the Equipment Manufacturing Specifications. It is not possible or practical to incorporate every option into every item of equipment. If an option that has not been previously quoted is to be included into the Equipment Manufacturing Specifications, STONEPAK reserves the right to adjust any pricing and delivery quotations accordingly.

- 10.1. **Option:** Inspections by independent inspection agencies
- 10.2. **Option:** Sleeve-type heat-shrinkable tubular plastic wire markers
- 10.3. **Option:** “Rigid” conduit system for an individual packaged piece of equipment
- 10.4. **Option:** STONEPAK installation of wire and conduit as part of a “Pre-wired System”
- 10.5. **Option:** NEMA 4 electrical enclosures
- 10.6. **Option:** Type 304 Stainless Steel product contact surfaces
- 10.7. **Option:** Type 316 Stainless Steel product contact surfaces
- 10.8. **Option:** Shipping documentation for non-domestic shipments
- 10.9. **Option:** Purchaser-designated Equipment Identification Number Tagging



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## 1. General

### Definitions

- 1.1.1. The term “Purchaser” as used in this document refers to the eventual owner of the equipment being purchased, and also to any other party that the eventual owner has authorized to act in his behalf.
- 1.1.2. An equipment “order” is accepted when the following conditions have been satisfied:
- 1.1.2.1. STONEPAK has provided Purchaser with an offer to provide equipment at a quoted price,
  - 1.1.2.2. Purchaser has committed to purchase the equipment being offered by providing a binding purchase document such as a Purchase Order or Letter of Intent, and
  - 1.1.2.3. STONEPAK has formally accepted the Purchaser’s purchase document in writing.
- 1.1.3. A “system” of equipment is defined as an engineered assembly of two or more individual packaged pieces of equipment that work together to perform a desired function. Typically, a “system controls” package is required to allow the individual pieces of equipment to be electrically integrated as a single operating entity.
- 1.1.4. *This italic font style is used for some wording in this Equipment Construction Specifications document. Italics are used to identify information that is provided as a supplemental reference – the document is complete with, or without, the wording in italic format.*

### 1.2. Scope

- 1.2.1. This Equipment Manufacturing Specification (EMS) shall be the governing document pertaining to the technical requirements of an equipment order agreement between STONEPAK and Purchaser. A complete EMS includes a current Data Request Form, STONEPAK Conditions of Sale, a Hazardous Area Electrical Construction Standards document (if applicable), a listing of Exceptions (if applicable), and an equipment performance guarantee (if applicable).



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### 1.3. Terms and Conditions of Sale

1.3.1. The attached STONEPAK Conditions of Sale apply to equipment being offered for sale. In any instance the STONEPAK Conditions of Sale conflict with Purchaser's conditions of purchase, the STONEPAK Conditions of Sale will prevail and be adhered to unless specifically noted in the Special Order Specifications Section of this document.

### 1.4. Data Request Form

1.4.1. A Data Request Form (DRF) shall be considered to be part of a complete Equipment Construction Specifications document. The DRF describes the properties of the product being packaged and serves as the basis for STONEPAK to properly recommend equipment to suit the purchaser's intended application. The information in the DRF shall serve as the basis for any guarantee of equipment performance offered by STONEPAK. It is the responsibility of the purchaser to review and verify the information in the DRF. STONEPAK cannot be held responsible for improperly specifying equipment on the basis of inaccurate or incomplete information in the DRF.

### 1.5. Concurrent design/build *(See the Reference Section for a description of concurrent design/build manufacturing procedure)*

STONEPAK operates on the concept of concurrent design/build, and all standard equipment pricing and standard lead-time quotations for equipment supplied by STONEPAK are based on this basis of manufacturing. Should the concurrent design/build method not be acceptable to the Purchaser, an alternative construction approach must be agreed-to between STONEPAK and Purchaser and be included in the Exceptions Section of this document. If an alternative to the concurrent design/build manufacturing approach is implemented, STONEPAK reserves the right to adjust any pricing and delivery quotations accordingly.

### 1.6. Order delivery scheduling

1.6.1. Following is an approximate scheduling timeframe requirement for a typical large equipment order. Scheduling timeframe requirements can vary according to the complexity of the order, and according to the current production schedule backlog. Many medium and small sized orders do not require completion of all of the tasks listed below. Firm delivery dates will be provided upon receipt of an order and complete order specifications.



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• Latest Document Revision April 2, 2009•

Purchaser  
Project #  
Date 05/15/09  
Printed  
Page Page 7 of 50

TASK	APPROXIMATE SCHEDULE
Start equipment general arrangement drawing submittal where warranted by the application and/or requested by the Purchaser	1 week after receipt of order
Complete equipment general arrangement drawing submittal for Purchaser review and approval	2 weeks after receipt of order
Start order entry of Bill of Material specifications into production schedule for standard items of the order	1 week after Purchaser return of approval documents
Start production floor planning and purchasing materials for order	1-2 weeks after Purchaser return of approval documents
Specify equipment and place purchase orders to “third-party” manufacturer vendors	2 weeks after Purchaser return of approval documents
Start process of producing order documentation	2 weeks after Purchaser return of approval documents
Start engineering of custom components of the order	2 weeks after Purchaser return of approval documents
Start production floor fabrication portion of order	2-3 weeks after Purchaser return of approval documents
Prepare and provide preliminary planning documentation to Purchaser	4 weeks after Purchaser return of approval documents
Complete the engineering of the custom components required for the order	6 weeks after Purchaser return of approval documents
Complete production floor fabrication portion of order	8 weeks after Purchaser return of approval documents
Complete production floor assembly, set-up, and testing of equipment, verification of as-built documentation	12 weeks after Purchaser return of approval documents
Purchaser check-out, tear-down, crating, preparation for shipment	12 weeks after Purchaser return of approval documents
Ship to job site – transit time	1-5 days for domestic shipments, depending on destination
Provide completed order documentation	at shipment
Provide shipping bill of lading	at shipment

### 1.7. STONEPAK responsibilities



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- 1.7.1. STONEPAK is responsible to communicate with Purchaser to understand Purchaser's needs and requirements in placing an order. STONEPAK is responsible to apply experience, judgement, and design talent as may be reasonable and necessary to recommend and provide equipment to fill the Purchaser's requirements. STONEPAK is also responsible to limit its scope of supply to items/equipment with which it has some knowledge and experience.
- 1.7.2. Where warranted by the application and/or requested by the Purchaser, STONEPAK is responsible to provide an equipment installation drawing that accurately represents the equipment being provided. Where possible, the equipment arrangement is to be integrated with building layout information of the area in which the equipment is to be installed.
- 1.7.3. STONEPAK is responsible to anticipate and request that the Purchaser provide materials to allow the equipment to be tested prior to shipment. Such materials may include the Purchaser's product, empty bags, filled bags, empty pallets, slip-sheets, etc. STONEPAK is responsible to coordinate the disposal of the materials and/or the return of the materials to Purchaser after testing.
- 1.7.4. If STONEPAK is supplying equipment manufactured by a "third-party" vendor, STONEPAK is responsible to coordinate with that vendor and to specify the equipment to allow integration with the equipment being supplied by STONEPAK. At the discretion of STONEPAK the "third party" supplied equipment may either be received at the Salt Lake City manufacturing facility for set-up and integration, or it may ship directly to the Purchaser's facility. STONEPAK is responsible to purchase and provide one (1) copy of the "third-party" vendor supplied documentation to Purchaser. Examples of such "third-party" vendors are manufacturers of such items as stretchwrappers, metal detectors, check weighers, powered curve conveyors, etc.
- 1.7.5. STONEPAK is responsible to coordinate and expedite an equipment order to meet the projected delivery date. STONEPAK is responsible to provide Purchaser with periodic verbal order status updates, and to advise Purchaser of any change in shipment scheduling. STONEPAK shall make their Salt Lake City manufacturing facility available to the purchaser for inspection of the equipment being ordered during the production process upon reasonable advance notice from Purchaser.
- 1.7.6. At time of shipment, STONEPAK is responsible to load the equipment onto carrier at the Salt Lake City manufacturing facility.
- 1.7.7. When the equipment is being shipped under STONEPAK's standard shipping arrangement of F.O.B. Salt Lake City, STONEPAK is responsible to assist the Purchaser, at request of the Purchaser, in filing a claim with the carrier for any shipping damages.



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1.7.8. STONEPAK is responsible to provide the Purchaser with accurate information to allow the equipment to be located and installed. This information includes the requirements for compressed air, dust collection, and electrical service as applicable.

### **1.8. Responsibilities of purchaser**

1.8.1. The Purchaser is responsible to communicate with STONEPAK to convey purchaser's needs and requirements in placing an order. The Purchaser is responsible to review this Equipment Manufacturing Specifications (EMS) document to assure conformance with intended order requirements. The Purchaser is responsible to immediately submit any exceptions to this EMS document to STONEPAK for a determination of feasibility, lead-time impact, and corresponding order pricing adjustment if applicable.

1.8.2. The Purchaser is responsible to provide STONEPAK with accurate building layout information of the area in which the equipment is to be installed. Electronic format for the layout is preferred. The Purchaser is responsible to review and approve the STONEPAK provided equipment installation drawing, and to confirm building dimensional details shown on that drawing. The Purchaser is responsible to communicate to STONEPAK factors that may affect the design of the equipment not identified on the installation drawing. Such factors may include a limited ceiling height, a restricted doorway access, a building obstruction that is not shown on the installation drawing, etc.

1.8.3. Upon request of STONEPAK, the Purchaser is responsible to provide materials to allow the equipment to be tested prior to shipment. Such materials may include the Purchaser's product, empty bags, filled bags, empty pallets, slip-sheets, etc. The Purchaser is responsible to accept the return of the materials after testing or pay for their disposal – STONEPAK does not have means to properly dispose of some materials. The tested material that is returned to the purchaser by STONEPAK is to be considered "contaminated" as STONEPAK does not have means to maintain the original integrity of the products during testing. The purchaser is responsible to absorb the freight charges in transporting the materials to-and-from the purchaser's facility. The purchaser is responsible to provide a Material Safety Data Sheet (MSDS) for each of the products being provided.

1.8.4. If Purchaser is obtaining equipment directly from a "third-party" vendor that is to be integrated with the equipment being supplied by STONEPAK, Purchaser is responsible to coordinate integration details between STONEPAK and that "third-party" vendor unless integration services are being purchased from STONEPAK. Examples of such "third-party" vendors are manufacturers of such items as stretchwrappers, metal detectors, check weighers, etc.



