Operation Clean Sweep® Australia

Program Manual



Making zero pellet loss your goal

Tangaroa Blue

Australian Marine Debris Initiative

NSW OCO

NSW Government

Victoria State Government

www.opcleansweep.org.au

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Information

Questions about or suggestions to improve the Operation Clean Sweep® program or materials may be submitted to info@opcleansweep.org.au.

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Photo: Operation Clean Sweep® Program Manual USA, 2015

INTRODUCTION

The Operation Clean Sweep® program and manual contain guidelines to help plastics industry operations managers reduce the accidental loss of pellets from all parts of the plastics value-chain into the environment. Globally, abatement of pellet loss has been included in the Declaration of Solutions for Marine Litter to help industry's role in addressing marine litter. We encourage companies to join other similar companies globally by signing the Declaration and by adopting the Operation Clean Sweep® program.

Each procedure contained herein may or may not be applicable to your specific operation. Manual users are free to implement the sections and steps that help achieve their company's specific goals. None of the guidelines are intended as a mandate. Compliance with state and local regulations is mandatory. These guidelines may help you to achieve compliance and avoid penalties.

There are many ways to work toward zero pellet loss at each stage in the value chain: raw material production and importing, transport and logistics, production and fabrication, and recycling. A systems approach, coordinated by all companies involved in the value-chain will produce the greatest impact.

The Operation Clean Sweep® materials are designed to provide maximum utility for all types of plastic handling and transporting operations. The online checklists have been created to facilitate customisation for your company. For example, each checklist may incorporate a unique company logo and specific process steps may be added or removed to reflect those involved in a particular operation. These enhancements will make it easy to create and copy forms that have the greatest value for your company.



Photo: OPERATION CLEAN SWEEP® Program Manual USA, 2015

PLASTIC PELLETS IN THE ENVIRONMENT

Plastic Pellet Loss — Its Impact and Its Management

In recent years and with increasing frequency, researchers have reported that seabirds, turtles and fish are ingesting a wide variety of plastic items, including pellets that could affect their ability to breathe, swallow or digest foods properly. Most of these plastics are used in consumer products (e.g. bottles, caps, containers) that have been carelessly discarded. Some of this litter is in the form of resin pellets that enter the waste stream and can end up in the ocean and our natural environment. When these pellets are accidentally eaten by wildlife, they may not pass through their digestive tracts, which could lead to malnutrition or even starvation. The impacts of ingested marine debris can be significant and warrant efforts to prevent plastic materials from entering the environment.

While consumers are responsible for the proper recycling and disposal of consumer products and packaging, the plastics industry must focus on proper containment of plastic pellets. We must prevent the pellets from getting into waterways that eventually lead to the sea.

All employees in every aspect of the industry must be educated on how to properly handle and dispose of plastic pellets with the goal of zero pellet loss.

THE OPERATION CLEAN SWEEP® PROGRAM

PLASTICS: The Plastics Industry Trade Association of the USA began an education effort in the early 1990s to reduce pellet loss by resin producers, transporters, bulk terminal operators and plastics processors. A number of public service materials under the name of OPERATION CLEAN SWEEP® were developed and disseminated to companies throughout the USA. The message was simple: resin pellets should be contained, reclaimed and/or disposed of properly. It's now time to refocus our industry on this problem and to expand the Operation Clean Sweep® initiative Internationally, including to Australia.

The ACC and PLASTICS are working together on a revitalised Operation Clean Sweep® to strengthen efforts to educate and change behaviour in the plastics industry with a goal of zero pellet loss.



The Tangaroa Blue Foundation and Chemistry Australia, with the NSW Environment Protection Authority Waste and Sustainable Materials Strategy Initiative, funded from the waste level, are Australian partners in this program. ACC, PLASTICS and their Australian partners are strongly committed to this effort and are encouraging plastics companies to participate in the Operation Clean Sweep® program, which includes the practices and tools outlined in this manual. In addition, ACC, PLASTICS and their Australian partners are encouraging companies to sign onto the Declaration for Solutions to Marine Litter, of which the Operation Clean Sweep® program is a key element. Only by working globally can industry help to affect the introduction of pellets into the environment.

