



**EVS**

World leaders in solder recovery  
EVS International

# EVS 1000

# Solder Recovery System

EVS INTERNATIONAL



# **EVS**

## **Solder Recovery**

### **Systems**

**Turns Dross Into Dollars**  
**FAST PAYBACK**  
**Gain and Retain ISO 14001**

**THE NEW EVS 1000**  
**WINNER of BEST PRODUCT and**  
**BEST ENVIROMENTAL PRODUCT**  
**at APEX USA 08 and NEPCON CHINA 08**  
**and PRODUCTRONICA GERMANY**





# THE 5 ADVANTAGES FOR USING EVS SOLDER RECOVERY SYSTEMS

**1) VERY FAST ROI ( MONTHS NOT YEARS)**

**2) PROCESS IMPROVMENTS**

**3) PRODUCTIVITY IMPROVEMENTS**

**4) ISO 14001 ( GAINING IT AND KEEPING IT)**

**5) REDUCTION OF COSTS**

( Rework – Nitrogen- Labour- Storage- Time)



# The EVS Solder Recovery System is Environmentally Friendly

- ISO 14001
- RECYCLE
- REDUCE
- REUSE



- The EVS 1000 is a smaller, lighter version of the popular EVS 7000/9000 Range with all of the recovery performance of the standard and lead-free solder units. The smaller size and footprint help reduce the cost, but still provide a capacity of 10lb/5kg of dross, giving a rapid payback and impressive return on capital (ROI).
- The very quick cycle time and manoeuvrability of this new machine will appeal to all customers who regularly de dross, use nitrogen or use 1 or 3 waves.
- With the increasing cost of solders and labour around the world the EVS 1000 is being installed at manufacturing facilities by customers looking to save money and improve their process.

# **EVS BULLET POINTS**

**The EVS is fully lead free compatible now.**

**The EVS creates huge savings as it will recover a minimum of 50% of pure solder from all the dross currently being sent away.**

**The EVS will cut solder purchases by up to 40-50%**

**The EVS has a very fast payback (ROI) = More productive capital.**

**The EVS means much less storage and handling of dross = Freed-up space and reducing costs.**

**The EVS means substantially less heavy lifting for staff, the heavy pure solder is retained by you = A happier, healthier staff.**

**The EVS makes a positive contribution to gaining and retaining ISO 14001 accreditation RECYCLE-REDUCE-REUSE = A happier, healthier environment and future.**

**The EVS speeds up the dedrossing process by up to 70%, less squeezing and no chopping without financial penalties. The solder is retained by you.**

**Staff are empowered by contributing to site savings and environmental improvements.**

**The EVS presents a rare opportunity to environmentally improve your factory while at the same time providing a substantial positive payback and improving your soldering process.**