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- 1.8.5. At time of shipment, the Purchaser is responsible to offload equipment from carrier and inspect for shipping damage. When the equipment is being shipped under STONEPAK's standard shipping arrangement of F.O.B. Salt Lake City, the Purchaser is responsible to file a claim with the carrier for any shipping damage.
- 1.8.6. The Purchaser is responsible to locate and install the equipment according to the instructions provided by STONEPAK.
- 1.8.6.1. The Purchaser is responsible to provide a compressed air system capable of providing "clean, dry" air of sufficient capacity to accommodate the compressed air requirements of the equipment being provided by STONEPAK. The Purchaser is responsible to provide, install and design the routing of the compressed air piping to the air drop locations on the equipment provided by STONEPAK. The Purchaser is responsible to reconnect air hosing provided by STONEPAK that may have been disconnected or removed for shipping purposes.
- 1.8.6.2. The Purchaser is responsible to provide a dust collection system of sufficient capacity to accommodate the dust collection requirements of the equipment provided by STONEPAK. The Purchaser is responsible to design, provide, and install the dust collection ducting to the dust collection locations on the equipment provided by STONEPAK.
- 1.8.6.3. The Purchaser is responsible to provide electrical service of sufficient amperage to accommodate the requirements of the equipment provided by STONEPAK. The Purchaser is responsible to provide, install and design the conduit routing and wire to the main electrical enclosures of the equipment provided by STONEPAK. Additionally, the Purchaser is responsible to provide and install the interconnecting conduit and wires between electrical enclosures as identified on the documents provided by STONEPAK. The Purchaser is responsible to reconnect conduit and wires provided by STONEPAK that may have been removed for shipping purposes. The Purchaser is responsible to electrically ground equipment in accordance with code and local law.



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## 2. Applicable Codes/ Tests and Inspections

### 2.1. OSHA compliance

2.1.1. Noise issues for STONEPAK's equipment other than low-pressure blowers

2.1.1.1. Except for the noise generated by STONEPAK low-pressure blowers, users of STONEPAK equipment have not reported excessive noise to be a problem in existing installations. Accordingly, noise reduction is not considered a high priority in the design of STONEPAK equipment. STONEPAK is not specialized in noise level testing and declines to warrant noise level for its equipment.

*At the request of the Purchaser, STONEPAK may be able to suggest equipment options that inherently produce less noise if minimal noise generation is an issue for the Purchaser.*

2.1.2. Noise issues for STONEPAK low-pressure blowers

2.1.2.1. The noise generated by STONEPAK low-pressure packaged blowers has caused concern for some customers. Each low-pressure blower assembly supplied by STONEPAK is provided with an inlet filter and 2 silencers that provide some noise dampening effect. STONEPAK is not providing additional means to dampen the noise generated by the blowers. When noise is a concern, STONEPAK typically recommends that the blowers be placed outside and away from operator exposure. Other options would be to place the blowers in a dedicated room or enclosure, or to install acoustical wall panels. Manufacturers that specialize in acoustical isolation include Tamer Industries ([www.tamerind.com](http://www.tamerind.com) --- 800-882-6348), and Illbruck ([www.illbruck-sonex.com](http://www.illbruck-sonex.com) --- 800-662-0032). STONEPAK is not specialized in noise level testing and declines to warrant noise level for its equipment. *(See the Reference Section for results of STONEPAK unofficial in-house blower noise level testing.)*

### 2.2. Quality control

2.2.1. STONEPAK quality control consists of multiple levels and types of inspection as part of a process that is both flexible and functional in a custom engineered equipment environment. The final inspection is a formal procedure, while the inspections that occur during the production phase are conducted informally. *See the Reference Section for a detailed description of the STONEPAK quality control process.*



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### 2.3. Customer inspections

- 2.3.1. STONEPAK invites and encourages the Purchaser to visit the Salt Lake City Bag Packaging Equipment manufacturing facility to inspect the equipment order and to receive installation instructions prior to shipment.
- 2.3.2. STONEPAK cannot guarantee Purchaser access to the manufacturing facilities of the various “third-party” vendors that may be used in producing an equipment order.

### 2.4. Applicable standards/ inspections by independent inspection agencies

*(Reference the Options Section for optional independent agency inspections – Section 10.1.)*

- 2.4.1. STONEPAK shall make every attempt to design and manufacture equipment in accordance with industry accepted standards. We pay special attention to ANSI/PMMA B155.1-2000 (American National Standard for Packaging Machinery) and NFPA 70: National Electrical Code. The equipment produced by STONEPAK shall not necessarily conform to all applicable codes and standards including those published by ANSI, AFBMA, AGMA, ASME, CEMA, etc. as it is not practical for our organization to keep current with them in order to do so. STONEPAK is not licensed to apply the marks of UL, CSA, or any other independent inspection agency. An independent agency inspection is not included by STONEPAK as a standard feature of an equipment order. If such an inspection and 3<sup>rd</sup> party certification is of value to you, we are willing to work with you on that – see section 10.1 below.
- 2.4.2. The STONEPAK Bag Packaging Equipment Plant is not ISO certified, and currently has no plans to become certified as such.

### 2.5. STONEPAK testing of third-party vendor purchase part items

- 2.5.1. STONEPAK does not conduct testing of equipment manufactured by “third-party” vendors. At STONEPAK discretion, some equipment produced by “third-party” vendors shall be received at the STONEPAK Salt Lake facility for set-up and integration with equipment manufactured by STONEPAK. When that occurs, it is done with the intent of verifying control signals and physical placement of the equipment, not to “test” the equipment.
- 2.5.2. STONEPAK does not conduct tensile tests for the steel used in the fabrication process.



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### 3. Documentation Submission and Approval

#### 3.1. Units of measure

- 3.1.1. English units of measure shall be used as the “Project Standard.” If requested by the Purchaser, any new documents being created for the project will show corresponding metric equivalent units in brackets in addition to the English units. Previously existing STONEPAK documents will use English units only. All documentation provided by STONEPAK shall be in the English language. *Selected standard equipment manuals are also available in Spanish – contact AP sales representative for details.*
- 3.1.2. All drawings created by STONEPAK shall be provided on standard English size paper to include 8 ½”X 11” and 11”X17” paper sizes.
- 3.1.3. The following units of measurement shall be used:
- 3.1.3.1. Gas flow – CFM (Cubit Feet per Minute)
  - 3.1.3.2. Pressure – PSIG (Pounds per Square Inch – Gauge); and also IN H2O (Inches of Water column)
  - 3.1.3.3. Velocity – FPM (Feet Per Minute)
  - 3.1.3.4. Density – LBS/Cu-Ft (Pounds Per Cubit Foot)
  - 3.1.3.5. Volume – Cu-Ft (Cubic feet)
  - 3.1.3.6. Temperature – F (degrees Fahrenheit)

#### 3.2. Typical documentation provided by STONEPAK with an order

- 3.2.1. Where warranted by the application and/or requested by the Purchaser, an equipment installation drawing shall be provided by STONEPAK.
- 3.2.2. Preliminary planning documents
- 3.2.2.1. Within 4 weeks of Purchaser return of approval drawings, a “preliminary planning document” package shall be provided by STONEPAK. The preliminary planning documents are provided as a convenience to the purchaser for initial equipment installation planning purposes. The preliminary planning document package shall, at a minimum, include the following items:
- 3.2.2.1.1. Preliminary electrical layout drawings showing power drop locations, electrical service requirements, and physical locations of the electrical enclosures within the system
  - 3.2.2.1.2. Preliminary electrical interconnect diagrams identifying electrical enclosures and showing purchaser supplied conduit interconnections between electrical enclosures
  - 3.2.2.1.3. Preliminary estimate of the number of purchaser supplied wires required in each of the conduit runs



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- 3.2.2.1.4. Preliminary utility connection diagram showing locations and requirements of purchaser supplied utility connections to include air drops and dust collection points
- 3.2.3. STONEPAK equipment data sheets
- 3.2.4. Equipment Operation and Maintenance manuals for each STONEPAK supplied item of equipment in the order (1 hard copy, 1 electronic copy).
- 3.2.5. One (1) copy of a vendor supplied Equipment Operation and Maintenance manual for any equipment manufactured by a “third-party” vendor being purchased through STONEPAK. Examples of such “third-party” vendors are manufacturers of such items as stretchwrappers, metal detectors, check weighers, etc.
- 3.2.6. STONEPAK System Controls manual
  - 3.2.6.1. If STONEPAK is supplying system controls for an order, a “System Controls” manual shall be prepared and provided at the time of equipment shipment. The documentation in the System Controls manual shall represent the “as-built” status of the equipment at time of shipment. Three (3) paper-based “hardcopies” of the System Controls manual shall be provided. Additionally, one (1) electronic copy of the all documentation included in the System Controls manual (to the greatest extent possible) shall be provided.
  - 3.2.6.2. The System Controls manual shall, at a minimum, include the following items:
    - 3.2.6.2.1. Equipment general arrangement layout drawing with dimensions to allow for physical placement of equipment
    - 3.2.6.2.2. Robot support base detail, if applicable
    - 3.2.6.2.3. Utility connection layout drawing showing physical locations of customer supplied utility connections to include air drop locations and dust collection locations
    - 3.2.6.2.4. Vendor catalog cut sheets pertaining to instruments and devices installed on the equipment
    - 3.2.6.2.5. Electrical schematic drawings pertaining to the custom system controls
    - 3.2.6.2.6. Electrical schematic drawings of individual equipment within the system electronically marked-up to “as-built” status.
    - 3.2.6.2.7. Electrical panel layout drawings pertaining to the System Main Electrical Enclosure and System Operator Control Stations, if applicable
    - 3.2.6.2.8. Enclosure door layout drawings pertaining to the System Main Electrical Enclosure and System Operator Control Stations, if applicable
    - 3.2.6.2.9. Electrical layout drawings showing power drop locations, electrical service requirements, and physical locations of the electrical enclosures within the system
    - 3.2.6.2.10. Electrical interconnect diagrams showing power drop requirements and conduit interconnections between electrical enclosures.



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- 3.2.6.2.11. Wire listing to correspond with the conduit runs identified in the electrical interconnect diagrams
- 3.2.6.2.12. Electrical enclosure pressurization diagrams, if applicable
- 3.2.6.2.13. Listing of recommended spare parts prepared specifically for the order
- 3.2.6.2.14. Ladder logic listing of the Programmable Logic Controller (PLC) code pertaining to System Controls, if applicable

### **3.3. Certified (“as-built”) documentation**

- 3.3.1. Drawings of equipment that are stamped as certified have been verified to be correct only as to the dimensional adherence of the equipment to the physical specifications shown on the drawing. Other factors such as seismic forces are not considered in determining a drawing to be certified. Certification of drawings by a Professional Engineer stamp is not offered by STONEPAK.
- 3.3.2. Any drawings not submitted as certified may be considered preliminary although they may not be marked as such.

