

Appendix I

Equipment List

(Total Scope of Supply)

Contractor reserves the right to carry out at any time technical modifications which may be necessary to achieve continuous process improvement and optimal plant operation, subject to previous written notification delivered by Contractor to Purchaser.

NOTE

concerning abbreviations:

- CC = CONTRACTOR's Oerlikon 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 10 01 A 001

- | | | | |
- | | | | +-- consecutive no.
- | | | +----- line identification
- | | +----- part no.1 in machine type section 10
- | +----- machine type section 10
- +----- type of apparatus

M-33	CC	1 set	eAFK	
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			Process	simultaneous draw-texturing of continuous filament
			Mechanical speed range	300 to 1200 m/min
			Polymer process range	Polyester, Polyamide or Polypropylene
			Denier range	22 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
			Number of positions per section	24 pos
			Electrical system	AC-version, inverter controlled
			M/C operation type	split version, A&B-side to be operated separately
M-33-01	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	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-33-03	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	ceramic,
			Operation	pneumatic with push button

M-33-04	CC	Heater	
M-33-04-01	CC	Primary heater Type Principle heat transfer Heating medium Heater length Heater rail length Temperature range Control Fume exhaust	24 heater per machine, 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 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-33-04-02	CC	Secondary heater Type Principle heat transfer Heating medium Heater length Heater tube 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 1.30 m 150 – 250°C 150 – 170 (+/- 2.0°C) 170 – 250 (+/- 1.0°C) Barmag PLC
M-33-05	CC	Cooling Type Principle No. Length	stainless steel plates with pinches contact, ambient air 1 cooling device per yarn end 1.10 m
M-33-06	CC	Crimp insertion Type Principle No. Drive Speed max. Suitable disc stacking Suitable inlet disc types Suitable working disc types Suitable outlet disc types Standard distance pieces incl.	Friction unit type 8E friction disc texturing 288 pcs per machine single motor, directly driven 22.000 rpm (+/- 1.5%) possible stacking up to 1-7-1 for 9mm discs guide disc, ceramic 7x PU disc, 9mm Temco knife edge disc, ceramic 1-4-1 to 1-7-1
M-33-07	CC	Plying device Type Principle No. Location Functionality	plying device plying of yarn ends by rotating rollers 1 roller per yarn end, below yarn quality monitoring and before feed G2 2ply

M-33-08	CC	Yarn quality monitoring Type Principle No. Measuring range Measuring frequency Functionality Output	Barmag UNITENS 3 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 printer
M-33-09	CC	Intermingling/detorque piping Type No. Location Functionality	Intermingling & detorque piping 1 per yarn end, between G2 and G2x , after sec. heater 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-33-10	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-33-11	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-33-12	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 and doffing. Waste yarn is transported to central collection bin.

M-33-13	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-33-14	CC	Take up / Traverse	Type No. positions each on three decks Location for string up action, finished Control Mechanical speed Max. package diameter Basic traverse stroke length Max. double strokes per minute Functionality	ATT 24 take up units per machine consisting of 12 take up positions, four One take up unit located between operator aisle and creel. Take up operator side facing inner aisle package side facing creel side for unloading action. Barmag ATT max. 1200 m/min 250 mm 250 mm 750 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-33-15	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)
M-33-16	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-33-17	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 440 V 60 Hz Control cabinet in conformity with GB regulations
M-33-18	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-33-19	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-33-20		Accessories	
M-33-20-01	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

D-041-20-02	CC	Creel Type No. Location Functionality	rotary side creel 1 set per machine, alongside each machine side creel suitable for holding 24 supply pack- ages each of up to 435 mm diameter. One package in operation and one pack- age as reserve to be connected via splice or knot
M-33-20-03	CC	Tubes and eyelets Type No. Location Functionality	tubes m between creel and machine to connect creels to machine
M-33-20-04	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-33-21	CC	Original parts	Spare parts Spare parts in a value of 10.000 USD, as follows:

