

2. Technical Data

2.1 Consumption Data

2.1.1 Electrical Connection Data

3 Phases Alternating Current AC	400 V +/- 10%, 50 Hz
Control Voltage	24 V DC

2.1.2 Power Input of Equipment

17.46 kW (subject to change)

2.1.3 Capacity of Equipment

~ 20 m²/h at 100 % space use
~ 15 m²/h at 75 % space use

Bankverbindungen

Kreissparkasse, Freudenstadt	(BLZ 642 510 60)	5115
Volksbank, Freudenstadt	(BLZ 642 910 10)	7349009
Dresdner Bank, Freudenstadt	(BLZ 600 800 00)	4139318
BW Bank, Freudenstadt	(BLZ 600 501 01)	4902 111
Commerzbank, Freudenstadt	(BLZ 694 400 07)	290 653 500
Postbank, Stuttgart	(BLZ 600 100 70)	6382-701

2238 Freudenstadt

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Date : 14.05.2007

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Drawing No. 21-20368-4-A1
Quote No. VG003956-001-04

Etch-Strip line
with a speed of 0.50m/min
Part 1: CuCl₂ Etching line, Relay-controlled
HU003260-001-11

enclosed the revised quotation

1. EQUIPMENT DATA

1.1 Measurements

- Working Width	650 mm
- Working Height	900 mm +/- 15 mm
- Machine Length	3250.00 mm

1.2 Conveyor Speed

- Operation Speed	0.50 m/min
- Frequency controlled conveyor drive	yes
- Range of Conveyor Speed	0.2- 6.0 m/min

1.3 Working Direction

- Working Direction	left-right
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1.4 Specification of Panels

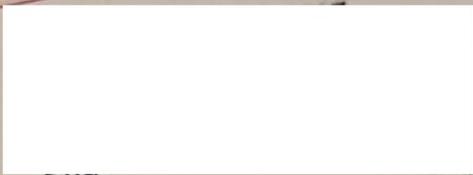
- Maximum Panel Width	475 mm
- Maximum Panel Length	305 mm
- Minimum Panel	180 x 180 mm
- Maximum Panel Thickness	4.50 mm
- Minimum Panel Thickness	0.05 mm
- Base Material	-FR4

1.5 Notes

- The length of the connector cable from control cabinet to machine which is included in the quotation can be found under "Ancillaries".
- Additional required cable is available for Euro 130,- / meter.
- Process times have to be checked and released by the customer.
- The calculation of the etching rate is based on the assumption of a HCl-content of 3 - 3.5 N and an etchinh rate of 2.8 sec/ μ m

Bankverbindungen

Kreissparkasse, Freudenstadt	(BLZ 642 510 60) 5115
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BW Bank, Freudenstadt	(BLZ 600 501 01) 4902 111
Commerzbank, Freudenstadt	(BLZ 694 400 07) 290 653 500
Postbank, Stuttgart	(BLZ 600 100 70) 6382-701



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Drawing No. 21-20368-4-A1
Quote No. VG003956-002-05

Etch-Strip Line
with a speed of 0.50m/min
Part 2: Alkaline Stripper, Relay controlled



2. Technical Data

2.1 Consumption Data

2.1.1 Electrical Connection Data

3 Phases Alternating Current AC 400 V +/- 10%, 50 Hz
 Control Voltage 24 V DC

2.1.2 Power Input of Equipment

41.69 kW (subject to change)

2.1.3 Capacity of Equipment

~ 20 m²/h at 100 % space use
 ~ 15 m²/h at 75 % space use

Bankverbindungen



1. EQUIPMENT DATA

1.1 Measurements

- Working Width	650 mm
- Working Height	900 mm +/- 15 mm
- Machine Length	4250.00 mm

1.2 Conveyor Speed

- Operation Speed	0.50 m/min
- Frequency controlled conveyor drive	yes (subject to change)
- Range of Conveyor Speed	0.2- 6.0 m/min

1.3 Working Direction

- Working Direction	left-right
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1.4 Specification of Panels

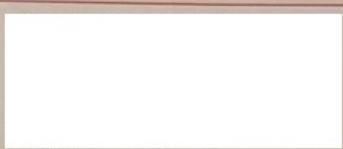
- Maximum Panel Width	610 mm
- Maximum Panel Length	460 mm
- Minimum Panel	180 x 180 mm
- Maximum Panel Thickness	3.60 mm
- Minimum Panel Thickness	0.850 mm
- Base Material	-FR4

