



FOOTWEAR DISTRIBUTORS AND RETAILERS OF AMERICA



Towards Zero
Manufacturing Waste
to Landfill or
Incineration in
Waste Management
HANDBOOK

July 2020

Moving Towards Zero Manufacturing Waste to Landfill or Incineration in the Footwear Industry

The Footwear Distributors and Retailers of America (FDRA) – which represents 90% of the total U.S. footwear industry – aims at measuring and reducing manufacturing waste to incineration or landfill in footwear factories. As a first step, the FDRA started a pilot project in 2019 focused on footwear manufacturing processes in the supply chain and is aiming to reduce waste in the participating pilot factories sent to incineration or landfill.

The intended outcomes of the project are as follows:

- Develop a baseline on waste management in footwear factories that captures how the factories currently manage their waste and measures improvements.
- Develop a business case for each factory with a financial plan inclusive of return on investment (ROI) to drive better waste management.
- Build the capabilities of the participating suppliers by implementing best in class industrial practices that maximize the use of materials and reduce the output of waste to landfill or incineration.
- Drive industrial demand on waste recycling and connect manufacturers to formal waste handlers.


As the important work of the pilot program continues, FDRA has published this handbook to help footwear companies better ascertain the various aspects of footwear production, manufacturing waste generated during production, and key strategies and techniques to move towards a more sustainable production model. For further information about the Shoe Waste Program and general inquiries contact FDRA at info@fdra.org.



About Footwear Distributors and Retailers of America: FDRA serves the full footwear supply chain and boosts the bottom lines of its members through innovative products, training and consulting on footwear design and development, sourcing and compliance, trade and customs, advocacy, and consumer and sales trend analysis for retailers selling shoes. Members include most U.S. footwear manufacturers, brands, retailers and importers. In all, FDRA supports nearly 500 companies and brands worldwide, representing 90% of total U.S. footwear sales, making it by far the largest and most respected American footwear trade and business association.



About ELEVATE: ELEVATE is a global leader on implementing sustainability practices into supply chains and has more than 600 staff, of which more than 350 are working in China.

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1. Waste Stream in Footwear Factory
 2. Current Waste Management System
 3. The challenge of waste recycling
 4. What waste can be recycled in shoe factory?
 5. How to improve my waste management practice?



1.WASTE STREAM IN FOOTWEAR FACTORY

2. Current Waste Management System

3. The challenge of waste recycling

4. What waste can be recycled in shoe factory?

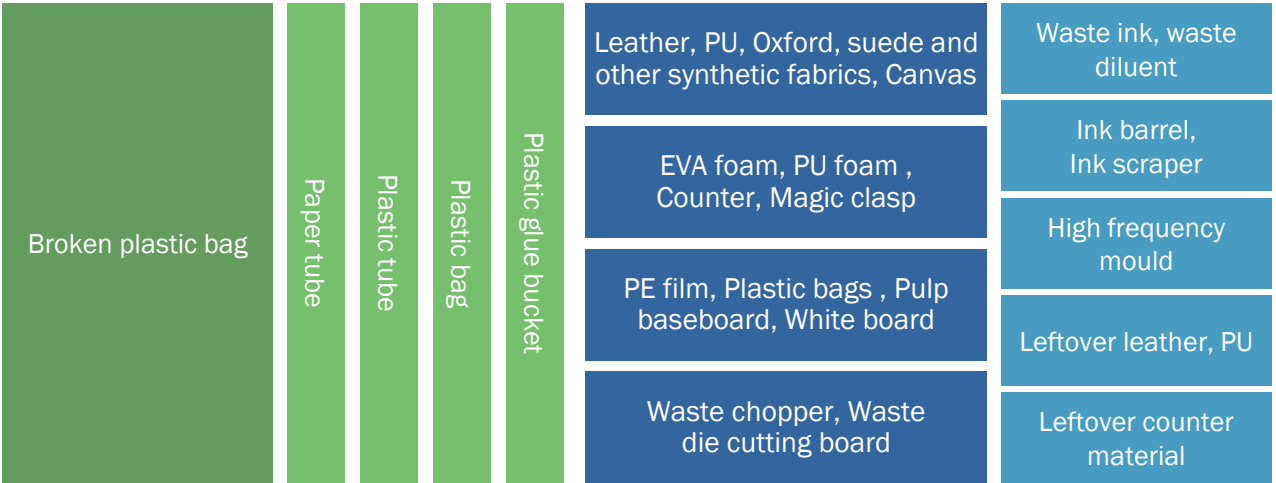
5. How to improve my waste management practice?

WASTE STREAM CHART

Production Processes:



Wastes generated:



Wastes generated:



WASTE STREAM CHART

Sole Processes:



Wastes generated:



Production Processes:



Wastes generated:



WASTE STREAM CHART

There are many types of waste generated during footwear production process. While many of them appear to be small and valueless, they can also be turned into treasure.



