

Brush Coil Cleaner
DTBC
Strip Spray Lubrication System
EPCNT



1. GENERAL DESCRIPTION

The scope of supply for this quotation consists in the detailed design, procurement, fabrication and assembly of auxiliary elements related to the below description of material and in-house testing.

The machine is suitable for the installation on a blanking line.

The proposal is composed from:

- Brush Cleaner for the Coil
- Oiler for the Coil

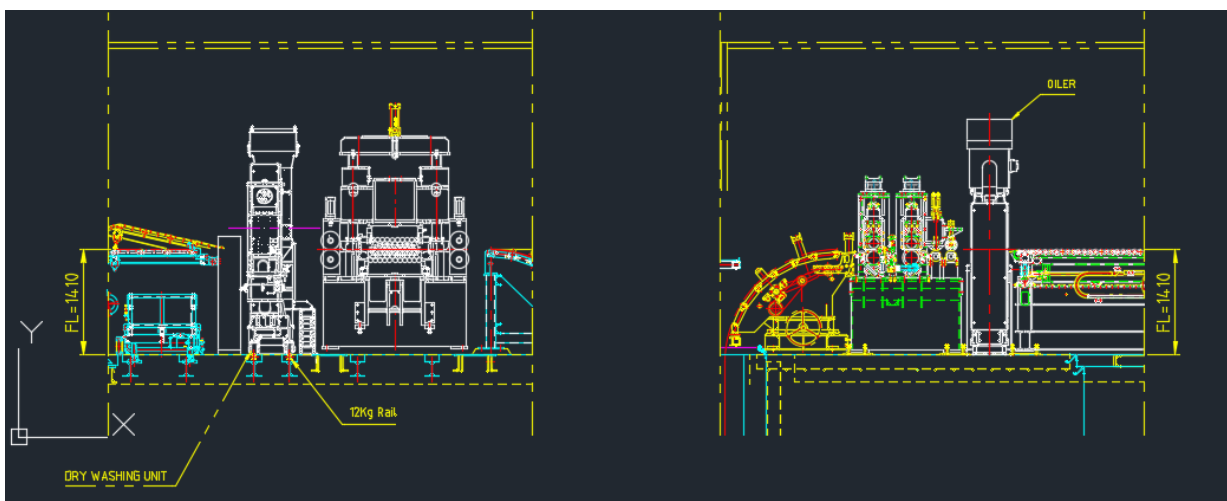
While running through the cleaner, the coil is cleaned on both sides by linear brushes. The dirt is stripped out from the brushes transported into a filter by suction system. These results are possible thanks to:

- mechanical brush effect by the linear brush
- capillary adhesive forces between micro- moistened filament and particle
- reduction of electrostatic charges brought about by the DTBR_300liquid.

While the coil is running through the spray box the upper and lower side can be sprayed with deep drawing oil media with adjustable quantities.

The special design of the suction system will prevent contaminated air from escaping through infeed and outfeed slot and the oil collected return back into the oil reservoir. The special design of the suction system also prevents the spray oil mist drops accumulation on the inside walls of the spray chamber from dropping on the passing coil.

For easy maintenance on the oiler the upper and bottom spray heads are extractable.



DTBC 2200
Brush Cleaner for the coil

EPCNT 2200
Oiler for the coil

2. TECHNICAL DATA

Type of materials	Steel and Aluminum
Thickness	0,5 – 4 mm for Steel
Max Thickness delta	+/- 2 mm Please note that we recommend to install guide rollers at the infeed and the outfeed of the cleaning machine to reduce pass line variations to a minimum (+/- 2 mm).
Material width (left to right)	Min 500 - max 2200 mm
Material shape	Coil
Working speed	Max 150 m/min
Total installed power supply brush cleaner	10 kW
Total installed power supply re-oiler	5 kW
Number of Oil	1
Oil Details	TBC
Electrical equipment	400V, 50 Hz, 3 phases, N, PE (different voltage available)
Safety interface	To be defined
Labelling	Standard Dietronic

3. MACHINES TECHNICAL DATA

Coil cleaner power consumption	10 Kw
Oil power consumption	5 kW
Control voltage	24 V DC
General Valve voltage	24 V DC
Oil Valve voltage	24 V DC
Brush cleaner air consumption	1200 NI/min at 6 bar
Air Supply	6 bar min
Communication with a line	Profinet

4. MAIN HOUSING

Structure

The machine's substructure is a solid and waterproof welded steel construction.

