

Item no.	Supplier	Quantity	Description
M-33-01-A	CC	1 set	eAFK HTI coolflex Process simultaneous draw-texturing of continuous filament Mechanical speed range 300 to 1200 m/min Polymer process range Polyester, Polyamide or Polypropylene Denier range 33 dtex to 330 dtex single yarn end Crimp insertion by friction aggregate with discs Cross section V Number of heaters per section 2 primary, 2 secondary Number of sections 12 sections Yarn ends / positions per section 24 / 24 pos Electrical system AC-version, inverter controlled M/C operation type split version, A&B-side to be operated separately
M-33-01-A-01	CC		Drive system Motor Type AC, Control inverter controlled by Barmag PLC/ATT setting of D/R, D/Y, underfeed as well as crossing angle of take up Drives for feed system units, take up units friction units traverse system auxiliaries Feed system Feed system G1 288 motors 0.040 kW each Feed system G2 288 motors 0.040 kW each Feed system G2x 288 motors 0.040 kW each Feed system W3 2 motors 5.500 kW each Take up system Traverse system W4 2 motors 5.500 kW each Take up system ATT 288 motors 0.040 kW each Friction system Friction units W6 288 motors 0.176 kW each Auxiliary system Oiling 72 motors 0.002 kW each Yarn displacement W3 2 motors 0.045 kW each Fume exhaust 2 motors 3.000 kW each Yarn suction (for string up) 1 motor 11.000 kW
M-33-01-A-02	CC		Feed system Godet 24 godet bars for each G1, G2 and G2x, each equipped with 12 godets with single motor and separator roller. Godets can be switched off by manual operation Shaft Shaft with nip roller and quick release for W3, centrally driven
M-33-01-A-03	CC		Thread up device Type automatic device with push up rod each push up rod is equipped with quick release for twist stop roller No. 1 thread up device per position Twist Stop Roller metallic (FK6-9C-132Z), Operation pneumatic with push button

Item no.	Supplier	Quantity	Description
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This is the preliminary scope of supply

We reserve the right to carry out at any time technical modifications which may be necessary to achieve continuous process improvement and optimal plant operation.

NOTE

concerning abbreviations:

CB = CONTRACTOR's Barmag scope of supply
CC = CONTRACTOR's China scope of supply
P = PURCHASER's scope of supply
PC = PURCHASER's scope of supply according to CONTRACTOR's specification
PE = PURCHASER's existing equipment
O = Optional supply

NOTE

concerning itemizing system
i.e.

M 33 01 A 001

					+-- consecutive no.
					+----- line identification
					+----- part no.1 in plant section 33
					+----- plant section 33, texturing
					+----- type of apparatus

Item no.	Supplier	Quantity	Description
M-33-01-A-04	CC	Heater	
M-33-01-A-04-01	CC	Primary heater Type Principle heat transfer Heating medium Heater length Heater rail length Temperature range Control Fume exhaust	24 heater per machine, HTI (High Temperature Insertion) Convection, 12 yarn ends per heater running in inserts with pinches electric 1.0 m first heating section 0.30 m second heating section 0.70 m 0 – 550°C (+/- 1.5°C) Barmag PLC via PC interface at each heating block in upper and lower position separate systems for A & B side 4 high efficiency blowers, 3.0 kW each
M-33-01-A-04-02	CC	Secondary heater Type Principle heat transfer Heating medium Heater length Temperature range Control	24 heater per machine, convection, 12 yarn ends per heater 12 exchangeable heater tubes, - spiral pinched Diphyll, vapour phase 1.30 m 150 – 250°C 150 – 170 (+/- 2.0°C) 170 – 250 (+/- 1.0°C) Barmag PLC via PC interface
M-33-01-A-05	CC	Cooling Type Principle No. Length	chromium plated aluminium tubes contact, ambient air active with connection to air conditioning 1 cooling device per yarn end 1.20 m
M-33-01-A-06	CC	Crimp insertion Type Principle No. Drive Speed max. Suitable disc stacking	Friction unit type 8E friction disc texturing, fixed center type 288 pcs per machine single motor, directly driven 18.000 rpm stacking with various disc types up to 1-8-1 for 9mm discs 1-11-1 for 6mm discs incl. corresponding distance pieces
M-33-01-A-08	CC	Yarn quality monitoring Type Principle No. Measuring range Measuring frequency Functionality Output	UNITENS continuous online tension measuring 1 sensor per yarn end, 0 – 150 cN alternatively set by software 0 – 75 cN 50 Hz Yarn quality grading CV value Mean value Error monitoring Computer display and output unit (sensor)