1.5 Notes

- The length of the connector cable from control cabinet to machine which is included in the quotation can be found under "Ancillaries". Additional required cable is available for Euro 130,- / meter.
- Process times have to be checked and released by the customer.
- The content of NaOH should be 2 - 3.5 %

Bankverbindungen

- 3.2 **Spray system for a WSI 2, consisting of:**
- 1 - PLC Control for intermittent spraying
 - 4 - WSI Spray pipe top, with electropneumatic valve and pulsed damper
 - 2 - WSI Spray pipe bottom, with electropneumatic valve and pulsed damper
- 3.3 **Transport system Innerlayer/Flex WSI 2 consisting of:**
- 1 - WSI 2 Innerlayer/Flextransport in PVC/Ti
- 3.4 **Pump system prepared for the installation of a filter, consisting of:**
- 1 - Pump - Immersion Pump 4.0 kW prepared for filter installation or pressure pipe
 - 1 - Frequency controller for max. 4 kW motors
 - 1 - Cartridge Filter - 1 x 10" filter with electrical lid control
 - 1 - Filter - Filter mesh 80 µm, PP
- 3.5 **Pressure measuring system consisting of:**
- 2 - Pressure gauge digital without current output
- 4 **Module 004 - Cascade rinse**
- 4.1 **KSM 3 - 875 mm consisting of:**
- 1 - KSM 3 PVC/Ti Cascade Rinse Module with lid safety interlock
- 4.2 **Cascade 1 in KSM 3, consisting of:**
- 2 - Spray pipe PVC straight with 6 quick-release nozzles
- 4.2.2 **Transport system Flex, consisting of:**
- 1 - KSM 3 Flex transport in PVC/Ti
 - 1 - Pump - Immersion Pump 0.37 kW without filter / COMpact filter
 - 1 - Cartridge Filter - 1 x 10" filter with quick-exchange device, electrical lid control
 - 1 - Filter - Filter mesh 80 µm, PP
 - 1 - Dry-Run protection or level control for installation in plastic modules, with control light
 - 1 - Exhaust connection, PVC, d=75 with damper
 - 1 - Overflow Pipe d=50
 - 1 - Tank - Solution Transfer Tank PP with immersion pump and level control
++ waste water from cascade 1 ++
- 4.3 **Cascade 2 in KSM 3, consisting of:**
- 2 - Spray pipe PVC straight with 6 quick-release nozzles
- 4.3.2 **Transport system Flex, consisting of:**
- 1 - KSM 3 Flex transport in PVC/Ti



- 1 - Pump - Immersion Pump 0.37 kW without filter / COMpact filter
- 1 - Dry-Run protection or level control for installation in plastic modules, with control light
- 1 - Overflow Pipe d=50

4.4 **Cascade 3 in KSM 3, consisting of:**

- 2 - Spray pipe PVC straight with 6 quick-release nozzles

4.4.2 **Transport system Flex, consisting of:**

- 1 - KSM 3 Flex transport in PVC/Ti
- 1 - Pump - Immersion Pump 0.37 kW without filter / COMpact filter

4.5 **Inlet system for a KSM 3 module, consisting of:**

- 1 - Flow meter 15 - 160 l/h, includes regulator valve
- 1 - Flowmeter Limit Contact min., with control lamp
- 2 - Electropneumatic valve PVC d=20

5 **Ancillaries**

- 20 - Cable connection to control cabinet
- 1 - Lamp - Flash lamp 3 colours
- 1 - Stand-by system including conveyor drive, controlled via sensor at entry
- 1 - Transfer SSL - Hong-Kong

Net value

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OPTION

- 1 **Buffer tanks for HCl and H2O2**
 - 2 - Tank - 100 l PP
++ Buffer tank H2O2 and HCl ++
 - 2 - Level Sensor for Tank with 4 Level Switches
 - 2 - Electropneumatic valve PVC d=20