### **3.4. Spare parts listing**

- 3.4.1. Upon Purchaser request, a listing of recommended spare parts list prepared specifically for an order will be provided at the time of equipment shipment. If System Controls are purchased from STONEPAK, the custom-prepared spare parts list is automatically included in the system manual. A preliminary typical list of spare parts will be provided upon Purchaser request after receipt of an order for purposes of planning and budgeting.

### **3.5. Documentation that is not available and/or not included with an order**

- 3.5.1. Cross sectional drawings
- 3.5.2. Foundation loading diagrams (except for the robot support base, if applicable)
- 3.5.3. P&ID (Piping and Instrument Diagram)
- 3.5.4. Instrument list
- 3.5.5. Calculation notes
- 3.5.6. Manufacturer’s inspection data report
- 3.5.7. Manufacturer’s acceptance tests
- 3.5.8. Welder performance tests, welder certifications, and welding procedure specifications are not available.
- 3.5.9. Written progress reports will not be issued, and a published manufacturing schedule will not be provided. However, verbal order status updates are available at any time upon Purchaser request.



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## 4. Electrical Design and Construction Requirements

### 4.1. Area classification and hazardous area construction specifications

4.1.1. The area classification rating shall be determined by the “authority having jurisdiction” over the installation as defined by the National Fire Protection Agency (NFPA 496), and shall be as listed in the Data Request Form. If applicable the appropriate STONEPAK hazardous area electrical construction standards document, as approved in writing by the Purchaser, shall be used in conjunction with the requirements of this section in determining appropriate equipment manufacturing specifications for a rated area. In case of conflict between this section and the hazardous area electrical construction standards document, the approved hazardous area document shall prevail.

### 4.2. Power supply

4.2.1. The Purchaser’s available line voltage shall be as listed in the Data Request Form.

4.2.2. STONEPAK equipment control voltage power level shall be 115 VAC single phase and/or 24 VDC, with one side properly grounded and the other side properly fused. In some cases, STONEPAK shall derive the control power from the line voltage power source by use of STONEPAK provided step-down transformer(s) at STONEPAK discretion. In other cases, the Purchaser shall provide the 115 VAC supply required by STONEPAK equipment.

### 4.3. Machine controls

4.3.1. STONEPAK shall provide a means to allow for operation and control of the equipment being provided by STONEPAK. At STONEPAK discretion, machine control shall typically be accomplished by the use of modularized distributed control for the major pieces of packaged equipment and by “System Controls” to integrate the machines together. (*See the Reference Section for a detailed discussion on distributed machine controls*) System Controls shall be customized as necessary to suit the specific requirements of the Purchaser’s application, while the STONEPAK standard machine control logic that has been developed for individual major pieces of equipment shall be supplied as applicable.

4.3.2. As listed below, an Allen Bradley SLC 5/xx series PLC shall be used to provide the major equipment with modularized distributed controls. STONEPAK reserves the right to upgrade PLC processor models at any time without prior notice.

STONEPAK Major Equipment Model/Type	Modularized Distributed Control Standard PLC Processor Model
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STONEPAK Major Equipment Model/Type	Modularized Distributed Control Standard PLC Processor Model
Model 110 AP Palletizer	Allen Bradley SLC 5/03
Model 2000P Sealer	Allen Bradley SLC 5/03
Model 2001P Sealer	Allen Bradley SLC 5/03
Model 2002P Sealer	Allen Bradley SLC 5/03
Model 506 Valve Bag Applicator	Allen Bradley SLC 5/03
Model 507 Valve Bag Applicator	Allen Bradley SLC 5/03
Model 509 Valve Bag Applicator	Allen Bradley SLC 5/03
Model 511 Valve Bag Applicator	Allen Bradley SLC 5/04
Model Clean-Pak	Allen Bradley MicroLogix or SLC 5/03

4.3.3. When STONEPAK is supplying System Controls, such System Controls shall typically include the items listed below. If System Controls are not being purchased from STONEPAK; it is Purchaser's responsibility to interface equipment, guarantee compatibility with existing equipment, and to provide the motor controls for conveyors and other items not controlled by STONEPAK standard equipment.

4.3.3.1. STONEPAK shall provide the engineering to design the controls to accomplish the intended system function. At STONEPAK discretion, means for control shall be accomplished by "hard-wire" relay logic, by pneumatic logic, by a Programmable Logic Controller (PLC), or by the use of a combination of the above control methods. When a PLC is used, STONEPAK shall select and provide an Allen Bradley model PLC with features and sufficient I/O capability to suit the application. *(See the Options Section for PLC model upgrades.)* When a PLC is used, STONEPAK shall provide the ladder-logic programming required to control the equipment provided by STONEPAK.

4.3.3.2. STONEPAK shall provide the System Controls support documentation as detailed in these specifications.

4.3.3.3. STONEPAK shall account for the "handshake" interface of the equipment supplied by STONEPAK to customer supplied discrete signals. Should the Purchaser require a higher level of communication than the use of discrete signals, or require a more extensive signal exchange than the simple "handshake" signals, such protocol must be agreed-to between Purchaser and STONEPAK and be included in the Exceptions sections of this document.

4.3.3.4. STONEPAK shall provide the electrical components to accomplish control of the motors and other output devices within the system. At STONEPAK discretion, those electrical components may include such items as motor starters, fuses, overload heaters, transformers, power supplies, selector switches, pushbuttons, pilot lights, relays, electrical disconnects, non-



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fused terminals, etc. *See the Options Section for upgrade to circuit breakers and fused terminals.*

- 4.3.3.5. STONEPAK shall provide operator control station(s) as required to allow for the equipment to be operated from a convenient location(s). Such control station(s) shall be provided with operator interface devices as necessary to allow for the equipment to be started, stopped and operated.
- 4.3.3.6. STONEPAK shall provide the electrical enclosures to house the control components in accordance with the enclosure rating requirements of these specifications.
- 4.3.3.7. STONEPAK shall provide the equipment supplied by STONEPAK with sufficient sensor devices to generate the input signals required to accomplish the intended function of the system. Such devices may include photo-eyes, proximity switches, limit switches, etc.
- 4.3.3.8. At STONEPAK discretion, “open-loop” communication shall be permitted for PLC input and output commands. *Open-loop communication may be otherwise described as “unilateral” communication or “one-way” communication, and is the opposite of “closed-loop” communication. Open-loop communication does not require the confirmation that an input has been received by the PLC, or that a PLC output has been acknowledged by its targeted device.*

#### 4.4. Conduit system

4.4.1. Following is a listing of electrical conduit and conduit fitting purchased part manufacturers that may be used in supplying an equipment order. STONEPAK reserves the right to select the manufacturer to suit the application and to change suppliers or manufacturers at any time without prior notice. Not all of the products listed will necessarily be provided with every equipment order.

CONDUIT/FITTING TYPE	MANUFACTURER
Conduit hub	Thomas & Betts
Conduit fitting - cast aluminum	Appleton Electric L.E. Mason Co.
Conduit fitting - galvanized cast iron	Appleton Electric Crouse Hinds
Cord grip	Appleton Electric or Killarc
Flexible conduit connector	Thomas & Betts
Flexible metallic conduit	Semcor
Liquid-tight flexible non-metallic conduit	Carlson Carflex



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4.4.2. “Standard” conduit provided with an individual packaged piece of equipment  
(See Options Section for upgrade to “Rigid” conduit system for an individual packaged piece of equipment)

4.4.2.1. At the discretion of STONEPAK, wiring may either be enclosed in liquid-tight flexible non-metallic conduit, or it may be part of a multi-conductor type SO cable. Flexible conduit smaller than 3/8” electrical trade size shall not be used.

4.4.2.2. The liquid-tight flexible non-metallic conduit and the multi-conductor type SO cable shall be routed and physically attached to the frame of the machine by the use of plastic wire tie-wraps as seems reasonable at time of assembly. The routing shall be such that the conduit/cabling is protected from damage from the machine itself, and from damage from an outside source as much as practical. Where type SO cord is used to connect to a cycling machine component, the cord shall be protected from damage by the use of a flexible cable carrier where practical.

4.4.2.3. Where construction is such that wiring must be disconnected for shipment, terminal blocks in accessible enclosure(s) shall be provided at sectional points. Enclosures shall be supported independent of all conduits and shall be rigidly secured in place.

4.4.2.4. Where conduit junctions are required, the use of cast aluminum conduit fittings with gaskets and aluminum covers shall be used. Cast aluminum conduit fitting types, shapes, and sizes shall be selected by STONEPAK to suit the application. Conduit entrances of the fitting bodies shall be threaded. Conduit fitting covers shall be removable and provided with gaskets and corrosion resistant screws.

4.4.2.5. At STONEPAK discretion, the molded electrical cord supplied with some devices shall be routed along the frame of the machine without being enclosed in conduit as seems reasonable at time of assembly. Such devices may include photoeyes, proximity switches, load cells, etc. The cord shall be routed to minimize the possibility of damage to the cord.

4.4.2.6. Where flexible conduit enters an enclosure, a bushing or fitting providing a smoothly rounded insulating surface shall be installed to protect the conductors from abrasion shall be used. An electrical cord-grip style fitting shall be used at the entrance of a device cord or SO cord into an enclosure. Where practical, the conduit/cabling shall enter enclosures through the side or the bottom.

4.4.2.7. As required, STONEPAK shall remove conduit and wire to allow for equipment breakdown for shipping purposes. The conduit that is removed shall be match-marked with the corresponding enclosure entrance opening to simplify its reinstallation. At time of installation, the Purchaser is responsible to reconnect any conduit and wires that may have been removed.



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4.4.2.8. Some of the STONEPAK individual packaged pieces of equipment may be supplied with one or more electrical enclosures shipped “loose” and intended for field installation. In that event, the purchaser is responsible to provide and install the interconnecting conduit and wires between electrical enclosures as identified on the documents provided by STONEPAK.

4.4.3. “Standard” conduit provided with a “system” equipment order (*See the Options Section for upgrade to “Pre-wired System” option.*)

4.4.3.1. Where STONEPAK is supplying a “system” of equipment, STONEPAK shall provide and install conduit and wire on the individual packaged pieces of equipment within the system as detailed in these specifications. However, STONEPAK does not supply the interconnecting conduit and wire between the packaged pieces of equipment within a system as a standard feature. The Purchaser is responsible to provide and install the interconnecting conduit and wires between the various electrical enclosures of the equipment within a system as identified on the documents provided by STONEPAK. STONEPAK is willing to provide inter-connect pre-wire to suit the job.

#### 4.5. Wiring

4.5.1. Wherever possible, STONEPAK shall provide and install all wiring between the electrical enclosures on the individual packaged pieces of equipment. The wires shall be run continuously between the electrical enclosures with no splices allowed in the wiring between the enclosures. At time of installation, the Purchaser will be required to reconnect any wires that may have been removed or disconnected for shipping purposes.