1. Waste stream in footwear factory

2.CURRENT WASTE MANAGEMENT SYSTEM





3. The challenge of waste recycling

4. What waste can be recycled in shoe factory?

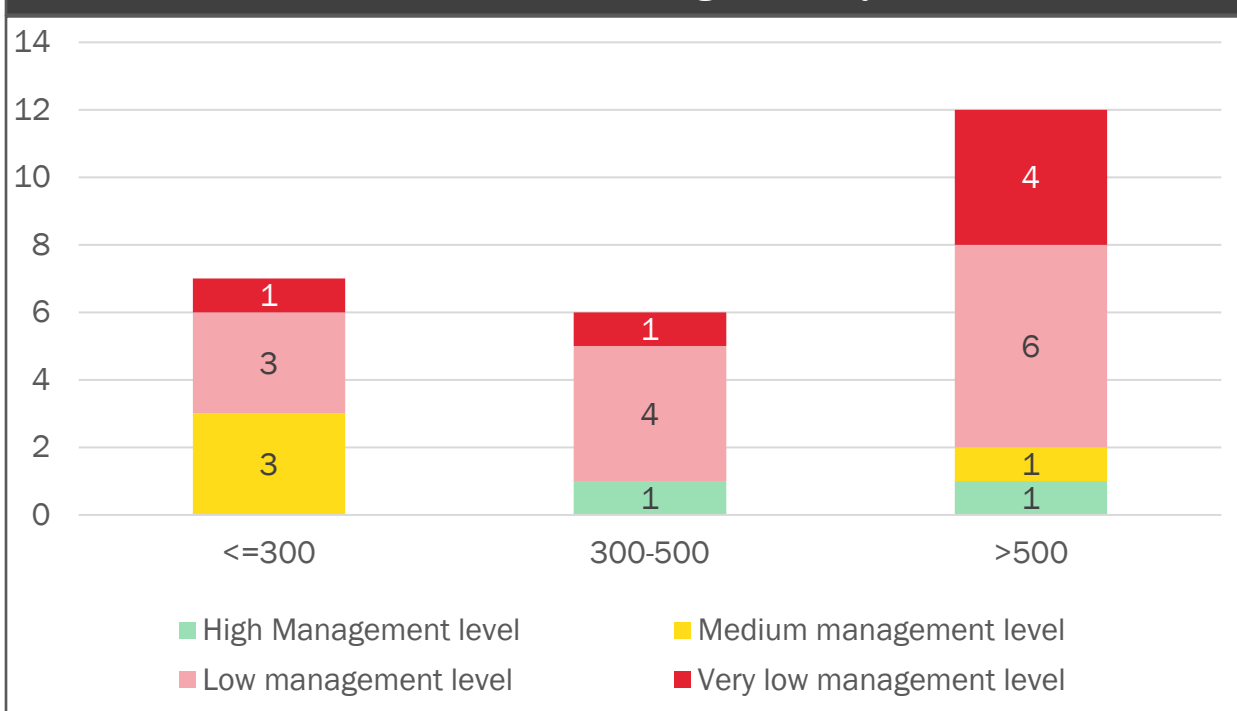
5. How to improve my waste management practice?

OVERVIEW OF WASTE MANAGEMENT SYSTEMS

Categorization of waste management models

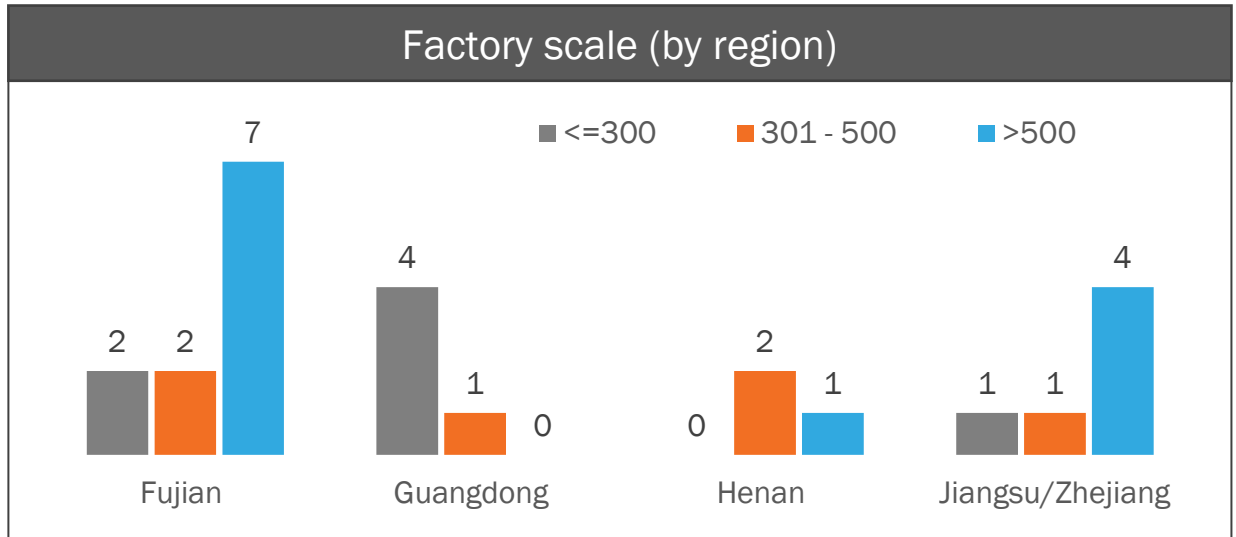
High management level		Currently factory recycles a variety of waste, and have some internal processes for waste management.
Medium management level		Factory recycles some of the waste, and there is waste separation in some processes (such as cutting).
Low management level		Factory only recycles a few types of wastes (such as paper), and there is no internal process for waste management.
Very Low management level		Factory does little of waste management, and it is outsourced to external waste handlers.

