



NEW TECHNOLOGY OVERMAN

ENGINEERING ▪ PROJECTS ▪ CONSULTANCY
PCB INDUSTRY ▪ MECHANICAL ENGINEERING ▪ DESIGN



Example of HCL line

HCL NTO Rinse-dryer Horizontal conveyORIZED process line

Technical Specification 2021-008 version A

Horizontal conveyORIZED line for

New Technology Overman
Diemewei 4306
6605 XE Wijchen
The Netherlands

Phone : : +31 (0)24 6448105
Mobile : : +31 (0)6-24988200

E-mail: : info@newtech-overman.nl
Website: : www.newtech-overman.nl

Bank Account no. : 13.11.45.797
IBAN no. : NL 11 RABO 0131145797
BIC no. : RABONL2U
Register no. : 09184662
BTW/VAT no. : NL 001881126 B28

Final clean process (1m/min)

The **NTO** Rinse-dryer line is semi-independent working machine designed for final cleaning the printed circuit board before shipment.

The line consists of polypropylene modules that are welded. These modules are mounted on a stainless steel frame. The conveyor system consists of stainless steel rods with polypropylene discs.

A cogwheel at the end of the rod is driven by another cogwheel on the main axis which is connected to a drive motor. In this line two main axis are mounted. One in the front and one in the rear.

Drive motor is mounted in output module. The drive speed is adjustable through a frequency controller and digital speed controller in the control cabinet.

2-cascade rinse module with spray bars and St. steel centrifugal pump.

Special designed MJ(Microjet) dryer ensure that all types of board even with small holes and blind vias are completely dry when it leaves this line.

All pumps, blowers, heaters and pipework are mounted underneath and at the backside of the machine.

Control of the line is by an inbuilt PLC (Siemens TIA Portal) which controls the relevant ladders of programmed steps and to enable the desired process steps to be achieved.

Electrical components and control switches (pumps, heaters, temperature control etc.) are in and on the electrical cabinet. On the cabinet is a main switch located and on top of that cabinet a green/red/orange alarm light.

There will be a clock timer build into the cabinet for automatic start up the heaters. As part of the warm up sequence all pumps to energize for 2 minutes every 10 minutes. This is to avoid tank hot spots.

EQUIPMENT DESIGNED AND MANUFACTURED IN THE NETHERLANDS.

TECHNICAL DATA:

Transportation width	: 640 mm [24" inch]
Working width	: Max. 625 mm [24,6" inch]
Working height	: 900 mm[35,4" inch] (adjustable)
Machine dimensions	: Approx. 1720 x 1200 x 1100 mm (LxWxH) [Approx. 67,7" x 47,2" x 43,3" inch (LxWxH)]
Working direction	: left to right (standard)
Conveyor speed	: 0.5 to 1.5 m/min [1,63 to 5 feet/min.] (adjustable)
Operation speed	: 1 m/min [3,3 feet/min]
Heating up time	: 2 hours
Module material	: PP
Frame material	: Stainless steel
Conveyor rod material	: Stainless steel with PP discs
Min. print length	: 120 mm [4,7" inch]
Min. print width	: 120 mm [4,7" inch]
Max. print width	: 610 mm [24" inch]
Min. print thickness	: 0,8 mm [0.02" inch]
Max. print thickness	: 5 mm [0.20" inch]
Max. aspect ratio	: Not applicable
Capacity	: Approx. : 25,6 m ² /h (1 m/min) [Approx : 11 inch ² /hour (at 3,3 feet/min.) (panel size 410x460mm -> 70% efficiency)]
Pipework connections	: water inlet Ø25 mm : water drain Ø40 mm : concentrate drain Ø40 mm : exhaust Ø40 mm

Electrical connection	: 3 phase 380 VAC N PE or 3 phase 220 VAC PE
Control devices	: 24 V DC
Power consumption	: Approx. 14 kW
Water consumption	: Max. 0,4 m ³ /h [105 gal/h] Fresh water
Exhaust extraction	: Approx. 200-400 m ³ /h [117-235 cfm]

CONSUMPTION QUALITY REQUIREMENTS :

Water inlet (cascade/rinse)	±20°C [68° F]
Water inlet (cooling)	<15° C [< 59° F]
Water hardness	8-12 °dH (german standard)

PROCESS SEQUENCE:

Module	Process	Material	Module length (inner size)	Temp.
1	Input	PP/ st. steel	350 mm [13,8"]	
2	2-Cascade rinse	PP/ st. steel	470 mm [18,5"]	
3	Dryer	PP/ st. steel	470 mm [18,5"]	60°-70°C [140-158° F]
4	Output	PP/ st. steel	350 mm [13,8"]	

Module design, module sequence and machine specification is according the specifying chemical machine/process data sheet. The machine is designed for chemicals from

MODULE 1	INPUT 350 : Left to right (INV-350/ST/0)
Length of module :	350 mm [13,8"]
Material :	PP / stainless steel
Material conveyor rods :	Stainless steel with PP discs
Safety measures :	Emergency stop button
Drain :	ø25 draining hose
Photo electric switch :	Switch machine on/off (stand-by function-> pumps/blowers etc.)

