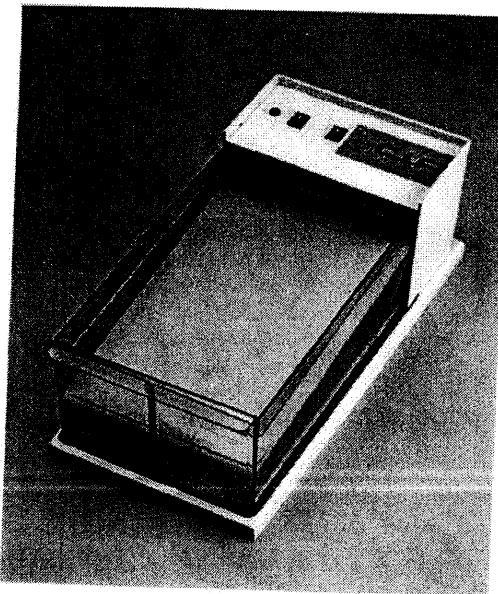


GRAV'CI 2 / GRAV'CI 3

(GB)	Foam Etching machine	3
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Service Manual Version 12.01



Foam Etching Machine - GRAV'CI 2

Reference	BB 2
Working area	180 x 240 mm
Tank capacity	3 l
Dimensions	430 x 210 x 190 mm
Net weight	2,8 Kg
Electrical supply	220/240 V – 50/60 Hz
Etching time 10 - 12 min	Yes
Heater 18° to 35° C	Yes
<ul style="list-style-type: none"> • Available also in 48 Volts Ref BB28 • Available also with working area 270 x 470 mm Model GRAV'CI 3 (Ref BB3 & BB38) 	

E.C. CONFORMITY CERTIFICATE



Us,

C.I.F
11 rue Charles Michels – 92220 Bagneux France
Fax 33 1 4547 1614
email : Cif@cif.fr – Site <http://www.cif.fr>

(GB) We certify under our responsibility that this product conforms to European Economic Community standards :

(GB) In conformance With European guidelines (89/392/CEE – 89/336/CCE) and to EN60-204-1 standard

Code : **BB2 / BB3**

(F) Déclaration du constructeur
 La société CIF – 92220 BAGNEUX, France, certifie que le produit répond bien aux directives de la Communauté Economique Européenne.

(GB) Manufacturer declaration :
 CIF company CIF – 92220 BAGNEUX, France, herewith declare that this product conforms to E.E.C. regulations.

(E) Declaracion del constructor
 La sociedad CIF – 92220 BAGNEUX, France, certifica que este producto satisface las directivas de la comunidad Europea.

(I) Dichiaraione del costruttore
 La società CIF – 92220 BAGNEUX, France, attesta che il prodotto risponde alle direttive della Unione Europea.

(D) Hersstellererklärung
 Hiermit erklärt die Firma CIF – 92220 BAGNEUX, France dass dieses produkt der Richtlinie EWG entspricht.

♦ In accordance with the following European Decrees :

- Directives 73/23/EEC for low voltage machines amended by 93/68/EEC
- Directives 98/37 EC for Machines
- Directives EMC 89/336/EEC amended by 92/31/EEC and 93/68/EEC

Bagneux, September 13th 2001

Authorised signature
 M. Bernard ANDRIOT,

ENGLISH**EXPOSURE UNIT AND ETCHING MACHINES**

YOU HAVE JUST FOUND THE OPTIMAL SOLUTION
A set to manufacture rapidly your own single and double sided printed boards

CONSTRUCTION OF ETCHING MACHINES

Tray made of welded PVC
 Transparent plexiglas cap (protect from splashing and smells)
 Control block entirely streamline shaped and dismountable
 Self-positioned inclined plane.
 Membrane pump (coated motor)
Heater : pyrex coated immersion heaters with built-in and adjustable thermostat, heating control on the machine with control indicator. A ceramic diffuser offers an important foam rate.
 DO NOT TURN ON HEATER WHEN THE MACHINE IS EMPTY

BEFORE PUTTING INTO SERVICE

- 1) Dismount inclined plane by spreading both sides of the tank (PVC is elastic enough to be bent).
- 2) Remove the packaging which could be left on the resistor
- 3) Control plastic tube fitting on ceramic diffuser
- 4) The etching machine is preset at a temperature of use of 30° C.
 For temperature control when starting up, fill the machine with water,
 - let it heat during 15 Minutes, measure the temperature with a thermometer : in case of abnormal temperature, adjust immersion heater
 Immersion heater setting : Clamp under the thumb and the index finger the rubber nipple which comes out from the head and turn the adjustment rod.
- 5) Place inclined plane into the tank checking it is correctly set in the grooves.

