

# 12 STEPS ZINC ETCHING PROCEDURE

## 1. STORAGE

Store zinc photoplates in a cool, dry place.

## 2. ARTWORK

Inspect negative carefully and opaque pinholes in the black areas. Pinholes result in pimply etching if not opaqued.

## 3. EXPOSURE

Expose using a Stouffer 21-Step Sensitivity Guide to a solid step 8-10. Overexposure causes excessive shadow-dot plugging and does not increase etching resistance of coating. Underexposure causes wash-off in development and etching failure.

## 4. DEVELOPING

Mix one part of Heated or Cold Hydro-Coat Developer with five parts water. Heated Hydro-Coat Developer should be used at 105°-115°F (41°-46°C). Cold Hydro-Coat Developer can be used at room temperature 70°-85°F (21°-29°C). In case of evaporation loss when using Hydro-Coat Developer, water alone should be added back to developer solution. DO NOT add back concentrate Hydro-Coat Developer to compensate for evaporation loss. Heated Hydro-Coat Developer should be changed when developing times exceed 90 seconds. Cold Hydro-Coat Developer used in trays should be changed daily.

## 5. TOUCH UP

Examine plate for flaws in the image areas retained on the plate and touch up as needed with Retouch Solution.

## 6. WEIGH

Record initial plate weight on your etching log prior to etching. Scale must be capable of weighing to the nearest 1/4 ounce.

## 7. DESCUM

Descum Hydro-Coat zinc plates using a solution of sulfuric and nitric acid. Refer to descum formulas on next page. Wipe the descum solution across the plate both horizontally and vertically. For best results apply solution n°1 followed by solution n°2, with a final repeat application of solution n°1. Use separate descum pads for each solution. Rinse between solution applications.

## 8. RINSE

Rinse plates thoroughly with water after descumming.

## 9. PLATE PROTECTOR

An application of Express Guard Plate Protector is recommended prior to etching to enhance performance of etching bath by preventing oxidation which can cause pimples.

## 10. ETCH

Etch plates according to recommendations of etching machine manufacturers and additive technical data sheets.

## 11. REPLENISH BATH

Record plate weight after etching to determine proper acid replenishment. Refer to acid addition chart on last page. Use the following formula to calculate replenishment (where 1:1 represents 30 milliliters of acid per ounce of zinc dissolved into bath):

*Initial plate weight - Post etching plate weight = amount of zinc dissolved*

Rate of replenishment (1:1 or 1.5:1) will depend upon how much zinc is in the bath. Refer to recommendations of equipment manufacturer.

*Example: 38.2 - 31.7 = 6.5 ozs. of zinc dissolved at a rate of 1:1 replenishment, 195 mls of acid are added to bath at a rate of 1.5:1 replenishment, 292,5 mls of acid are added to bath.*

Check dip gauge and restore proper level in bath by adding water or draining excess.

## 12. TOP REMOVAL (optional)

Use Hydro-Coat Top Remover II according to directions on label.



## BASIC ZINC ETCHING BATH FORMULA

### FORMULA

NITRIC ACID (42 Bé) .....	12%
SUPER ETCH or VELV-ETCH .....	3%
WATER .....	85%

STANDARD ZINC ETCHING BATH SHOULD BE MAINTAINED AT 78° - 82°F (26° - 28°C). IDEAL TEMPERATURE MAY VARY BASED ON APPLICATIONS.

## ZINC DESCUM

### SOLUTION N°1: H<sub>2</sub>SO<sub>4</sub> / HNO<sub>3</sub>

- 3.42 L WATER
  - 350 ML CONCENTRATE SULFURIC ACID\*
  - 30 ML NITRIC ACID\* (42 Bé)
- (FORMULA MAKES 3.8 L OR 1 GAL. OF DESCUM SOLUTION).