OPTIONS :

Exhaust :	ø40mm pipe connection
Exhaust :	ø40mm pipe connection (with control valve)
Drain :	ø25 draining pipe
Photo electric switch :	Multiple Photo electric switches
Transportation	Motor transport (0,18 kW)



Example of an input module

MODULE 2	2-CASCADE RINSING 470 : Left to right (2CAS-470/ST/0)
Length of module :	470 mm[18,5"]
Material :	PP / stainless steel
Material conveyor rods :	Stainless steel with PP discs
Material appendages :	PVC
Number of rinsing sections :	2x rinsing section
Number of spray bars :	Each section with one pair of spray bars (with PVDF flat jets; 5/6 pcs each)
Number of squeeze rolls :	1 pair of PP rolls at input and output of each section
Number of pumps	Each section with a direct drive pump (0,45Kw)
Dry-run protection :	Each section with a level control
Water inlet :	Fresh water inlet through flowmeter with solenoid valve (in 3e comp.) 150 l/h
Drain :	ø32 draining pipe in each section
Safety measure :	Glass safety hood with protection switch

OPTIONS :

Water inlet :	Demi water inlet (in 3e comp.) ... l/h
Material appendages :	PP
Number of spray bars :	Each section with two pair of spray bars (with PVDF flat jets; 5/6 pcs each)
Type of pump	Each section with a magnetic drive pump (0,55Kw)
Material of squeeze rolls :	EPDM or Viton rolls at input and output of each section

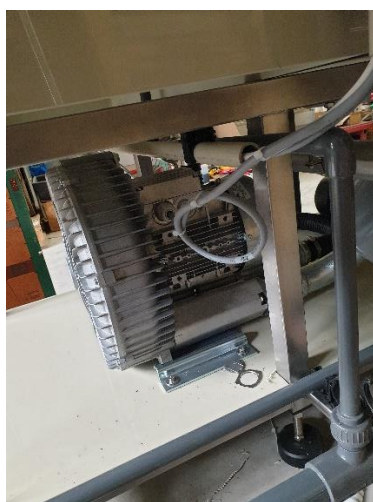


Examples of a cascade module

MODULE 3	DRYING 470 : Left to right (DR1A-470/ST/0)
Length of module :	<i>470 mm [18,5"]</i>
Material :	<i>PP / Stainless steel</i>
Material conveyor rods :	<i>Stainless steel with PP discs</i>
Material appendages :	<i>PVC/PP</i>
Type of air knife	<i>2 pair of micro-jet dryers (NTO MJ-dryer)</i>
Number of blowers :	<i>2x blower (3 kW)</i>
Number of heaters :	<i>2x air heater (2,5 kW)</i>
Number of cotton rolls :	<i>1 pair of PP foam rolls at input each module</i>
Temperature protection :	<i>Thermostat</i>
Drain :	<i>Ø25 draining hose</i>
Exhaust :	<i>Ø40 pipe connection</i>
Safety measure :	<i>Glass safety hood with protection switch</i>

OPTIONS :

Number of air knives :	<i>2 pair air knives</i>
Drain :	<i>Ø25 draining pipe</i>
Exhaust :	<i>Ø40 pipe connection with control valve</i>

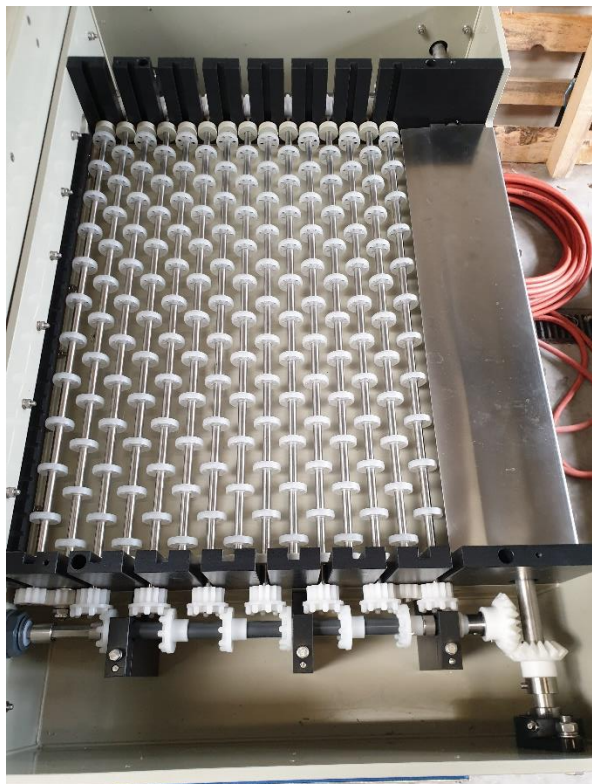


Example of a Drying module showing NTO MJ-dryer

MODULE 4	OUTPUT 350 : Left to right (UTV-350/ST/0)
Length of module :	<i>350 mm [13,8"]</i>
Material :	<i>PP / stainless steel</i>
Material conveyor rods :	<i>Stainless steel with PP discs</i>
Safety measures :	<i>Emergency stop button</i>
Drain :	<i>ø25 draining hose</i>
Transportation	<i>Motor transport (0,18 kW)</i>

