

You best partner in environment protection --CuSo4 recycling machine--

- Manufacturing :Wa Shin Chemical machine Corp.
- Location: Taiwan
- Oversea distributor: T.S.I.C
• (Three. Star. International. Corp.)
- Tel: 886-922-492-398 , Email: johnhan@threestar.com.tw

Company background

- Wa Shin is the biggest CuSO_4 recycling manufacturing in Asia , around 100 sets were sold in Taiwan , China , and Korea's , PCB shop & plating company in the past 6 years
- Wa Shin is the best company in this field

Comparison between (H₂SO₄+H₂O₂) & (SPS) --Better choice to use (H₂SO₄+H₂O₂)

Item	Chemical	(SPS NaPS)	(H ₂ SO ₄ +H ₂ O ₂)
Running cost		1.357NT/psf	0.792NT/psf 41%
Operation rate		stop 20min for each 3K panels	100% operation rate
Etching depth		20-70uinch (wider range)	Stable & can control the depth by the user
Etching rate		Low	adjustable
Waste water after process		Must handle by the waste water equipment & will take a lot effort to remove Cu from them	Will be remove 98% min. by the recycle machine
Residue after micro etching process		Cu. metal salt .& will be required to clean frequently	Easy to clean for no Cu metal salt

The CuSO_4 recycling machine in Dry film pre-cleaning & plating process

- When the process is using H_2SO_4 / H_2O_2 to proceed micro etching , then Cu^{2+} & SO_4^{2-} in the saturated solution will react each other & some CuSO_4 melt crystal , that crystal will be catch by the recycling machine , the reaction formula is as follows.
- Recycled quantity : 3500 g/ Hr
- Chemical Reaction:
 - $2\text{Cu} + \text{H}_2\text{O}_2 \longrightarrow \text{Cu}_2\text{O} + \text{H}_2\text{O}$
 - $\text{Cu}_2\text{O} + \text{H}_2\text{O}_2 \longrightarrow 2\text{CuO} + \text{H}_2\text{O}$
 - $\text{CuO} + \text{H}_2\text{SO}_4 \longrightarrow \text{CuSO}_4 + \text{H}_2\text{O}$
- Verall Reaction
- $\text{Cu} + \text{H}_2\text{O}_2 + \text{H}_2\text{SO}_4 \longrightarrow \text{CuSO}_4 + 2\text{H}_2\text{O} \quad \Delta H < 0$

Benefit of CuSO_4 recycling machine

- 1. Reduce the waste water (include Cu) drain volume through this recycling process.
- 2. Will not be required to stop machine to clean micro etching tank for the machine is clean & efficiently
- 3. The recycling CuSO_4 can be sold to make profit
- 4. The all pipes in recycling machine will not be blocked and will make the operation in both micro etching & recycling machine easier.
- 5. Low noise & easily maintenance
- 6. Detail return description : see next page

investment						Return		
Machine cost			Maintance &interest			Annular retun		
items	name	\$USD	item	name	\$USD	item	name	\$USD
1	machine	39.5K	1	interest(8%)	3K	1	Chemical 81400kg	26.3K (0.32/kg)
2	install	2.5K	2	Electricity (0.07US/ KW Hr)	0.4K	2	CuSo4 14100kg	1.7K (0.11/kg)
			3	maintance	1K	3	Waste paste reduce 22800kg	4.5K (0.2/kg)
						4	Waste water reduction 81400kg	15K (0.19/kg)
	42K		4.4K			47.5K		
Total	46.4K					47.5K		

- Cost saving in first year: $47.5K - 46.4K = 1.1K$ USD.
- Return time: 11 months
- Return on second year: $47.5K - 4.4K = 43.5K$ USD.
- Above return not include the operation rate cost
- Cost saving compare with (SDS) : 41.6%

Major Customer in PCB shop

Taiwan (some portion)

Nan Ya PCB & Cu foil

ITEQ

Unimicron.

Unicap.

Tripod.

Chin Poon

PWC

China (some portion)

Asus

Parato

GCE

TUC

Chandworld

Unitech.

G.C.E

Unicap

Uniplus

Hanstar

GunDa

Unic

ITEQ China

- space require small & easy handling
- isolate design –no bad smell & claen.
- All material is used Stainless stell.



- The Recycle Cu_2So_4 is with little H_2O and easy
- handle .



After service

- Machine installation
- Test Run to ensure the performance
- Maintain training even is easily in machine maintain
- Local support

設備製造目的及理想

- 1.讓使用者在污染源隔離狀況下作業.降低人員操作危險性.
- 2.減少藥水使用.降低廢棄物處理量.綠色環保貢獻者.