# Wave soldering:

**Dross formation :  
50 – 75%**

**Very costly, even with  
excellent supplier contracts**

**Handling and transportation  
is not really environmentally  
friendly: ISO 14001**







# **Dross reduction methods:**

## **Chemical**

- 1: Adding Wave Oils**
- 2: Dross Reducing Chemicals**
- 3: Nitrogen Systems**



## **Mechanical**

- 4: EVS Solder Recovery Systems**



# CHEMICAL DROSS REDUCTION

## **Wave Oils:**

**Wave oils have been around for Many Years. Although they reduce dross there are many negative side effects.**

**Very expensive as the oils have to added to the process EVERY FEW HOURS.**

**Have been reported to increase shorts bridging and rework.**

**Wave maintenance, cleaning and wave downtime all increase.**

**Oily/Black coating on contact parts, pumps and solder pot.**

**This increases Running costs significantly.**

## **EVS 1000 VERSUS WAVE OILS**

- 1) Once you have paid for the EVS machine you are forever making a large monthly savings.
- **WAVE OILS:** Constant have to buy the liquid and ship the remaining dross back to them at your costs ( VERY EXPENSIVE) as they started the price low and increased it steadily and the new Lead Free WAVE OIL is even more expensive that lead solder WAVE OIL.
- 2) One EVS can be used between 1-3 waves so your ROI and efficiency of de drossing is substantially improved..
