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ITEM #I.

BRAMPTON ENGINEERING MODEL 150-24-ACE HEAVY DUTY EXTRUDER

consisting of the following:

- 1½ inch compression screw, 24:1 L/D with Colmonoy 56 hardfacing on the flights, chromium plating in the root and Maddock mixing section
- barrel with cast-in bi-metallic lining (Xaloy 101 equivalent) extending through feed throat in one piece
- barrel divided into 3 temperature control zones
- heating and cooling of barrel by means of heavy duty cast aluminum heater and high capacity blowers, each zone closely encapsulated with insulated shroud for minimum heat loss while heating and maximum heat removal while cooling
- sheet metal barrel cover over insulated air cooled heaters adds extra protection and gathers hot exhaust air to enable withdrawal by extra ducting
- cast aluminum barrel heaters, rated at 550°F operation, are wired 460/1/50/60
- barrel heater power wiring and thermocouples are terminated in a junction box for field wiring to control panel
- thrust bearing with B-10 rating of 580,000 hours at 5000 psi and 155 RPM, an integral part of the gearbox for precise alignment and long actual life
- heavy duty gearbox to give 155 RPM maximum screw speed at 1750 RPM input, rated at 36 HP providing 1.80 service factor when used with a 20 HP drive
- water-cooled feed throat
- heavy gauge sheet metal hopper with sight glass, slide gate shut-off and material dumping chute

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- **barrel end equipped with three piece clamp**
- non-reversible breaker plate supplied
- rupture disc rated at 8500 psi or a suitable pressure for the process
- 20 HP **IMPACT™** FIELD-ORIENTED CONTROL AC DRIVE by ALLEN BRADLEY
  - AC flux vector technology and fully programmable digital drive
  - 0.1% speed regulation over 100:1 speed range
  - rugged AC motors with minimum maintenance and built-in thermal switch
  - programmable electronic overload motor protection and sensorless motor temperature torque compensation
  - full torque capability at zero speed
  - **near-UNITY power factor** at all speeds and loads saves utility charges
  - meets the most stringent demands of all standards - VDE/IEC, EN, UL, CSA and CE. Autotuning function tunes the speed and torque regulators with minimum setup. Logic control 'ride thru' of 0.5 seconds to 2 seconds thereby preventing nuisance trips. Selectable operating language (English plus one of French, German, Italian, Japanese or Spanish)
  - accepts virtually any input voltage
  - **supplied with line reactor choke for drive protection**
- all components are precision aligned on heavy duty fabricated base with unique stiffening webs to eliminate torsional and bending deflection; complete multi-point leveling jack bolts

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ITEM #II.

FREE STANDING EXTRUDER CONTROL PANEL

- includes broad band harmonic suppressor to meet or exceed the requirements of item 8.6 of the VFD specifications.
- NEMA 12 floor mounted panel with extruder start/stop, speed adjust potentiometer and applicable line controls
- includes 3 position SYSCON-RKC model REX-C400 self tuning controllers for the barrel zones featuring built-in ammeters and heater break alarm
- solid state contactors for trouble free operation
- all wiring to numbered connecting blocks
- cold start protection prevents extruder drive from starting unless all extruder and down stream zones maintain setpoint for a period of 1 hour

DIGITAL INSTRUMENTATION

- digital screw RPM meter and % motor load meter
- melt temperature readout for repeatable process conditions
- Gentran GT434 digital pressure indicator with high & low alarm setpoints to activate audible alarm; includes GT76 pressure probe accurate to ± 1%
- line speed indicator

DOWNSTREAM ZONES

- SYSCON-RKC model REX-C400 self-tuning 2 position controllers featuring built-in ammeters and heater break alarm
- includes solid state contactors and all wiring to numbered connecting blocks

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- thermocouple and power plugs for each BE-supplied downstream zone are wired to terminal strips in a junction box mounted to the extruder base near the right side of the barrel end (facing downstream)

ITEM #III.

BRAMPTON ENGINEERING SINGLE-LAYER STATIONARY BLOWN FILM DIE

consisting of the following:

- 3 inch diameter die lips
- bottom fed spiral die
- manufactured from 4340 machine steel hardened to 26-32 Rc
- material flow surfaces highly polished
- all parts electroless nickel plated all over, plating is heat treated to a hardness of 60 Rc
- all melt distribution takes place in the spirals allowing the die lips to be sized to provide the optimum velocity and pressure balance characteristics necessary for uniform gauge film
- computer designed flow passages reduce the die's sensitivity to variations in the material to be run through the die
- die lips are hardened to more than 40 Rc and have recessed edges for double protection in this vital area
- outer die lip is adjustable for concentricity with the inner die lip
- top surface of outer die lip is insulated to reduce heat loss
- high capacity, long life, insulated ceramic heaters are provided
- 2 external die heating zones wired 480/1/60

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STREAMLINED DIE PORT

- Although all Brampton dies have direct melt channels (ports) between the block and the spirals, the area where this channel introduces the melt stream into the spiral is one of complex flow patterns. If rapid flushing of the die is a requirement for frequent color or material changes, we recommend the further streamlining of this port area.

BE STATIONARY DIE BLOCK AND CARRIAGE

consisting of the following:

- large radius turn in solid steel block to reduce possible hang-up points
- all required heaters
- flow passages streamlined and polished to reduce degradation
- single adaptor customized to suit either a new or existing extruder, includes ceramic band heaters
- the straight adaptor has a maximum length of 24" and features two standard melt access holes at 90^0 to each other, one with a 1/4" deep melt temperature thermocouple and the other with a melt plug bolt
- all wiring from die and adaptor terminates in junction box mounted on die stand. Cable extensions and plugs are NOT included unless die is ordered with BE extruder
- die carriage complete with steel wheels and levelling bolts

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ITEM #IV.