Item no.	Supplier	Quantity	Description
M-33-01-A-09	CC		Intermingling piping Type No. Location Functionality Intermingling piping 1 per yarn end, between G2 and G2x Intermingling of yarn by use of intermingling jets with compressed air incl. - intermingling piping - pressure regulator - air filter - couplings (female, straight), suitable for Heberlein type intermingling jets
M-33-01-A-10	CC		Electronic yarn sensors Type No. Location Functionality Non contact yarn sensors 1 per yarn end, between W3 and take up yarn sensor activate corresponding yarn cutter
M-33-01-A-11	CC		Yarn cutter Type No. Location Functionality Barmag Power Cut 1 per yarn end, between creel and G1 cut yarn after activation by corresponding yarn cutter cut yarn in case of power failure for protection of PU discs
M-33-01-A-12	CC		Yarn suction device – string up Type No. Location Functionality Waste yarn collection system with central blower and collection bin as well as separate suction piping on A & B side for string up 1 per machine, blower and collection bin in filter cabinet suction piping above between G2x and secondary heater yarn suction system for waste yarn collection during threading. Waste yarn is transported to central collection bin.
M-33-01-A-13	CC		Yarn suction device – take up Type No. Location Functionality Waste yarn collection system by means of injectors and collection bin underneath each take up section 1 injector per position 1 bin per take up section, injectors at each take up position, collection bin underneath take up Injector system for waste yarn collection during doffing procedure. Waste yarn is transported to de-central collection bins of each take up.
M-33-01-A-14	CC		Take up / Traverse Type No. ATT 24 take up units per machine consisting of 12 take up positions, four

Item no.	Supplier	Quantity	Description
			positions each on three decks Location Control Mechanical speed Max. package diameter Basic traverse stroke length Max. double strokes per minute Functionality One take up unit located between operator aisle and creel. Take up operator side facing inner aisle for string up action, finished package side facing creel side for unloading action. Barmag ATT max. 1200 m/min 250 mm 250 mm 800 High speed take-up for winding cylindrical as well as conical packages with adjustable taper angles Traverse system equipped with take-up processor for programmable control of stroke reduction and ribbon breaking which are adjusted in such a way that differences in the yarn tension are extensively equalised. The following parameters are set by computer interface - stroke length - crossing angle - anti bulging - starting ramp - transfer tail position - transfer tail length - last layer position - last layer length
M-33-01-A-15	CC		Automated package doffing device Type No. Location Functionality automated package doffing device including CPC package cradle with pneumatic loading/relieving action 1 per take up position, take up unit Each take-up position is equipped with an automated package doffing device, consisting of: - Empty-tube magazine with sensor for tube monitoring for supply of max. 4 empty tubes. - Running-time controlled yarn trapping and cutting device, including yarn suction. - Package lifting and braking device, sensor-monitored spool transfer to buffer position. - Transfer of empty tubes - Threading of yarn end on empty tube with formation of transfer tail, standard tubes without slot are used. - Centering discs with yarn catching and yarn cutting device, for standard take-up tube of inner diameter 69.2/57.15 mm, 290mm length. - Layout with second parking position for full DTY bobbins (250 mm diameter)