Interface points with a press line

The electrics and pneumatics connections pass along the machine side in a cable chain and can be plugged at separate connection boxes (1 for Cleaner, 1 for Oiler).

At these connection box the two machines must be connected from the customer side (air supply, power supply, cables interface – Dietronic will provide a document for details).

Cable and Pipe Channels

All channels to connect the connection boxes to the HMI must be provided from a customer (Dietronic will provide a document for details) as well as the channel to connect the 2 connection boxes.

All cables and pipe from Dietronic side are scope of supply.

Electrical control

The machine operating panel is placed separately according to the line layout.

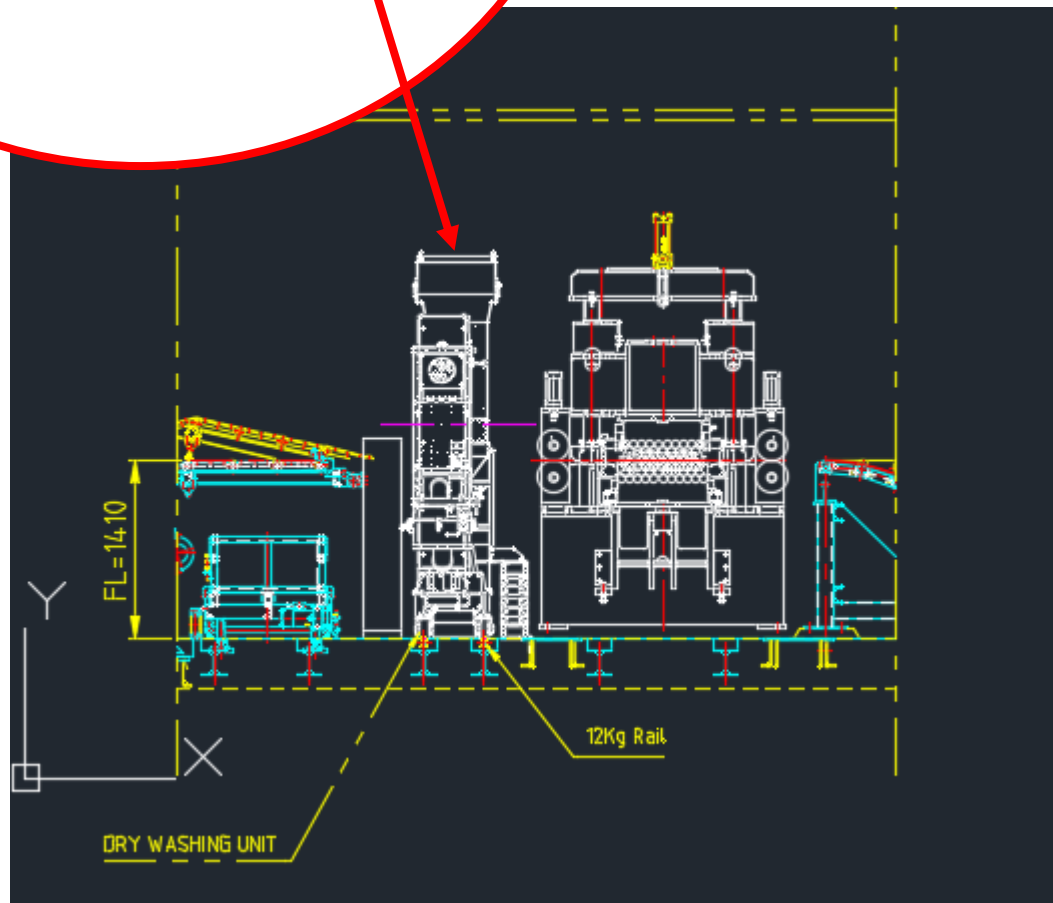
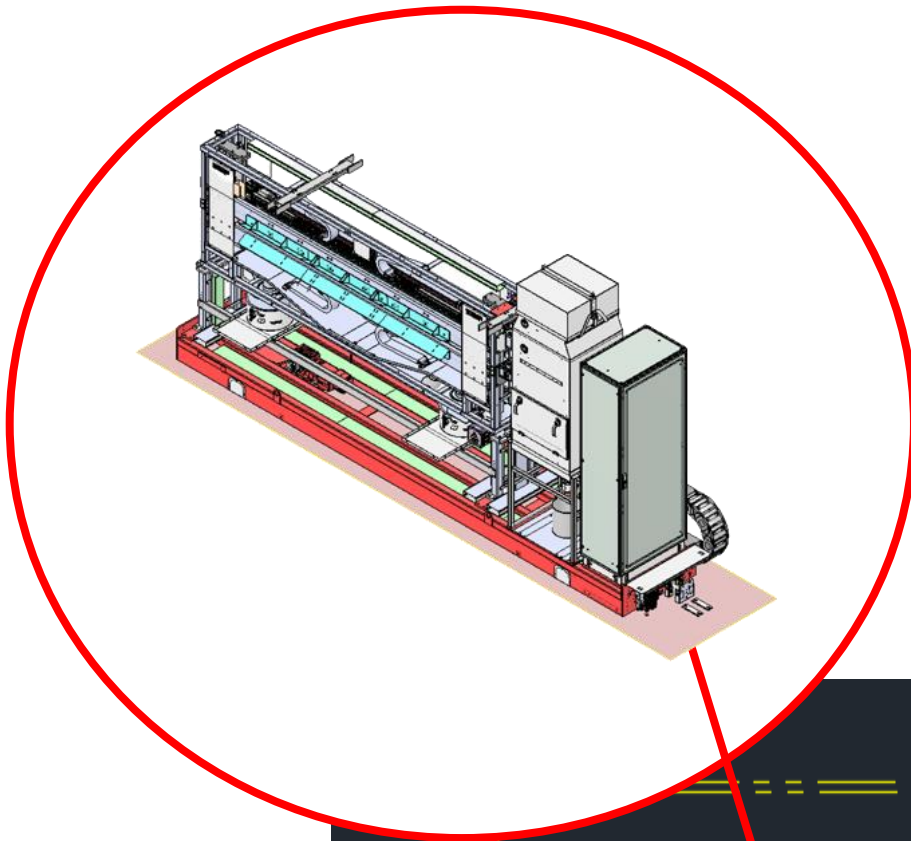
The control cabinets will be placed separately according to the line layout.