OPTIONS :

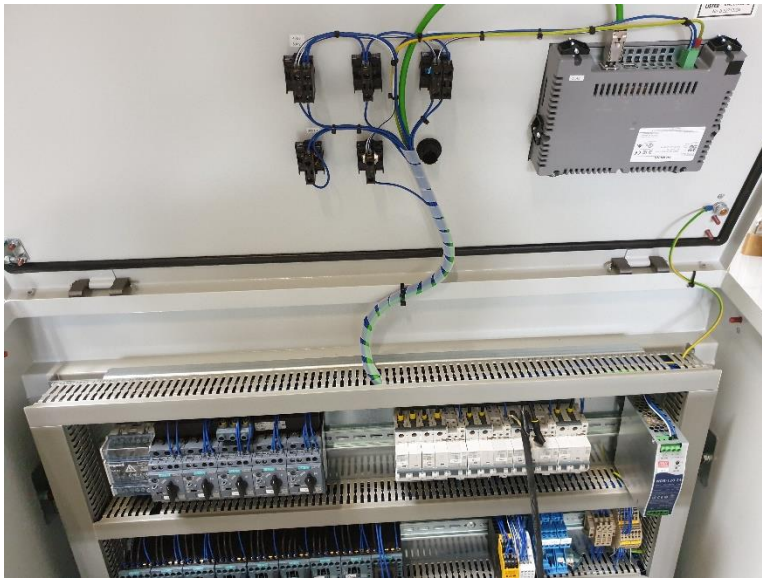
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- | | |
|-----------|---|
| Exhaust : | <i>ø40mm pipe connection (with control valve)</i> |
| Drain : | <i>ø25 draining pipe</i> |
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Example of an output module

CONTROL CABINET

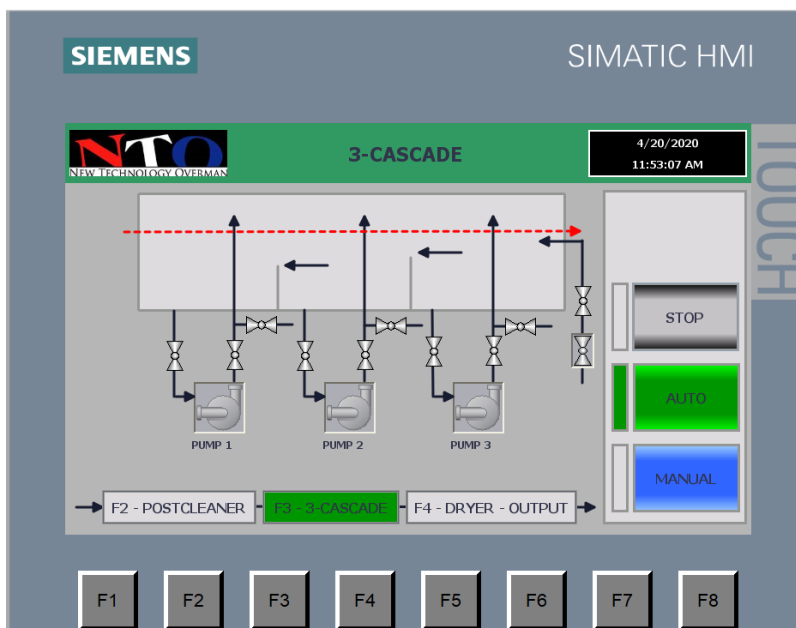
- Cabinet dimensions : approx. 1000x600x400 [39,4'' x 23,6'' x 15,7'' inch] (HxWxD)
- Cable connection between line and cabinet, standard 4m [13,1' feet]
- All electrical components in control cabinet
 - * Relays for heaters, motors etc.
 - * PLC Controller
 - * Motor safety switch
 - * Frequency controller
- Switches, lamps, etc. in the cabinet front doors
- Emergency stop
- Main switch



Example of control cabinet with HMI display.

PLC CONTROL

- PLC controller unit (Siemens TIA Portal)
 - * A display is built in the control cabinet where a visualisation system with graphic representation shows the layout of the machine and control display.
 - * All Parameters settings and readout functions are indicated on the visualisation system
- All electrical components in control cabinet
 - * Relays for heaters, motors etc.
 - * Motor safety switch
 - * PLC Controllers
 - * Frequency controller
- On request it is Possible to have English, German or other language in the screen.



Example of HMI display

OTHERS

- Automatic stop of pumps/blowers by lifting glass safety hood (disconnection of protection switch!)
 - Several Emergency stops are placed on the machine and electro cabinet
 - Proximity switch (at input module) for automatically switching on/off pumps, water inlet etc.
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OPTIONS :

COMMUNICATION

- Modem or internet connection for communication purpose
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DRIPTRAY

- Material : Polyethylene
 - Dimension : Inside the line
 - Drip tray rim height : $\pm 50\text{mm}$ [2" inch]
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