EQUIPMENT CHARACTERISTICS

PRODUCTION EQUIPMENT (lines)

The production line to manufacture resin-bonded products (hereinafter referred to as **line**) incorporates equipment for manufacture of resin bonded products. The equipment is designed to produce roof, tiles, ridge tiles, paving slabs and other resin bonded products.

1. Line characteristics

- **Output at the rate of 1700 m^2 of roof tiles per month operating 3 shifts 5-day working week.**
- **Installed capacity consumed by the basic equipment at 380V not more than 48kW.**
- **Electricity consumption- 8.4 kWt per 1 m^2.**
- **Number of staff per shift is 4.**
- **Minimum production area required is 80-100 m^2.**
- **Storage area required is 40-60 m^2.**
- **Specific electricity consumption (including ancillary equipment) – 17 kWh per 1 m^2.**
- **Reverse water supply closed system of 300 litres capacity is used for cooling process.**
- **The following raw materials are used:**
  - **plastic waste (polyethylene HDPE or LDPE , polypropylene, polystyrene, polyethylene terephtalate, ABS plastics);**
  - **sand;**
  - **master batches of colour mix.**

Note: natural gas and (or) liquefied gas, compressed air are not used, fluid or solid wastes are not formed.

2. Line consists of

Extruder	**1**
Screw fed machine	**1**
Hydraulic Press	**1**
A set of molds	**3**
Dry ingredients mixer *	1
Hammer crusher (stone crusher) *	1
Rotor shredder *	1
Film shredder *	1
Ancillary equipment *	

Note: «*» - equipment supplied separately at customer’s request or contract.

Basic line

1. Extruder

Extruder hereinafter referred to as the Extruder is designed for preparation (melting and mixing) of a consistent polymer mix from shredded polymers.

Parameter description	Nominal value	Tolerance
Production capacity, kg/h	30	±4
Screw diameter at the entry, mm	137	-3
Screw diameter at the exit, mm	80	-3
Screw rotation frequency, min-1	12.5	±10%
Nominal drive capacity, kW	2.2	±10%
Nominal electric heaters capacity, kW	10.5	±15%
Number of adjustable zones, items	3	-
Number of controllable zones, items	3	-
Mix temperature at the exit, ºC	195	+30
Maximum temperature in heating zones, ºC	280	-10
Overall dimensions, mm:		
length	3600	±20
width	630	±20
height	990	±20

2. Screw Fed Machine

Screw Fed Machine is designed to generate heated composite material from sand, polymer mix & master-batch ready for onward processing in the mold type "matrix-punch".

Parameter description	Nominal value	Tolerance
Production capacity, kg/h	180	±5
Screw diameter, mm	245	-5
Screw rotation frequency, min-1	18,0	±10%
Nominal drive capacity, kW	5,5	±10%
Nominal electric heaters capacity, kW	18,0	±15%
Number of adjustable zones, items	3	-
Number of controllable zones, items	3	-
Mix temperature at the exit, ºC	185	+25
Maximum temperature in heating zones, ºC	280	-10
Overall dimensions, mm:		
length	3865	±20
width	1300	±20
height	1240	±20
Weight, kg	650	±5

3. Hydraulic Pres PG-3

Press components:

Hydraulic press	**1 item**
Hydraulic drive station	**1 item**
Cooling tank	**1 item**
Tables for cooling products	**2 items**
Restraining platens	**20 items**

Parameter description	Nominal value	Tolerance
Press		
Strike force, kilogauss	90000	+600
Table stroke, mm	350	±5
Number of cylinders	1	-
Cylinder plunger diameter, mm	190	-
Table dimensions, mm	600x620	-
Overall dimensions, mm:		
length	1200	±10
width	600	±5
height	1765	±10
Weight, kg	960	±10
Hydraulic drive station		
Volume of oil to use, Litres	200	±10 liters
Nominal delivery, Litres/min - piston pump (high pressure section) - gear type pump (low pressure section)	 8.6 103	 ±0.1 ±1

Operating pressure, MPa - piston pump (high pressure section) - gear type pump (low pressure section)	33.0 3.0	+0.5 +0.5
Pressure of setting the relay pressure, MPa	5.0	+0,5
Electric drive capacity, kW	7.5	±10%
Heat exchanger electric motor capacity, kW	0.25	±10%
Overall dimensions, mm:		
length	810	±5
width	675	±5
height	1680	±10
Weight, kg (excluding oil)	490	±5
Mold Cooling System		
Cooling tank volume, Litres	310	±10
Circulation pump capacity, l/min	5	±1
Number of pumps, items	2	-
Tank overall dimensions, mm:		
length	1000	±10
width	460	±5
height	910	±5
Tank weight, kg	85	±2
Table for cooling products including restraining platens		
Overall dimensions, mm:		
length	1750	±10
width	900	±10
height	830	±10
Number of tables	2	
Restraining platens, weight, kg	11.0	±0.3
Number of platens,	20	
Mold for ordinary tiles		
Overall dimensions, mm:		
length	550	±0.5
width	468	±0.5
height	205	±0.5
Weight, kg	220	±0.1
Mold for ridge tiles		
Overall dimensions, mm:		
length	325	±0.5
width	460	±0.5
height	210	±0.5
Weight, kg	120	±0.1
Mold for paving slabs		
Overall dimensions, mm:		
length	400	±0.5
width	600	±0.5