4.5.2. All STONEPAK supplied wiring to which external connections must be made shall be brought to terminal strips and labeled for Purchaser field wiring. The terminal strips shall be mounted in enclosure(s) having a minimum rating of NEMA 12.

4.5.3. Wires provided by STONEPAK shall be marked with adhesive-type wrap-around wire markers. (*See the Options Section for upgrade to sleeve-type heat-shrinkable tubular plastic wire markers.*) All wires that terminate in a different enclosure than where they originate shall be marked at each end of the wire. The wire designation at each end of the wire shall match the labeling of the terminal to which the wire is connected. At STONEPAK discretion, wires of short length that are totally enclosed within a single enclosure may not be marked at both ends if the terminals to which such wires attach are obvious, readily accessible, and the wire routing is clearly visible throughout its entire length. Examples of such wires include jumper wires and motor-starter branch circuit wires.



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- 4.5.4. Wires of dissimilar voltage levels shall not be permitted in the same conduit except in the case of the thermal switch wires (“J” wires”) connected to explosion-proof motors, if applicable. Wires of dissimilar voltage levels shall be permitted within the same electrical enclosure; however, such wiring shall be kept separated to the greatest extent possible.
- 4.5.5. Any control wire conduit that runs between any pair of enclosures that can readily accommodate terminals shall have a minimum of 2 spare wires pulled, or 10% of the total number of wires, whichever is greater.
- 4.5.6. Machine Tool Wire (MTW) shall be used in the internal wiring of the electrical enclosures and in conduit runs within the framework of a machine that are considered to be an integral part of a machine. MTW shall also be used in conduit that is external to a machine that requires the electrical connection to be flexible such as in a repetitive-motion cycling application. When such flexibility is not required at a conduit connection, THHN nylon-jacketed-insulation wire shall be used in the conduit that is external a machine. Conductors shall be stranded.
- 4.5.7. Motor leads shall be sized according to the National Electric Code but no less than #12 AWG wire.



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4.5.8. Single conductors shall conform to the following color code:

WIRE COLOR	WIRE TYPE
White	Neutral
Green, or Green with yellow trace	Ground
Black	Line voltage wiring
Red	115 VAC control wiring
Red	115 VAC PLC output
Red	115 VAC PLC input
Orange	230 VAC control wiring
Dark Blue	24 VDC wiring (500 series numbering)
Gray	24 VDC return wiring (600 series numbering)
Light Blue	Intrinsically safe wiring (700 series numbering)
Yellow	Interface signal wiring

#### 4.6. Enclosures

- 4.6.1. As a minimum, electrical enclosures shall be provided with a NEMA 12 rating with the following exceptions, where applicable: (*See Options Section for upgrade to NEMA 4 electrical enclosures*)
- 4.6.1.1. The “front enclosure” operator control station of the Model 770 GWC packer is a proprietary in-house fabricated enclosure. While it is built to be as “dust-tight” as possible, it does not carry a formal enclosure rating.
- 4.6.1.2. The power-conditioning transformer that is supplied with the Model 770 GWC packer is manufactured by Sola/Hevi-Duty. The transformer has only a NEMA type 1 rating because its housing is constructed of a perforated sheet-metal fabrication to allow for heat dissipation. Accordingly, STONEPAK recommends that the Sola transformers be located in a clean/safe area – typically away from the packaging area.
- 4.6.1.3. Some of the STONEPAK supplied ultrasonic valve sealing equipment is provided with a step-down voltage transformer. The transformer is of a potted open-style construction with a NEMA type 3R rating. Accordingly, STONEPAK recommends that the step-down transformers be located in a clean/safe area – typically away from the packaging area.
- 4.6.2. To minimize condensation build-up, desiccant packets manufactured by Cortec Corporation (or STONEPAK substituted equal) shall be installed in all electrical enclosures prior to shipment.



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#### 4.7. Marking of electrical enclosures and components

##### 4.7.1. Main electrical enclosure nameplate

4.7.1.1. Each electrical enclosure that will be serviced with a line-voltage power supply drop shall be provided with a permanent identification nameplate. The nameplate shall be attached to the enclosure so as to be plainly visible after installation. The nameplate shall list the serial number, supply voltage, phase, frequency, and supply current required. A reference to the applicable electrical drawing shall be provided. Where more than one incoming source of electrical power is provided to the enclosure, the nameplate shall so state. The supply current shown on the nameplate shall not be less than the full-load currents for all motors and other equipment that can be in operation at the same time under normal conditions of use. The following format shall be used as a template for a main electrical enclosure nameplate:

BAG PACKAGING CONVEYORS SYSTEM CONTROLS  
MAIN ELECTRICAL ENCLOSURE

MANUFACTURED BY: STONEPAK  
BAG PACKAGING EQUIPMENT

FOR: PURCHASER NAME  
PURCHASER LOCATION

MODEL: SYSTEM SERIAL #XXXXXXX  
SHIPPED: SHIP DATE

VOLTS: XXX PHASE: X HERTZ: XX AMPS: XX

INSTALL PER STONEPAK ELECTRICAL RECONNECT DRAWING XXXXXX-X

CAUTION! MORE THAN ONE SOURCE OF ELECTRICAL SUPPLY TO  
ENCLOSURE. REFER TO WIRING DIAGRAM.

##### 4.7.2. Secondary electrical enclosure nameplate

4.7.2.1. A permanent identification nameplate shall be attached to each electrical enclosure that does not receive a line-voltage power supply drop. Examples of such secondary enclosures include electrical junction boxes and some operator control stations. All secondary electrical enclosure designations shall match the corresponding electrical drawings. The following format shall be used as a typical template for a secondary electrical enclosure nameplate:



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OPERATOR  
CONTROL STATION 1

4.7.3. Control panel devices and components identification

4.7.3.1. All control panel devices and components shall be plainly identified with the same designation as shown on the electrical drawings. This identification shall be adjacent to (not on) the device or component. The following format shall be used as a typical identification template for a device or component:

PANEL DEVICES	IDENTIFICATION TAG
MAIN DISCONNECT	DS106 – 30 AMPS FU106, FRS-30
CONTROL TRANSFORMER	T172, 500VA
CONTROL TRANSFORMER PRIMARY	FU169, FNQ-R-3 2/10
CONTROL TRANSFORMER PRIMARY	FU171, FNQ-R-3 2/10
CONTROL TRANSFORMER SECONDARY	FU175, FNM-7

4.7.4. Identification of devices located external to control panel

4.7.4.1. All devices located external to the control panel(s) shall be identified with the same designation as shown on the electrical drawings. This identification shall be adjacent to (not on) the device. The following format shall be used as a typical identification template for an external located device:

PANEL DEVICES	IDENTIFICATION TAG
FLATTENER CONVEYOR PE	PE216
TRANSPORT CONV. DRIVE MOTOR	MTR213
SS DISPENSER VACUUM CUPS DOWN PROX	PX325
SS DISPENSER VACUUM ON SOL	SOL530

**4.8. Grounding**

4.8.1. When a machine that is manufactured by STONEPAK requires an electrical power source, the grounding terminal of the main electrical enclosure of the equipment shall also serve as the grounding terminal for the equipment itself. At STONEPAK discretion, the continuity of the grounding circuit shall be accomplished by connections through conductors or machine structural members. At STONEPAK discretion, the equipment grounding terminal shall be identified with the marking EQUIP. GRD., or by use of the universal grounding symbol, or by coloring the terminal GREEN.



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#### 4.9. Standard electrical purchased components

4.9.1. Following is a listing of electrical device purchased part manufacturers that may be used in supplying an equipment order. STONEPAK reserves the right to select the device manufacturer to suit the application and to change suppliers or manufacturers of standard components at any time without prior notice. Not all of the devices listed will necessarily be provided with every equipment order.

DEVICE TYPE	MANUFACTURER
Alarm horn/ alarm light	Federal Signal
Brake – electric	See mechanical components section
Circuit breaker	Allen Bradley Cutler Hammer
Communication cable	Belden Alpha
Conduit sealing plug	Crouse-Hinds
Disconnect - electrical	Allen-Bradley
Enclosure - electrical	Hoffman
Fuse	Bussman
Fuse block adapter	Allen Bradley or Bussman
Interface – Data Highway Plus	Allen Bradley
Interface – DeviceNet	Allen Bradley
Interface - Flex I/O	Allen Bradley
Interface - Remote I/O	Allen Bradley
Intrinsic-safe barrier	Pepperl+Fuchs Banner Crouse-Hinds R. Stahl Inc.
Limit switch	Allen Bradley Micro Switch
Load cell	Revere Transducers HBM, Inc. Flexweigh
Motherboard – Pentium CPU (GWC)	Axiom Technology
Monitor - GWC	IEB
Motor disconnect - remote	Hubbell
Motor starter	Allen-Bradley
Motor starter overload heater	Allen Bradley
Proximity switch	Pepperl+Fuchs



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**EQUIPMENT  
MANUFACTURING  
SPECIFICATIONS**

• Latest Document Revision April 2, 2009•

Purchaser  
Project #  
Date 05/15/09  
Printed  
Page Page 26 of 50

DEVICE TYPE	MANUFACTURER
	Effector
Photoeye	Banner Allen Bradley Telco
Pilot light	Allen-Bradley
Pressure switch	Dwyer Barksdale
Programmable Logic Controller	Allen-Bradley
Pushbutton	Allen-Bradley
Pushbutton - emergency stop	Allen-Bradley
Relay	Allen Bradley Potter & Brumfield
Temperature switch - enclosure	Hoffman
Terminal block	Entrelec or Wago
Terminal block - fused	Allen Bradley
Torque controller	Allen Bradley
Touch-screen Operator Interface Terminal	Cutler Hammer or Allen Bradley
Transformer – AC control voltage step-down	Micron
Transformer - DC voltage power supply	Idec
Transformer – DC (GWC front enclosure)	Startech
Transformer – DC (GWC rear enclosure)	Power One or Condor
Transformer - main electrical power supply step-down	Acme General Electric
Transformer - power conditioning	Sola/Hevi-Duty
Ultrasonic components	Branson
Variable frequency drive controller	Allen Bradley T.B. Woods
Wire label – adhesive type	Thomas & Betts
Wire label - heat-shrink type	Brady
Wireway	Panduit



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## 5. Structural Design and Construction Requirements

### 5.1. Materials of fabrication

#### 5.1.1. Structural components (non-product contacting surfaces)

5.1.1.1. Equipment structural components shall be fabricated from standard, commercially available, carbon steel shapes conforming to English gauge dimensions. At STONEPAK discretion, such shapes may include angles, bar stock, sheet, channels, plate, tubing, etc.

