APPENDIX 1

(to be taken, read and construed as an integral part of this Agreement)

HIGH PRECISION SLITTING LINE
LTA 1300/150/80 – M 208/1,0/7,0

1. TECHNICAL DATA

1.01 MATERIAL DATA

Material			Aluminium und Aluminium-Alloys Series 1000, 3000, 4000, 5000, 6000, 7000, 8000
Material condition			cold rolled hard, half hard 0 temper
Material surface			greasy, dry, slightly oiled bulb plate coils (“checkered coil”)
Delivery condition			without paper with / without spools
Material thickness		1,0 – 7,0	mm
Strip width	Entry strip	500 – 1.330	mm
Strip width	Exit strip	20 – 1.300	mm
Tensile strength	min.	65	N/mm²
	max.	500	N/mm²
Yield point	min.	20	N/mm²
	max.	480	N/mm²
Material elongation		max. 50	%

1.02 LINE DATA

Line direction		to be defined
Pass line height	1.100	mm
Line Speed	max. 150 max. 80	m/min for thickness ≤ 3,0 mm m/min for thickness > 3,0 mm
Threading Speed	10 – 15	m/min - with closed safety doors
Jogging Speed	approx. 10	m/min - with open safety doors
sound emission level average of one shift measured according DIN	< 85	dB (A) with safety fence

Stopping times of the line

Normal acceleration	max. 10	m/min/s (depending on coil data)
Normal stop	max. 10	m/min/s (depending on coil data)
Quick stop	max. 20	m/min/s (depending on coil data)

1.03 RECOMMENDED MANPOWER (FOR REFERENCE ONLY)

Operating of the slitting line	1 operator 2 helpers 1 tool technican for tool preparation

1.04 RECOMMENDED MAINTENANCE PERSONNEL (FOR REFERENCE ONLY)

For normal maintenance	1 electrical fitter 1 mechanical fitter 1 hydraulic/pneumatic fitter 1 electrics / automation specialist

1.05 MODE OF OPERATION / WORKING MODE

Line

- with direct tension between decoiler and slitting shear
- with loop after the slitting shear
- overlaid speed regulation for loop pit regulation
- with direct tension between decoiler and recoiler in edge trimming mode

Decoiler

- strip centre control device for the decoiler

Slitting shear

- slitting with rubber bonded spacers
- with automatic regulation of the overlap (CNC)
- running of the material at centre line

Brake unit

- braking of the strips with tension pad

Recoiler

- rewinding of the strips with and without sleeves
- rewinding of the strips directly onto the mandrel
- strip tension measuring and regulation on the recoiler with force measuring bearings at
- the deflection roll

1.06 COIL CAR

Coil weight	3.500	kg
Travelling speed	10	m/min.
Travel way	approx. 3.000	mm
Lifting height (till mandrel)	approx. 600	mm

1.07 DECOILER

Coil weight	3.500	kg
Coil Condition		wound tightly (min. 8 N/mm²)
		straight wound
Coil inside diameter	400/500/600	mm
Expansion range	380 – 420	mm (round at 400 mm)
With filler segments	480 – 520	mm (round at 500 mm)
with filler segments	580 – 620	mm (round at 600 mm)
Coil outside diameter	max. 1.300	mm
Decoiling		from top
		from bottom
Strip tension	3.900 – 27.300	N in slitting mode (with loop)
	19.500 – 136.500	N in edge trimming mode

1.08 AUTOMATIC CENTRE CONTROL SYSTEM

Manufacturer	EMG	
Correction distance on decoiler	+/-100	mm

1.09 PINCH ROLL UNIT

Roll diameter	400	mm
Amount of rolls	2	pieces

1.10 PRE – LEVELLER TYPE VR 1300 – 120/5

Levelling Roll diameter	120	mm
Amount of rolls	5	pieces

1.11 PINCH ROLL UNIT

Roll diameter	300	mm
Number of rolls	2	pieces

1.12 EDGE TRIMMING SHEAR BS208

Effective width	400 – 1.300	mm
Opening between knives	1.500	mm (in slitting mode)
Circular knife diameter	400	mm
Knife shaft diameter	280	mm