height	184	±0.5
Weight, kg	160	±0.1

Separately supplied equipment

Equipment supplied separately at customer's request or contract

- **Rotor shredder – capacity ≥50 kg per hour, the mesh size ø8; N=10kW.**
- **Film shredder – capacity ≥25 kg per hour, the mesh size ø8; N=5kW.**
- **Dry ingredients mixer – a concrete mixer is used, volume capacity of 50-250 l; N=1,2 kW.**
- **Hammer crusher (stone crusher) – capacity ≥50 kg per hour, the mesh size ø8; N=10 kW.**

1. Roof-tile Mould

The equipment offered is to be in compliance with the specified details set out below : -	
MAKE	**Britanica**
MODEL	**Mould for roof tile**
COUNTRY OF MANUFACTURE	**Ukraine**
Production capacity	**Max 35 cycles per hour**
Total power Rating (kW)	**N/A**
Total power consumption (kWh)	**N/A**
Noise level dB(A) @ 1m	**N/A**
Overall dimensions mould tool (mm)	**Length 580 Width 550 Height 270**
Overall of finished roof tile (mm)	**Length 405 Width 318 Height 50 Thickness - variable 8 nominal**
Total weight of roof tile mould tool (kg)	**Net 220**
Total weight of finished roof tile (kg)	**Net 2.50 (+/- 0.05)**
Number of rooftiles per M^2	**9**

2. Ridge tile mould set (ridge tile – end ridge tiles)

The equipment offered is to be in compliance with the specified details set out below : -	
MAKE	**Britanica**
MODEL	**Mould for ridge tiles**
COUNTRY OF MANUFACTURE	**Ukraine**
Production capacity	**Max 42 cycles per hour**
Total power Rating (kW)	**N/A**
Total power consumption (kWh)	**N/A**
Noise level dB(A) @ 1m	**N/A**

Overall dimensions mould tool (mm)	**Length 550 Width 500 Height 280**
Overall of finished ridge tile (mm)	**Length 325 Width 230 Height 115 Thickness - variable 8 nominal**
Total weight of ridge tile mould tool (kg)	**Net 120**
Total weight of finished ridge tile (kg)	**Net 2.20 (+/- 0.05)**

3. Slab moulding tool

The equipment offered is to be in compliance with the specified details set out below : -	
MAKE	**Britanica**
MODEL	**Mould for paving slabs**
COUNTRY OF MANUFACTURE	**Ukraine**
Production capacity	**Max 20 cycles per hour**
Total power Rating (kW)	**N/A**
Total power consumption (kWh)	**N/A**
Noise level dB(A) @ 1m	**N/A**
Overall dimensions (mm)	**Length 550 Width 545 Height 240**
Overall dimensions finished slab (mm)	**Length 333 (+/- 0.05) Width 333 (+/- 0.05) Thickness 38 (+/- 0.05)**
Total weight of slab mould tool (kg)	**Net 170**
Weight of slab (kg)	**58**

4. Screw fed machine for drying sand

2 adjustable heat zones
2 controllable heat zones
Temperature of sand at exit, 175°C (+/- 25)

The equipment offered is to be in compliance with the specified details set out below : -	
MAKE	**Britanica**
MODEL	**Screw Fed machine – for drying sand**
COUNTRY OF MANUFACTURE	**Ukraine**
Production capacity (kg/h)	**180 (+/- 5)**
Total power Rating (kW)	**Drive 5.5 (+/- 10%) Heating 18 (+/- 15%)**
Total power consumption (kWh)	**18.5**
Noise level dB(A) @ 1m	**Less than 80**
Overall dimensions (mm)	**Length 3865 (+/- 20mm) Width 849 (+/- 20mm) Height 1240 (+/- 20mm)**
Total weight (kg)	**620 (+/- 5kg)**

FACTORY SPACE REQUIRED	**100 square metres of covered space 100 square metres external space**

Ancilliary equipment

A list of ancillary equipment, accessories and measuring devices required for the production site:

- **Magnetic separator to extract metal from plastic;**
- **Screw fed sand dryer to dry sand;**
- **Vibrosieve to sieve sand;**
- **Collecting bins – bins for collecting, storing and transportation of shredded plastic waste (film, pieces, sand);**
- **Trolley for materials and finished products, capacity 200kg;**
- **Strapping tool – for strapping finished products with packing strip;**

From the list of ancillary equipment customer will need to decide which ancillary equipment they are to purchase, then which ancillary equipment they wish to purchase locally and which equipment they will want to purchase from Britanica.