- **WAVE OILS:** has to be added to EACH wave every few hours again (VERY EXPENSIVE). and over you pay high costs to reduce dross forever. ( DOESN'T MAKE ANY SENSE)
- 3) EVS puts pure solder back in to your solder pot. What you put in the EVS is what you get back, No chemistry or change of state of the solder.
- **WAVE OILS:** Why would you want to add an additive to your process.
- 4) EVS cleans up your process, No Dross reducing powders or oils needed, Reducing your shorts bridging and rework.
- **WAVE OILS:** Increases maintenance costs of the wave and coats wave in black discharge, massive increases in maintenance.
- 5) EVS fits in perfectly with your plants ISO14001 mantra of RECYLCE, REDUCE and REUSE with the EVS achieves all three.
- **WAVE OILS:** are adding a new chemical to your process and you can not RECYLE, REDUCE and REUSE the remaining dross that comes from the waves, you have to ship it back to the supplier



## **CHEMICAL DROSS REDUCTION**

### **DROSS REDUCING POWDERS:**

**Dross Reducing Powders have been around for many years. Although they reduce dross there are MANY NEGATIVE SIDE EFFECTS.**

**The powders have to be mixed in to the dross on the wave causing an increased exposure to fumes that can be dangerous to the operator and the people around the wave.**

**Pot cleaning and down time increases as the powders have to be mixed in to the dross and the dross chopped up for 20-30 minutes.**

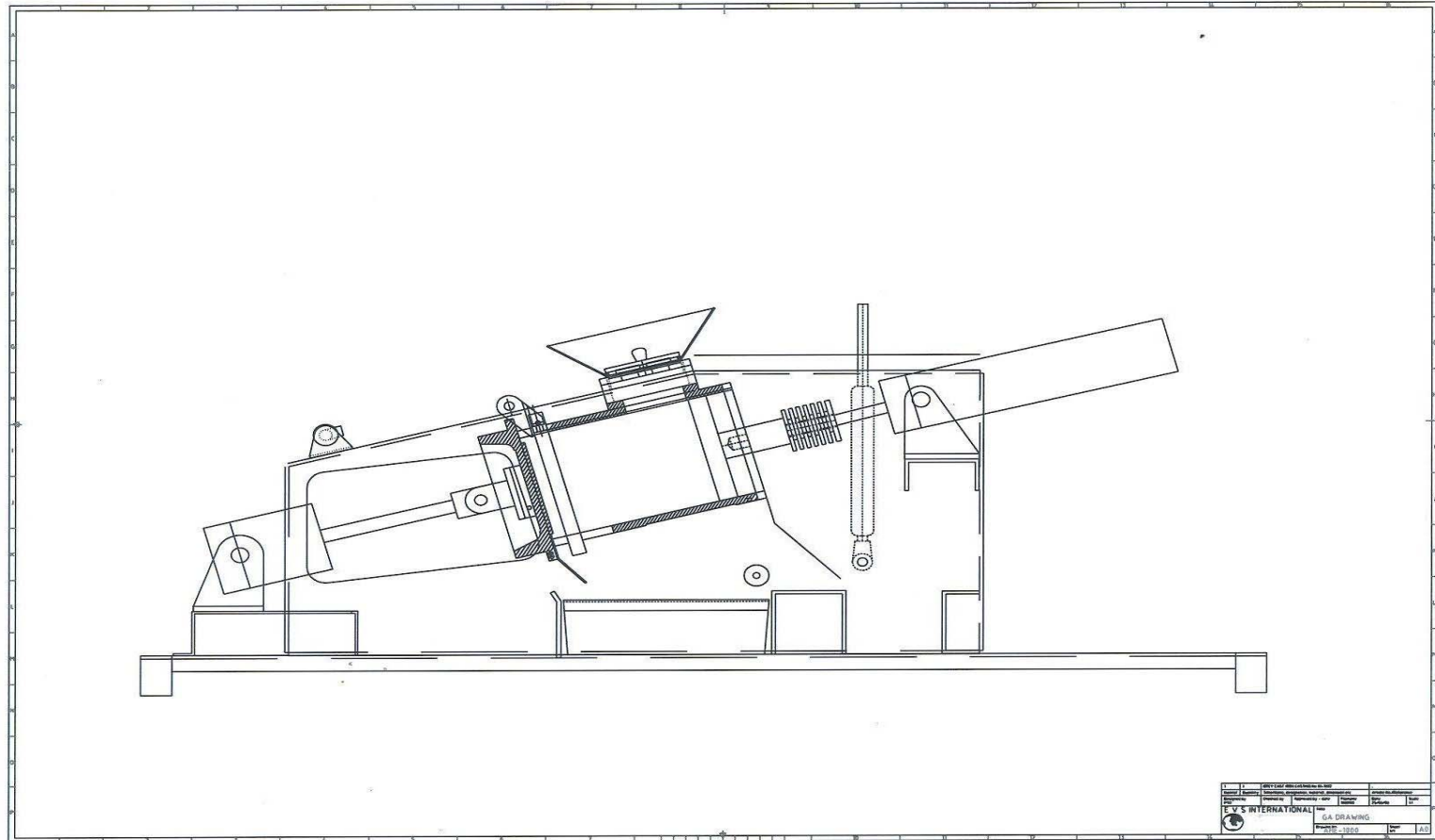
**The powders and this chopping/mixing has been**