Overview of waste management systems

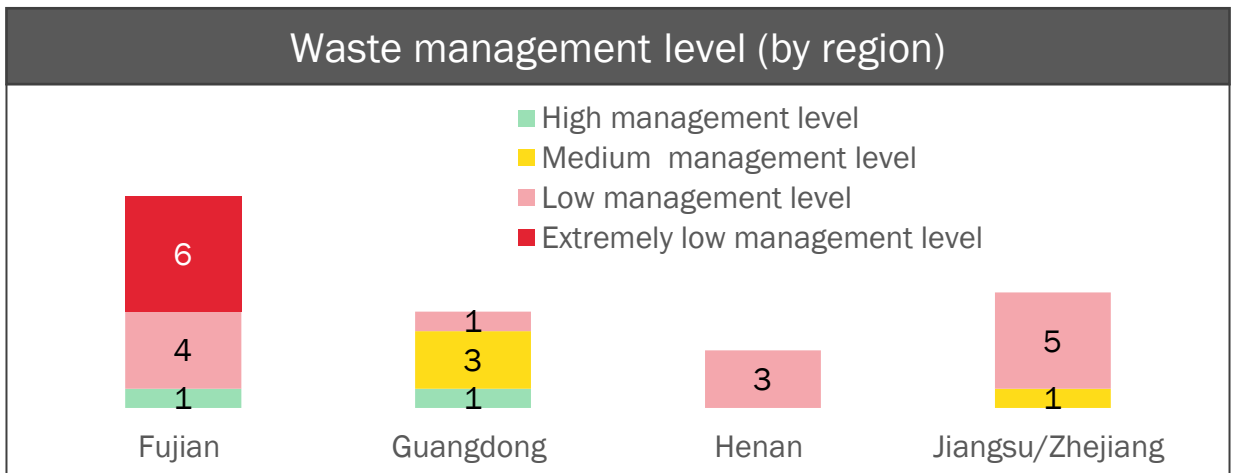


- Most factories have relatively low levels of waste management.
- The proportion of factories with high level of waste management is not high.
- There is no clear correlation between waste management level and factory's size. There is no evidence that larger factories have higher levels of waste management.

WASTE MANAGEMENT MODELS



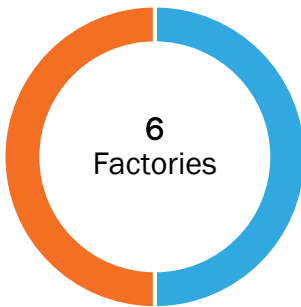
- We see clear regional differences. Factories in Fujian, Jiangsu and Zhejiang are relatively large. More than half of the factories in these two regions are large factories with more than 500 employees. The factories in Guangdong are relatively small, mostly small factories with less than 300 employees.



- However, in terms of waste management, while Guangdong factories are smaller, their overall performance of waste sorting and recycling is better than other regions. Fujian factory has a lot of room for improvement in this area. About half of Fujian shoe factories use waste outsourcing services and do not sort or recycle internally (very low waste management level).
- Henan factories face more external challenges in waste management than other regions. Local government may ask factories to use designated waste handler, and factories need to pay a fixed price (20,000 RMB per year) for their service. In addition, local waste handlers' availability and maturity is also lower than in other regions.

OVERVIEW OF WASTE MANAGEMENT MODELS

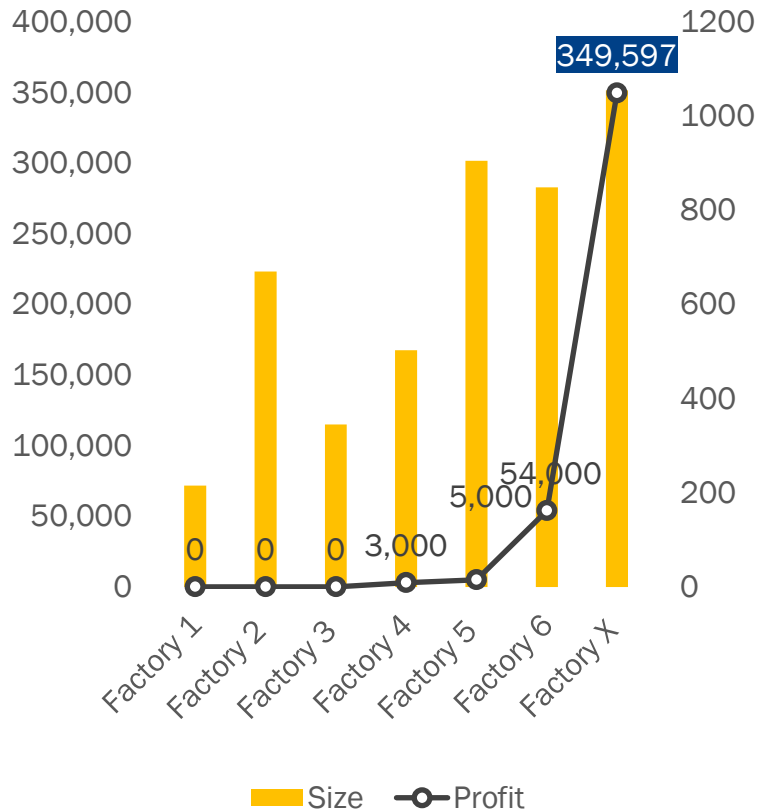
Extremely low management level



50% (3 factories)
Outsourcing with profit

50% (3 factories)
Outsourcing with no profit/cost

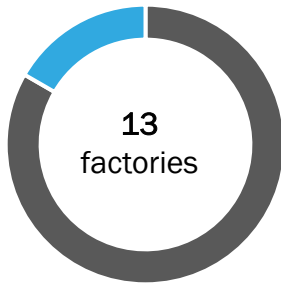
Comparison of waste profitability - Annual income from waste (RMB)