HOW YOU CAN HELP

Each segment of the industry, including resin producers, transporters, bulk terminal operators and plastics processors, has a role to play in eliminating resin pellet loss. It's the little things that count - a few pellets here, a handful there. They all add up when you consider the thousands of facilities in the industry and the frequency with which resin pellets are loaded and unloaded.

Commitment by everyone in every company, from top management to the shop floor employees, is essential to eliminating pellet loss.

Pellet containment is good for the environment. It's good for business – pellet loss represents a source of revenue loss. And, in many jurisdictions, there are separate legal or permit requirements addressing pellet loss.

With your help and cooperation, we can make great strides to help our industry protect the environment. All Operation Clean Sweep® partners look forward to working with you on this project to accomplish this important goal.

VALUE

If you could take a simple step to help strengthen your company's:

- sustainability initiatives;
- contribution to preserving water quality and wildlife;
- compliance with federal and state regulations and avoidance of fines;
- safety/housekeeping program;
- employees' well-being;
- operational efficiency;
- financial bottom line; and
- reputation in the community…

… **would you take it?**

The campaign's goal is: to help every plastic resin handling operation implement good housekeeping and pellet containment practices to work towards achieving zero pellet loss. Operation Clean Sweep® is being conducted in thousands of plants around the world, all adding to the effort to protect the environment.

That step is Operation Clean Sweep®, a product stewardship program of the APC, PLASTICS and their Australian partners.

Pellet loss has many negative impacts on individual companies, on the plastic industry as a whole and on the environment.

- Slips and falls are a major cause of plastic industry accidents.
- Accidents mean lost time, higher worker compensation costs and lower employee morale.
- Violations of storm water regulations in states like Victoria can result in penalties of up to $700,000 if taken to court.
- Spilled pellets can eventually end up in our waterways and the ocean. Whether they're handled in an inland plant or a seaside facility, pellets can be transported to storm drains that lead to rivers and then to the ocean — resulting in litter and posing a threat to marine life such as sea birds, turtles, and fish.

When the industry handles pellets as responsibly as possible:

- Pellets are kept out of the natural environment including waterways and oceans.
- Companies enhance their reputations as good stewards of the environment - an increasingly important factor for attracting the investment community and high-quality employees; and
- More material stays a valuable product rather than becoming waste, improving efficiency.

Operation Clean Sweep®'s ultimate goal is to help keep plastic pellets out of the environment, but these efforts can also help improve relations with stakeholder groups and community organisations that expect the industry to minimise its environmental footprint.

The industry needs every processor's help to get results.

Zero
Pellet Loss

Our Goal



- Contain Spills
- Clean Up Swiftly and Effectively
- Recycle or Dispose of Properly

Operation Clean Sweep®

Do Your Part to Protect the Environment

IMPLEMENTATION

1. Commit to making zero pellet loss a priority.
   - Sign the Pledge to Prevent Resin Pellet Loss.
2. Assess your company's situation and needs.
   - Comply with all environmental laws and regulations that address pellet containment.
   - Conduct a site audit.
   - Determine if you have appropriate facilities and equipment.
   - Determine if employees have and are following appropriate procedures.
   - Identify problem areas and develop new procedures to address them.
   - Communicate your experiences to peers in the industry.
3. Identify value-chain partners from raw materials, transport and logistics, production and fabrication and recycling to plan a coordinated approach with.
4. Make needed upgrades in facilities and equipment as appropriate.
   - Consider building this program into other procedures such as ISO 9000 Quality and ISO 14000 Environmental Management systems.
5. Raise employee awareness and create accountability.
   - Establish written procedures (the procedures and checklists in this manual may be modified to suit your needs, they are available in the checklists section or at www.opcleansweep.org.au).
   - Make certain the procedures are readily available to employees.
   - Conduct regular employee training and awareness campaigns on Operation Clean Sweep®.
   - Assign employees the responsibility to monitor and manage pellet containment.
   - Encourage each worker to sign the employee commitment pledge.
   - Solicit employee feedback on your program.
   - Use workplace reminders such as stickers, posters, etc.
6. Follow up and enforce procedures — when management cares employees will care too.
   - Conduct routine inspections of the facility grounds — production areas and parking lots, drainage areas, driveways etc.
   - Continuously look for ways to improve the program. Share best practices through the Operation Clean Sweep® website www.opcleansweep.org.au.