## EVS 1000 VERSUS DROSS REDUCING POWDERS

- 1) EVS systems speeds up your dedrossing time by up to 70%.
- DROSS REDUCING POWDERS increase dedrossing time and create more work as they have to be chopped in to the dross and mixed for 20-30 minutes to be effective.
- 2) EVS systems have a separate fume extraction as standard.
- DROSS REDUCING POWDERS increase exposure to fumes and can be dangerous to the operators and people around the wave.
- 3) EVS puts pure solder back in to your solder pot. What you put in the EVS is what you get back, No chemistry or change of state of the solder.
- DROSS REDUCING POWDERS: Why would you want to add additives to your process.
- 4) EVS cleans up your process, No DROSS REDUCING POWDERS needed, Reducing your shorts bridging and rework by 30to 40%.
- DROSS REDUCING POWDERS: Increases maintenance costs of the wave and coats wave in a powder, significantly increases in maintenance and downtime.

# Hot Chamber Method - How it works- 1:



# Hot Chamber Method - How it works- 2:

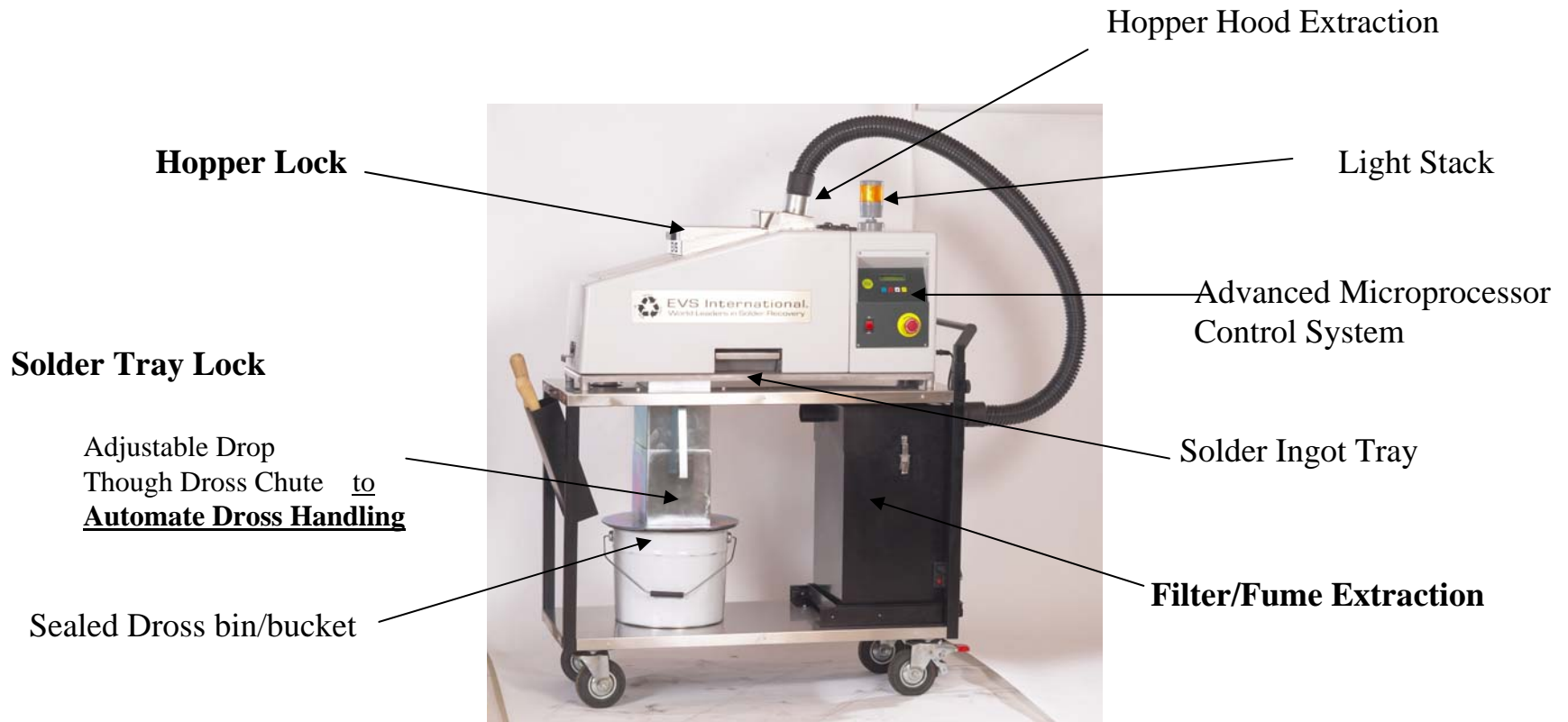
❖ At the end of the cycle the dross is automatically emptied in to a sealed dross bin/bucket.



