



**NUBAL** production and process  
equipment for the  
printed circuits industry

## CLEANING & DRYING MACHINES

Modular Range of P.C.B. Cleaning Machines  
with Driers & Rinse/Driers



Scrubbing Line consisting of CDO, High Pressure Rinse Unit and HSD with Infeed and Outfeed Conveyors

Board processing industries have, over the years, required a variety of cleaning and scrubbing operations essentially to ensure a high quality finished product.

Nubal have responded to these requirements by manufacturing, as part of the Intersystem range, a number of wet process scrubber/cleaners and driers suitable for P.C.B.'s and other rigid boards.

As with all main modules in the Intersystem range, both the single

and double scrubber/cleaners have been designed to function either independently or as part of a larger scheme.

Construction is of Stainless Steel with a PVC central compartment with conveyor rollers running in PTFE-lined bearings. Splash covers are polycarbonate.

For operator comfort and safety all electrical controls are located within easy reach above the working height of the machine.

For additional safety each machine has circuit-on lights, stop button and mains isolation switch fitted as standard.

All modules are designed for extremely easy, rapid service and cleaning for minimal downtime.

Water supply is either mains water or via a re-circulation and filtration system such as a sand-filter, a cyclone type separator or centrifuge.

An additional high pressure water wash can be supplied giving pressures up to 50 bar.

# NUBAL SCRUBBING, DRYING AND RINSE/DRYING MACHINES

CSO - Single brush scrubbing machine with oscillation.

CDO - Double brush scrubbing machine with oscillation.

CSO/DH - As CSO with heated drying section incorporating two pairs of airknives.

CDO/DH - As CDO with heated drying section incorporating two pairs of airknives.

HSD - Drier module with one pair of squeegee rollers and two pairs of airknives.

SHSD - Drier module with one pair of squeegee rollers and four pairs of airknives, fed from 2 high capacity blowers.

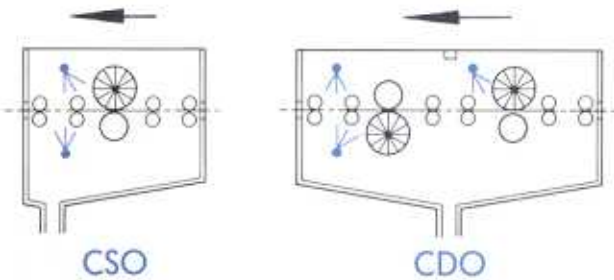
RD - Rinse/Drier module incorporating one pair of spray tubes in the rinse section and two pairs of airknives in the drying section.

HSRD - Rinse/Dryer module incorporating two pairs of spray tubes in the rinse section and one pair of squeegee rollers with two pairs of airknives in the drying section.

SHSRD - Rinse/Drier module incorporating two pairs of spray tubes in the rinse section and one pair of squeegee rollers with four pairs of airknives in the drying section, fed from 2 high capacity blowers.



CSO/DH



CSO

CDO

## SCRUBBING MACHINES

Nubal brush/scrubber machines are built to a modular system with a basic working height of 915mm (36").

Single brushing and double brushing units are available with separate rinse section, brush oscillation is supplied as standard.

Individual valve control for water tubes is included as standard.

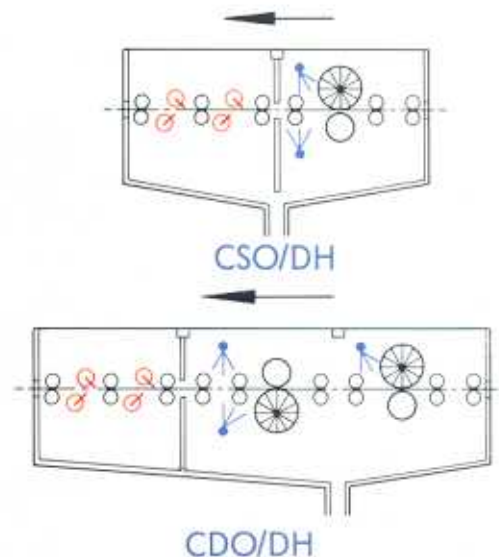
The position of the brushes in the double unit is normally one top and one bottom to process both sides in one pass but modules can be supplied with two top or two bottom brushes if required.