Item no.	Supplier	Quantity	Description
M-33-01-A-16	CC		Oiling device Type No. Location Functionality yarn lubrication roller with oil trough 1 roller per single take up position, 1 trough per each take up deck in front of each single take up position single driven shaft with grooved rollers rotates in oil troughs taking and applying oil on yarn running in the roller's groove. Oil troughs of each take up unit are joint, therefore a centralized oiling is possible. Yarn lifting during doffing procedure.
M-33-01-A-17	CC		Control cabinet BASS Type No. Location Voltage Power supply Cycles Norms/Regulations main power supply and machine control 1 per machine, in front of machine 220 V 380 V 60 Hz Control cabinet in conformity with GB regulations
M-33-01-A-18	CC		Barmag CAT (Computer Aided Texturing) Type No. Location Control Input main control panel and input 1 per machine, in front of machine CAT for ATT Siemens S7 all machine parameters are set on an interface via keyboard and monitor
M-33-01-A-19	CC		Maintenance platform Type No. Location Functionality steel construction for maintenance including 1 ladder 1 per machine, at the upper part of the machine on each side in front of in front of the heaters as well as one platform alongside the field electric cabinets for maintenance of heaters, string up device and electrical cabinets
M-33-01-A-20			POY Feed
M-33-01-A-20-02	P		Creel
M-33-01-A-20-03	P		Tubes and Eyelets
M-33-01-A-21			Accessories
M-33-01-A-21-01	CC		Injection guns Type No. Location Functionality portable suction gun 2 per machine, portable and to be connected to com- pressed air supply located on machine suction guns for threading of yarn
M-33-01-A-21-03	CC		Intermingling jets Type Heberlein SwissJet, incl.

Item no.	Supplier	Quantity	Description
		No. Location Functionality	- straight nipple - insert S2 (50 – 167 dtex) 288 per machine, intermingling between G2 & G2x for intermingling of yarn,
M-33-01-A-21-04	CC	A/C unit Type No. Location Functionality	indoor A/C unit for cooling of electrics 1 per e-cabinet, integrated in electrical cabinet keep temperature inside electrical cabinet stable and within set points
M-33-01-A-22		Consumables	
M-33-01-A-22-01	CC	Inlet Discs Type No. Functionality	ceramic inlet discs (FK6-32-721) 9mm, ø 52mm, CERAMTEC 288 pcs per machine, ceramic inlet discs suitable for use with PU working discs
M-33-01-A-22-03	CC	Working Discs Type No. Functionality	PU working discs (FK6-32-831) 9mm, ø 52.5mm, 85 ShA°, TEMCO 2016 pcs per machine, PU working discs
M-33-01-A-22-05	CC	Outlet Discs Type No. Functionality	ceramic outlet discs (FK6-32-779) 9mm, ø 49mm, CERAMTEC 288 pcs per machine, ceramic outlet discs suitable for use with PU working discs (knife disc type)
M-33-01-A-22-06	CC	Spacer Type No. Functionality	spacer 1-4-1 to 1-8-1 arrangement, corresponding distance piece for use with working discs on Barmag Friction Aggregates
M-33-01-A-23	CC	Original parts Spare parts	Spare parts in a value of 10.000 USD per machine mutually to be defined in due time. Contractor will provide spare parts proposal in due time for purchaser's selection.

Item no.	Supplier	Quantity	Description
M-33-02-A	CC	1 set	eAFK V Standard Process simultaneous draw-texturing of continuous filament Mechanical speed range 300 to 1200 m/min Polymer process range Polyester, Polyamide or Polypropylene Denier range 33 dtex to 330 dtex single yarn end Crimp insertion by friction aggregate with discs Cross section V Number of heaters per section 2 primary, 2 secondary Number of sections 12 sections Yarn ends / positions per section 24 / 24 pos Electrical system AC-version, inverter controlled M/C operation type split version, A&B-side to be operated separately
M-33-02-A-01	CC		Drive system Motor Type AC, Control inverter controlled by Barmag PLC/ATT setting of D/R, D/Y, underfeed as well as crossing angle of take up Drives for feed system units, take up units friction units traverse system auxiliaries Feed system Feed system G1 288 motors 0.040 kW each Feed system G2 288 motors 0.040 kW each Feed system G2x 288 motors 0.040 kW each Feed system W3 2 motors 5.500 kW each Take up system Traverse system W4 2 motors 5.500 kW each Take up system ATT 288 motors 0.040 kW each Friction system Friction units W6 288 motors 0.176 kW each Auxiliary system Oiling 72 motors 0.002 kW each Yarn displacement W3 2 motors 0.045 kW each Fume exhaust 2 motors 3.000 kW each Yarn suction (for string up) 1 motor 11.000 kW
M-33-02-A-02	CC		Feed system
M-33-02-A-02-01	CC		Basic Feed system Godet 24 godet bars for each G1, G2 and G2x, each equipped with 12 godets with single motor and separator roller. Godets can be switched off by manual operation Shaft Shaft with nip roller and quick release for W3, centrally driven
M-33-02-A-03	CC		Thread up device Type automatic device with push up rod each push up rod is equipped with quick release for twist stop roller No. 1 thread up device per position for 2 yarn