Motor for Immersion Depth Adjustment

Number	2	pieces
Type	AC	Servomotor with encoder

Linear Absolut Encoder for Immersion Depth Measurement

Number	2	pieces
Manufacturer	T+R	
Measuring steps	0,01	µm

1.13 PINCH ROLL UNIT

Roll diameter	300	mm

1.14 HIGH PRECISION SLITTING SHEAR M 208/1300 – TWIN CNC TYPE

Knife diameter	400	mm
Knife regrinding diameter	min. 370	mm
Knife shaft diameter	280	mm
Key way	with	
Spacer diameter	320	mm

Max. amount of cuts

Material thickness	Max. No. of strips	Max. No. of cuts
1,0 – 2,0 mm	25	26
> 2,0 – 4,0 mm	13	14
> 4,0 – 5,0 mm	9	10
> 5,0 – 6,0 mm	7	8
> 6,0 – 7,0 mm	5	6

Motor for Immersion Depth Adjustment

Number	2	pieces
Type	AC	Servomotor with encoder

Linear Absolut Encoder for Immersion Depth Measurement

Number	2	pieces
Manufacturer	T+R	
Measuring steps	0,5	µm

1.15 2 SCRAP WINDERS

Material thickness	max. 7,0	mm
Width of the edge scrap	10 – 70	mm
Scrap coil diameter Ø	750	mm
Scrap coil width	750	mm
Volume	0,325	m³
Scrap coil weight	max. 400	kg

1.16 STRIP BRAKING UNIT

Press width	400	mm
Press length	1.390	mm
Amount of cambers	1	piece
Deflection roll Ø	500	mm
No. of separating shafts	2	pieces

1.17 PINCH ROLL UNIT

Roll diameter	200	mm

1.18 CROPPING SHEAR

Material thickness	max. 7,5	mm

1.19 SEPARATION SHAFTS

Diameter	100	mm
Spacers diameter	100 x 120	mm
Separation discs diameter	100 x 180	mm

1.20 RECOILER

Coil inside diameter	400/500/600	mm
Coil outside diameter	max. 1.300	mm
Coil weight	max. 3.500	kg
Winding proportion	1.300 : 400	= 3,25 : 1
Tension	max. 136.500	N
Recoiling		to top
Modes of operation		without sleeves with sleeves

1.21 SLEEVES RECOILER

Inside diameter	398/498/598	mm
Material		Cardboard Steel (rewinding and edge trimming only, no slit coils)

1.22 COIL CAR WITH HOLD DOWN ARM

Coil weight	max. 3.500	kg
Travel way	approx. 3.500	mm
Travelling speed	10	m/min
Lifting height	approx. 500	mm
Hold down arm segments	approx. 70	pieces

1.23 TURNSTILE

No. of coil arms	2	pieces
Arms for diameter	400/500/600	mm
Load	2 x 3.500	kg
Turning angle	4 x 90	degrees
Turning speed	approx. 1	min / rotation

1.24 ELECTRIC

Power	400	V, 3 Phase
Line Type	TN	- System, grounded

Voltage fluctuation	-5 / +10	%
Frequency	50	Hz
Frequency fluctuation	±2	%
UPS Power Supply	230	V, 1 Phase, 16 A
Solenoid valve	24	V DC
Control voltage general	230	V AC
Control voltage PLC I/O	24	V DC
Control voltage sensors	24	V DC
Regulations for the electro-technical equipment (as applicable)		DIN VDE 0100 DIN EN 60204-1 DIN EN 60439-1

1.25 STANDARD EQUIPMENT

MECHANIC

Roller Bearings		FAG, INA, SKF
Roller Guides		THK, INA
Toothed couplings		Flohr, Tschan
Disc Brakes		Twiflex