The communication is Ethernet or Profinet

Software

The software is provided in protected mode (only reading mode, not writing mode) until warranty expiration. The default language is English.

5. GENERAL DESCRIPTION COIL BRUSH CLEANER



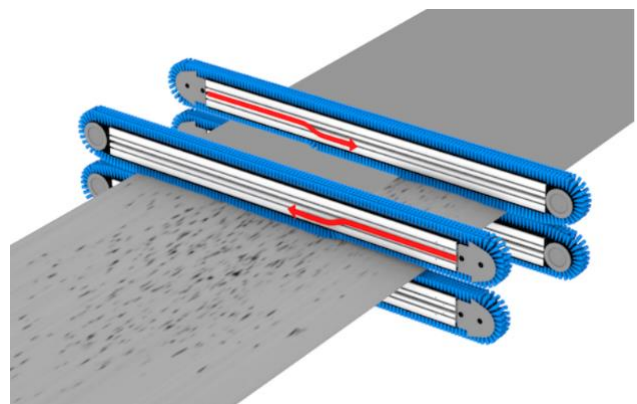
The linear brush wipes transversally across the product surface. Particles will cling to the micro-moistened filaments which will thus remove them effectively and transport them to the suction connection.

These results are possible thanks to:

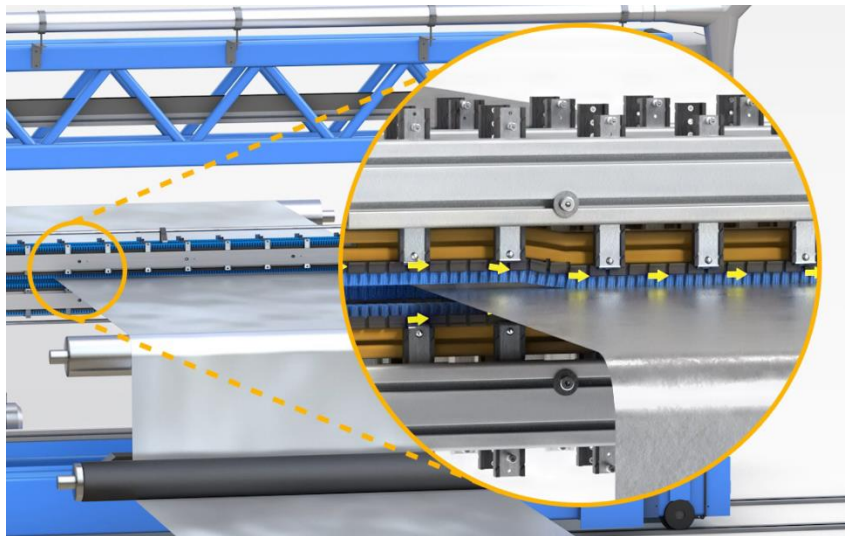
- mechanical brush effect by the linear brush
- capillary adhesive forces between micro-moistened filament and particle
- reduction of electrostatic charges brought about by the DTBR_300 liquid.

Linear Brushes

Two Sword Brushes, wipe transversally across the material surfaces. The micro-moistened brush filaments (Antistatic Liquid system) remove even the most minute particles from the subject surface. The integrated pressure buffer provides for a constant wiping pressure and a premium cleaning result. The adjustment frame VE 25. allows a vertical adjustment of the Sword Brushes e.g. to adapt them to the material's thickness or to remove them from the material surface for maintenance purposes.



To protect the filaments and prolong the industrial life of the brushes, the linear brushes are lifted slightly at the edge of the strip and will touch the surface only after having just passed the material's edge. The brushes at the inlet and outlet of the machine wipe in opposite directions, thus guaranteeing that the entire product surface is cleaned effectively.



Pneumatic Height Adjustment

The cleaning module may be mounted on an adjustment frame to integrate a height adjustment:

1. Manual adjustment via crank (HVM)
2. Electrical adjustment via actuator (HVE). An automatic thickness adjustment is possible if HVE is linked to the overall control
3. Pneumatic adjustment via pneumatic cylinder (HVP).

Quick removal of module from material surface, e.g. in crash situations. The mechanical and the electrical height adjustment may be combined with the pneumatic adjustment.

The brushes are supported by pneumatic pistons for fast opening.

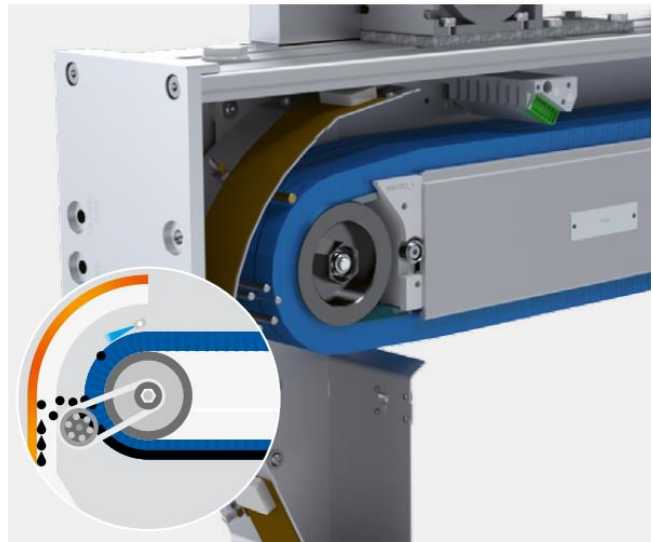
A safety device before on the entrance of the machine is connected to the signal to open fast the brushes. The upper brush can be open for 200 mm and the lower for 100 mm.

Self-Cleaning of the Brushes

At the deviation, the linear brushes widen, so that particles may be detached more easily. Rotating steel elements (racks) remove the particles mechanically from the filaments. Additionally, there are compressed air driven nozzles, that blow into the brush filaments to cancel the capillary adhesive forces between the particles and the filaments.