- Factory X = Good practice in the project, with a high level of waste management. It can generate a profit of 349,597 RMB by recycling waste every year. The factory located in Putian, Fujian.
- Six factories with very low waste management levels are in Fujian Province. There are two models.
- Three of them do not charge or get paid for waste outsourcing. Waste handlers take away garbage. The other three factories are paid for outsourcing their waste management. The waste handler pays a fee to the factory to be able to take ownership of wastes.
- No correlation between model used and factory scale.
- By comparison, this is a missed opportunity for those three factories on outsourcing with no profit/cost model. Even if the factory does not make any internal improvements, only by changing the current model, some benefits can be obtained from the waste.
- For factories that gets paid for waste outsourcing, by comparing the benefits of Factory X, we can see that there is still a lot of room for improvement.

OVERVIEW OF WASTE MANAGEMENT MODELS

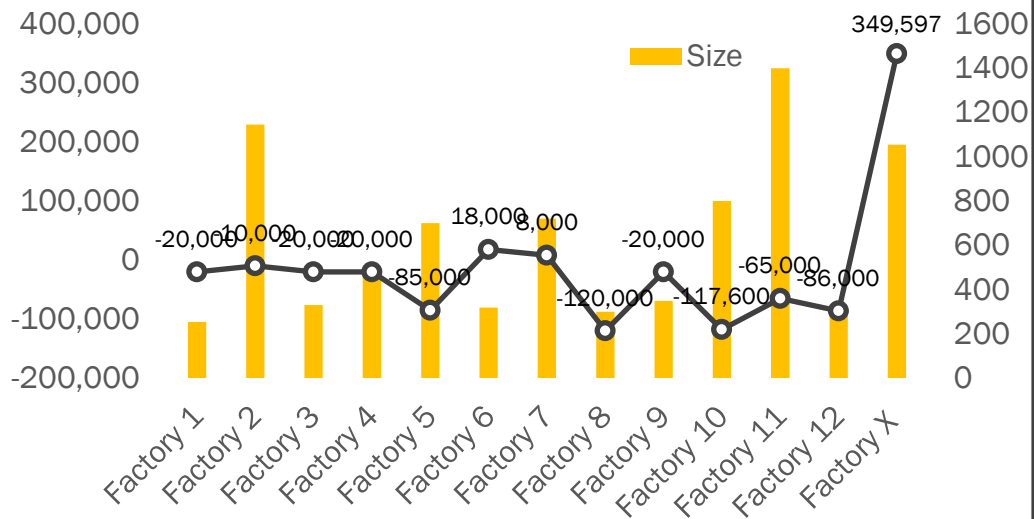
Low management level



83% (10 factories)
Outsourcing with cost

17% (2 factories)
Outsourcing with profit

Comparison of waste profitability - Annual income from waste (RMB)



* Only 12 factories are included in analysis, because one of the 13 factories has not handle the waste and currently store wastes onsite per government's requirement.

- Factory X = Good practice in the project, with a high level of waste management. It can make a profit of 349,597 RMB by recycling waste every year. The factory located in Putian, Fujian.
- 13 factories with low waste management level are distributed throughout the country, including 5 factories in the Yangtze River Delta, 2 in Henan, 2 in Fujian, and 1 in Guangdong.
- Most of these factories use outsourcing with a cost models, which means that the waste handlers take away the garbage, and factories need to pay them. Only two factories in Fujian use outsourcing with profit model, in other words they have certain income from waste. As mentioned before, the models used has no relevance to the factory size.
- For factories that pay for outsourcing,, one reason is internal management decision. Three factories can have significant room for improvement, and the largest one can save at least 100,000 RMB a year.
- Another reason is the local government, which requires factories to use designated waste processors (7 factories). But the factory can offset this part of the expenses by sorting, recycling and selling certain waste.

- 
1. Waste stream in footwear factory
 2. Current waste management system

3.THE CHALLENGE OF WASTE RECYCLING

4. What waste can be recycled in shoe factory?
5. How to improve my waste management practice?

THE CHALLENGES OF WASTE RECYCLING

Awareness level of management team

- Not aware of potential value of waste management, and they still feel waste is garbage, and garbage is worthless.
- Don't know what can be recycled.
- Too few to recycle and it is not worth it.
- Too low value to recycle thus it is not worth it.

Onsite Management Capability

- Workers lack awareness, thus are unable to do a good job of waste separation.
- Space limitations at the production site. There is not enough space for waste storage.
- Lack of responsible person to oversee/monitor.

- Existing waste treatment contract, it's more convenience
- The current contracting method is economically valuable for some factories
- Contracting is not over now, no changes can be made
- It is difficult to supervise and manage waste processors

- Lack of available and mature recycling service providers in the region. There is no corresponding waste disposer for disposal (e.g. Northern China)
- The local government specifically requires factory to use designated waste handlers.