Similarly, the 125mm (5") Superfine brushes, that are fitted as standard, can be replaced by a variety of brushes to meet specific requirements.

The large diameter anvil or billy rollers are driven by a sprung Stainless Steel belt which automatically adjusts to any speed variations.



CDO/DH



CSO/DH

CDO/DH

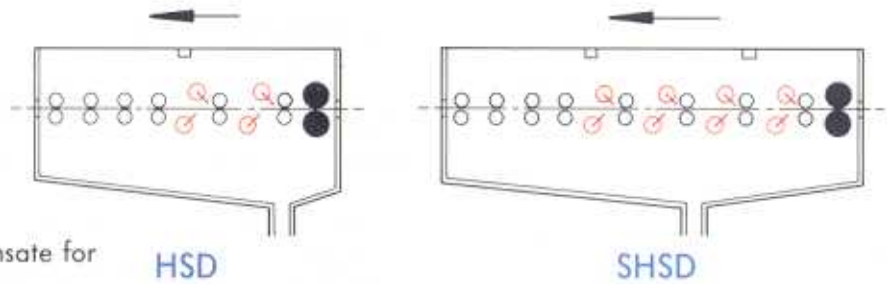
Modules with the 'DH' suffix have identical cleaning and washing sections to the basic brushing machines, with the additional benefit of highly efficient drying sections.

The drying section comprises four air-knives mounted in self-adjusting carriers which automatically compensate for different thicknesses of board.

The heated air for the air-knives originates from a high capacity blower designed for a low noise-level operation and no sound insulation equipment should be necessary for operator comfort.

As with the cleaning section, nip rollers fully stabilise boards while passing through the drying chamber.

The combination of brushing section and drier (designated CSO/DH and CDO/DH) results in an inexpensive and compact cleaning machine with very high standards of output.



### DRIERS AND RINSE/DRIERS

Nubal Driers and Rinse/Driers are built to complement the Intersystem range but can also be used with other manufacturers process machines.

Made to the same high standards as our brushing machines, i.e. stainless steel framework and panels with heavy duty P.V.C. central compartments.

Nubal driers and rinse/driers are designed to have a long and trouble-free working life.

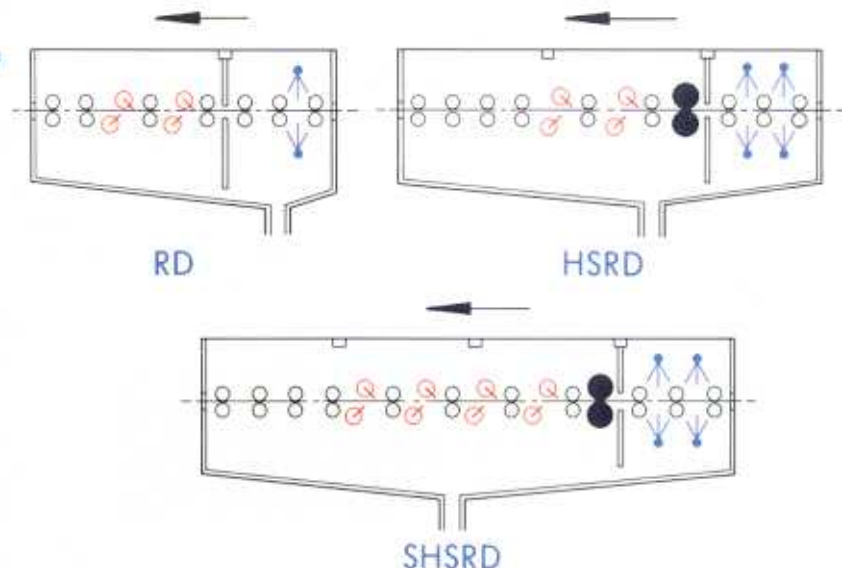


Shown above is central compartment of HSRD showing 2 pairs of spray tubes in the rinse section followed by a pair of squeegee rollers and 2 pairs of airknives mounted in self-adjusting carriers in the drying section.

### Optional Equipment

In order for you to gain the best possible use from your Intersystem units, we provide a number of additional facilities.