The suction system will absorb the particles.

Benefit: Improved self-cleaning and automatic cleaning process



Steel and Dry aluminum: only cyclone with heating

The patented Antistatic liquid system permits effective removal of even very fine particles.

DTBR_300 Cleaning Liquid Applicator

DTBR_300 is an antistatic cleaning agent. The brush filaments are micro-moistened with DTBR_300, thus providing an effective removal of even very fine dust particles

1. Micro-moistened brush filament with antistatic liquid
2. DTBR_300 sprayer SQL 51.
3. Distributor block VTB 100.
4. DTBR_300 regulator and filter unit IR 100. DTBR_300 filter, dosage and display of inner pressure of pressure buffer
5. DTBR_300 central supply pump, e.g. IS 102

The DTBR_300 liquid is supplied by a pneumatic from on frame tank of 20 lt tank with electric filling level control as well as pump and connections for refilling the reservoir.

Automatic refilling unit for the DTBR_300 tank from barrel or IBC Container 1000 lt.

The unit is provided with level sensor switch displayed on the HMI of the machine.

Calibrated nozzles control the amount of liquid applied on the single brush.

The consumption of the DTBR_300 is estimate in about 2L for hour.

NUMBER OF BRUSHES	4: 2 above, 2 below
FILAMENTS	black filaments in polyamide, length of filaments 17mm, diameter 0,2 mm
SUCTION FILTER	DUSTOMAT 4-10
BRUSH CLEANILESS LEVEL	< 0,5 mm particle size
DTBR_300 RESERVOIR	50 litres
UPPER BRUSH HEIGHT ADJUSTMENT	manual positioning of the upper brush
SAFEY BRUSH DEVICE	laser sensor for anti coil collision control for upper and lower brush (Dietronic will provide sensor and support, THE CUSTOMER will install on the infeed conveyor)