### SOLUTION N°2: HNO<sub>3</sub>

- 3.04 L WATER
  - 760 ML NITRIC ACID\* (42 Bé) 20% HNO<sub>3</sub>
- (FORMULA MAKES 3.8 L OR 1 GAL. OF DESCUM SOLUTION).

**\* CAUTION: DO NOT ADD WATER TO ACID.**  
ALWAYS ADD ACID SLOWLY TO WATER TO AVOID A HAZARDOUS EXPLOSION.

## RECOMMENDED BATH MAKEUP for SELECTED STANDARD INDUSTRY ETCHING MACHINES

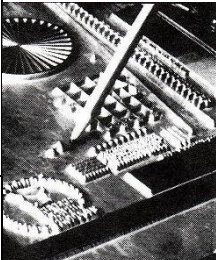
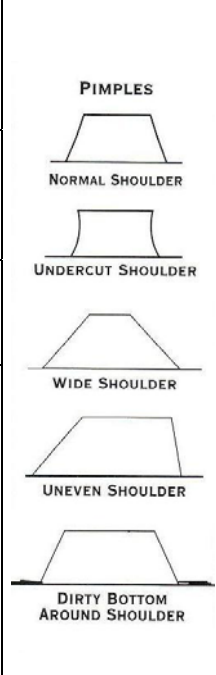
MACHINE	CAPACITY	ACID 42 Bé	SUPER ETCH or VELV-ETCH	STARTING RPM
ULTRAMATIC 40	40 LITERS	about 5 LITERS	about 1,5 LITERS	500 - 550
ULTRAMATIC 90	90 LITERS	about 10 LITERS	about 3,0 LITERS	500 - 550
ULTRAMATIC 200	200 LITERS	about 25 LITERS	about 6,0 LITERS	500 - 550

BATH REPLENISHMENT VARIES SIGNIFICANTLY BY EQUIPMENT.  
REFER TO MANUFACTURER RECOMMENDATIONS.

## ACID ADDITION CHART

ZINC DISSOLVED		ACID ADDITIONS		ZINC DISSOLVED		ACID ADDITIONS	
OZS.	GRAMS	1 TO 1* MLS	1.5 TO 1* MLS	OZS.	GRAMS	1 TO 1* MLS	1.5 TO 1* MLS
1	28	30	45	31	879	930	1395
2	57	60	90	32	907	960	1440
3	85	90	135	33	936	990	1485
4	113	120	180	34	964	1020	1530
5	142	150	225	35	992	1050	1575
6	170	180	270	36	1021	1080	1620
7	198	210	315	37	1049	1110	1665
8	227	240	360	38	1077	1140	1710
9	255	270	405	39	1106	1170	1755
10	284	300	450	40	1134	1200	1800
11	312	330	495	41	1162	1230	1845
12	340	360	540	42	1191	1260	1890
13	369	390	585	43	1219	1290	1935
14	397	420	630	44	1247	1320	1980
15	425	450	675	45	1276	1350	2025
16	454	480	720	46	1304	1380	2070
17	482	510	765	47	1332	1410	2115
18	510	540	810	48	1361	1440	2160
19	539	570	855	49	1389	1470	2205
20	567	600	900	50	1418	1500	2250
21	595	630	945	51	1446	1530	2295
22	624	660	990	52	1474	1560	2340
23	652	690	1035	53	1503	1590	2385
24	680	720	1080	54	1531	1630	2430
25	709	750	1125	55	1559	1650	2475
26	737	780	1170	56	1588	1680	2520
27	765	810	1215	57	1616	1710	2565
28	794	840	1260	58	1644	1740	2610
29	822	870	1305	59	1673	1770	2655
30	851	900	1350	60	1701	1800	2700