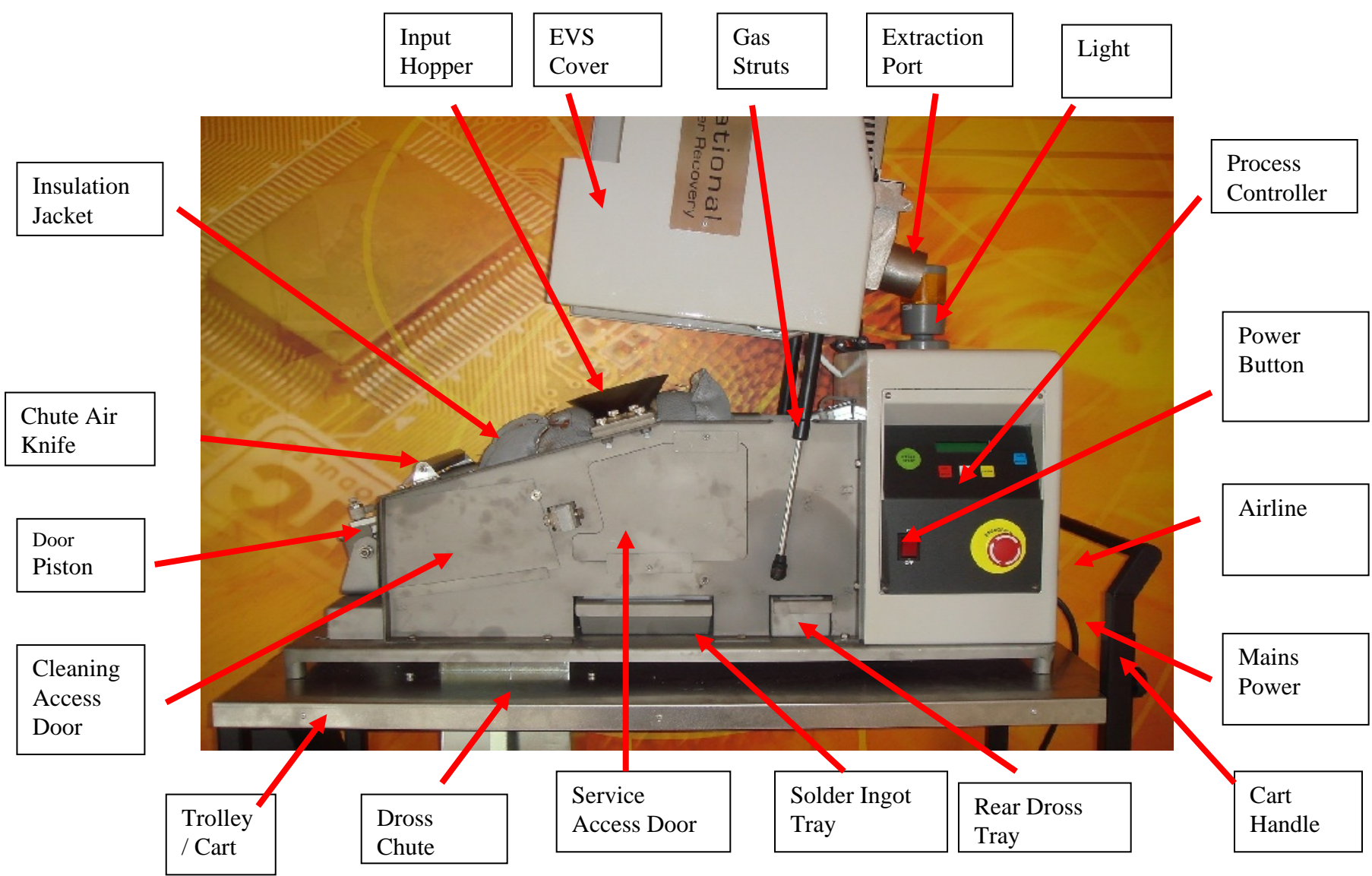
❖ Recovered  
Solder is formed in 3 ingots.



**Figure 1**





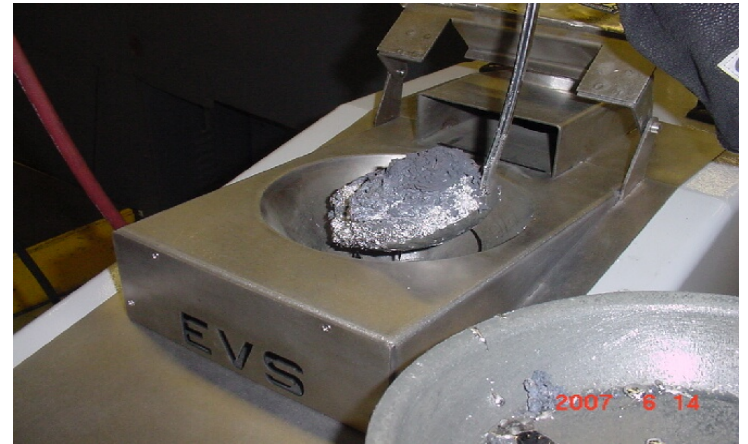


## DeDrossing with EVS is as easy as 1-2-3

1 Open the loading hatch...



2 Load dross direct from the wave...

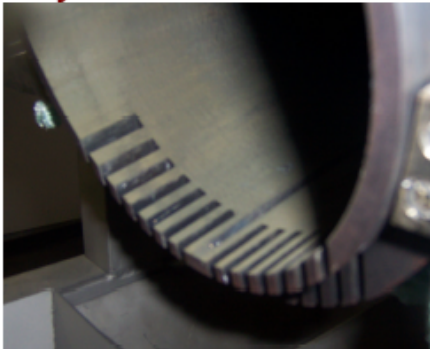


3 Press the Cycle Start button...





**4** The machine squeezes the dross through the chamber teeth into the Ingot Tray



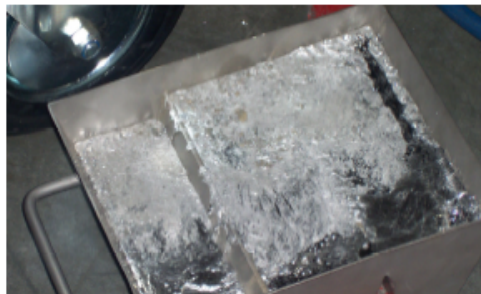
**5** At the end of the cycle the chamber door opens automatically-