- 3.7 **Dosing system antifoam, consisting of:**
 - 1 - Pump - Dosing pump 2.5 l/h for anti-foam unit
 - 2 - Antifoam dosing dripper system
 - 2 - Manual valve PVC d=12
 - 1 - Liquid Suction Armature in PP / 50 l/h with level switch

- 3.8 **Dosing system consisting of:**
 - 1 - Conductivity measuring device, variable measuring range 100 µS/cm to 2 S/cm
 - 1 - Pump - Dosing pump 0 - 54 l/h with suction and pressure hose
 - 1 - Liquid Suction Armature in PP / 500 l/h with level switch
 - 1 - Check valve for dosing pump 25 - 54 l/h
 - 1 - Overflow valve 25 - 54 l/h
 - 1 - Base for dosing pump 7.2 - 120 l/h
 - 1 - Flowmeter 60 - 640 l/h, includes regulator valve
 - 1 - Flowmeter Limit Contact min., with control lamp
 - 1 - Electropneumatic valve PVC d=20

- 4 **Module 008 - Cascade rinse**
- 4.1 **KSM 3 - 875 mm consisting of:**
 - 1 - KSM 3 PVC/SS Cascade Rinse Module with lid safety interlock
- 4.2 **Cascade 1 in KSM 3, consisting of:**
 - 2 - Spray pipe PVC straight with 9 quick-release nozzles
- 4.2.2 **Transport system Flex, consisting of:**
 - 1 - KSM 3 Flex transport in PVC/SS
 - 1 - Pump - Immersion Pump 0.37 kW without filter / COMcompact filter
 - 1 - Cartridge Filter - 1 x 10" filter with quick-exchange device, electrical lid control
 - 1 - Filter - Filter mesh 80 µm, PP
 - 1 - Dry-Run protection or level control for installation in plastic modules, with control light
 - 1 - Overflow Pipe d=50
- 4.3 **Cascade 2 in KSM 3, consisting of:**
 - 2 - Spray pipe PVC straight with 9 quick-release nozzles
- 4.3.2 **Transport system Flex, consisting of:**
 - 1 - KSM 3 Flex transport in PVC/SS
 - 1 - Pump - Immersion Pump 0.37 kW without filter / COMcompact filter
- 4.4 **Cascade 3 in KSM 3, consisting of:**
 - 2 - Spray pipe PVC straight with 9 quick-release nozzles
- 4.4.2 **Transport system Flex, consisting of:**
 - 1 - KSM 3 Flex transport in PVC/SS

2.2. Module Description

Item	Quantity	Description	Total price
1		Module 001 - Entry	
1.1		TRE 2 - 625 mm, consisting of:	
	1	- TRE 2 PVC/Ti Entry module with emergency stop switch	
	1	- Exhaust Connection d=75 mm Ti, TRE-TRA-TRK with 2 squeegee rollers	
	1	- Exhaust, exhaust damper for exhaust connection	
	1	- Support foot, with height adjustment	
	1	- Service Unit for electropneumatic valves with pressure reducer and pressure control	
	1	- Encoder	
	1	- Sensor with Fixing Device and Top Discroller	
	1	- Emergency stop, addit. rear side	
1.2		Transport system Flex for TRE 2, consisting of:	
	1	- TRE/TRA/TRK 2 Flex transport in PVC/Ti	
	1	- Conveyor Drive 0.1 - 3.0 m/min continuously adjustable frequency-controlled with reluctance motor	
	1	- Digital conveyor display	
2		Module 002 - Etch	
2.1		AZM 4 - 1125 mm, consisting of:	
	1	- AZM 4 PVC/Ti Fine-Line-Etch module and safety interlock	
	1	- Overflow Pipe d=50	
	3	- Dry-Run protection or level control for installation in plastic modules, without control light, for PLC applications	
	1	- AZM 4 Catch Mesh below spray frame	
	1	- AZM Exhaust connection, with mechanical damper	
	2	- AZM Etch chamber light	
	1	- Manual valve PVC d=12 ++ sample valve ++	
	1	- Condenser include valve, PVC/Ti	
	1	- Condenser - Piping basic price	
	3	- Condenser - Piping per exhaust damper	
2.2		Spray frames	
	1	- AZM Oscillation of spray manifold	
	1	- AZM 4 Q-Fine-Line Spray Frame bottom, perpendicular spray pipes, staggered nozzles	
	1	- AZM 4 Q-Fine-Line Spray Frame top, perpendicular spray pipes, staggered nozzles	
	2	- AZM Q- Spray Frame halfway shut-off by manual valve, for use with acid process	