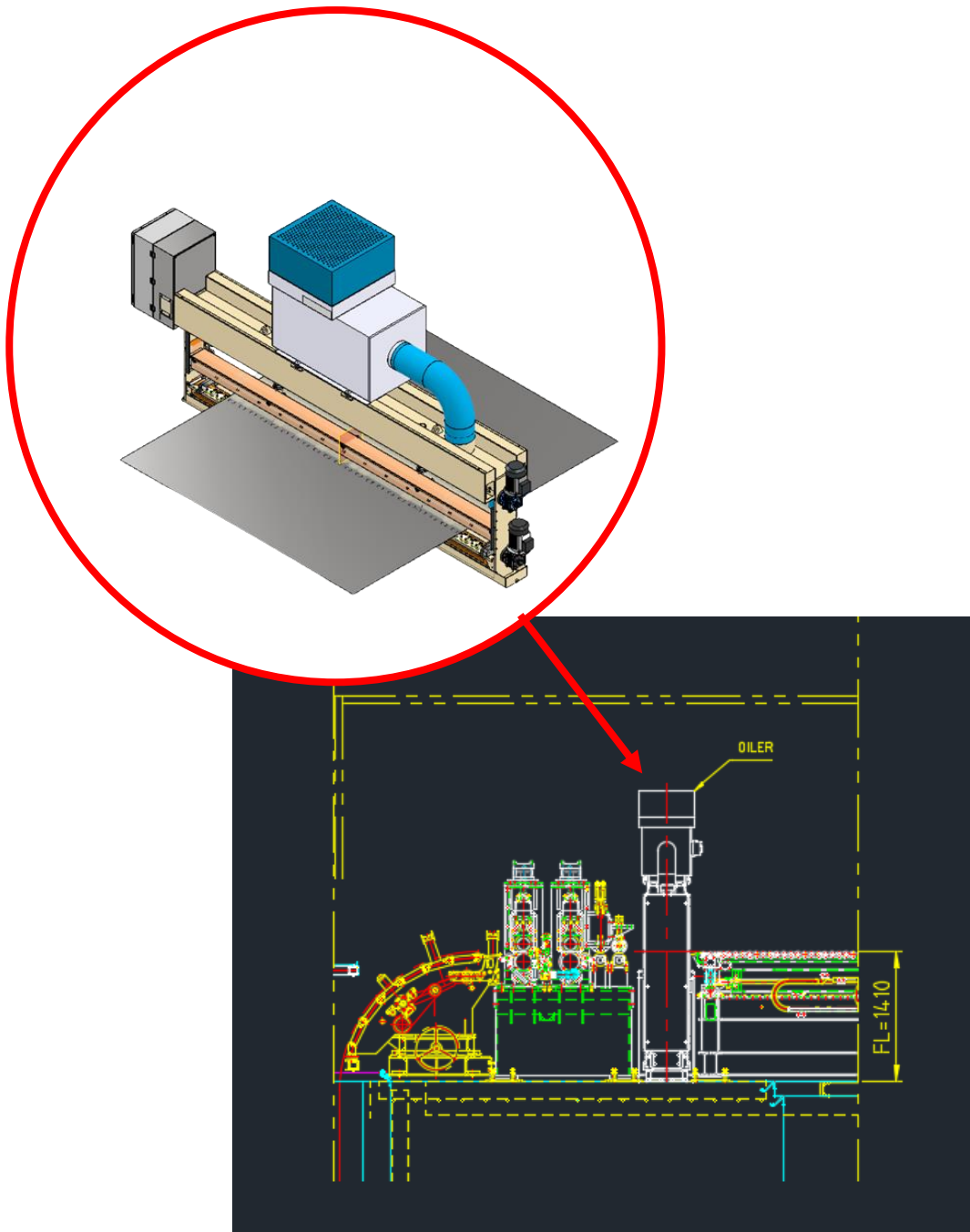


Test n°	Speed	Spot n°	Cleaning Result
1	100m/min	1	88,89%
		2	34,20%
2	100 m/min	1	98,28
		2	99,57%
3	150 m/min	1	82,82
		2	97,6
		3	97,26
		4	97,26
		5	23,37
		6	75,95



Cleaning performance 98% of particulars removal below 50 micro is required.
 We can only confirm this requirement, when certain basic surface conditions are defined.
 The cleaning results also can be influenced from initial conditions of the material.

6. GENERAL DESCRIPTION REOILER



The machine is created to apply very accurate oil forming lubricants onto blanks of uncoated or zink-coated steel as well as aluminum.

The sheet metal passes through the spray box and the top and bottom side of the sheet metal can be sprayed with most types of oil according to the programmed spray pattern.

The controlled spray lubrication system consists of: a spray box, connected to a suction system, as well as a plastic tank for collecting the lubricant from the spray box.

A Control panel allows the input of all system adjustment parameters.

The system allows strip lubrication, interfaced with the material feed, with an oil metering adjustment from 0.5 to 5 g/m².

STRIP OILER SPECIFICATION	
NUMBER OF SPRAY NOZZLES	A spray nozzle every 100 mm (Top and Bottom)
SMALLEST SINGLE SPRAY STRIP	100 mm
OIL QUANTITY APPLICATION RANGE	0,5 – 5 g/m ²
NUMBER OF FREELY PROGRAMMABLE INTENSITIES UPPER AND LOWER SIDES	adjustable quantities
OIL RESERVOIR	No.1 tank
OIL MEDIA DETAILS	TBD
WASTE OIL RECOVERY TANK	Plastic tank for lubricant recovery from the spray box and suction system
OIL FILTER	filter 10 micron
HIGH EFFICIENCY SUCTION FILTER	N°1 0.35 kW each; 2500 m ³ /h with analogic pressure gauge

The machine is supplied with all mechanical, electrical, hydraulic and pneumatic equipment.
The lubricant is NOT included.