Photo: Operation Clean Sweep® Program Manual USA, 2015

CONDUCTING A SITE AUDIT

One of the most effective ways to improve your facility's containment of pellets is to identify the areas where spills and losses occur most frequently and fix them.

1. Use the site audit checklist to audit every transfer point at your site.
2. Identify the major spill areas.
3. Determine the cause of spills in each area.
4. Research/brainstorm ways to solve each problem.
5. Implement the simplest effective solution.
6. Follow up to measure success.
7. Repeat as necessary.

Most companies may not perform all of the operations on the site audit checklist. Customise the checklist to suit your facility. Add any missing operations.

Worksite setup

Ensure your worksite is properly set up to prevent loss and assist clean-up.

EPA Regulations

The Environment Protection Act 1970 classifies plastic resin pellets as industrial waste. They are covered under section 27A.

Facilities – Take the following steps wherever possible and practical:

- To pave or not to pave — that is the question:
  - A paved area facilitates clean-up but allows pellets to be carried into storm drains and the environment by wind and water.
  - Unpaved areas are more difficult to clean, but pellets tend to stay where they fall and can be recovered.

Choose the solution that is best for your facility.

- Pave loading/unloading areas where unavoidable spills occur to facilitate clean-up:
  - Include a slope or a berm to contain pellets on paved areas.
  - Equip areas with vacuums, brooms or dustpans.
  - Cordless vacuums may be best suited for outdoor clean-up.
- For clean-up in gravel yards, consider fitting vacuums with a screen or mesh on intake hoses to collect pellets without disturbing gravel.
- Provide catch trays for use at all car/truck unloading valves.
- Use bulk-handling equipment that is designed to minimise pellet leakage.
- Install central vacuum systems where practical.
- Install connecting hoses equipped with valves that will close automatically when the connection is broken.
- Properly empty and seal bulk containers (rail or truck) prior to shipment. Loss of residual pellets from unsealed “empty” bulk cars and trucks is a significant problem.
- Place pellet disposal cans at rail yards for loading and unloading.
- Assure proper handling when storing and removing waste pellets. All vendors should follow “no loss to the environment” procedures.
- Seal expansion joints in concrete floors with flexible material to avoid pellet accumulation in hard to clean spaces.
- Conduct routine inspections and maintenance of equipment used to capture and contain pellets.

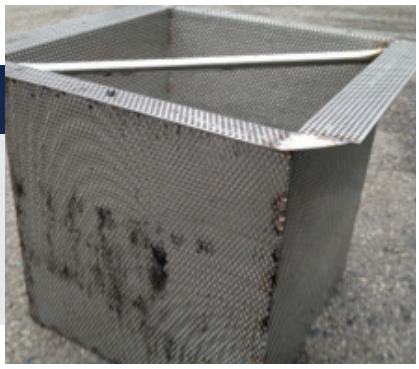
CONTAINMENT SYSTEMS

- Storm drain screens are the last line of defence against accidental pellet release. They should be every facility's number one priority for installation.
- Install zero loss containment systems (such as storm drain screens) wherever necessary to prevent pellets from escaping plant boundaries. There are two possible containment systems that could be installed:
  - Area-specific containment systems in each pellet handling area. Area-specific containment systems would be the primary pellet containment systems, and the facility-wide system would serve as a backup.
  - Facility-wide containment systems, which are effective in controlling pellet releases from facilities covering a large area and handling large volumes of pellets.