- 1 - Pump - Immersion Pump 0.37 kW without filter / COMpact filter
- 4.5 **Inlet system for a KSM 3 module, consisting of:**
 - 1 - Flowmeter 60 - 640 l/h, includes regulator valve
 - 1 - Flowmeter Limit Contact min., with control lamp
 - 2 - Electropneumatic valve PVC d=20
- 5 **Module 009 - Dryer**
 - 5.1 **TKM 2 - 625 mm, consisting of:**
 - 1 - TKM 2 PP/SS Dryer with Pt 100 and Safety Thermostat
 - 2 - Exhaust connection, d=90 without damper
 - 5.2 **Transport system Flex, consisting of:**
 - 1 - TKM 2 Flex transport PP/SS
 - 5.3 **Air nozzles for dryer TKM 2, consisting of:**
 - 1 - TKM Dry Jet with 2 blowers à 3.0 kW SS, with non-return valve, used with IL and flex material in dryer, including 2 suction filters
- 6 **Module 010 - Output**
 - 6.1 **TRA 2 - 625 mm, consisting of:**
 - 1 - TRA 2 PVC/SS exit module with emergency stop switch
 - 1 - Support foot, with height adjustment
 - 1 - Emergency stop, addit. rear side
 - 6.2 **Transport system Flex for TRA 2, consisting of:**
 - 1 - TRE/TRA/TRK 2 Flex transport in PVC/SS
- 7 **Ancillaries**
 - 20 - Cable connection to control cabinet
 - 1 - Stand-by system including conveyor drive, controlled via sensor at entry
 - 1 - Transfer SSL - Hong-Kong

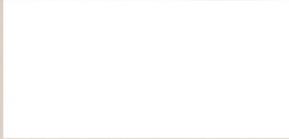
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- 1 - Safety thermostat with control lamp SS with Pt 100, TÜV inspected, for hardwired machine
- 2.6 **Pressure measuring system, consisting of:**
 - 2 - Pressure gauge digital without current output
- 2.7 **Wastewater transfer tank system, consisting of**
 - ++ waste water from Stripper and cascade after etching (K2 and K3) ++
 - 1 - Tank - Solution Transfer Tank PP with immersion pump and level control
- 3 **Module 007 - Post Strip**
 - 3.1 **WMT 1 - 375 mm, consisting of:**
 - 1 - WMT 1 PP/SS process module with tank as substructure and lid safety interlock
 - 1 - Cascade connection between two modules
 - 1 - Dry-Run protection or level control for installation in plastic modules, with control light
 - 1 - Manual valve PP d=16
++ sample valve ++
 - 3.2 **Transport system Flex, consisting of:**
 - 1 - WMT 1 Flextransport PP/SS
 - 3.3 **Spray system for a WMT 1, consisting of:**
 - 2 - Spray pipe SS, straight, with quick-release connection and threaded nozzles (top)
 - 2 - Spray pipe SS, straight, with quick-release connection and threaded nozzles (bottom)
 - 1 - WMT-WSM 1 Input pipe SS
 - 3.4 **Pump system prepared for the installation of a filter, consisting of:**
 - 1 - Pump - Immersion Pump 1.8 kW prepared for the installation of a filter or pressure pipe
 - 1 - Cartridge Filter - 1 x 10" filter with quick-exchange device, electrical lid control
 - 1 - Filter - Filter mesh 80 µm, PP
 - 3.5 **Temperature control, consisting of:**
 - 1 - Safety thermostat with control lamp SS with Pt 100, TÜV inspected, for hardwired machine
 - 1 - Thermostat with digital display, SS with Pt 100 temperature probe for hardwired machine
 - 1 - Heater 4.5 kW, SS
 - 1 - Cooling coil SS without electropneumatic valve
 - 1 - Electropneumatic valve PVC d=20
 - 3.6 **Pressure measuring system, consisting of:**
 - 2 - Pressure gauge digital without current output