**6** Dross is emptied into the dross pail:



**7** Take out the tray, place in a safe position and allow to cool.



**8** Put solder back in the solder pot.



# QUESTIONS

# ANSWERS

**What is the effect on the alloy of processing tin lead dross at 285-350 C in the EVS?**

Hundreds of customers doing thousands of solder tests over many years have shown shown that the levels of impurities contained within the solder alloy processed processed through the EVS are exactly the same as the solder in the solder pot. What you put in is exactly the same as what you get out and

**Can I use the same EVS for Lead and Lead Free Solders?**

EVS on all its range offer both Lead and Lead Free versions. Due to cross contamination you can not use the same EVS for Lead and Lead Free. Free. Separate machines would be needed. EVS also offer a Lead Free upgrade kit to convert a machine used on Lead solder to Lead Free..

**Do the internal temperatures create additional contaminants?**

**NO:** What you put the EVS is what you get back out. Exactly the solder quality of solder that is in the solder pot.

**What is the maximum and minimum dross loads the EVS can process in one cycle sequence?**

EVS 7000 – 1.5kg/3 lbs Minimum > 10 kg/10lbs Maximum  
EVS 9000 – 5.0 kg/8 lbs Minimum > 20 kg/40lbs Maximum

**Can I process dross from a bath that has an oil blanket or that has had wave oils to reduce dross?**

**Never use oil** with EVS as the oil burns and causing smoking. One advantage of of using the EVS is that more frequent de-drossing can be carried out without additional cost, thereby **eliminating the need for an oil blanket or Wave Oils** - another financial saving. The logic of using a messy, time consuming process which which limits the process options generated by new technologies is questionable and questionable and highly expensive as they have to be added every 4 hours.

**Can I process dross that has been treated with dross reducing chemicals?**

For dross reducing chemicals to be effective they should be stirred into the dross, dross, which **creates an emulsion which in turn results in the** chemical being present in every solder joint on the PCB. This process has been rejected by a major major American computer manufacturer and is also an unnecessary cost. Regardless the dross can be processed although yields may be slightly reduced. EVS reduced. EVS customers by stopping using dross reducing powders they have significantly reduced shorts, bridging and rework. Again a massive saving in cost cost and time.



# QUESTIONS

# ANSWERS

**What is the power consumption of the EVS?**

EVS max consumption is 1.6 KW during start up. The unit has a soft start to lower power demands and once at operating temperature runs at 3-5 Amps.

**What precautions do I need to ensure my machine operator's safety?**

The EVS is a safe machine to operate. Operators should wear the recommended safety Equipment and follow the instructions in the operating manual provided which should be displayed by each machine. Warnings are displayed on the machine.

**ONLY TRAINED PERSONNEL SHOULD OPERATE THE EVS.**

**What extraction do I need?**

The EVS has a standalone filtration system that requires no external ducting.

**Yes.** The EVS complies with all CE requirements, plus BS5304 and is covered by National, National, European, International and USA patents.

**Does the EVS have any approvals and patents?  
patents?**

The EVS is pre-set to provide optimum results in dross recycling. But is fully Programmable. Programmable.

**Can the temperature of the EVS be varied?**

**No,** as the temperature in the EVS is regulated to shut down should the temperature reach reach 400C (716F) well below lead fume generation.

**Does the cycling process produce lead fumes?**

**What happens to the final dross deposit?**

The remaining solder dross can be sent in the normal way to your solder supplier.