Prepare for Flooding & Rain

Make sure the containment system can handle heavy rains and flooding.

The system should be capable for handling 100-year flood conditions.



- Place screening in all storm drains. The mesh of the screening should be smaller than the smallest pellet handled at the facility. Clean the storm drain screens weekly to prevent drain clogging and overflow. Pay particular attention to cleaning screens after every rain. Two-stage screens minimise clogging problems.
- Install baffles, skirts and booms in containment ditches or ponds. Use surface skimmers or vacuum systems to remove accumulated pellets.
- To prevent storm drain contamination, employ dry clean-up methods whenever possible. Dry clean-up procedures also prevent pellets from being further contaminated by compounds in the storm water.

Anticipate Rain

Design systems to handle 100-year flood conditions.

Use a collector grate and filtered storm drain system with a screen consistent with the range of pellet size handled.



EMPLOYEE EQUIPMENT

Ensure that employees have ready access to:

- Brooms, dustpans, rakes, etc.
- Heavy-duty shop vacuums for inside use.
- Portable shop vacuums for outside use.
- Catch trays or tarps.
- Wide-mouth sample collection jars or poly-bags.
- Tape for repairing bag or box damage.
- Scrap pellet containers (drums, bulk boxes, etc.).
- Procedures you expect workers to undertake and checklists to assist in follow-through. (Checklists are available to customise via the website).
- Forklift clean-up kit (see page 20).
- Assure that employees have ready access to the proper clean-up equipment at all locations where spills might occur.

Slips and Falls

Slips and falls are the number one cause of plastic industry accidents.

A Clean Work Area

A clean work area reduces slips and falls and improves employee morale.



(Photos: O'Reilly, 2010. http://www.inboundlogistics.com/cms/article/on-the-road-morris-illinois-plastics-pellets-and-pallets/)



Photo: Operation Clean Sweep® Program Manual USA, 2015

DESIGNING A TRAINING PROGRAM

Designing a training program involves a sequence of steps that can be grouped into five phases: conducting a needs assessment, defining training objectives, detailing program specifics, implementing the training and evaluating its effectiveness.

1. Needs assessment – conduct a site audit (page 8) and determine if employees have and are following appropriate procedures. Make needed site improvements and write/modify procedures prior to launching a training program.
2. Identify value-chain partners from raw materials, transport and logistics, production and fabrication and recycling to plan a coordinated approach with.
3. Instructional objectives – identify what training is needed to ensure procedures are being followed.
4. Details – determine how, who, where and when you will train. Consider the following areas: explaining the environmental impact of pellet loss, defining the role each individual plays in affecting change and ensuring knowledge of appropriate procedures.
    - Use Operation Clean Sweep® to design and develop training program and program content.
    - Select the techniques used to facilitate learning (team meetings, hand-outs, video, website, etc.).
    - Select the appropriate setting for your meetings.
    - Prepare materials.
    - Identify and train the instructors.
    - Create department goals.
5. Implementation – schedule classes, facilities, participants and instructors, deliver materials, conduct training.
6. Evaluation – determine participation reaction to the training, how much they learned and to what degree the department goals were met. Re-evaluate all procedures to assess the effectiveness of the Operation Clean Sweep® program annually.

EMPLOYEE PARTICIPATION AND ACCOUNTABILITY

Ensure employees are aware of and accountable for pellet loss prevention, containment, clean-up and disposal.

Establish written procedures. The procedures and checklists in this manual may be modified to suit your needs. They are available online at www.opcleansweep.org.au

Make certain the procedures are easily available.