Spray Head Composition

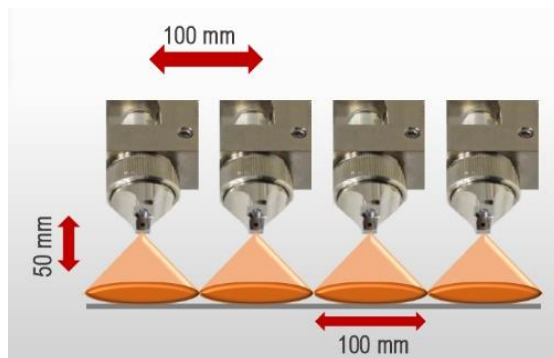
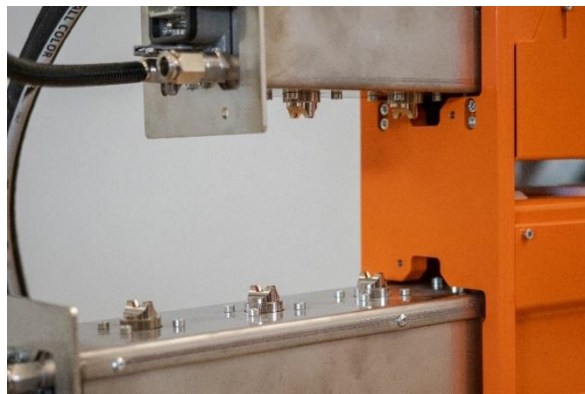
Inside the spray box there are an upper and a lower extractable spray head that contains the LVLP spray valves model DTJ04.

The extraction of the spray heads is from the side of the machine.

The distance between the DTJ04 spray valves is 100 mm, the distance of the spray valves from the material is 50 mm and the spray angle is 90°.

The number of spray valve depends of the size of the machine. (Please see the above table chart).

The spray valve is Low Volume Low Pressure design of spray valve with needle (more size available according to the viscosity of oil) activated by pneumatic signal. On the back of the spray valve is possibly change the volume applied from a single DTJ04 spray valve.



Inside of the spray box is designed to prevent spray-oil mist drops depositing on the inside walls of the spray box from dropping onto the coil or passing blank.

Oil Quantity Programmability and Spray Intensity

The usual intensity application of most of kind of oil in a approx. quantity of $< 0.5 - 5\text{g/m}^2$.

This variation is connected to the global oil pressure or independently by a screw on the back of single spray valve.

Air Pressure Control

The air pressure is completely automatic, no manual action is needed, adjustable from the operator panel.

Oil Mist Extraction System

A suction system is mounted on the top of the machine. Air is extracted from the machine housing by means of a fan. This will prevent contaminated air from escaping through infeed and outfeed slots. Oil-mist separators clean the extracted air and return the oil back into the reservoir.

The inside of the spray box is designed to prevent spray-oil mist drops depositing on the inside walls of the spray box from dropping onto the passing coil.

A high efficiency filter (the combination of polyester fabric and Teflon), also allows the removal of smokes and vapors, providing filtration efficiencies reaching the remarkable value of 99,9%, IFA-BGIA Certification. All models are equipped with a differential pressure gauge to monitor the filter life.

Oil Media Reservoirs and Oil Media Pressure Control

The machine is equipped with 40 lt oil tanks and by a pneumatic pump an accumulator of 2 litres is automatically refilled and maintained at constant fix level. With air pressure on this accumulator automatically controlled from the HMI is possible to set a very constant oil pressure to the spray heads.

An additional recovery tank of 40 lt permits to collect the oil from the tray of the machine and with a pneumatic pump this oil is filtered 10 μ and automatically refilled to the main tank.

Automatic refilling units for the Oil media tanks from barrel or IBC Container 1000 lt.

The unit is provided with level sensor switch displayed on the HMI of the machine.

Waste Tank

Plastic tank for collecting the oil that comes from the suction system and the spray box. The system is equipped with a level control that alerts the operator if the maximum level is reached.

Pump station for automatic lubricant refilling unit

The machine can be equipped with a pumping unit for refilling the main tank(s) from 200-liter drums or 1000-liter containers.

Each unit has a tank to contain any oil leaks on the floor as well as an air pump to send the lubricant to the main tank.

The main tank has a dual level control (minimum and maximum) that manages an interceptor valve.