#### 5.1.2. Product contact surface material of construction

5.1.2.1. "Mild steel" product contact surface materials of construction shall be used as AP's standard offering. (*See Options Section for upgrade to Stainless Steel product contact surface construction.*) Where the term "product contact surface" is used, it shall make reference to the equipment components that can come in contact with the bulk product prior to it being packaged in a bag, and not to the components that can contact the bag itself. (*See the Reference Section for an item-by-item breakdown of the packaging equipment "mild steel" construction materials that have a possibility of coming into contact with the product.*)

### 5.2. Standard welding procedures

#### 5.2.1. Welding processes used

At STONEPAK discretion, the Metallic Inert Gas (M.I.G.) welding process shall be used for the fabrication of equipment. The Tungsten Inert Gas (T.I.G.) welding process shall be used on intricate stainless steel parts such as bag filling tubes.

#### 5.2.2. Continuous welds/ skip welds

Welds on the external seams of product chambers shall be continuous. Welding of the internal seams of chamber product contact surfaces shall not be provided as a standard procedure. (*See the Options Section for upgrade to internal welds on product contact surfaces.*) At STONEPAK discretion, welds on the equipment structural steel members may not be continuous to help reduce heat distortion to the frame members.

#### 5.2.3. Grinding/ polishing

Grinding on the welds of the external seams of product chambers shall be very minimal to lightly remove the weld "high spots". The bulk of such welds shall be permitted to remain to help prevent product from seeping through the seams in the material. Light hand grinding of the welds of the equipment structural steel members shall be performed where required to allow the parts to assemble properly. The bulk of the equipment structural welds shall be permitted to remain to help provide strength to the machine component. The surface finish of the product



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contact material shall be as supplied by its vendor. Polishing, or otherwise enhancing the material surface finish quality, shall not be provided by STONEPAK as a standard procedure.

5.2.4. Welding of mild steel to stainless steel

The welding of mild steel to a stainless steel surface shall be permitted in the construction of product bins, hoppers and chambers where the product contact surface is stainless steel and the bin external members are of mild steel. The mild steel members may include such external items as structural bin-support components, chamber hinge brackets, and mating flanges. Where mild steel is welded to stainless steel, a stainless steel welding filler wire suitable for dissimilar materials shall be used. Where mild steel is welded to stainless steel, the part shall be constructed such that the mild steel member will not come into contact with the product. In the case that it not possible to prevent the product from contacting the mild steel member, the affected member shall be upgraded to the same type stainless steel as the base material.

### 5.3. Surface preparation and painting

5.3.1. Internal surfaces

Internal product contact surfaces shall be cleaned to be visibly free of dirt, moisture, scale, oil and weld slag prior to shipment. If required, such cleaning shall consist of mechanical wire brushing and of manually wiping the internal surfaces with solvent. Internal product contact surfaces shall not be painted or otherwise coated.

5.3.2. Painting of external surfaces. (*See the Options Section for alternative color and surface preparation procedures.*)

5.3.2.1. Paint shall be applied to external equipment surfaces, whether constructed of mild steel or aluminum. Most stainless steel surfaces will be bead blasted and unpainted. No shop painting shall be applied to shafts, sprockets, gears, instruments, fasteners, fittings, brass, bronze, threaded connections, hose, interconnecting conduit, or to any nameplate. Electrical enclosures that are obtained from outside vendors shall be provided with the standard surface treatment as supplied by their manufacturers. Additional painting of the electrical enclosures that are obtained from outside vendors shall not be provided by STONEPAK as a standard procedure.

5.3.2.2. External surfaces shall be cleaned to be visibly free of dirt, moisture, scale, oil and weld slag prior to painting. As required, such cleaning shall consist of mechanical wire brushing, power sanding, and manually wiping the internal surfaces with solvent.

5.3.2.3. External surfaces shall be painted with Steel It Primer (#4210).



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- 5.3.2.4. The external fabricated surfaces of STONEPAK equipment shall be painted with one coat Steel It, lead free, Epoxy, high quality, industrial paint (#4907).
- 5.3.2.5. All painted parts and equipment shall be processed through a forced air paint bake system.
- 5.3.3. Unless otherwise stated in these specifications, the equipment being produced by third-party vendors shall be painted with the standard colors offered by those vendors.

#### **5.4. Pneumatic control**

- 5.4.1. The equipment supplied by STONEPAK shall be designed to operate optimally at an 80 psig supply air pressure and all equipment packaging rate performance guarantees are made on that basis. *(In actual practice, STONEPAK equipment functions to a minimum of 60 psig air supply with negligible adverse effects under most conditions.)*
- 5.4.2. STONEPAK equipment that requires a high-pressure air supply shall be supplied with an air filter/regulator by STONEPAK. STONEPAK shall also supply a means to shut-off and lockout the air supply at each high-pressure air drop connection location.
- 5.4.3. At STONEPAK discretion high-pressure control air piping shall be accomplished by the use of one or more of the following: rubber air hose, polyethylene tubing, copper tubing, galvanized pipe, or other.
- 5.4.4. All pneumatic cylinders shall be provided with rod wipers. At STONEPAK discretion, pneumatic cylinders shall be provided with cushions on both ends where warranted by the application.

#### **5.5. Lubrication**

- 5.5.1. Low-pressure air blowers shall be assembled by STONEPAK and shipped without lubrication. Prior to operating the blowers, the Purchaser shall provide and install the blower lubrication oil as required to suit the ambient operating conditions.
- 5.5.2. Other than the Morse brand, all other makes of gear reducers shipped with STONEPAK equipment are pre-lubricated by their respective manufacturers. The Morse brand gear reducers shall be lubricated by STONEPAK prior to shipment. *(The lubrication oil currently used in the Boston brand reducers is a Mobil Oil product Mobilgear 636 Industrial Gear Oil ISO VG 680 – subject to change without prior notice.)* Gear reducers, other than the Morse brand, shall be shipped from STONEPAK as they are received with the lubrication oil provided by their manufacturers.



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5.5.3. Purchased bearings shipped with STONEPAK equipment are pre-lubricated by their respective manufacturers. Re-lubrication, or additional lubrication, of purchased bearings shall not be provided by STONEPAK as a standard procedure. At STONEPAK discretion, the bushings of some components that are manufactured by STONEPAK shall be lubricated at time of assembly. *(The lubrication grease currently used in the bushings of some STONEPAK fabricated assemblies is Chevron Multi-purpose Dura-lith Grease EP NLGI2 – subject to change without prior notice.)*

5.5.4. Any special lubricant products or lubrication procedures required by the Purchaser other than STONEPAK standard will incur an additional charge.

### 5.6. Standard mechanical purchased components

5.6.1. Following is a listing of the manufacturers of various mechanical purchased parts that may be used in supplying an equipment order. STONEPAK reserves the right to select the vendor to suit the application and to change suppliers or manufacturers of purchased components at any time without prior notice. Not all of the items listed will necessarily be provided with every equipment order.

MECHANICAL PURCHASED PART	MANUFACTURER
Air filter/regulator	Norgren
Air hose	Gates
Air polyethylene tubing	Nycoil
Bearing - pillow-block & flange mount	Sealmaster Dodge Morse MB Manufacturing Miller
Bearing - conveyor idler roller	Miller
Bearing - linear	Thompson
Blower	Roots or Fuji
Brake – electric	Warner Dings
Brake – pneumatic	Horton
Bushing	Boston Thompson
Camroll	Osborn
Clutch – pneumatic	Horton
Conveyor belting – acetal	Rexnord



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84116 U.S.A.

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☎ 801 363-7830  
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## EQUIPMENT MANUFACTURING SPECIFICATIONS

• Latest Document Revision April 2, 2009 •

Purchaser  
Project #  
Date 05/15/09  
Printed  
Page Page 31 of 50

MECHANICAL PURCHASED PART	MANUFACTURER
Conveyor belting – rubber/PVC	Thermoid Chemprene
Conveyor belting – wire mesh	Ashworth Cambridge, Inc.
Cylinder – air	Springville Numatics Miller
Cylinder – hydraulic	Miller
Cylinder – rodless air	Numatics Origa
Gear reducer	SEW Eurodrive Boston
Hydraulic cylinder	Miller
Inflatable air boot	Firestone
Lubrication fitting	Zerck
Pneumatic shock dampener	Enidine
Pressure gauge	Norgren Marsh
Pump - hydraulic	Webster Fluid Power
Rack and pinion gear	Dodge Boston
Roller chain	Morse
Shaft coupling	Rexnord or Lovejoy
Sprocket	Browning Dodge Martin Morse
Valve – air piloted control	Numatics Humphrey
Valve – air flow control	Pneu-Trol
Valve – manual, gate	Milwaukee Valve
Valve – pinch type	Red Valve
Valve – solenoid, air	Numatic Skinner Valve Humphrey



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## 6. Shipping Arrangements and Procedures

### 6.1. Disassembly, crating, corrosion protection

6.1.1. Equipment shall be shipped assembled to the greatest extent possible. Where clearances require partial disassembly for shipping purposes, the components that are removed shall be match-marked to facilitate re-assembly. (See the Reference Section for a listing of estimated crate shipping weights and dimensions.)

6.1.2. All equipment produced by STONEPAK that is to be shipped to destinations in the continental U.S., Mexico, and Canada shall be crated and stretch-wrapped prior to shipment. (See the Options Section for optional export crating and optional container shipment.) Equipment crating shall be constructed to allow the crate to be offloaded from the carrier and handled with a fork truck. Such crating shall be sufficient for short-term indoor storage and for protection of the equipment for domestic shipments when the load is adequately tarped during transportation. The Purchaser shall be responsible to provide protection from the effects of weather damage and condensation if the equipment is to be stored for extended periods, particularly if stored outdoors.

**STONEPAK does not recommend that electrical and electronic components be stored outdoors due to potential for damage from condensation build-up; even when covered from the elements. STONEPAK's equipment warranty will not cover damage to electrical and electronic components that have been stored outdoors.**

6.1.3. Mild steel equipment components that are not normally painted shall be sprayed with a rust inhibitor prior to shipment. Such components may include shafts, sprockets, rack and pinion gears, etc. Internal product contact surfaces shall not be coated with rust inhibitor, or any other type of coating.

**6.2. Equipment serial number tagging** (See the Electrical Section of this document for tagging of electrical enclosures and components. See the Options Section for optional Purchaser-designated Equipment Identification Number Tagging.)