Waste Handlers

External Factors



1. Waste stream in footwear factory

2. Current waste management system

3. The challenge of waste recycling

**4. WHAT WASTE CAN BE RECYCLED
IN A SHOE FACTORY?**

5. How to improve my waste management practice?

IDENTIFY RECYCLABLE/REUSE WASTE

Metal



Paper



Plastics



Upper Materials





Sole Materials



Wood Materials



Legend

	Recyclable
	Conditional Recyclable

IDENTIFY RECYCLABLE/REUSE WASTE—METAL

Waste Machine



Waste Die Cut



Waste Mold



Waste Scissors



Waste metal accessories





Waste Zipper Heads



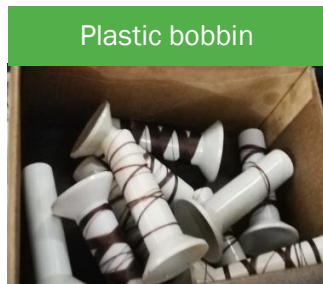
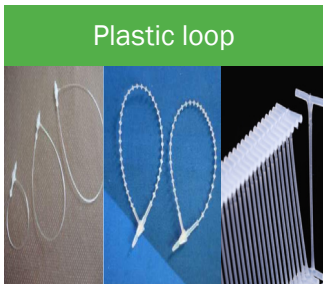
Can these be recycled?

- Yes. Metal waste can be recycled.
- It can be melted and used to produce other metal products.
- There are available waste handlers responsible for metal recycling.

Legend

	Recyclable
	Conditional Recyclable

IDENTIFY RECYCLABLE/REUSE WASTE – PLASTICS (Non leftover materials)



Can these be recycled?

- Yes. These types of plastic are recyclable.
- After granulated, according to the customer wear-resistant standards with a certain proportion of new materials to regenerate new products.
- Not broken plastic bags can be used again for other products.
- There are available waste handlers responsible for collecting these plastics.

Legend

	Recyclable
	Conditional Recyclable

IDENTIFY RECYCLABLE/REUSE WASTE – PAPER

Waste paper carton box



Waste paper tube



Waste paper box





Waste paper card



Can these be recycled?

- Yes. Paper waste can be recycled.
- It can be used to make new paper products.
- Not broken boxes can be used again for other products.
- There are available waste handlers responsible for paper recycling.

Legend

	Recyclable
	Conditional Recyclable

IDENTIFY RECYCLABLE/REUSE WASTE – UPPER MATERIAL

Natural leather



PVC leftover



Leftover counter



Sandwich mesh leftover



Leftover magic clasp





Leftover rubber



Can these be recycled?

- Conditionally yes.
- Natural leather – can be recycled to make recycled leather, those in large size can be used to make small items. As we learn from the market that leather needs to be at least the size of a palm to be recycled.
- Other leftover upper materials – Other shoe upper scraps can be mixed with new materials to make fabrics or other products in a certain proportion without being fitted or glued.

Legend

	Recyclable
	Conditional Recyclable

IDENTIFY RECYCLABLE/REUSE WASTE – UPPER MATERIAL

Leftover plush



Leftover sponge



Leftover pearl cotton





Other leftover fabric



Can these be recycled?

- Conditionally yes.
- Other upper materials – Other shoe upper scraps can be mixed with new materials to make fabrics or other products in a certain proportion without being fitted or glued.
- Notes for fabrics – For cloth, leftover materials without glue can be sold in the professional cloth crushing market. Most can be used to make rags. For the remaining fabric, stock fabric, if the factory can not use, can be sold to the professional stock market. It can be used to make other products.

Legend

	Recyclable
	Conditional Recyclable

IDENTIFY RECYCLABLE/REUSE WASTE- OUTSOLE MATERIAL

TPR outsole TPR



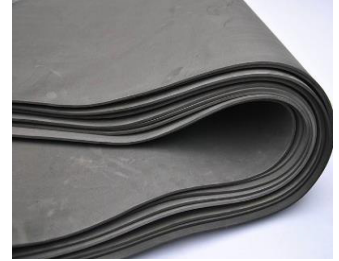
Rubber outsole



EVA outsole



EVA midsole



Sole forming channel



Scrapped ABS heel



Plastic waterproof platform





EVA grinding powder




Can these be recycled?

- Yes.
- Smash and granulate, mix new materials in a certain proportion to make sole or other products.
- EVA Grinding powder can make plastic runway and other products.

Legend

	Recyclable
	Conditional Recyclable

- 
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5. HOW TO IMPROVE MY WASTE MANAGEMENT PRACTICE?

WASTE MANAGEMENT SYSTEM

1

Understand your waste recycling opportunities and its supply chain
Research on waste types, production processes that generate wastes, local recycling industry chain, etc.

2

Establish waste management policies or procedures that are most appropriate for your factory. Set up practical reduction target.

3

Clarify the responsibilities of waste management personnel, waste collection personnel, responsible persons in the waste management area, etc.

4

The waste collection bucket shall be provided to ensure the classification when the waste is generated, and the waste shall be stored in the waste management area.

5

Waste data recording, tracking, and analysis

6

Train and motivate employees to develop the habit of waste classification.