## TROUBLESHOOTING

<b>PROBLEM</b>	<b>POSSIBLE CAUSES</b>	<b>PROBLEM</b>	<b>POSSIBLE CAUSES</b>	
PIMPLES	<ul style="list-style-type: none"> <li>PINHOLES IN NEGATIVES</li> <li>IMPROPER DESCUMMING</li> <li>POOR BATH CIRCULATION</li> <li>DIRTY EQUIPMENT</li> <li>HIGH BATH TEMPERATURE</li> <li>CONTAMINATED ACID</li> <li>PADDLE SPEED TOO LOW</li> <li>EXPRESS GUARD PLATE</li> <li>PROTECTOR NOT USED</li> </ul>	UNDERCUTTING OR TIGHT SHOULDERS	<ul style="list-style-type: none"> <li>PADDLE SPEED TOO HIGH</li> <li>TOO MUCH PADDLE DIP</li> <li>LOW BATH TEMPERATURE</li> <li>FROZEN OR SEPARATED ADDITIVE</li> <li>ACID CONTENT TOO HIGH</li> <li>CONTAMINATED ACID</li> <li>NOT ENOUGH ADDITIVE (REV-FLEX, X-FLEX, X5K)</li> </ul>	
UNEVEN SHOULDERS & DEPTH	<ul style="list-style-type: none"> <li>MACHINE NOT LEVEL</li> <li>TOO MUCH ACID LOOSE HEAD MOTION</li> <li>ROTATION OF THE TURNTABLE NOT IN ORDER</li> </ul>	SHORT BATH LIFE	<ul style="list-style-type: none"> <li>IMPROPER ADDITIVE ADDITIONS</li> <li>IMPROPER ACID ADDITIONS</li> <li>EXCESSIVE EXHAUST</li> </ul>	
ROUGH SHOULDERS	<ul style="list-style-type: none"> <li>BATH TEMPERATURE TOO LOW</li> <li>TOO MUCH ACID</li> <li>EXCESSIVE EXHAUST</li> <li>CONTAMINATED ACID</li> <li>LOW ADDITIVE CONCENTRATION</li> </ul>	DIRTY BOTTOM AROUND SHOULDERS	<ul style="list-style-type: none"> <li>SPENT ETCHING BATH</li> <li>CONTAMINATED ETCHING BATH</li> <li>CONTAMINATED ACID</li> </ul>	
WIDE SHOULDERS	<ul style="list-style-type: none"> <li>LOW PADDLE SPEED</li> <li>HIGH BATH TEMPERATURE</li> <li>TOO MUCH ADDITIVE</li> <li>LOW ACID CONCENTRATION</li> </ul>	EXCESSIVE COLOR LOSS	<ul style="list-style-type: none"> <li>EXCESSIVE DESCUMMING</li> <li>NOT DESCUMMED AS PRESCRIBED</li> <li>SPENT ETCHING BATH</li> <li>HIGH BATH TEMPERATURE</li> </ul>	
PINHOLES	<ul style="list-style-type: none"> <li>EXPOSURE TOO LOW</li> <li>OVERDEVELOPED</li> <li>PLATE PINHOLES IN NEGATIVE</li> <li>DIRTY GLASS IN VACUUM FRAME</li> </ul>	STEPS IN SIDEWALL	<ul style="list-style-type: none"> <li>SLOW ROTATION OF THE PLATEHOLDER</li> </ul>	
VARIABLES IN BATH OPERATION				
<p><b>TEMPERATURE</b> INCREASED BATH TEMPERATURE INCREASES ETCH RATE AND TENDS TO WIDEN SHOULDER AND DECREASE TONE DEPTH. REDUCED BATH TEMPERATURE HAS THE OPPOSITE EFFECT.</p> <p><b>PADDLE SPEED</b> INCREASED PADDLE SPEED INCREASES ETCH RATE AND TENDS TO TIGHTEN SHOULDERS INCREASING TONE DEPTH. DECREASED PADDLE SPEED HAS THE OPPOSITE EFFECT.</p> <p><b>ACID CONCENTRATION</b> INCREASED ACID CONCENTRATION INCREASES ETCH RATE AND TENDS TO TIGHTEN SHOULDERS. DECREASING ACID CONCENTRATION HAS THE OPPOSITE EFFECT.</p>				