Item no.	Supplier	Quantity	Description
M-33-02-A-04	CC	Twist Stop Roller Operation Heater	ends metallic, (FK6-9c-132z), pneumatic with push button
M-33-02-A-04-01	CC	Primary heater Type Principle heat transfer Heating medium Heater length Temperature range Control Fume exhaust	24 heater per machine, Contact, 12 yarn ends per heater open/close heater with manually operated door 6 heating blocks containing V shaped heater plates with pinches Diphyl, vapour phase 2.0 m 150 – 170°C (+/- 2.5°C) 170 – 250°C (+/- 1.5°C) Barmag PLC via PC interface at each heating block in upper and lower position separate systems for A & B side 2 high efficiency blowers, 3.0 kW each
M-33-02-A-04-02	CC	Secondary heater Type Principle heat transfer Heating medium Heater length Temperature range Control	24 heater per machine, convection, 12 yarn ends per heater 12 exchangeable heater tubes, - spiral pinched Diphyl, vapour phase 1.30 m 150 – 250°C 150 – 170 (+/- 2.0°C) 170 – 250 (+/- 1.0°C) Barmag PLC via PC interface
M-33-02-A-05	CC	Cooling Type Principle No. Length	nitrated stainless steel plates with pinches contact, ambient air 1 cooling device per yarn end 1.10 m
M-33-02-A-06	CC	Crimp insertion Type Principle No. Drive Speed max. Suitable disc stacking	Friction unit type 8E friction disc texturing, fixed center type 288 pcs per machine single motor, directly driven 18.000 rpm stacking with various disc types up to 1-8-1 for 9mm discs 1-11-1 for 6mm discs incl. corresponding distance pieces
M-33-02-A-08	CC	Yarn quality monitoring Type Principle No. Measuring range Measuring frequency Functionality Output	UNITENS continuous online tension measuring 1 sensor per yarn end, 0 – 150 cN alternatively set by software 0 – 75 cN 50 Hz Yarn quality grading CV value Mean value Error monitoring Computer display and output unit (sensor)

Item no.	Supplier	Quantity	Description
M-33-02-A-09	CC		Intermingling piping Type No. Location Functionality Intermingling piping 1 per yarn end, between G2 and G2x Intermingling of yarn by use of intermingling jets with compressed air incl. - intermingling piping - pressure regulator - air filter - couplings (female, straight), suitable for Heberlein type intermingling jets
M-33-02-A-10	CC		Electronic yarn sensors Type No. Location Functionality Non contact yarn sensors 1 per yarn end, between W3 and take up yarn sensor activate corresponding yarn cutter
M-33-02-A-11	CC		Yarn cutter Type No. Location Functionality Barmag Power Cut 1 per yarn end, between creel and G1 cut yarn after activation by corresponding yarn cutter cut yarn in case of power failure for protection of PU discs
M-33-02-A-12	CC		Yarn suction device – string up Type No. Location Functionality Waste yarn collection system with central blower and collection bin as well as separate suction piping on A & B side for string up 1 per machine, blower and collection bin in filter cabinet suction piping above between G2x and secondary heater yarn suction system for waste yarn collection during threading. Waste yarn is transported to central collection bin.
M-33-02-A-13	CC		Yarn suction device – take up Type No. Location Functionality Waste yarn collection system by means of injectors and collection bin underneath each take up section 1 injector per position 1 bin per take up section, injectors at each take up position, collection bin underneath take up Injector system for waste yarn collection during doffing procedure. Waste yarn is transported to de-central collection bins of each take up.
M-33-02-A-14	CC		Take up / Traverse Type No. ATT 24 take up units per machine consisting of 12 take up position four positions each on three decks