Conduct regular employee training and awareness campaigns on the Operation Clean Sweep® program.

Spills Will Happen

Ensure that employees:

- *Take ownership by taking the pledge.*
- *Immediately clean-up a spill.*
- *Recycle or dispose of loose pellets properly.*

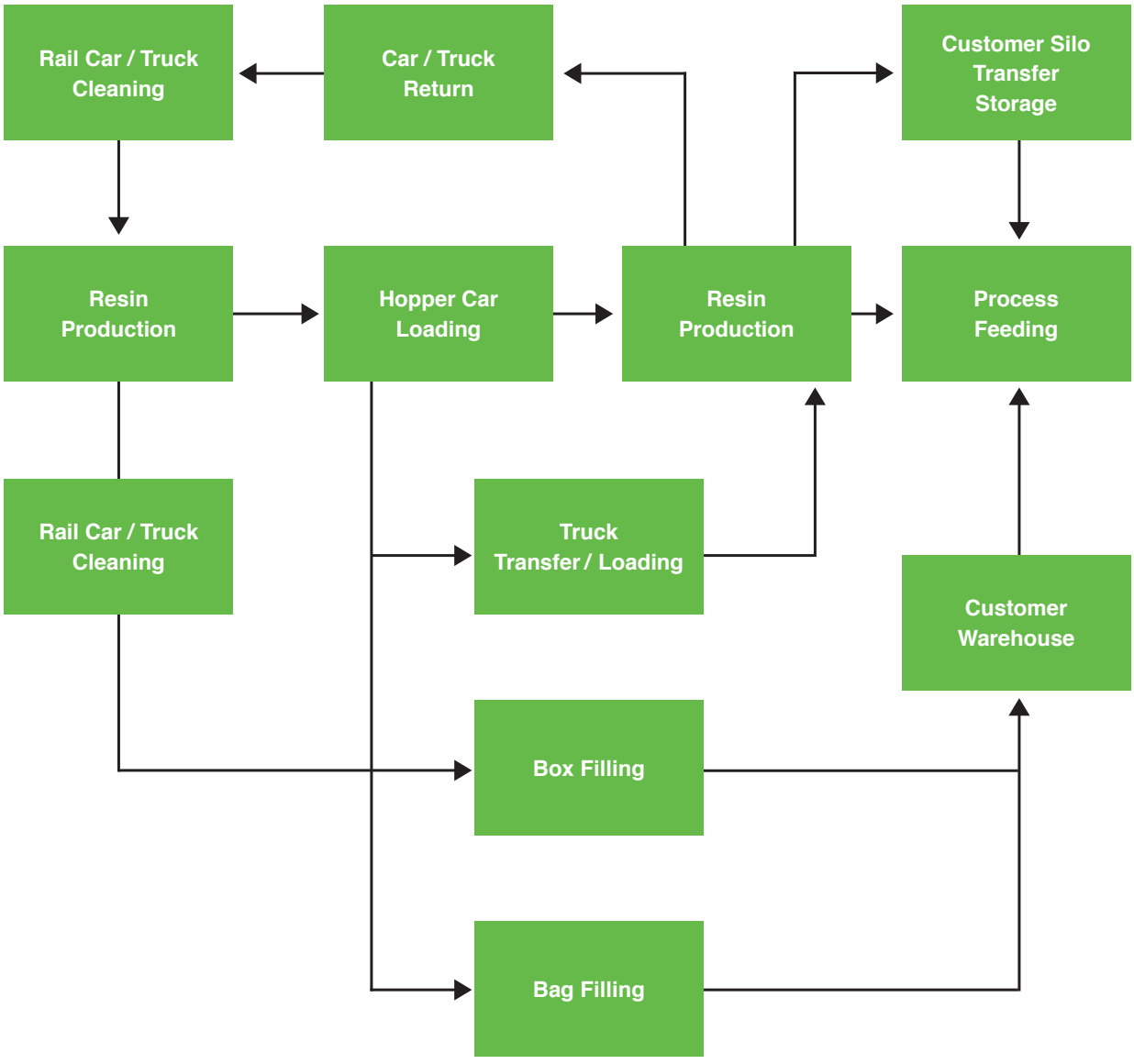


(Photo: Transfio, 2015. http://www.transflo.net/index.cfm/products/plastics/)