6.2.1. Each item of equipment supplied by STONEPAK shall be furnished with an aluminum nameplate permanently affixed to the equipment in a readily accessible and visible location. In addition to the STONEPAK name being included on the nameplate as the manufacturer, the nameplate shall also list the model number and serial number of the equipment. The required markings shall be inscribed on the tag by one or more of the following methods: etching, stamping, engraving, or printing by a mechanical means. The following format shall be used as a typical template for an equipment serial number tag:



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**STONEPAK**

Model XXXXXXXX  
Serial XXXXXXXX

6.1.1. Equipment supplied by “third-party” vendors shall be furnished with the standard tagging offered by those manufacturers.

**6.3. Shipping documentation for domestic shipments** (*See the Options Section for documentation provided for foreign shipments.*)

6.3.1. Each crate shall be marked with the Purchaser’s name, Purchase Order number, Purchaser’s delivery address, and STONEPAK’s serial number(s) of the equipment in the crate. A complete packing list showing all of the equipment in the shipment shall be attached to one of the crates. A Bill of Lading pertaining to each load of the shipment shall be prepared. A copy of the Bill of Lading pertaining to each load shall be provided to the driver of that load and a copy of all of the Bills of Lading in the shipment shall be faxed to the Purchaser.



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## **7. Equipment Installation, Start-Up, Training, Performance Acceptance**

### **7.1. Equipment installation**

7.1.1. Equipment installation shall be considered an “Extra Service” as defined by STONEPAK Conditions of Sale and is not included as part of an equipment quotation unless it is specifically noted in the quotation. STONEPAK can provide a supervisor to assist with the installation of the equipment at Purchaser request and expense.

### **7.2. Equipment start-up (commissioning)**

7.2.1. Equipment start-up assistance shall be considered an “Extra Service” as defined by STONEPAK Conditions of Sale and is not included as part of an equipment quotation unless it is specifically noted in the quotation. Any quotation provided by STONEPAK for equipment start-up services shall be subject to the following conditions:

7.2.1.1. Prior to the arrival of the STONEPAK start-up technician(s), the equipment being commissioned shall be completely installed per instructions and documentation provided by STONEPAK. A complete installation includes mechanical placement of the equipment, electrical connections and connections to the product supply, high-pressure air, and dust collection system as applicable.

7.2.1.2. The packaging area in which the equipment being commissioned is located shall be free of all construction activity, supplies and workers. All overhead construction work shall either be completed, or at a minimum shall not be conducted concurrent with the equipment start-up.

7.2.1.3. Purchaser shall provide at least one company representative to be dedicated exclusively to the start-up effort. That representative shall serve as the STONEPAK prime point of contact during equipment commissioning.

7.2.1.4. Purchaser shall provide final, real, actual product to the equipment being commissioned within 24 hours of STONEPAK request.

7.2.2. Equipment start-up assistance of equipment supplied by a “third-party” manufacturer shall be considered an “Extra Service” as defined by STONEPAK Conditions of Sale and is not included in an equipment quotation unless it is specifically noted in the quotation.

Some “third-party” manufacturers require that their machine start-up services be performed by one of their factory-authorized technicians in order for their warranty



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to be valid. Such is typically the case with stretchwrappers. STONEPAK is not recognized as a factory authorized service center for any third party manufacturer, and is unable to perform authorized start-up services where such services are required.

### 7.3. Training

- 7.3.1. Operator training shall be considered an “Extra Service” as defined by STONEPAK Conditions of Sale and is not included in an equipment quotation unless such training is specifically noted in the quotation.
- 7.3.2. An informal “hands-on” operator orientation to familiarize Purchaser personnel with basic operation of the equipment shall be included as part of STONEPAK equipment start-up services when such services are purchased.
- 7.3.3. Formal in-depth operation, maintenance, and trouble-shooting training classes are offered for any equipment purchased from STONEPAK. The agenda of the formal training courses is custom-tailored to a Purchaser’s specific requirements, and shall be quoted upon request.

### 7.4. Equipment performance expectation, acceptance, and guarantee

- 7.4.1. Any formal written equipment Performance Guarantee, or informal expectation of performance, shall be subject to the following conditions and understandings:
  - 7.4.1.1. The equipment must be properly installed.
  - 7.4.1.2. The equipment must be properly maintained.
  - 7.4.1.3. The equipment must be properly operated.
  - 7.4.1.4. The bags must be properly sized and manufactured. The bags must not overfilled, “stuffed”, or under-filled.
  - 7.4.1.5. The product must be consistent and free of lumps.
  - 7.4.1.6. An adequate product supply and a consistent product level must be maintained above the packer.
  - 7.4.1.7. An adequate supply of clean, dry air at 80 psig (minimum) must be available to the equipment.
  - 7.4.1.8. The operators and technical staff must be properly trained on the equipment.
  - 7.4.1.9. Unless otherwise stated, the weight-range accuracy expectation of filled bags shall be determined on an individual packer basis at two standard deviations from the average weight of bags filled on that packer.  
*(As an example, an expected weight accuracy of 4 ounces would indicate (statistically) that 95% of the bags filled on a given packer would weigh within +/- 4 ounces of the average bag weight on that packer.)*
  - 7.4.1.10. Unless otherwise stated, all rates are considered to be “instantaneous”, indicating an optimum machine rate. *(Many equipment users plan on a 60-80% utilization factor to allow for interruptions in the product supply, product changeovers, operator breaks, and other basic plant inefficiencies.*



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*Actual long-term production will always be lower than the instantaneous machine rate.)*

7.4.1.11. In the event that the Purchaser retains a portion of the purchase price pending a satisfactory equipment performance test, the amount being retained shall not exceed 10% of the purchase price. Unless otherwise stated, the Purchaser shall not withhold such retainer for more than 90 days from the date of shipment should the performance test not be conducted due to factors outside of STONEPAK control.

7.4.2. When a formal equipment Performance Guarantee is required by the Purchaser, it shall be created on an order-by-order basis to suit the particular conditions of the application. The details of such Performance Guarantee shall be discussed and agreed-to in writing between STONEPAK and Purchaser and be included with these Equipment Manufacturing Specifications. When a formal Performance Guarantee has been created for a specific equipment order, it shall serve as the sole document in determining that the equipment has met its performance expectations.

7.4.3. When a formal Performance Guarantee has not been created for a specific equipment order, STONEPAK shall consider that such equipment has met its performance expectations when the “quantifiable” parameters listed in the Data Request Form are satisfied. Quantifiable parameters shall be defined as expectations that can be measured, counted, weighed, timed, etc. to arrive at value that can be compared with a desired target. Examples of quantifiable parameters may include bags per minute, filled bag weight, etc.

7.4.4. Performance characteristics that are not quantified are subject to the interpretation of an individual observer and may include such intangible items such as dusting, cleanliness, appearance, etc. Should such items become a problem - STONEPAK shall work with Purchaser, at Purchaser request, to find technically feasible solutions to them. The cost of implementing any solution shall remain the responsibility of the Purchaser.

## **7.5. Warranty and corrective work (repair)**

7.5.1. STONEPAK warranty responsibility and corrective work repair procedure shall be administered as detailed in STONEPAK’s Conditions of Sale.



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## 8. Exceptions

This Exceptions Section includes a listing of special manufacturing specifications required by the Purchaser that are different from STONEPAK's standard offering. Where an order requirement listed in the Exceptions Section conflicts with the standards listed elsewhere in these Equipment Manufacturing Specifications, the wording in the Exceptions Section shall prevail. In the case that a manufacturing requirement that has not been previously quoted is to be included into the Exceptions Section, STONEPAK reserves the right to adjust any pricing and delivery quotations accordingly.

8.1. Space reserved.



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## 9. Reference – (supplemental information)

This Reference Section is provided as a supplement to the Equipment Construction Specifications.

### 9.1. STONEPAK quality control

STONEPAK quality control consists of multiple levels and types of inspection as part of a process that is both flexible and functional in a custom engineered equipment environment. The final inspection is a formal procedure, while the inspections that occur during the production phase are conducted informally. Following are the details of that process that are typical for a large system equipment order:

#### 9.1.1. Production phase informal inspection process

##### 9.1.1.1. Fabrication shop & machine shop self inspection:

Each fabricator and machinist is expected to self-inspect each part that they produce for conformance to the details of the fabrication drawing. Each fabricator and machinist has the authority to stop the job to question a design requirement and/or to suggest a more effective design alternative.

##### 9.1.1.2. Assembly floor personnel self inspection:

Each assembler has the responsibility of inspecting each part being incorporated into the assembly for proper fit. Each has the authority to stop the assembly process and to return a defective part to the machine shop, fabrication shop, or to return a purchased part to a supplying vendor as may be required for corrective action.

*STONEPAK is in the fortunate position of having skilled production floor personnel, many of whom have several years of service with this company in this industry. Many of them are literally the world's leading authorities on producing the type of specialized equipment manufactured by STONEPAK. They understand the intended end-use of the equipment, and are able to provide very efficient and effective hands-on quality control.*

#### 9.1.2. Final inspection and formal sign-off process

Formal final inspection of the completed equipment is made prior to shipment. The equipment is “dry-cycled” and inspected for correctness, completeness, functionality, and adherence to equipment specifications. Multiple departments representing various disciplines inspect, and sign-off that the equipment meets intended requirements:

##### 9.1.2.1. The Production Department inspects and signs-off that order production is complete.



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- 9.1.2.2. Applications Engineering inspects and signs-off that the equipment is complete as ordered including Purchaser required options as listed in the Exceptions Section of this document.
- 9.1.2.3. Design Engineering inspects and signs-off that the individual pieces of equipment in an order conform to design requirements.
- 9.1.2.4. Systems Engineering inspects and signs-off that the overall system of equipment operates as expected to meet Purchaser requirements listed in the Data Request Form. During their inspection, Systems verifies that the as-built documentation is completed and that Purchaser specified custom order requirements are included.
- 9.1.2.5. The Service Department inspects and signs-off that the equipment cycles as expected. Service also tries to anticipate unforeseen equipment installation and maintenance issues to allow them to be corrected prior to shipment.

## 9.2. “Mild steel product contact surface” materials

Following is a listing of packaging equipment components that may be used in supplying an equipment order conforming to “mild steel product contact surface” materials of construction requirements. STONEPAK reserves the right to substitute the materials of construction listed at any time without prior notice. Not all of the products listed will necessarily be provided with every equipment order.