7

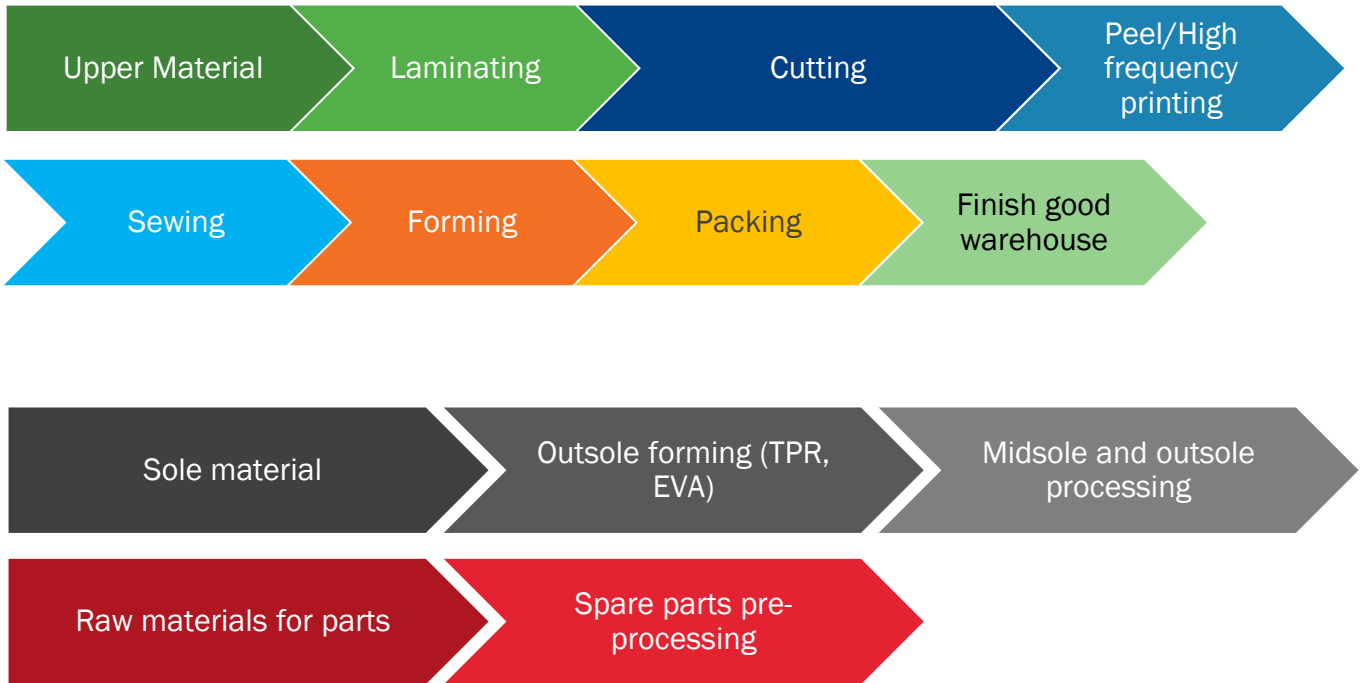
Supplier management. Ask raw material supplier to provide material description and discuss the possibility of recycling. The waste handler shall explain the final flow direction of waste and provide relevant evidence.

8

Invest in advanced equipment to reduce waste generation

1. UNDERSTAND YOUR WASTES

Write down your production processes. Please remember to include warehouses and sample room (if applicable).



Write down wastes generated each at your production processes. The key is to write down as detailed as possible and try to include all kinds of wastes. You may refer to the slide earlier for ideas.

2. ESTABLISH THE PROCEDURE AND TARGETS

What does the policy and procedure should include?

Expectations:

Waste must be recycled / reused

Example: Prepare a list of materials for reuse and recycle as an attachment

Waste must be sorted

Example: Responsible department is responsible for differentiating each type of waste

Waste must be weighed

Example: waste must be weighed prior to disposal. Have the form filled out and have relevant person verify and signature

Product, machine and tool scraps need to be approved prior to disposal

Example: Waste machines and tools must be submitted for approval before disposal

Waste handlers must be regulated

Example: The waste handler needs to meet the basic conditions before it can be used

Processes:

Waste recycling

Review waste / raw materials regularly and update inventory

Waste management on production floor

- The staff of the production department will sort out waste as required and place it in the designated location.
- Clarify authority for managers at different levels to approve scrap products.
- Specify the process for different equipment's disposal, such as any new scissor will not be given unless the old scissor is provided ; how much of the chopping board needs to be scrapped; what parts of the machine need to be removed for reuse prior to disposal.
- Cleaners transfer waste to the waste management area on a daily basis, Once in the morning and another in the afternoon.
- When transferring waste to the central waste area, the waste registration form should be filled by department. Responsible person in the waste area need to verify and shall not accept incorrect records.

Waste management in central area

- Waste needs to be stored separately.
- Waste shall be sorted and weighed separately per type, registered and recorded in the waste disposal form.
- The finance department shall monitor, review and collect payments.
- After the waste is processed, security guard can only release respective cars with the presence of waste disposal form signed by the waste manager and the finance department.

Roles and Responsibility:

- Define waste management team personnel and their responsibilities
- Define the responsibilities of other departments (such as logistics, finance, and production)
- Define the appropriate disciplinary action if you violate the waste policy.

3. ROLES AND RESPONSIBILITIES



Workers

- Workers are the first responsible person for waste separation.
- Sufficient waste collection bins should be provided next to workers.
- Integrate waste collection into standard operations



Responsible Waste Staff per Floor

- Responsibilities of the staff:
 - Collect waste from each worker's workstation.
 - Check the separation of waste and make timely correction if needed.
 - Indicate associated department and line information of the waste
 - Transport waste to the central recycling site in designated vehicles / boxes.
- This person can be a cleaner.



Responsible Waste Staff at Waste Area

- Responsibilities of the staff:
 - Record the in and out of waste.
 - Weigh the waste when it comes in and out.
 - The waste is further separated according to the needs.
 - Track the output of waste and check by department / line.