- Explain the impact of pellet loss on the environment and the company.
- Make spill prevention, clean-up and containment a company philosophy and priority.
- Promote that philosophy daily.
- Assign specific employees the responsibility to monitor and manage pellet containment.
- If it gets assigned as a regular part of employee jobs, it gets done.
- Consider hiring a full-time housekeeping/warehouse sweeper, if appropriate. Having one person assigned this job improves the efficiency of other workers.
- Stress the importance of immediate clean-up of any spills by the person associated with the spill.
- Review current procedures and identify whether there has been a history of problems in a certain area.
- Reaffirm existing, or develop new procedures.
- Use workplace reminders such as stickers, posters, etc.
- Encourage teamwork and employee feedback.
- Conduct regular inspections of the entire facility to assure compliance with Operation Clean Sweep® principles.
- Reward and/or recognise milestones and significant achievements of the team or teams that achieve designated goals of the pellet loss prevention program.

PREVENTION, CONTAINMENT AND CLEAN-UP PROCEDURES

There are many steps involved in the movement of plastic pellets from the resin production facility, through the distribution network, to the processor. Spills and pellet loss to the environment can occur at any step. The procedures in this section provide best practices for each handling step. Making employees aware of and holding them accountable for these prevention, containment, clean-up and disposal procedures, is the way to zero pellet loss.



Acknowledge Hard Work

Simple steps, like bringing in a special lunch, to acknowledge employees' hard work to prevent loss can go a long way in keeping your company's commitment front and centre.

(Diagram: Operation Clean Sweep® Program Manual, 2015)

PROCEDURES: PELLET TRANSPORT AND PACKAGING

Shipping container, hopper car and hopper truck cleaning, loading, storage and unloading present special resin handling challenges.

Cleaning Empty Containers, Hopper Cars and Trucks:

- Use an air lance to make total pellet removal easier.
- Ensure hopper car and truck cleaning areas have wastewater collection and pellet filtration systems installed.
- Recover all pellets from wash water.
- Recycle, resell or dispose of collected pellets properly.

Top Loading Hopper Car and Trucks:

- Operate the conveying system properly to avoid clogging and necessitating the opening of lines.
- If a line must be opened to clear blockage, anticipate the potential for pellet loss and always place a catch pan or tarp under the connection.
- Remove any spilled pellets from the top of the car/truck before leaving the containment area - residual pellets will fall to the ground as cars/trucks are moved outside the plant.

Sealing Loading Cars/Trucks:

- Close all outlet caps properly before cars/trucks are moved (and request customers to do the same when returning empties).
- Apply seals on all outlet caps (1/8” stranded steel cable or its equivalent).
- Design or modify loading systems so that transfer lines can be completely emptied, with any residual resin being discharged into a container after loading is completed.

Storing at Intermediate Sites:

- Consider exposure to vandalism when selecting sites.
- Establish security procedures as necessary (e.g. fencing and lighting).
- Advise companies to report any incidents (e.g. shippers, railroads, trucking companies and processors).

UNLOADING HOPPER CARS AND TRUCKS

Valve Opening

- Contain any possible spills during hook-up by placing a catch pan under the unloading valve before opening.
- Purge unloading tubes within containment area.
- Keep area swept up or vacuumed.
- Consider installing connecting hoses equipped with valves that will close automatically when the connection is broken. Clogged hoses, material bridging in outlets, etc., can require uploading lines to be opened, which presents the risk of spillage.
- Anticipate the potential for pellet loss before opening the line.
- Place pellet disposal cans at rail yards for loading and unloading.
- Have a catch pan or tarp ready to catch pellets.
- Immediately clean-up and properly dispose of any spilled pellets.
- Surges in unloading lines can cause pellets to be vented into the environment. To prevent this, install a bag house, filter bag assembly or other control device at the unloading system vent.