HYDRAULIC

Oil		ISO VG 46
Hydraulic pressure	100	bar general
Valves		Bosch-Rexroth
Cylinders	general	Storz, according ISO 6020/1 and 6022
	compact cylinder	Römheld
	rotation cylinder	Storz
Fittings		according DIN2353, heavy type series
Fitting system		WALFORMplus or WALRing
Pipes	fixed	according DIN 1630, steel zinc coated, CR6 free
	flexible	high-pressure hose with wire mesh layer

PNEUMATIC

Pneumatic pressure	min.	5 bar
Valves		Festo
Cylinders		Festo
Piping	flexible	PU (Polyurethane)

ELECTRIC

AC-motors		Siemens
AC-gear motors		Siemens
4Q Power converter		Siemens
PLC, Controller		Siemens
Switch cabinet, control desks		Rittal
PC		Windows PC Newest version
Relays, buttons		Siemens
Terminal strips		Weidmüller; Phoenix
Proximity switches	general	IFM
	on hydraulic compact cylinder	Römheld
	on pneumatic cylinder	Festo
Incremental Position transducer		T+R
Linear solenoid transducer		MTS, T+R
EPC / CPC		EMG
Tension measuring bearings		FMS

1.26 ENVIRONMENT

Temperature	in shop	5 – 40	°C
	in electric room	5 – 35	°C
Humidity		max. 80	%
Installation altitude		< 1.000	m AMSL
Installation site			non-corrosive environment non-flammable zones

1.27 COLOURS

Machine parts	RAL 7035	light grey
Hydraulic unit	RAL 7016	anthracite grey
Hydraulic cylinder & accessories	RAL 7016	anthracite grey
Hydraulic Pipes	natural	steel zinc coated, CR6 free
Motors	RAL 7016	anthracite grey
Gear boxed	RAL 7016	anthracite grey
Danger Parts	RAL 1021	yellow
Moveable Parts	RAL 1021	yellow
Protecting Devices	RAL 1021	yellow
Fences, Safety Guard	RAL 1021	yellow
	RAL 9005	jet black (wire mesh of fences)

Switch Cabinet	RAL 7035	light grey
Terminal Box	RAL 7035	light grey
Control Desk	RAL 7035	light grey

11. Guarantees

		GUARANTEE VALUES
Regularity of the strips except for the first and last 5 layers *	Layer on layer	± 0,3 mm
	Entire strip coil	≤ 1,0 mm
Width tolerance for coils that have been levelled before putting on the slitting line *	for strip widths ≤ 100 mm	± 0,04 mm
	for strip widths > 100 mm	± 0,07 mm
Burr height *	burr height to be measured without deburring rolls	max. 3% of material thickness
Slitting shear **	Radial accuracy of the arbours	max. 0,002 mm
	Shoulder run out of the arbours	max. 0,002 mm
	Parallelism between arbours	max. 0,008 mm

* to be measured and valued during the Final Acceptance Test (FAT)

** to be measured during pre-acceptance tests at B+S workshop with participation of the Buyer's representative.

12. DELIVERY limitations

Following items are not included in our delivery if not mentioned before

- Unloading and transport of the line to the foundations as well as the necessary lifting and transport equipment
- Foundations, foundation works and the necessary fastening elements
- Steel cladding as well as covers / steel grating of the scrap baller pit
- Grouting of the machines
- Supply of electricity to the switch board
- Units for reactive compensation, capacitor etc.
- Generator for pressure air and pipelines to the compressed-air conditioner.
- Oil filling for gear units and hydraulic units
- Coverings, fences, railings, stairs, crossings etc., which are not expressively described in the offer
- Cable stacker groove, steel armoured conduit, plastic tubing's
- Other tools
- Removal of scrap and other waste process materials
- Operating materials and process materials
- Spare- and wearing parts other than the ones specified
- Organisation and costs for local travel (insideTurkey)