Item no.	Supplier	Quantity	Description
			Location One take up unit located between operator aisle and creel. Take up operator side facing inner aisle for string up action, finished package side facing creel side for unloading action. Control Barmag ATT Mechanical speed max. 1200 m/min Max. package diameter 250 mm Basic traverse stroke length 250 mm Max. double strokes per minute 800 Functionality High speed take-up for winding cylindrical as well as conical packages with adjustable taper angles Traverse system equipped with take-up processor for programmable control of stroke reduction and ribbon breaking which are adjusted in such a way that differences in the yarn tension are extensively equalised. The following parameters are set by computer interface - stroke length - crossing angle - anti bulging - starting ramp - transfer tail position - transfer tail length - last layer position - last layer length
M-33-02-A-15	CC		Automated package doffing device Type automated package doffing device including CPC package cradle with pneumatic loading/relieving action No. 1 per take up position, Location take up unit Functionality Each take-up position is equipped with an automated package doffing device, consisting of: - Empty-tube magazine with sensor for tube monitoring for supply of max. 4 empty tubes. - Running-time controlled yarn trapping and cutting device, including yarn suction. - Package lifting and braking device, sensor-monitored spool transfer to buffer position. - Transfer of empty tubes - Threading of yarn end on empty tube with formation of transfer tail, standard tubes without slot are used. - Centering discs with yarn catching and yarn cutting device, for standard take-up tube of inner diameter 69.2/57.15 mm, 290mm length. - Layout with second parking position for full DTY bobbins (250 mm diameter)

Item no.	Supplier	Quantity	Description
M-33-02-A-16	CC		Oiling device Type No. Location Functionality yarn lubrication roller with oil trough 1 roller per single take up position, 1 trough per each take up deck in front of each single take up position single driven shaft with grooved rollers rotates in oil troughs taking and applying oil on yarn running in the roller's groove. Oil troughs of each take up unit are joint, therefore a centralized oiling is possible. Yarn lifting during doffing procedure.
M-33-02-A-17	CC		Control cabinet BASS Type No. Location Voltage Power supply Cycles Norms/Regulations main power supply and machine control 1 per machine, in front of machine 220 V 380 V 60 Hz Control cabinet in conformity with GB regulations
M-33-02-A-18	CC		Barmag CAT (Computer Aided Texturing) Type No. Location Control Input main control panel and input 1 per machine, in front of machine CAT for ATT Siemens S7 all machine parameters are set on an interface via keyboard and monitor
M-33-02-A-19	CC		Maintenance platform Type No. Location Functionality steel construction for maintenance including 1 ladder 1 per machine, at the upper part of the machine on each side in front of in front of the heaters as well as one platform alongside the field electric cabinets for maintenance of heaters, string up device and electrical cabinets
M-33-02-A-20			POY Feed
M-33-02-A-20-02	P		Creel
M-33-02-A-20-03	P		Tubes and Eyelets
M-33-02-A-21			Accessories
M-33-02-A-21-01	CC		Injection guns Type No. Location Functionality portable suction gun 4 per machine, portable and to be connected to com- pressed air supply located on machine suction guns for threading of yarn
M-33-01-A-21-03	CC		Intermingling jets Type Heberlein SwissJet, incl. - straight nipple

Item no.	Supplier	Quantity	Description
		No. Location Functionality	- insert S2 (50 – 167 dtex) 288 per machine, intermingling between G2 & G2x for intermingling of yarn,
M-33-02-A-21-04	CC	A/C unit Type No. Location Functionality	indoor A/C unit for cooling of electrics 1 per e-cabinet, integrated in electrical cabinet keep temperature inside electrical cabinet stable and within set points
M-33-02-A-22		Consumables	
M-33-02-A-22-01	CC	Inlet Discs Type No. Functionality	ceramic inlet discs (FK6-32-721) 9mm, ø 52mm, CERAMTEC 576 pcs per machine, ceramic inlet discs suitable for use with PU working discs
M-33-02-A-22-03	CC	Working Discs Type No. Functionality	PU working discs (FK6-32-831) 9mm, ø 52.5mm, 85 ShA°, TEMCO 4032 pcs per machine, PU working discs
M-33-02-A-22-05	CC	Outlet Discs Type No. Functionality	ceramic outlet discs (FK6-32-779) 9mm, ø 49mm, CERAMTEC 576 pcs per machine, ceramic outlet discs suitable for use with PU working discs (knife disc type)
M-33-02-A-22-06	CC	Spacer Type No. Functionality	spacer 1-4-1 to 1-8-1 arrangement, corresponding distance piece for use with working discs on Barmag Friction Aggregates
M-33-02-A-23	CC	Original parts Spare parts	Spare parts in a value of 10.000 USD per machine mutually to be defined in due time. Contractor will provide spare parts proposal in due time for purchaser's selection.