Be Vigilant

Pellet loss can occur at any stage of operations.

Be vigilant to ensure that pellets do not escape into the environment.

Completing Unloading

- Ensure that the car/truck/container is thoroughly unloaded.
- Cycle the outlet valve while air is flowing.
- Visually confirm that each compartment is empty.
- Purge the line before disconnecting.

Sealing Valves

- Close all valves.
- Secure outlet caps and top hatches.

The "Usual Suspects"

Open valves, outlet caps and top hatches are frequent causes of material spills.

Make sure to close off all pellet "escape routes" once the car is unloaded.

Sampling

- Conduct sampling only in areas protected by containment equipment.
- Review procedures for taking samples to eliminate any possible spillage.
- Use wide-mouth containers or poly-bags for samples.
- Use a funnel collection system to effectively channel pellets into containers.
- Sampling from unloading tubes:
  - Place a catch pan or heavy duty tarp under outlet before opening to catch any spills. (Several commercial devices have been developed specifically for preventing spills during sampling).
- Sampling from top hatches:
  - Exercise extra caution to avoid spillage, which can also pose a slipping hazard.
  - Close hatches and apply cable seals to prevent access by vandals.



PROCEDURES: SPILLS AND PACKAGING

Spills

- Exercise caution to avoid spillage.
- Clean-up any spills immediately.

Packaging

Using the proper packaging, filling and material-handling procedures can go a long way in minimising pellet loss.

Selecting Packaging Materials

- Use packaging designed to minimise the possibility of breakage and pellet leakage. Use puncture-resistant shipping containers where possible.
- Use reinforced bags, such as woven polypropylene bags, and line larger containers with puncture-resistant material.
- Minimise the use of valved bags, or seal valved bags immediately after filling.

Collecting Spilled Pellets

Collecting spilled pellets reduces contamination, permitting normal usage rather than requiring disposal.

Bags: Filling and Handling

- Inspect all pallets for protruding nails or broken boards.
- Use bags that are not easily punctured.
- Use a heavier weight container/bag if breakage is a recurring problem.
- Move and stack bags immediately after filling to avoid seepage.
- Tape leaks or replace leaking bags.
- Regularly clean-up pellets spilled during the filling process. Where possible, select filling equipment designed to prevent pellet loss.
- Implement warehouse and handling procedures that minimise the chance of pellet spillage.
- Dispose of collected pellets properly.

Caution

Shipping bags often use a mechanical closure that does not provide a positive seal against leakage once the bag is filled.

Bags: Emptying and Disposal

- Thoroughly empty bags.
- Collect, handle, store and transport the empty bags to avoid/contain the escape of pellets.
- Recycle plastic resin bags, shrink-wrap and stretch-wrap, whenever possible.
- Dispose of packaging in a well-managed landfill when recycling is not available.
- Stress the need for “no loss to the environment” procedures.

Caution

Some loss also occurs during the filling process.

Bulk Boxes

- Use bulk boxes that are not easily punctured.
- Tape leaks or replace leaking boxes.
- Regularly clean-up pellets spilled during the filling process.
- Dispose of collected pellets properly.

Select Proper Bags and Pallets

Bags typically are stacked 40 – 50 per pallet, and pallets are usually sorted at least two high. Both individual and palletised bags are subject to the rigours of warehouse movement and storage. Proper bag and pallet selection can help to reduce damage.