4. WASTE SEPARATION

Waste generated at production station shall be separated as much as possible

One material = one collection bucket

- A collection barrel or trailer shall be provided for each material used every day (as detailed as possible)
- Waste collection barrel should be enough.
- Without affecting the waste recycling, the waste collection bucket can be used for different wastes. Therefore, it is not necessary to provide a waste collection bucket for each material at each post. Different collecting barrels can be used to hold different wastes at different times. (keep clean)

Place waste collection bucket as close to workers as possible

- At the position where waste is generated, equipped with waste collection buckets, which is convenient for workers to collect waste immediately.

Waste collection bucket need to be easily identified / conveniently separated

- The collection bucket or the corresponding location should clearly identify the purpose.
- Consider using different color collection buckets.
- Waste collection buckets can use various forms of containers. Not limited to buckets or baskets, it can be bags.



The collection barrel is clearly marked to distinguish various types of waste



Needle carriage post provides collection barrel to collect PE film separately.



Each sewing position is equipped with a collection bag for different wastes.

4. WASTE SEPARATION

Waste generated at production station shall be separated as much as possible

BEFORE



Paper tube is everywhere.

AFTER



Waste glue bucket is used to store paper tube

BEFORE



Leftover materials are put on the ground directly

AFTER



Each punching machine shall be equipped with at least one leftover collection barrel.

4. WASTE SEPARATION

Central waste area shall have separate areas to store different types of wastes. Waste shall be kept dry, clean and cleaned in time to prevent spontaneous combustion.

- The central waste area shall be in safe distance from the production and warehouse area.
- Waste shall be stored separately by their type in the central waste area.
- Waste shall be kept dry, clean and cleaned in time to prevent spontaneous combustion
- The waste management area shall be equipped with sufficient number of fire extinguishers.

BEFORE



Wastes are mixed and stored together.

AFTER



Waste are clearly stored in different areas.

5. WASTE DATA MANAGEMENT



- Waste generated at production positions shall be separated as much as possible
- The cleaners transfer the waste to the waste area twice a day, once in the morning and one in the afternoon.

- The waste area shall keep track of the incoming / outgoing data of waste.
- When transferring waste to the waste area, fill in the waste registration form by department. Personnel in the waste area need to verify and shall not accept incorrect records.
- Waste data records need to be accurate and complete
- Waste data need be analysed
- Statistical analysis can be done by workshop, production line or group.
- The analysis process and results shall be communicated to each worker so they understand. that each worker can understand the waste management and improve it

- Waste shall be sorted and weighed separately per type, registered and recorded in the waste disposal form
- The finance department shall monitor, review and collect payments.
- After the waste is processed, the security can only be released with a form signed by the waste manager and the Ministry of Finance

2019年11月废弃物处理表

日期	名称	数量	单价	财务	废品负责人
11月8日	纸皮	096T	1500元	黄汉宁	薛庆福
	纸皮	084T	1500元	黄汉宁	薛庆福
	纸皮	099T	1500元	黄汉宁	薛庆福
11月9日	纸皮	101T	1500元	黄汉宁	薛庆福
11月11日	纸皮	102T	1500元	黄汉宁	薛庆福
11月16日	塑料布	021T	2000元	黄汉宁	薛庆福
11月18日	中底板	208T	450元	黄汉宁	薛庆福
11月23日	毛毛	152T	100元	黄汉宁	薛庆福
	垫板	270kg	20元	黄汉宁	薛庆福
	塑料罐	116斤	15元	黄汉宁	薛庆福
	破袋	361斤	08元	黄汉宁	薛庆福
11月25日	织棉	204斤	08元	黄汉宁	薛庆福
11月27日	纸皮	097T	1500元	黄汉宁	薛庆福
	纸皮	099T	1500元	黄汉宁	薛庆福

6. WORKER TRAINING AND MOTIVATION



ACCOUNTABILITY

- Clearly define roles and responsibilities and avoid grey areas



COMPETITION

- Organize a competition between departments regarding waste sorting/recycling
- Recognize extraordinary team performance



INCENTIVE

- Set KPIs and provide monetary or non-monetary reward
- Use the profit gained from recycling to support worker engagement projects



6. WORKER TRAINING AND MOTIVATION

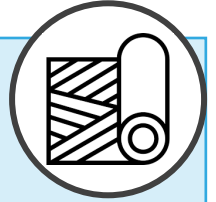
- Pre job or regular training on waste management procedures.
- A material manual can be developed to clarify which wastes can be recycled
- Recyclable waste bulletin board should be established to guide workers.
- Slogans related to waste separation and recycling can be made.
- Set reasonable and feasible waste reduction target according to the reality of the plant.
- The reduction target should be publicized to make all workers understand.



7. WASTE HANDLER MANAGEMENT

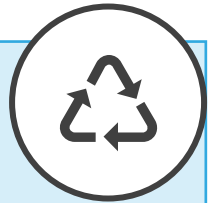
Raw material supplier:

- Ask raw material supplier to provide material certificate, which should clarify the different components of the material and its feasibility of recycling. Also understand the packaging material and if the raw material suppliers are open to recycle the leftover materials.
- For example, a manufacturer of counter in Dongguan is willing to recycle the counter scraps produced by the factory, the recycling price is 4,500 RMB per ton; if the counter scraps that are not produced by the factory are 3500-4000 RMB per ton.



Waste supplier:

- The waste handler needs to provide corresponding qualifications.
- Sign waste contracts if possible.
- The waste handler needs to explain the final flow of waste and provide relevant evidence.