The pump station mainly consists of:

- barrel holder for barrel or IBC Container for Oil Media 1
- barrel holder for barrel or IBC Container for Brush Cleaning liquid



7. GENERAL SPECIFICATIONS INCLUDED IN THE QUOTE

Certifications:	QUASI MACHINE 2006/42/EC Machine Directive
Labelling:	Standard DieTronic
Circuit Diagrams	Supplied in PDF version
Notes:	The software will be supplied with comments in Italian. Until the warranty expires, only a reading copy will be provided. The intellectual property of some key-blocks is password-protected.
Machine colour:	RAL 2004 and RAL 7035 for electrical cabinet
Standard length of cables and hoses:	Cable length between EC oiler and cleaner to the HMI 20 m

NOT Included:

- Downloading from truck
- Positioning of the machine. DieTronic is not responsible about condition and alignment.
- Re-assembling of parts dismounted for transportation (DieTronic supervision included)
- All the activities that require to fix on the concrete
- Communication devices and cable for software interface between our machine and the line including cable channels
- Software integration to the line
- Positioning of IBS or Barrel holder
- Channels and installation for flexible pipes to connect the Antistatic liquid from the IBC or Barrel holder to the connection box (flexible pipes included)
- Channels and installation for cables to connect the machine from connection box to the HMI pulpit (cables included)
- Power supply and cable from the line to the machine
- Piping for air supply from line to the machine

Warranty Conditions

The Warranty goes into effect after maximum 60 days from when the new Dietronic unit has been delivered to the customer premises and expires at the end of the Warranty Period specified above.

The Warranty covers repairs to correct any unit defects related to materials or workmanship existing at the time of purchase. All requests must be approved by Dietronic prior to any work being performed during the Warranty Period. Specific exceptions to the Warranty are listed in the Exclusions section.

Dietronic will provide repairs to the unit during the Warranty Period in accordance with the Terms, Limitations, and Conditions. This is the sole Warranty provided by Dietronic.

Exclusions

Unit components subject to normal wear during the Warranty Period are not covered by Warranty and include the following items:

1. Filters (Oil tank, oiler suction systems filters)
2. Other wear parts

Component failure caused by customer misuse/abuse of the unit (e.g. incorrect modification of machine parameters that cause damages or the usage of incompatible materials), voids the Warranty.

Machine rupture caused by part handling/misuse or damages due to exposure to elements or incorrect storage of the equipment, voids the Warranty.

Standard Equipment Warranty Coverage

All unit components are warranted for 1-Years, except the items listed in the Exclusions section and workmanship.

Dietronic will supply new or remanufactured component of equal or better quality to replace the failed component, the works to complete the replacement of the faulty items are at customer's charge unless differently decided by Dietronic; it is the sole discretion of Dietronic to determine best method of replacement. The replaced component will be covered for the remainder of the Warranty Period or 90 days, whichever is longer.

The faulty material should be returned to Dietronic for check, unless differently specified by Dietronic, the costs incurred to return the material are solely at customer charge, if the items are not returned within 30 days from the reception on the replacement material they might be charged to the customer.

Commissioning Conditions

Please schedule a possible installation date with Mrs. Elisa Beccaria (service@dietronic.eu)

The following preconditions need to be met for a successful commissioning:

- 1) The Machine has to be mounted and aligned
- 2) The electrical, pneumatic and liquid connections must have been installed
- 3) Electricity and compressed air should be available according to Dietronic specification
- 4) Free access to 230 V.
- 5) Customer must provide necessary safety training and access cards
- 6) Customer must guarantee working time without interruptions for Dietronic technicians
- 7) Commissioning will take place only once in Customer Plant
- 8) Working time 7 am to 5 pm; if technicians need to work extra hours, we will charge surpluses for night shifts or work during the weekends.

Scope of commissioning:

- 1) Functional control of the installation
- 2) Initial start-up of the system

Not included in the above price are the following items:

- 1) All sorts of mounting and installations works
- 2) Correcting mounting errors or deviations from Dietronic specifications

All waiting periods that go back to external factors or to non-compliance with the preconditions for a successful

commissioning will be invoiced according to the Dietronic pricelist for technicians.

An authorized person of the customer will have to confirm that the above services have been rendered directly after the end of the commissioning.

This must be done on the Dietronic form "confirmation commissioning". This confirmation ends the commissioning, the risk for running the machine will pass on to the customer.

A separate trip of the technicians to receive the customer's or end-customer's final acceptance is not included in this quotation/ order confirmation.

All additional services or items, that are not included in this quotation/ order confirmation will be charged according to the Dietronic pricelist for technicians.