1. Wattmeters or ammeters to gauge brush pressure.
2. Solenoid valve for automatic water shut-off to machine.
3. Re-circulating system.
4. Water saver system.
5. Brushmiser infeed conveyor to utilise full width of brushes.
6. High pressure washing system.
7. Filtration systems.
8. Ceramic anvil rollers.
9. Inner-layer processing attachments.



Key to Schemes:—

- |  |                 |  |                   |
|--|-----------------|--|-------------------|
|  | Brush           |  | Spray Tube (Jets) |
|  | Anvil Roller    |  | Air Knife         |
|  | Conveyor Roller |  | Squeegee Roller   |

## SPECIFICATIONS

	SCRUBBING MACHINES				DRIERS		RINSE/DRIERS		
	CSO	CDO	CSO/DH	CDO/DH	HSD	SHSD	RD	HSRD	SHSRD
LENGTH	400mm (16")	640mm (25")	675mm (26½")	915mm (36")	640mm (25")	930mm (36½")	640mm (25")	930mm (36½")	1220mm (48")
ADD 280mm (11") FOR EACH INFEED AND OUTFEED CONVEYOR									
WIDTH	1050mm (41")	1050mm (41")	1050mm (41")	1050mm (41")	1050mm (41")	1050mm (41")	1050mm (41")	1050mm (41")	1050mm (41")
HEIGHT	1098mm (43")	1098mm (43")	1098mm (43")	1098mm (43")	1098mm (43")	1098mm (43")	1098mm (43")	1098mm (43")	1098mm (43")
ADD 410mm (16") TO HEIGHT FOR MACHINE FITTED WITH SWITCHBOX									
(FOR SIZES OF CRATED MACHINES ADD 150mm (6") TO EACH DIMENSION)									
WEIGHT	205 Kg	324 Kg	375 Kg	465 Kg	290 Kg	344 Kg	275 Kg	305 Kg	390 Kg
WEIGHT (PACKED)	279 Kg	409 Kg	460 Kg	550 Kg	380 Kg	429 Kg	330 Kg	390 Kg	490 Kg
RECOMMENDED POWER SUPPLY IN AMPS	20A	20A	30A	30A	30A	50A	30A	30A	50A

Brushes, standard  
 Conveyor rollers  
 Nip rollers  
 Anvil rollers  
 Brush and anvil bearings  
 Conveyor roller bearings  
 Main side frames  
 Slideway  
 Power supply UK  
 Water consumption per spray tube at 30 p.s.i.  
 (2.10 Kg cm<sup>2</sup>)  
 Conveyor speed  
 Brush rotation speed  
 Motor size (conveyor)  
 Motor size (each brush)  
 Brush oscillation  
 Motor size (blower)  
 Heater (blower)  
 Minimum board thickness  
 Maximum board thickness  
 Minimum board width  
 Maximum board width  
 Minimum board length

125mm (5") 'S' Superfine FLP  
 30mm (1¼") rubber covered stainless steel  
 30mm (1¼") rubber covered stainless steel  
 75mm (3") stainless steel  
 Sealed roller or bronze, mounted in heavy duty aluminium castings.  
 PTFE lined  
 Heavy duty aluminium castings  
 Precision ground stainless steel  
 380-440 volts, 3 phase + N, 50 Hz (others on request)

5.2 litres (1.15 gallons) per min.  
 0 to 4m (12') per min.  
 1600 rpm  
 Fractional hp  
 1 hp  
 100 strokes per min at 6mm movement  
 2 hp  
 3 kw  
 0.75mm (1/32") (.15mm (.006") with inner layer attachments).  
 6mm (¼")  
 51mm (2")  
 610mm (24")  
 165mm (6½")



Photo (above) showing brush and anvil bearings mounted in heavy duty anodised aluminium castings, supported by precision ground stainless steel slideways. Also shown is the conveyor nip roller drive system incorporating heavy duty bevel gears.



Photo (at left) shows internal view of the rear of a CDO/DH showing the brush drive system, plumbing for the rinse jets and the high capacity blower delivering heated air to the airknives via flexible hose.



# NUBAL

## NUBAL ELECTRONICS LIMITED

Headcorn Road, Sutton Valence,  
 Maidstone, Kent ME17 3EH England.  
 Tel: (0622) 843927  
 Fax: (0622) 842284  
 Telex: 965633 Nubal G

Because of our policy of continuous improvement, we reserve the right to alter specification without prior notice.