7. HOW TO FIND A SUITABLE WASTE HANDLER

Traditional Method

1. Getting information from friends, counterparts, and other stakeholders.
2. Waiting for waste handlers to drop by and provide a quotation.
3. Getting information from advertisement.
4. Browsing website - www.58.com

VS

Web Search

1. Using a searching engine, such as Baidu.
2. Using forums, Baidu Tieba and other platforms as a tool.
3. Browsing professional recycling catalog websites.
4. Using an online map for searching.

7. HOW TO FIND A SUITABLE WASTE HANDLER



Use a searching engine:

- Use keywords for searching. For example, "city name + garbage recycling", "city name + waste name", "city name + environmental protection technology", "city name + recycling", "city name + renewable resources", and so on.
- Find relevant waste handlers from the search results.
- Call the suitable waste handler for further communication.



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所在地: 福建/莆田市 公司规模: 1-49人 注册资本: 200万人民币 注册年份: 2018 资料认证: 经营模式: 制造商 经营范围: 莆田市鼎冠环保科技有限公司成立于199...
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7. HOW TO FIND A SUITABLE WASTE HANDLER

Internet

Other internet resources:

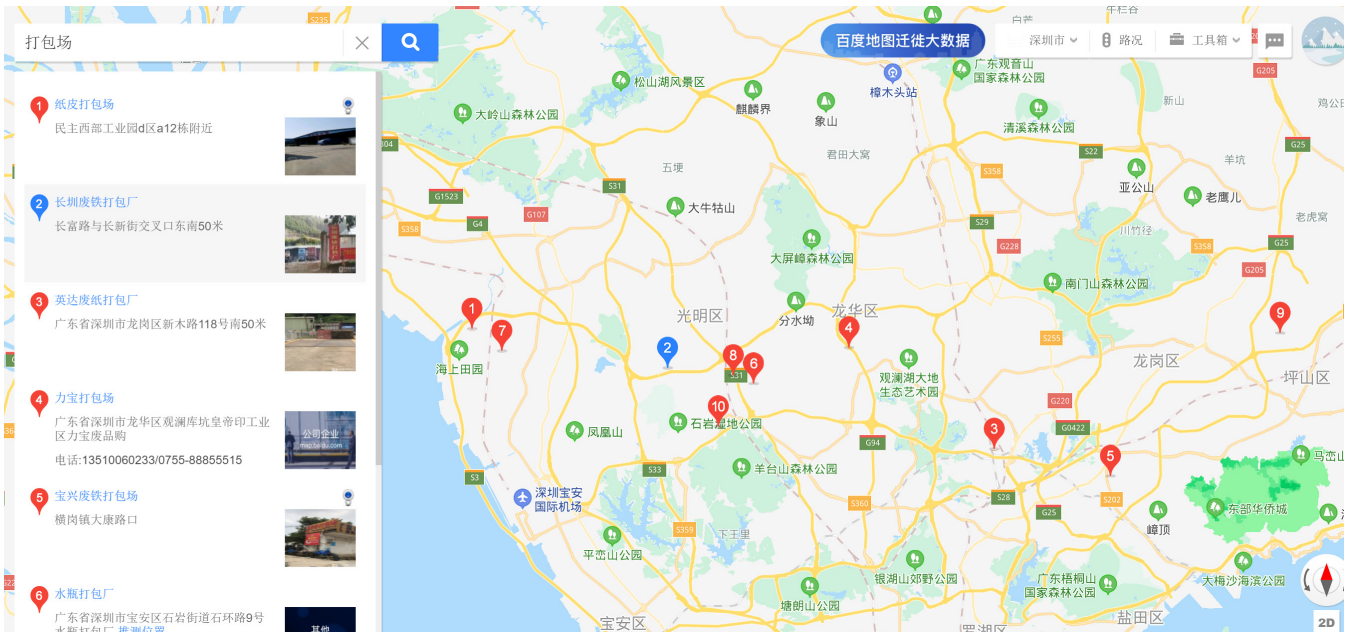
- www.zz91.com is a professional catalog for waste recycling company, where a professional waste handler maybe found.
- Search the information of waste handlers in Baidu Tieba, <https://tieba.baidu.com/index.html>.
- Call the waste handler for further communication.

7. HOW TO FIND A SUITABLE WASTE HANDLER



Use an online map for searching:

- Open the online map and enter keywords such as “garbage collecting station”, “waste packaging”, etc. to check the locations of relevant waste handlers.
- Find a suitable waste handler from the search results.
- Visit the waste handler for further communication.



7. HOW TO FIND A SUITABLE WASTE HANDLER



How to verify the qualification of waste handlers:

- Waste handlers shall provide valid business license, and/or other waste handling certificate.
- Sign a formal contract with waste handlers, requiring them to treat waste in accordance with promises or routine practices.
- If possible, visit the waste handling plant to confirm that the waste disposal process is in compliance.
- Require periodic or random inspection of waste handlers' methods and procedures for handling waste.

8. INVESTMENT IN TECHNOLOGY TO REDUCE WASTE

Invest in advanced technology, equipment and tools to reduce waste generation.



Using sealed automatic glue coating equipment to reduce hazardous waste.

Pros and cons of sealed automatic glue coating equipment:

- Gum saving rate of more than 10%;
- Saves 30% of traditional manual gluing time.



Using laser cutting equipment to reduce the number of leftovers.

Pros and cons of laser cutting equipment:

- Save material for about 1%.
- Estimated accuracy increases by 8%.
- Can efficiently cut complex patterns.
- The efficiency of cropping ordinary/normal patterns is very low.
- It requires big investment.



THANK YOU