

ALL INQUIRIES REGARDING THIS ORDER
SHOULD REFER TO THIS NUMBER
WORK ORDER NUMBER

45552

Battenfeld Gloucester
SMS group

Battenfeld Gloucester Engineering Co., Inc.
Blackburn Industrial Park/P.O. Box 900
Gloucester, MA 01931-0900 USA
978-281-1800 FAX 978-282-9111
Quotation Number 77318-0
M/E Due 03/17
E/E Due 03/17
Order Entry Date 01/17/06
Date Prepared 01/19/06
Schedule Date 06/02/06

"Acceptance of the order of the buyer named on the face hereof ("Buyer") expressly is made conditional on Buyer's assent to the Terms and Conditions on the last page hereof, and Gloucester Engineering Co., Inc ("Seller") agrees to furnish the articles described herein only upon those Terms and Conditions"

SOLD TO:

JAN 20 2006

SHIP TO:

CUSTOMER NO	CUSTOMER P.O NO	Salesman	GEO CODE	SHIP VIA	DATE SHIPPED	PREPAID	COLLECT	TERMS
01488	EN290916	GS/NJN	SC	Best way	00/00/00	X		See Below

Rev 03m
gs EEC

23493

Item	Qty	Item Description	Amount
		6.0" Monolayer PP Sheet Extrusion Line	
		Product Specifications	
		Material: PP (Dow 404)	
		Structure: Mono	
		Rate: 2500 PPH	
		Thickness: 10 - 40 mil	
		Finished Width: 28 - 52" (44" average)	
		Die Width: 54"	
01	1	6.0" 30:1 Contracool® Extruder, 6 Zones	\$183,589.00

1. Barrel - 4140 steel with an Xaloy 102 or equivalent liner. Barrel is drilled and tapped for thermocouples, pressure transducer and rupture disc (one rupture disc included). 2:1 Feed section is constructed of machined ductile iron and jacketed for cooling 8.0 GPM (1.8 m³/hr) (at 40° - 80°F). Barrel is provided with a powder seal and three-piece clamp and flange with o-ring for connection to screen changer.
2. Gear Reducer - Double reduction helical design. Gears are carburized case hardened and ground with a minimum AGMA rating of 12. Housing is constructed of machined cast gray iron with an integral thrust bearing. All bearings (including the thrust bearing) are lubricated using a positive/splash

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		system. Lubricating oil is externally cooled and filtered using a closed loop heat exchanger pumping system interlocked with the drive. Reducer has a rating of 640 HP at 100 RPM with a 1.5 service factor. Thrust bearing has a B-10 life of 110,000 hours at 100 RPM and 5000 PSI. Gearbox is directly coupled to drive motor shaft. All reducers are test run at Battenfeld Gloucester Engineering Co., Inc. prior to shipment. 3. Vent - Large opening port located for best devolatilization with stack and plug included. Vent to be left-hand side looking downstream (LHSLDS). 4. Base - Heavy duty full length steel weldment, stress relieved and precision machined for accurate alignment and support of gearbox, thrust system and barrel. Barrel support permits thermal expansion. 5. Heaters - Finned cast aluminum jackets with integral heating elements. Six zones are wired 460/3/60. Infra-Kote heat contact paste and spring washers on all heaters. 6. Cooling System - Contracool® air cooling system uses extruder base as air plenum with single exhaust blower common to all zones drawing air from it. Each zone is provided with a baffle which is automatically controlled with a damper actuator. As the baffle is opened, air is drawn through the slotted barrel cover and around the shrouded heater band and exhausted away from the process. Blower located on extruder sub-base. 7. Hopper - By customer. 8. Accessories - Sectional screw pusher assembly (threaded steel), rupture rated at 75 PSI, junction box located on extruder base with numbered terminal strips for barrel wiring terminations and power receptacles (for adapters and die), thermocouples for all barrel zones. 9. Left hand gearbox - right hand operating side looking downstream	

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~~Gloucester Engineering Co., Inc.~~
~~100 State Street~~
~~Gloucester, MA 01931~~
~~Attention: Mr. [redacted]~~

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Item	Qty	Item Description	Amount
02	1	Gearbox for 6.0" Extruder in item 01	
		1. Price included in extruder	
03	1	Extruder Control Panel	
		1. Cabinet - Free standing, force ventilated, straight faced NEMA 12 cabinet with "through-the-door" disconnect.	
		2. Temperature Controllers - Eurotherm 2208E temperature controllers with contact suppressors are provided for each extruder barrel zone. Controllers are mounted flush in panel face and are completely prewired to a numbered terminal strip. Additional instruments as may be required for downstream equipment are quoted separately elsewhere. Ammeters are provided for each zone.	
		3. Contactors - Solid State contactors.	
		4. Operator Devices - Start/Stop stations provided for extruder drives, cooling system, melt pump, and vacuum pump. Digital meters are included for extruder drive RPM and amps.	
		5. Wiring - All wiring is coded, fused and sized according to the national electrical code. Wiring terminations are numbered, both on the conductor and at the terminal strip to which it is connected. Power and signal wiring are separated to avoid electrical noise. Interconnections between extruder and other equipment and to supply source are customer's responsibility.	