Item	MaterialNo	Position	Description	Recommended Qty by OCN	Unit
15	BG-A-780-4505	Friction Unit	780450_5-ZV TOOTHED BELT	20	PCS
16	BG-A-780-0826	Friction Unit	780082_6-ZV BALLOON THREAD GUIDE	20	PCS
19	BG-A-E13-8549	Friction Unit	FK6-32-828 THREAD-GUIDE	10	PCS
24	BG-C-205-7387	Friction Unit	FKE-25C-695Z FRICATION MOTOR 380V	2	PCS
26	BG-1-025-1677	Friction Unit	FK6-32C-40Z COMPLETE WITH BROELL-THREAD GUIDE	4	PCS
30	BG-A-413-2660	Heater	413266_0-ZV THERMOSTAT	1	PCS
31	BG-A-D01-3771	Heater	Y2-25-2265 RESISTANCE THERMOMETER	1	PCS
32	BG-1-009-7740	Heater	Y2-25-2349 RESISTANCE THERMOMETER PT100 (L=1500)	1	PCS
33	BG-1-010-2542	Heater	Y2-25-6893 RESISTANCE THERMOMETER PT100 (L=2700)	1	PCS
34	BG-A-365-2719	Heater	365271_9-ZV THREAD-GUIDE	20	PCS
36	BG-A-506-5426	Heater	FK6-43-614Z THREAD-GUIDE	10	PCS
39	BG-1-007-3558	Oiling	FKE-25-15 SENSOR	2	PCS
40	BG-1-025-1540	Oiling	EAFK-8C-7Z LIFTING DEVICE	2	PCS
41	BG-1-025-1538	Oiling	EAFK-21C-3Z THREAD-GUIDE	10	PCS
42	BG-1-004-9214	Oiling	SENSOR	2	PCS
49	BG-A-680-8121	Oiling	680812_1-ZV THREAD-GUIDE	10	PCS
50	BG-1-008-3762	Oiling	AFK3-8-16Z STEPPING MOTOR	4	PCS
51	BG-A-D09-2474	Roller	FK6-21-991 FEED ROLL	2	PCS
56	BG-C-206-7317	Roller	FK6-21C-19Z PRESSURE ROLLER	2	PCS
57	BG-A-D08-5655	Roller	FK6-21-956 BEARING	4	PCS
60	BG-1-011-1984	Roller	FK7-21-41 GODET	4	PCS
62	BG-1-006-2123	Roller	AFK3-21-40 THREAD-GUIDE	10	PCS
63	BG-1-011-3703	Roller	FK7-21-57 SWITCH	10	PCS
64	BG-C-201-3491	Roller	FK6-1C-6 CLAMP COUPLING	2	PCS
72	BG-1-012-2437	String Up	AFK-9-239 TWIST STOP ROLL	4	PCS
76	BG-C-204-9751	String Up	FK6-9C-66Z THREAD-GUIDE ("LF")	4	PCS
95	BG-A-E54-3483	winding	AFK-4-31 GEAR BELT PULLEY	2	PCS
96	BG-A-260-3145	Winding	260314_5-ZV DEEP GROOVE BALL BEARING	4	PCS
100	BG-A-E38-4047	winding	TOOTHED BELT	10	PCS
101	BG-1-018-7199	Winding	EFKA-9C-4Z THREAD-GUIDE	10	PCS
112	BG-A-E68-4512	Winding	AFK-1-14 TAKE-OFF ROLL	2	PCS

115	BG-1-021-6610	Winding	AFK3-33-3Z YARN BREAK DETECTOR	2	PCS
116	BG-1-022-5008	Winding	EFKA-33C-2Z THREAD-GUIDE	4	PCS
117	BG-1-009-1168	Winding	AFK3-9-10 YARNDEFLE CTOR	10	PCS
118	BG-A-D35-8240	Yarn Cutter	D35824_0-ZV YARN BREAK DETECTOR	2	PCS
119	BG-1-008-5581	Yarn Cutter	AFK3-33-18 YARN TENSION SENSOR	2	PCS
120	BG-C-202-5185	Yarn Cutter	Y5-25-1237 YARN CUTTER	5	PCS
121	BG-A-508-7451	Yarn Cutter	THREAD-GUIDE	20	PCS
126	BG-A-E64-8910	Elec. parts	WIRING BOARD	1	PCS
127	BG-A-D89-4427	Elec. parts	TERMINAL DEVICE	1	PCS
128	BG-A-523-6740	Elec. parts	TERMINAL DEVICE	1	PCS
131	BG-C-206-0775	Elec. parts	PT100 TEMPERATURE CONTROL BOARD	1	PCS
132	BG-C-203-1931	Elec. parts	ELC-006	1	PCS
133	BG-C-206-4727	Elec. parts	ELC019 FRICTION UNIT CONTROL BOARD	1	PCS
134	BG-E-001-2720	Elec. parts	INPUT BOARD	1	PCS
135	BG-C-201-0098	Elec. parts	SOLID RELAY	2	PCS
136	BG-C-201-0029	Elec. parts	SOLID RELAY 50A	2	PCS
137	BG-C-204-9431	Elec. parts	ATV61HD18N4Z INVERTOR 18.5 KW	1	PCS
141	BG-C-202-9354	Elec. parts	ELC005-1Z RED RORNER LAMP	1	PCS
142	BG-C-202-9355	Elec. parts	ELC005-2Z YELLOW CORNER LAMP	1	PCS
145	BG-C-207-5673	Elec. parts	ATV71HD11N4Z Inverter 11KW 27.7A	1	PCS