EQUIPMENT COMPONENT		MATERIAL OF CONSTRUCTION	
<b>Surge bin</b>	• Bin walls/ cover	Mild steel	
	• Bin level indicator diaphragm	Neoprene	
	• Cover gasket	White FDA BUNA 65	
<b>Transition hopper</b>	• Hopper walls	Mild steel	
	• Hopper flange	Mild steel	
	• Gasket for flange	White FDA BUNA 65	
	• Hopper sightglass	Lexan	
	• Gasket for sightglass	White FDA BUNA 65	
<b>Packer</b>	Product inlet	White neoprene with tire cord fabric	
		• Packer top-hat	Mild steel
		• Feedgate valve body	Malleable iron



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• Latest Document Revision April 2, 2009 •

Purchaser  
Project #  
Date 05/15/09  
Printed  
Page Page 40 of 50

EQUIPMENT COMPONENT		MATERIAL OF CONSTRUCTION
	• Feedgate valve seat	Hycar, BUNA-N or EPDM
	• Feedgate valve disc	Malleable iron or Stainless steel
	• Feedgate valve shaft	Mild steel
	• Feedgate valve bushings	Luberized bronze
Packer chamber	• Packer upper chamber	Mild steel
	• Three-way valve gasket	White FDA BUNA 65
	• Sight glass cover	Acrylic
	• Sight glass cover gasket	White FDA BUNA 65
	• Packer spacer chamber	Mild or Stainless steel
	• Packer lower chamber	Mild or Stainless steel
	• Chamber pressure probe	Polyethelene
	• Chamber pressure probe piping	Mild steel (or stainless steel or brass)
	• Packer chamber gasket	White FDA BUNA 65
Filling components	• Chamber nozzle gasket	White FDA BUNA 65
	• Chamber nozzle	Cast steel housing with mild steel tubing
	• Product pinch tube	Natural tan rubber
	• Isolation bracket insert tube	304 Stainless Steel
	• Isolation tube	Natural rubber with 304 Stainless Steel
	• Inflatable sealer	Natural SBR
	• Filling tube	304 Stainless Steel
Air handling components	• Packer air pad	White neoprene with solid woven cotton belt
	• Disseminator sock	Polypropylene or cellulose
	• Disseminator air piping	Galvanized mild steel (or stainless steel)



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EQUIPMENT COMPONENT		MATERIAL OF CONSTRUCTION
	• Disseminator air inlet gasket	White FDA BUNA 65
Chamber separate timed exhaust	• Butterfly valve body	Malleable iron
	• Butterfly valve seat	Hycar
	• Butterfly valve shaft	Mild steel
	• Butterfly valve gasket	White FDA BUNA 65
	• Butterfly valve disc	Malleable iron or Stainless steel
	• Butterfly valve top-hat	Mild steel or Stainless steel product contact
	• Butterfly valve bushings	Brass
	• Pinch valve bladder	Food Grade Neoprene
Dust collection	• Filling tube cowl	ABS
	• Dust spout	Mild steel
	• Dust spout gasket	White FDA BUNA 65
	• Packer frame dust collector	Mild steel
	• Dust collector transition gasket	White FDA BUNA 65
	• Dust collector transition piece	Mild steel or Stainless steel

### 9.3. Explanation of STONEPAK method of providing distributed modularized controls for major pieces of packaged equipment:

STONEPAK designs and builds each major piece of packaged equipment to be an engineered stand-alone module. The engineered module concept allows for a piece of equipment to be provided as an individual machine, and also to be easily assembled as part of a custom system. A modular design not only encompasses the physical structure of a piece of equipment, but also includes its integrated machine controls as follows:

- A piece of equipment that has distributed modularized controls will include a dedicated Programmable Logic Controller (PLC) to allow for the control and operation of that machine. A large system of equipment provided by STONEPAK will likely include several machines that each have their own independent controls.



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- A piece of equipment that has distributed modularized controls will include a standard PLC program developed by STONEPAK to control and operate that machine.

The advantage of distributed modularized equipment controls is that it allows equipment to be produced with a reasonable price and delivery time. Standard machines with distributed controls are more easily supported by the STONEPAK Service Department, and they can be more easily upgraded should factory machine improvements occur. A disadvantage of modularized equipment controls is that they may not readily adapt to a plant-wide master supervisory control scheme that a Purchaser may intend to use.

All standard equipment list pricing and lead-time quotations for equipment supplied by STONEPAK are made on the basis that the major pieces of equipment will be provided with distributed machine controls. Should modularized distributed machine control not be acceptable to the Purchaser, an alternative machine control method must be agreed-to between STONEPAK and Purchaser and be included in the Exceptions section of this document. If an alternative approach is implemented, STONEPAK reserves the right to adjust any pricing and delivery quotations accordingly.

#### **9.4. Explanation of STONEPAK method of concurrent design/build**

STONEPAK operates on the concept of concurrent design/build. Because this approach is different from traditional pre-engineered methods of producing custom-engineered equipment, it is important that both STONEPAK and the Purchaser understand its advantages and limitations.

Concurrent design/build allows the production floor to build the standard portion of the order while the engineering departments work on the custom non-standard portions of the same order. The advantage of concurrent design/build is that, if managed properly, it can be a very efficient method of operation – allowing for custom equipment to be produced with a reasonable price and delivery time. The limitation of concurrent design/build is that completed engineering support documentation for an order is typically not finalized until approximately the same time that the equipment is ready for shipment.

All equipment pricing and lead-time quotations for equipment supplied by STONEPAK are based on the concurrent design/build approach. Should the concurrent design/build method not be acceptable to the Purchaser, an alternative manufacturing approach must be agreed-to between STONEPAK and Purchaser and included in the Exceptions section of this document. If an alternative to the concurrent design/build manufacturing approach is implemented, STONEPAK reserves the right to adjust any pricing and delivery quotations accordingly.



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#### **9.5. Results of STONEPAK in-house blower noise level testing**

An unofficial maximum noise level test was conducted to determine the approximate amount of noise generated by a STONEPAK low-pressure packaged blower. In-house personnel conducted the test using an inexpensive noise-measuring meter. The test was conducted outdoors, in a setting intended to satisfy “free-field” conditions. The meter was set to the “A” range decibel setting. The test was conducted with one (1) STONEPAK low-pressure blower operating at its noisiest condition-with its discharge venting directly to atmosphere. Under those conditions, a maximum reading of about 82 decibels (dB-A) was recorded at a distance of 5 feet from the blower.

In real application the blowers usually end up in some sort of room/building with inherent reverberation to amplify the noise. To further increase noise levels several blowers are typically located next to each other. The average application would experience noise dB-A level in a range of the low to mid 90s although the actual noise level is ultimately a function of several variables.

#### **9.6. Results of STONEPAK Ultrasonic Sealer noise level testing**

A noise level test was conducted to determine the approximate amount of noise generated by a STONEPAK Ultrasonic Sealer. The test was conducted by a professional engineer from the University of Utah-Department of Mechanical Engineering.

The sound level was measured at 93 to 101 dBA when sealing the valve corner of a bag. This was the sound of the Branson unit during a sealing cycle. Issues to consider with noise levels on STONEPAK Ultrasonic Sealers:

- Horn to Anvil seal time duration can range from 1 to 3 seconds.
- Frequency:
  - The packer mounted Clean Pak operates at 4 cycles per minute maximum
  - The Model 2001P operates up to 12 cycles per minute
  - The Model 2002P operates up to 22 cycles per minute



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## 10.Options - (alternative methods of equipment construction included as a reference only)

This Options Section is not a formal part of the Equipment Manufacturing Specifications; it is compiled as part of this document for convenience and for reference purposes only. The alternative methods of construction listed in this Options Section are not necessarily part of the equipment specifications for the equipment being offered. If the Purchaser prefers one of the Options Section alternatives, that option must be agreed-to between STONEPAK and the Purchaser and incorporated into the Exceptions Section of the Equipment Manufacturing Specifications. It is not possible or practical to incorporate every option into every item of equipment. If an option that has not been previously quoted is to be included into the Equipment Manufacturing Specifications, STONEPAK reserves the right to adjust any pricing and delivery quotations accordingly.

### Options Section Table of Contents

#### 10.1. OPTION: Inspections by independent inspection agencies

10.1.1. *Occasionally, it may be required that equipment being provided by STONEPAK be inspected by an independent inspection agency such as Underwriters Laboratories (UL) or Canadian Standards Association (CSA). STONEPAK is not licensed to apply the marks of UL, CSA, or any other independent inspection agency. Independent agency inspections typically involve two parts; first, an inspection at the manufacturer's facility and second, a "field inspection" after installation at the Purchaser's facility.*

10.1.2. When requested by the Purchaser, STONEPAK can help to coordinate the manufacturer's site portion of an independent agency inspection under the following conditions:

10.1.2.1. The Purchaser shall pay for the cost of the inspection, as invoiced by the independent inspection agency, plus a 10% administration fee added by STONEPAK. *The cost of an independent agency inspection typically starts at \$10,000.* The Purchaser will also absorb the cost of any corrective action required by the inspector

10.1.2.2. The Purchaser will coordinate the "field inspection" portion directly with the independent inspection agency. The Purchaser shall pay for the costs of that inspection, and will also absorb the cost of any corrective action required by the inspection agency during that inspection.

#### 10.2. OPTION: Sleeve-type heat-shrinkable tubular plastic wire markers



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10.2.1. Where possible, wires shall be labeled at each end or termination with sleeve-type heat-shrinkable tubular plastic wire markers as manufactured by Brady USA, Inc. or STONEPAK substituted equal. At STONEPAK discretion, wires that are too short in length to allow for the installation of the heat-shrinkable markers may not be marked at both ends. Examples of such wires include jumper wires. STONEPAK shall heat-shrink the wire markers onto the wires during the assembly of the electrical enclosure. Care shall be taken to not melt or otherwise damage the insulation of the wires during installation while heat shrinking the wire markers. The wire designation shall match the labeling of the terminal to which the wire is connected.

**10.3. OPTION: “Rigid” conduit system for an individual packaged piece of equipment**

10.3.1. All conduit shall be rigid mild steel or intermediate mild steel (IMC) galvanized conduit with threaded connections, except where flexibility is required at an electrical connection. Rigid conduit smaller than ½” electrical trade size shall not be used. The use of electrical metallic tubing (EMT) shall not be permitted.

10.3.2. Where flexibility is required at an electrical connection, the use of liquid-tight flexible metallic conduit, liquid-tight flexible non-metallic conduit, or type SO cord shall be permitted at STONEPAK discretion. Flexible conduit smaller than 3/8” electrical trade size shall not be used. The length of a flexible electrical connection shall be kept as short as possible. The following conditions shall govern the use of flexible electrical connections:

10.3.2.1. A flexible electrical connection shall be permitted at the connection to an equipment component that is subject to cycling, movement or vibration during its normal course of operation. Where STONEPAK provides the conduit to a motor junction box, a flexible electrical connection shall always be used to connect to the motor junction box.

10.3.2.2. A flexible electrical connection shall be permitted in a space-restricted instance where the use of rigid conduit would result in sharp bends that would either damage the conduit or restrict the internal diameter of the conduit.

10.3.2.3. A flexible electrical connection shall be permitted at shipping breakpoints to allow for ease of disassembly and subsequent field re-assembly. At the discretion of STONEPAK, a flexible electrical connection shall be used at the conduit entrance to an electrical enclosure to accommodate minor adjustments in enclosure position at time of installation.