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Butterfield Gloucester

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Item	Qty	Item Description	Amount
		6. Line layout, panel layout and electrical drawings to be reviewed by Walt Jones (Lancaster SC) before manufacture.	
04	1	6.0" 30:1 Extruder Screw	\$33,830.00
		1. Barrier design with mixing section. 2. Manufactured from alloy steel. 3. Colmonoy 56 flights. 4. Cored through feed section. 5. Polished surface	
05	1	500 hp AC Yaskawa Drive	\$78,450.00
		1. Vector Controller a. NEMA 1 enclosure b. Input circuit breaker with door interlock handle. c. Fused blower motor starter (where required). d. Encoder feedback. e. Air conditioned cabinet 2. Marathon AC Motor a. 1800 rpm base speed Normally closed thermostat. b. Includes encoder. c. 20:1 Constant torque speed range.	

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Item	Qty	Item Description	Amount
06	1	6.0" Drawer Type Magnet 2/1 Feed d. 3,300 Foot (1005.8 Meters) altitude e. 40°C Ambient, Class F insulation, inverter duty. 3. Start-up of drive included.	\$2,552.00
07	1	Dynisco UPR700 Panel Mounted, Digital Pressure Gauge and Transducer 1. With horn, indicating light and shut down	\$2,790.00
08	1	Digital Melt Temperature Meter Located in the Operating Control Panel 1. Melt thermocouple included.	\$931.00

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Butterfield Gouda

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Item	Qty	Item Description	Amount
09	1	02-030408 Exttek HSC-60 Hydraulic Screen Changer - Monolayer 1. Pressure actuated seal system never needs adjustment and is guaranteed leak-free. 2. Screen changer comes fully assembled and configured for a clamp connection to extruder. 3. Rugged design allows up to 10,000 PSI operating pressure and 3000 PSI drop across the screen pack/breaker plate. 4. One-piece body construction ensures accurate alignment of the computer designed breaker plate, improving flow and eliminating polymer hang-up. Slide plate and two (2) Dynisco Exttek nickel-plated breaker plates include (Does not include cover plates, snap rings or breach locks). 5. Heat pipe technology ensures reliable, uniform slide plate heating (5-year guarantee on heat pipes). Screen changer body is heated by high reliability cartridge heaters. 6. Easy operator access is provided by the compact, integrated cylinder/valve assembly and rugged swing-up guards with visual indication of slide plate position. 7. The downstream seal is located in position by a counter bore in the body, allowing the downstream reducer bushing to be removed for pulling the extruder screw through the installed screen changer without the seal becoming dislodged. 8. Nickel plated flow surfaces. 9. Includes solenoid valve, controls and hydraulic hoses. 10. Wired for one (1) heat zone (includes heaters, type J thermocouple(s) and appropriate connector/connection. This item does not include temperature	\$30,117.00

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Item	Qty	Item Description	Amount
10	1	02-030432 Hydraulic Power Unit for Operating Hydraulic Screen Changers 11. control instrument/equipment). Six (6) additional stainless steel "O" rings for screen changer/barrel connection included.	\$6,928.00
11	1	02-379108 6.0" Adapter System - To Connect Screen Changer to Melt Pump 1. Machined from alloy steel. 2. One-piece straight construction. 3. Electroless nickel plated.	\$5,563.00

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Mr. Ed Rider

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Item	Qty	Item Description	Amount
12	1	02-012648 LCI ES 90/90 Melt Pump 1. Solid State, digital readout, pressure loop controller. 2. Complete unit is mounted on a BGE designed mobile cart for positive alignment and easy maintenance. 3. Wired for one (1) heat control zone. 4. AC drive quoted separately. Housing included.	\$63,450.00
13	1	02-022714 30 hp AC Yaskawa Drive 1. Vector Controller a. NEMA 1 enclosure b. Input circuit breaker with door interlock handle. c. Fused blower motor starter (where required). d. Encoder feedback 2. Marathon AC Motor a. 20:1 Constant torque speed range b. 1800 rpm base speed c. Includes encoder d. 40°C Ambient, Class F insulation e. NC Thermostat f. 3,300 Foot altitude maximum 3. Start-up of drive included	\$16,239.00