**Yes.** However it is important that dross from each individual machine cycle returned to the to the original bath otherwise cross contamination will be evident. On sites with multiple multiple WSM's where cross contamination is critical it would be wise to install a higher higher ratio of EVS's to wave soldering machines to prevent expensive cross contamination. contamination.

**Can I use EVS to recycle dross from more than  
one wave soldering machine?**

**No.** The same operators who dedrosses the waves now would operate the EVS and as EVS is EVS is a self contained process permitting more rapid de-drossing without penalty. Your Your operators time is then freed for other duties.

**Do I need extra personnel to operate EVS?**



# **EVS**

## **SOLDER RECOVERY SYSTEM**

### **THE LEAN, CLEAN, GREEN, MACHINE**

**LEAN** Rapid Return on Investment - Months Not Years  
40-50%+ Reduction in Solder Purchases

**CLEAN** Self-Contained Process  
No Chemicals, Additives or Radiation  
Up to an 70% Reduction of Dross Off Site

**GREEN** Improves the Environment  
Contributes to ISO 14001 RECYCLE-REDUCE-REUSE  
Lead Free Solder Compatible

# Q

Customer "A"

Long Term:  
3 months

Date	02/08	03/08	04/08
Sn	<b>62.7</b>	<b>62.6</b>	<b>62.7</b>
Sb	<b>.024</b>	<b>.023</b>	<b>.023</b>
Cu	.24	.23	.23
Zn	<.001	<.001	<.001
Fe	<.001	<.001	<.001
As	<.001	<.001	<.001
Ni	<.001	<.001	<.001
Bi	<b>.017</b>	<b>.016</b>	<b>.017</b>
Cd	<.001	<.001	<.001
Ag	<b>.018</b>	<b>.017</b>	<b>.016</b>
Al	<.0002	<.0002	<.0002
In	.002	.002	.002
Au	<b>&lt;.001</b>	<b>.001</b>	<b>.001</b>