10.3.2.4. Where type SO cord is used to connect to a cycling machine component, the cord shall be protected from damage by the use of a flexible cable carrier where practical.

10.3.3. At STONEPAK discretion, the molded electrical cord supplied by the manufacturers of some devices shall be routed along the frame of the machine



without being enclosed in conduit as seems reasonable at time of assembly. Such devices include photoeyes, proximity switches, load cells, etc. The cord shall be routed to minimize the possibility of damage to the cord. The exposed length of a molded electrical cord shall be kept as short as possible.

- 10.3.4. At STONEPAK discretion, conduit fittings shall be either cast aluminum or hot-dipped galvanized cast metal with types, shapes, and sizes selected by STONEPAK to suit the application. Conduit entrances of the fitting bodies shall be threaded. Conduit fitting covers shall be removable and provided with gaskets and corrosion resistant screws.
- 10.3.5. Conduit shall be held securely in place and supported at each end. Conduits shall be cut smoothly, and all sharp edges that may come in contact with the wire insulation shall be removed. Where practical, conduits shall be arranged so as to avoid being used as a step or platform. Enclosures shall be supported independent of all conduits and shall be rigidly secured in place.
- 10.3.6. Where conduit enters an enclosure, a bushing or fitting providing a smoothly rounded insulating surface shall be installed to protect the conductors from abrasion shall be used. Where practical, conduits shall enter enclosures through the side or the bottom.
- 10.3.7. As required, STONEPAK shall remove conduit and wire to allow for equipment breakdown for shipping purposes. The conduit that is removed shall be match-marked with the corresponding enclosure entrance opening to simplify its reinstallation. At time of installation, the Purchaser is responsible to reconnect any conduit and wires that may have been removed.
- 10.3.8. Some of the STONEPAK individual packaged pieces of equipment may be supplied with one or more electrical enclosures shipped “loose” and intended for field installation. In that event, the purchaser is responsible to provide and install the interconnecting conduit and wires between electrical enclosures as identified on the documents provided by STONEPAK.

**10.4. OPTION: STONEPAK installation of wire and conduit as part of a “Pre-wired System”**

When STONEPAK is supplying a “system” of equipment, STONEPAK shall provide and install conduit and wire on the individual packaged pieces of equipment within the system as detailed in these specifications. Additionally, STONEPAK shall supply as much of the interconnecting conduit and wire as is practical between the packaged pieces of equipment within a system according to the following general guidelines:

- 10.4.1. At STONEPAK discretion, all conduit shall be rigid mild steel or intermediate mild steel (IMC) galvanized conduit with threaded connections, liquid-tight flexible metallic conduit, liquid-tight flexible non-metallic conduit, or type SO cord. The use of electrical metallic tubing (EMT) shall not be permitted. Rigid conduit smaller than ½” electrical trade size and flexible conduit smaller than 3/8” electrical



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trade size shall not be used. The following conditions shall govern the use of flexible electrical connections:

- 10.4.1.1. At STONEPAK discretion, flexible electrical conduit shall be permitted to accomplish difficult bends or conduit routing that would otherwise require the bending of conduit or the use of factory pre-formed sections. A flexible electrical connection shall be permitted in a space-restricted instance where the use of rigid conduit would result in sharp bends that would either damage the conduit or restrict the internal diameter of the conduit. Such flexible conduit shall also allow for minor positional adjustments of equipment at time of installation.
- 10.4.1.2. A flexible electrical connection shall be permitted at the connection to an equipment component that is subject to cycling, movement or vibration during its normal course of operation. Where STONEPAK provides the conduit to a motor junction box, a flexible electrical connection shall always be used to connect to the motor junction box.
- 10.4.1.3. A flexible electrical connection shall be permitted at shipping breakpoints to allow for ease of disassembly and subsequent field re-assembly. At STONEPAK discretion, a flexible electrical connection shall be used at the conduit entrance to an electrical enclosure to accommodate minor adjustments in enclosure position at time of installation.
- 10.4.2. At STONEPAK discretion, the molded electrical cord supplied by the manufacturers of some devices shall be routed along the frame of the machine without being enclosed in conduit as seems reasonable at time of assembly. Such devices include photoeyes, proximity switches, load cells, etc. The cord shall be routed to minimize the possibility of damage to the cord. The exposed length of a molded electrical cord shall be kept as short as possible.
- 10.4.3. Wires of dissimilar voltage levels shall not be permitted in the same conduit except in the case of the thermal switch wires (“J” wires”) connected to explosion-proof motors, if applicable. Any control wire conduit that runs between any pair of enclosures that can readily accommodate terminals shall have a minimum of 2 spare wires pulled, or 10% of the total number of wires, whichever is greater.
- 10.4.4. At STONEPAK discretion, conduit fittings shall be either cast aluminum or hot-dipped galvanized cast metal with types, shapes, and sizes selected by STONEPAK to suit the application. Conduit entrances of the fitting bodies shall be threaded. Conduit fitting covers shall be removable and provided with gaskets and corrosion resistant screws.
- 10.4.5. Conduit shall be held securely in place and supported at each end. Conduits shall be cut smoothly, and all sharp edges that may come in contact with the wire insulation shall be removed. Where practical, conduits shall be arranged so as to avoid being used as a step or platform. Enclosures shall be supported independent of all conduits and shall be rigidly secured in place.



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- 10.4.6. Where conduit enters an enclosure, a bushing or fitting providing a smoothly rounded insulating surface shall be installed to protect the conductors from abrasion shall be used. Where practical, conduits shall enter enclosures through the side or the bottom.
- 10.4.7. As required, STONEPAK shall remove conduit and wire to allow for equipment breakdown for shipping purposes. The conduit that is removed shall be match-marked with the corresponding enclosure entrance opening to simplify its reinstallation. At time of installation, the Purchaser is responsible to reconnect any conduit and wires that may have been removed.
- 10.4.8. Although a “pre-wired system” is being provided, an equipment installation may require that one or more electrical enclosures be electrically interconnected in the field at time of installation. In that event, the purchaser is responsible to provide and install the interconnecting conduit and wires between electrical enclosures as identified on the documents provided by STONEPAK. Examples of some of the enclosures that are typically electrically interconnected in the field with Purchaser provided conduit and wire follow:
- 10.4.8.1. The motor junction boxes of packer blower motors are typically required to be field interconnected.
- 10.4.8.2. Valve bag packers are typically supplied with field-interconnected conduit and wire.
- 10.4.8.3. The electrical interface to system equipment manufactured by a third-party vendor is typically field installed.
- 10.4.8.4. The main electrical enclosure of an Ultrasonic Valve Bag Sealer is generally located remote from the machine itself. The electrical interface between the enclosure and machine is typically field installed.
- 10.4.8.5. On a large equipment system, it may make sense to designate two or more zones for purposes of running conduit and wire. In that case, the electrical interconnections between the zones are typically field installed.
- 10.4.8.6. When a Valve Bag Applicator is used, the Packer control enclosures are always mounted remote from the frames of the Packers and require field wiring.
- 10.4.8.7. In some instances, the main electrical enclosure and the operator control station of a Valve Bag Applicator machine are located remote from the machine itself and may require field wiring.

#### **10.5. OPTION: NEMA 4 electrical enclosures**

As a minimum, electrical enclosures shall be provided with a NEMA 4 rating with the following exceptions, where applicable:

- 10.5.1. The “front enclosure” operator control station of the Model 770 GWC packer is a proprietary in-house fabricated enclosure. While it is built to be as “dust-tight” as possible, it does not carry a formal enclosure rating.



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- 10.5.2. The power-conditioning transformer that is supplied with the Model 770 GWC packer is manufactured by Sola/Hevi-Duty. The transformer has only a NEMA type 1 rating because its housing is constructed of a perforated sheet-metal fabrication to allow for heat dissipation. Accordingly, STONEPAK recommends that the Sola transformers be located in a clean/safe area – typically away from the packaging area.
- 10.5.3. Some of the STONEPAK supplied ultrasonic valve sealing equipment is provided with a step-down voltage transformer. The transformer is of a potted open-style construction with a NEMA type 3R rating. Accordingly, STONEPAK recommends that the step-down transformers be located in a clean/safe area – typically away from the packaging area.
- 10.5.4. The power-supply enclosure for the ultrasonic valve sealing equipment is manufactured specifically for STONEPAK by Hoffman. It is only available in a NEMA type 12 construction.

**10.6. OPTION: Type 304 Stainless Steel product contact surfaces**

- 10.6.1. “304 Stainless Steel” product contact surface material of construction standards shall be used. *(See Options Section for upgrade to 316 Stainless Steel product contact surface construction.)* Where the term “product contact surface” is used, it shall make reference to the equipment components that can come in contact with the bulk product prior to it being packaged in a bag, and not to the components that can contact the bag itself. *(See the Reference Section for an item-by-item breakdown of the packaging equipment “304 Stainless Steel” construction materials that have a possibility of coming into contact with the product.)*

**10.7. OPTION: Type 316 Stainless Steel product contact surfaces**

- 10.7.1. “316 Stainless Steel” product contact surface material of construction standards shall be used. *(See Options Section for optional 304 Stainless Steel product contact surface construction.)* Where the term “product contact surface” is used, it shall make reference to the equipment components that can come in contact with the bulk product prior to it being packaged in a bag, and not to the components that can contact the bag itself. *(See the Reference Section for an item-by-item breakdown of the packaging equipment “316 Stainless Steel” construction materials that have a possibility of coming into contact with the product.)*

**10.8. OPTION: Shipping documentation for non-domestic shipments**

- 10.8.1. Each crate shall be marked with the Purchaser’s name, Purchase Order number, Purchaser’s delivery address, and STONEPAK’s serial number(s) of the equipment in the crate. A complete packing list showing all of the equipment in the shipment shall be attached to one of the crates. A Bill of Lading pertaining to each load of



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the shipment shall be prepared. A copy of the Bill of Lading pertaining to each load shall be provided to the driver of that load and a copy of all of the Bills of Lading in the shipment shall be faxed to the Purchaser.

10.8.2. A pro-forma invoice shall be prepared for customs declaration purposes.

10.8.3. A Certificate of Origin document shall be prepared for customs declaration purposes.

**10.9. OPTION: Purchaser-designated Equipment Identification Number Tagging**

When the Purchaser requires the equipment to be tagged with information beyond that included with the STONEPAK standard serial number tag, an additional nameplate shall be created and affixed to the equipment adjacent to the STONEPAK serial tag. The additional nameplates will only be stamped with data explicitly specified by the Purchaser. STONEPAK will not reference the ASME code, or any other code, on the nameplates.



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