BRAMPTON ENGINEERING DUAL LIP AIR RING

- Uni-Flo Model UFO4E air ring with dual orifice lips, precision machined to ensure uniform air flow onto the bubble
- manufactured from heat treated aluminum
- design allows interchangeable lipsets
- four inlets adapted to interface with 3-inch I.D. hoses
- lips provided are for a 3 inch diameter die

BE AIR RING DISTRIBUTOR MANIFOLD

- cyclone type distributor to evenly divide the air from the blower into the air ring inlet ports
- six inch inlet; four 3-inch outlets

AIR RING BLOWER

- high pressure with 3 HP motor to supply air to the air ring
- cleanable metal inlet filter
- rated at 500 cfm at 26" water

VAC FREQUENCY CONTROL

- AC motor speed control for 3 HP blower
- eliminates need of damper
- allows blower speed to be controlled from VAC control panel. Digital readout of speed provides infinite control at repeatable setting

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- controlling the motor speed results in reducing the temperature rise in the blower as well as considerable energy savings as the blower is using only the horsepower required rather than the full horsepower of the motor
- supplied with line reactor choke for drive protection

BROAD BAND HARMONIC SUPPRESSOR

- meets or exceeds the requirements of item 8.6 of the VFD specifications.
- NEMA 1 enclosure 13"x13"x13" (WDH)

BRAMPTON ENGINEERING COOLING COIL FOR BLOWN FILM

- Model CC500-3 with stainless steel outer shell construction designed to withstand the operating pressures of the air ring blower
- automatic 3 way valve for temperature regulation, with manual bypass
- 1" condensate drain; trap by customer
- high efficiency heat exchanger
- drawer type, metal, washable filter
- thermometers on inlet water, outlet water and outlet air
- insulated outer shell

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ITEM #V.

BRAMPTON ENGINEERING BLOWN FILM STATIONARY TOP NIP ASSEMBLY

consisting of:

- two 24-inch wide, 6-inch diameter cored nip rolls, one moveable pneumatically operated neoprene (60 - 65 durometer) covered roll and one fixed chromed steel roll
- **IMPACT™** field-oriented control Flux Vector technology AC drive by Allen Bradley
- supplied with line reactor choke for drive protection
- collapsing frames are 24 inches wide by 36 inches long covered with hard wood maple slats
- one handwheel adjusts all four corners at the top of the collapsing frame, another handwheel adjusts the bottom corners. This assures perfect alignment at all times which helps to prevent wrinkles.
- manual collapsing frame angle adjustment
- one side of the collapsing frame is attached to the opening nip roll for ease of operator thread-up
- low friction aluminum idler roll
- operators control mounted in extruder control panel for ease of operation

ITEM #VI.

BLOWN FILM TOWER

- manufactured from square steel tubing and assembled in our plant, painted, disassembled and shipped in sections
- access is by ladder

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- nip rolls will be approximately 9 feet above floor
- **ceiling height in tower area is 125 inches**
- tower is designed and built with every effort to comply with Occupational Safety and Health Act (OSHA) "standards". It is designed as part of a blown film **machine**. It is **not** designed as a "building", i.e., it is **not** expected to be subjected to wind loads **nor** is it designed to Uniform Building Code (or other similar) "standards". All such "standards" are subject to interpretation by local OSHA and/or building inspectors. As such BE cannot guarantee compliance with all OSHA or permitting board requirements. If modifications are required and are clearly defined, BE will modify its original work at the Purchaser's specific request at prices in effect at the time of the modification
- tower is **not** assured to meet local "code" requirements. Such assurance can be given after "code" requirements are clearly supplied to BE by local authorities. Engineering drawings and/or design modifications requested for use in obtaining local permits or "code" approval will be charged at prices in effect at the time of work
- tower **is** certified by a registered Professional Engineer to be **structurally** adequate for Seismic 3 conditions when carrying BE-supplied equipment

IDLER ROLLERS

To convey the film from the nip to the winder station includes the following:

- aluminum rollers, 24 inch face width and 2.5 inch diameter
- dead shafts to suit tower width
- shaft mounting blocks to be welded or bolted to the tower

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ITEM #VII.

BRAMPTON ENGINEERING CANTILEVER WINDER

consisting of the following:

- includes broad band harmonic suppressor as required to meet or exceed the requirements of item 8.6 of the VFD specifications.
- roll face width permits a maximum of 24 inch wide cores
- 20 inch maximum finished roll diameter
- dual set point footage counter initiates index at first set point and sounds alarm at second set point to notify operator to make manual transfer; automatically resets when alarm signal is silenced
- two 3 inch diameter pneumatic shafts to grip core
- shafts driven by single torque motor and pneumatic clutches
- power indexing of turret, automatically stops in operating position
- new shaft automatically starts when indexed
- operator presses a "stop/deflate" button to disengage drive clutch and deflate shaft after cutting the film to the new roll
- operator must activate a "Safe to Index" switch after roll removal and shaft replacement

LAY-ON ROLL

- adjustable pneumatic lay-on pressure
- automatically retracts and returns during roll change
- produces harder rolls for easier handling and reduced packaging space