## Customer "B"

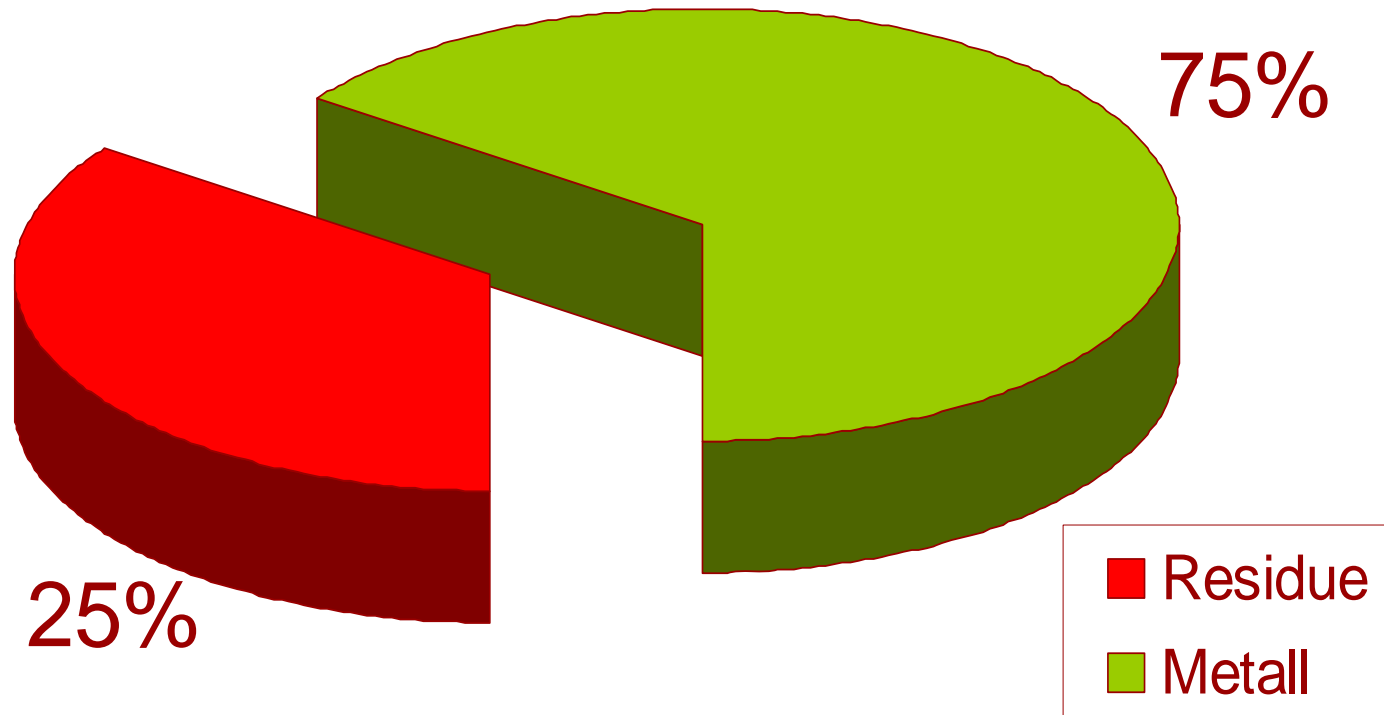
Q

Long Term:  
18 months

Date	07/06	01/07	08/07
Sn	<b>62.7</b>	<b>62.8</b>	<b>62.8</b>
Sb	<b>.29</b>	<b>.28</b>	<b>.27</b>
Cu	<b>.06</b>	<b>.05</b>	<b>.05</b>
Zn	<.001	<.001	<.001
Fe	<.001	<.001	<.001
As	<b>&lt;.001</b>	<b>&lt;.002</b>	<b>&lt;.001</b>
Ni	<b>&lt;.003</b>	<b>&lt;.006</b>	<b>&lt;.005</b>
Bi	<b>.024</b>	<b>.025</b>	<b>.024</b>
Cd	<.001	<.001	<.001
Ag	<b>.018</b>	<b>.017</b>	<b>.018</b>
Al	<.0002	<.0002	<.0002
In	<b>.002</b>	<b>.003</b>	<b>.001</b>
Au	<b>.003</b>	<b>.002</b>	<b>.003</b>



# Solder Recovery Efficiency



**Dross in: 5.00 Kilos**

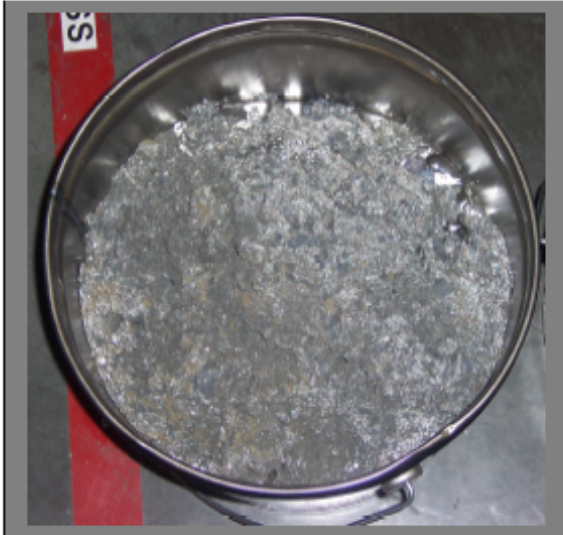
**Dross out: 1.25 Kilos**

**Metal out: 3.75 Kilos**

*Dross after the EVS*



*Dross without usina the EVS*



**Solder After EVS**





# EVS PATENT PROTECTION

**1. The EVS Machine has a world wide product patent**

But more importantly it also has:

**2. A world wide patent on the process of mechanically heating and squeezing solder dross**

**3. All patents are protected by patent insurance**



## **Conclusion :**

- **40- 50 % savings on solder purchase.**
  - **Up to 70% less dross handling and transportation**
  - **No Additives-Powders or Oils**
  - **Contribute to the ISO 14001**
- RECYCLE-REDUCE-REUSE**
- **No change in quality of the solderbath**
  - **Easy to use – significant operators time savings**



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**For more detailed information  
visit:**

**[www.solderrecovery.com](http://www.solderrecovery.com)**



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