All ancillary equipment we offer is purchased from outside suppliers. Prices for ancillary equipment which is to be purchased from another company must be confirmed to us by the supplier before we accept your order.

Description	Specification	Weight	Recommend		
			Necessity	To be purchased in customers location if available	Purchase from Britanica
Rotor shredder for plastic*	Production capacity >50 kg/hr, grate hole to be Ø8; N=10kWt	1200kg	Essential	Yes	Recommend local purchase
Film shredder*	Production capacity >25 kg/hr, grate hole to be Ø8; N=5kWt	570kg	Essential if plastic film is to be used	Yes	Recommend local purchase
Dry ingredients mixer*	Ordinary concrete mixer (capacity 50-250 L) is used, N=1.2 kWt		Essential	Yes	Recommend local purchase
Hammer crusher (stone crusher)*	Production capacity >50 kg/hr, grate hole to be Ø8; N=10kWt		Not essential at start		
Magnetic separator	Separator for extraction metal from plastic		Not essential at start		
Screw fed sand dryer	Equipment for drying sand 1	620kgs	It is essential to use dry sand		Only if preferred
	Equipment for drying sand 2			Yes	Local method is available
Vibrosieve screen	Vibrosieve to screen sand		Not at start		
Collecting Bin	Bin for collecting, storing and transportation of shredded plastic waste (film, pieces, sand)		Essential	Yes	Recommend local purchase
Hand operated fork truck	Trolley for materials and finished products,		Essential	Yes	Recommend local purchase

	capacity 200kg				
Strapping tool	**A tool for strapping finished products with packing strip**		**Essential**	**Yes**	**Recommend local purchase**
Scales	**50kg floorstanding precision scales for components**		**Essential**	**Yes**	**Recommend local purchase**
Moulding tool for slab	**Additional moulding tool for manufacture of paving slabs**	**As required**	**Recommended**	**No**	**Recommend purchase from Britanica**

WE CONSIDER

That for a single production line it may be realistic to operate without a separate film shredder. hammer crusher, magnetic separator, or vibrosieve screen.

That the customer may find alternative techniques for drying sand to be available locally.

That the customer should be able to acquire a collecting bin, strapping machine, hand fork truck, scales from local suppliers.

The customer should decide if additional moulding tools for manufacture of paving tiles are required

TERMS OF BUSINESS

Our terms for all purchases are :

Order to be placed 12 weeks before scheduled date of dispatch.

Then:
- 50% of invoice to be prepaid 12 weeks before the scheduled date of dispatch.
- Remainder of invoice to be paid on despatch.

Payment can be to our bank in Ukraine or the UK and can be in the form of a letter of credit (LOC) to be drawn down when consignment has been handed to the shipper and has cleared Ukraine Customs in Lugansk.

Our prices are ex-works Rovenky. The customer is responsible for cost of transport and shipping.

A formal contract to be exchanged at the time of order.

TRANSPORT

Packing will be to a 20ft Sea Container. The container will be sufficient for the equipment described above plus a limited quantity of ancillary equipment. Should more ancillary equipment be required the customer should budget for shipment of a 40’ container.

The Ukraine shipping company Formag is able to provide prices for carriage from Lugansk to the port of Illichesk (Odessa) and onward to a port selected by the customer. It will be prudent to compare prices from Formag with a quote from a shipping company in your own country. To give you some idea a recent quote for carriage of a 20 ft container from the Britanica factory to Illichevsk was $1600 and from Illichevsk to Port Tema, Ghana a further $3850.

An engineer can be provided at the customers location to commission the equipment, instruct a maintenance engineer and train operatives to operate the equipment. For this there will be a charge of $2000 per week plus costs for the Britanica engineer to travel from and back to Ukraine, together with costs for providing suitable accommodation and meals.

The customer is responsible for arranging for the equipment to be installed with all services working and to have available a supply of raw materials for when the Britanica engineer arrives at the customer's location.

The Engineer will be a Russian language speaker with a knowledge of English language which may be limited to terms for the equipment, processes and materials used.

The prices quoted include a supply of spare parts sufficient to maintain the equipment for 12 month's use according to the recommended procedures set out in the equipment user and maintenance manual.