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~~1200 Main Street~~
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Item	Qty	Item Description	Amount
14	1	6.0" Static Mixer with Adapter 1. Koch KMB 600 to homogenize melt stream from extruder or melt pump. 2. Adapter machined from alloy steel designed to house static mixer. 3. One-piece, straight construction. 4. Electroless nickel plated.	\$26,781.00
15	1	6.0" Angled Adapter System - To Connect Extruder/Screen Changer to Die 1. Designed for angled die to roll orientation. 2. Manufactured from alloy steel with modular construction for ease of cleaning. 3. Manifold designed for streamlined melt flow. 4. Electroless nickel plated.	\$28,050.00
16	1	54" Ultraflex H-40 Flat Die by Extrusion Dies, Inc. 1. Designed for 10 - 40 mil PP 2. Manifold optimized for best performance with required materials 3. Lip - duckbill design with opening range from .001 - .040 4. Adjustment - pushbolts on one-inch centers 5. Die body made from high purity, forged alloy tool steel. 6. Manifold and flow surfaces 4-6 rms, lands 103 rms. 7. Lips hardened t 48-54 Rockwell C.	\$46,280.00

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Mr. Ed Rider

Item	Qty	Item Description	Amount
17	15	02-012388 Eurotherm 2208E Temperature Controller 1. Auto tuning. 2. Separate displays for process & setpoint 3. Setting value (set point) lock function 4. Power failure memory 5. Temperature alarm indicator 6. Prewired and premounted in cabinet.	\$1,676.00 EA \$25,140.00
18	1	02-378002 Die Support 1. Designed to support and align die during production and provide space for convenient operation and maintenance.	\$14,005.00

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Item	Qty	Item Description	Amount
19	1	02-381017Z 2. Fabricated from steel plate. Model 2000 Slant SLA Hydraulic 3-Roll Stack 56" - 24" Independent Drive. 1. FRAME - Upstack configuration. Precision surface ground side frames. Constructed with dowelled girts to assure accurate roll alignment. 2. ROLLS - Steel double shell with heavy journals. Hard stainless steel overlay, plated with hard chrome and surface finished to 0.5 rms mirror finish. Rolls indicate less than .0005 TIR while turning in stack. 3. ROLL CONFIGURATION - The rolls are installed within the side frames at a 45° angle from the extruder centerline. A 45° adapter is used to connect die to the extruder to provide proper die penetration into the nip. This configuration eliminates sag and air entrapment. 4. NIP ACTUATION - Rolls in solid bearing holders are located in split lever arms for rapid roll removal. Hydraulic cylinders are used in both nips to provide 700 PLI of closing force. Low pressure by-pass for gap adjustment. 5. ROLL STOPS - Heavy duty support blocks with precision adjustment through a hand wheel - worm gear assembly. Roll gap indication to be at nips (both sides) and in control panel. 6. DRIVE - Each roll is driven with an independent AC drive. The middle roll controls line speed. The bottom and top rolls are electronically integrated as follower for precision timing of surface speeds. 7. POWER TRAIN - Drive power is transferred directly to a speed reducer which is coupled to the roll journal. 8. ROLL TEMPERATURE CONTROL - Each roll is equipped with a closed loop system using a centrifugal pump with mechanical seals, shell and tube	\$456,605.00

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Robertson Gloucester

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		exchanger, immersion heater and reservoir tank. System rated for operation up to 250°F with water. System designed for high velocity flow. Roll temperature regulated with a cooling solenoid. TCU to be located under conveyor. 9. PLUMBING - Copper piping used throughout and sized for maximum sheet cooling capability. 10. CONVEYOR - Aluminum frame with stainless steel idlers with quality bearings. Design to be determined with Customer based on location for post cooling rolls. 11. POWER TRAVERSE - Air motor driven to traverse sheet line away from die for maintenance and screw removal. 12. TRACK - Heavy duty flat and "V" track. Length as required for extruder screw removal. 13. CONTROL PANEL - Located in vertical panel attached to roll stack. Completely intertwined for single service drop by Customer. Includes cooling fan (ref. wo 42520). Disconnect included. 14. Safety cable to be routed across front of roll stack on bottom in addition to top and sides. Re-settable E-stop switches to be used. 15. Mounting and electrical interface for Customer-supplied thickness gauge. 16. Right hand operating side looking downstream	
20	1	02-380020 Dial Roll Gap Readout	\$6,889.00