INSTRUCTIONS FOR USE

Fill the machine with Ferric Chloride (or perchloride at 41° B). The machine can't work with superactiv ferric chloride
 – 3,5 Litres for Model N° 2

Make sure that the machine is horizontal.

Switch on the pump and add some Perchloride if there is not foam enough (gently pour controlling foam increase).
 Perchloride level should reach no higher than the bottom of the inclined plane.).

Switch on the heater and wait until temperature rises.

For a rapid etching, use our perchloride at 41° B

Place your circuit and your machine is ready to etch.

A pair of gloves is supplied with each machine.

EXPOSURE, DEVELOPMENT, ETCHING**THE FINAL RESULT EXCLUSIVELY DEPENDS ON THE CARE TAKEN DURING EACH OPERATION****EXPOSURE**

- Remove the adhesive black protection from your C.I.F. positive presensitised PCB.
- Place our film or original drawing on emulsion layer (Pay special attention to placement ; component side or track side)
- Place the set (film + board) on your exposure unit.
- Expose your board :
 from 1.30" to 2'30" when using a film or an inactinic grid
 from 2'30" to 4' when using a plant tracing paper. (make a test to calibrate your exposure unit).

DEVELOPMENT

Prepare AR 45 developer in a tray

Pour the contents of CIF bag into a tray and add the quantity of water required at 20°C

Wait for a complete dissolution of the crystals.

Immediately after exposure, put the board into the developer and shake the tray.

The photosensitive resin which has been exposed should disappear in less than 2 minutes.

If development has not been totally carried out, please refer to the table at the end of the notice).

If the plate is not immediately etched, rinse it with running water.

Version 12.01

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GRAV'CI 2 / GRAV'CI 3 : Codes BB2 / BB3

ETCHING

Heat your etching machine before exposing your circuit, put the board into the etching tank, turning the side to be etched upward.

Switch on the pump.

Ferric Chloride will cover the plate and corrode the copper which is not protected by resin.

Etching time should be from 6 to 7 minutes if Perchloride is new.

When etching time has doubled, change ferric chloride.

Double-sided etching

Circuit elevated by 4 nylon screws

RESIN REMOVAL

With buffer et C.I.F.stripper ref. AR 62 or AR 61.

Resin can be left during drilling to protect copper.

Etched board can be reexposed and resin destroyed with U.V. : plunge the board into the developer.

Your circuit is finished (you can either tin or varnish)

FOR FOAM ETCHING MACHINES Ref. BB2 – BB3 – BB28 – BB38
ONLY USE PERCHLORIDE AT 41°B

These machines do not run correctly with superactivated perchloride

INCIDENT AND SOLUTION TABLE

INCIDENTS	CAUSES	SOLUTIONS
Photo sensitive circuit Development is not made	Exposure time too short. Out of date plate. Development temperature too low – saturated developer.	Carry out test with grey scale (test film) and a new developer – Minimum temperature 18°C
Circuit cut during development or out of focus development	Bad contact of original on the plate - Mylar too thick - Drawing density not black enough – cut on the drawing	Improve pressing or check the machine – Make a contact film (C.I.F. rephorene film) . Check light table.
Copper full of holes after etching	Over exposed plate – drawing not opaque enough – bad contact – etching time too long	Check the original and make test with grey scale (test film)
No etching	Resin remains on the plate. Saturated etching agent	Increase exposure and development times – change etching agent.
Fine tracks after etching	U.V. pass under the original – under etching phenomenon – Mylar too thick	Improve contact. Improve etching system – Make a contact film – Place the photo layer against the resin

ADMISSIBLE (1A) INTENSITY INTO A CONDUCTOR

Conductor width in mm

Cu 35 μ	0.36	0.4	0.72	1.14	1.78	2.5	3.5	4.5	5.8	7.1
$\text{A T}^{\circ} \rightarrow 20^{\circ}\text{C}$	1.2	1.3	2.7	3.8	5.2	6.8	8.3	9.7	11.2	13