- 2.3 **Transport System Flex, consisting of:**
 - 1 - AZM 4 Innerlayers/Flex Transport in PVC/Ti
- 2.4 **Pump system prepared for installation of a filter, consisting of:**
 - 1 - Pump - Immersion Pump 4.0 kW prepared for filter installation or pressure pipe
 - 1 - Cartridge Filter - 1 x 10" filter with electrical lid control
 - 1 - Filter - Filter mesh 80 µm, PP
- 2.5 **Pressure measuring system consisting of:**
 - 2 - Pressure gauge digital without current output
- 2.6 **Temperature control for AZM**
 - 1 - Thermostat with digital display, TI, with Pt 100 temperature probe for hardwired machine
 - 1 - Safety thermostat with control lamp Ti with Pt 100, TÜV inspected for hardwired machine
 - 1 - 2 x Cooling coil in Titanium, with one electropneumatic valve
 - 2 - Heating 4.0 kW Titanium
- 2.7 **Replenishment for etchant**
 - 1 - Schmid-Regeneration for CuCl- Etch line consisting of:
 - Redox Measuring Device
 - Conductivity measuring device, variable measuring range 100 µS/cm to 2S/cm
 - Digital density control with current output, 4 - 20mA
 - Injector PVC, d=75 with 5 inlets
 - 1 x manual valve PVC d=40, main injector, 1x injector air
 - 1 x manual valve PVC d=20, suction from the module
 - Flow meter 10,200 l/h - with digital display and current output 4 - 20mA
 - 3 x flow meter 60 - 640 l/h, includes regulator valve
 - 1 x flow meter 15 - 160 l/h, includes regulator valve
 - 7 x flow meter minimum contact
 - 6 x electropneumatic valve d=20 PVC
 - 3 x dirt catcher d=20
 - 2 - Liquid Suction Armature in PP / 500 l/h with level switch
- 2.8 **Wastewater transfer tank system, consisting of**
++ waste water from Etching module ++
 - 1 - Tank - Solution Transfer Tank PP with immersion pump and level control
- 3 **Module 003 - Intermittend Etch**
 - 3.1 **WSI 2 - 625 mm, consisting of:**
 - 1 - WSI 2 PVC/Ti Process module for intermittent etching, with safety interlock
 - 1 - Cascade connection - WMT - WSM
 - 1 - Flow Restrictor



2.2. Module Description

Item	Quantity	Description	Total price
1		Module 005 - Inspection	
1.1		TRK 2 - 625 mm, consisting of:	
	1	- TRK 2 PVC/Ti inspection module with emergency stop switch	
	1	- Exhaust Connection d=75 mm SS, TRE-TRA-TRK with 2 squeegee rollers	
	1	- Emergency stop, addit. rear side	
1.2		Transport system Flex for TRK 2, consisting of:	
	1	- TRE/TRA/TRK 2 Flex transport in PVC/Ti	
	1	- Conveyor Drive 0.1 - 3.0 m/min continuously adjustable frequency-controlled with reluctance motor	
	1	- Digital conveyor display	
2		Module 006 - Strip	
2.1		STM4 - 1125 mm, consisting of:	
	1	- STM 4 Stripper module in PP/SS and safety interlock	
	1	- Dry-Run protection or level control for installation in plastic modules, with control light	
	1	- Antifoam overflow	
	1	- Manual valve PP d=16 ++ sample valve ++	
2.2		Spray system for STM 4, consisting of:	
	9	- Spray pipe SS with SS-flat-spray nozzles bottom	
	9	- Spray pipe SS with SS-flat-spray nozzles top	
	1	- Pump 4.0 kW immersion pump in SS for STM modules	
2.3		STM 4 Flextransport consisting of:	
	1	- STM 4 Flextransport PP/SS	
2.4		Resist filter system for a stripper, consisting of:	
	1	- Filter- Cyclone filter, belt filter with electropneumatic valve and sensor for belt control system and collection basket with pump 4.0 kW	
	1	- STM - ZBF-Bail Out Pump for drip tray Includes: Tank and pump to bail-out drip-tray of filter basket into drain	
2.5		Temperature control, consisting of:	
	1	- Electropneumatic valve PVC d=20	
	1	- Cooling coil SS without electropneumatic valve	
	2	- Heating 10 kW, SS	
	1	- Thermostat with digital display, SS with Pt 100 temperature probe for hardwired machine	