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Item	Qty	Item Description	Amount
21	1	02-387410Z Post Cooling Roll Assembly 1. Two (2) driven 20" diameter steel post cooling rolls speed matched to roll stack. Use existing rolls, TCU, motors, gearboxes and controller s/n 45213. 2. Independent drives. 3. Rolls share a common TCU, pump, heat exchanger, heater, temperature control, solenoid, etc. 4. Mounted in an independent frame. 5. To be located between stack and conveyor. This post cooling station will be designed to allow relocation to other positions, e.g., downstream if required.	\$41,350.00
22	1	02-388014 56" Pull Roll 1. Frames - Precision ground side frames. 2. Rolls - Two (2) eight-inch diameter Hypalon covered rolls of 55/60 durometer. 3. Nip Actuation - Independent, pneumatic control of pressure for each side of nip. Mechanical adjustment of roll opening. 4. Drive - Rolls are driven with an AC flux vector drive and motor for precise speed control. 5. Roll to be the same as supplied on pull roll on Work Order 43524.	\$40,710.00
23	1	02-388726 Face Knife Slitter - Heavy Duty	\$12,275.00

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Item	Qty	Item Description	Amount
24	1	Spare Roll - 56" x 24"	\$23,500.00
25	1	Start-up and Training	\$8,801.00

BGE will provide installation supervision and start-up service in the amounts specified below. It will be the responsibility of the purchaser to ensure that the time is well spent. Any time over the specified amounts will be charged at our standard per diem rates, plus room and board expenses. Any time over eight hours per day will be charged at our prevailing rates. Customer is expected to provide air, plumbing, interconnecting wiring, mounting and wiring to all machinery, power and consoles. BGE will provide interconnecting wiring diagrams and interconnecting conduit and cabling diagrams for a wiring subcontractor to use.

All installation, auxiliary support equipment and alignment of the equipment shall be provided by the purchaser. The purchaser shall also provide skilled assistance to the BGE engineers.

ENGINEERING COPY

ALL INQUIRIES REGARDING THIS ORDER
SHOULD REFER TO THIS NUMBER
WORK ORDER NUMBER

45552

Battenfeld Gloucester

SMS group

Battenfeld Gloucester Engineering Co., Inc.
Blackburn Industrial Park/P.O. Box 900
Gloucester, MA 01931-0900 USA
978-281-1800 FAX 978-282-9111

Quotation Number 77318-0
M/E Due 03/17
E/E Due 03/17

Order Entry Date 01/17/06
Date Prepared 01/19/06
Schedule Date 06/02/06

"Acceptance of the order of the buyer named on the face hereof ("Buyer") expressly is made conditional on Buyer's assent to the Terms and Conditions on the last page hereof, and Gloucester Engineering Co., Inc ("Seller") agrees to furnish the articles described herein only upon those Terms and Conditions"

SOLD TO:

SHIP TO:

CUSTOMER NO	CUSTOMER P.O NO	Salesman	GEO CODE	SHIP VIA	DATE SHIPPED	PREPAID	COLLECT	TERMS
01488	EN290916	GS/NJN	SC	Best Way	00/00/00	X		See Below

Item	Qty	Item Description	Amount
		SPECIFIED AMOUNTS OF TIME INCLUDED:	
		One (1) BGE start-up technician 10 days	
		Note: Price does not include transportation, room & board, which will be the responsibility of the customer.	
26	1	Customer Discount	(\$69,289.00)
		Start-up: Not included.	
		Voltage: Electrical features of Battenfeld Gloucester Engineering machinery are designed, certified and labeled 508A, CAN/CSA STD C22.2 No. 14 and NFPA79.	
		Other national of local codes and approvals must be specified prior to order entry and may incur additional costs. In all cases, the machinery must be installed according to the requirements of the applicable electrical code by a licensed electrician or electrical contractor.	
		Terms: 30% Deposit with order	
		60% Payable prior to shipment	
		10% Net 30 days..	
		Partial shipments/partial billings allowed.	
		Ultramarine Blue (RAL #5002), Warm Gray (RAL #9002) (Customer's Standard Paint).	
		NET TOTAL	\$1,085,536.00

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SOLD TO:

SHIP TO:

23493

CUSTOMER NO	CUSTOMER P.O NO	Salesman	GEO CODE	SHIP VIA	DATE SHIPPED	PREPAID	COLLECT	TERMS
01488	EN290916	GS/NJN	SC	Best Way	00/00/00	X		See Below

Item	Qty	Item Description	Amount
		Note: One (1) set of manuals is included with the price of the equipment. Extra sets to be quoted separately. FOB: Plant of Manufacture. Add'l: DC/TJF	