Improve Palletising Methods

- Move and stack bags immediately after filling to avoid seepage from valves.
- Stack bags on pallet in tight, interlocking patterns.
- Shrink or stretch-wrap pallet to stabilise stacks and help contain lost pellets.
- Use corrugated cardboard caps on the top and bottom of pallets to minimise puncturing or tearing bags and to contain loose pellets.
- Block and brace outbound loads to avoid broken bags in transit.

Handling Materials

Forklift Clean-up Kit

- *Broom*
- *Long handled dustpan*
- *Repair tape*
- *Bucket for collection/ disposal*

Select these items to fit together in the bucket on the forklift using elastic cords.

Situate the kit so as not to interfere with the safe operation of the forklift.

- Forklift operators must be trained and skilled in damage prevention as well as proper clean-up.
- Institute handling procedures that minimise puncture of bags and boxes with forklift tines.
- Repair or replace punctured packages and clean-up any spills immediately to prevent loss of pellets. Sealing a leak when it occurs is much easier than sweeping 100 metres of warehouse.
- Consider outfitting all forklifts with a clean-up kit.
- Place catch trays between the dock and trailer at shipping and receiving bays.
- Inspect pellet packaging before off loading, particularly pellets bagged in unreinforced paper or corrugated bulk boxes. This will prevent pellet release through the gap between the vehicle and the loading dock.

Storage

Consider covering all packaging resin stored outside (RIBCs FIBSs, supersacks, etc.) to prevent photo-degradation of the containers.



(Photo: H. Taylor, 2013)

Improper handling can cause bags to be torn leaching pellets all over a work area.

PROCEDURES: OTHER TRANSPORT VEHICLE CONCERNS

Container Trucks

- Shipping:
  - Sweep or vacuum any loose pellets in the truck/container.
  - Carefully inspect empty trailers for damaged interior walls or defective floors that can tear bags. Consider refusing to use such containers or cover problem areas with corrugated linerboard.
  - Block and brace outbound loads to avoid broken bags in transit.
- Receiving:
  - Inspect truck and rail shipments containing palletised bags of pellets and document the condition of bags and pallets received. If the shipment is significantly damaged, notify the transporter and manufacturer. Consider refusing to accept delivery.

Hopper Cars and Trucks — Repairs

- Work in a paved area to facilitate containment and clean-up.
- Properly contain, handle or recycle small quantities of residual pellets. If larger quantities are involved, contact the shipper.

Transport Accidents

- Contact the shipper for assistance/advice if a derailment or highway accident results in a spill of resin pellets.

PROCEDURES: MARINE TRANSPORT

Marine transport of pellets requires special attention due to the high potential for release into the environment. Because of the close proximity to water, loose pellets in and around water-front warehouses, docks, ocean-going containers and on ships themselves must receive extra attention.

Anyone handling pellets directly or managing their shipment must be well-informed about the importance of spill prevention, the need for prompt clean-up and proper disposal practices.

- Do NOT sweep pellets into the water.
- Properly contain and handle any pellets from previous shipments when cleaning ship holds or ocean containers.
- Keep ocean containers in good repair — eliminate protrusions that could tear bags and boxes.
- Avoid stowing resin containers on deck. Place resin containers in ship holds.
- Do NOT jettison containers of resin.

PROCEDURES: WASTE RECYCLING AND DISPOSAL

Final Step

Careful disposal is the final step to ensuring that pellets do not affect the environment.

Preferred Disposal Methods

1. *Avoidance*
2. *Reuse*
3. *Recycling*
4. *Recovery of energy (generating heat energy from prescribed industrial waste)*
5. *Treatment*
6. *Containment*
7. *Disposal*

Include pellet retention capabilities and practices in criteria for selecting waste disposal companies.

Ensure pellets are properly disposed of to avoid contaminating the environment.

- Store waste pellets in properly labelled containers.
  - Do not permit loose pellets to accumulate on the ground or floors.
  - Install a minimum of one pellet-specific waste container in each pellet-handling area.
  - Routinely check that there is adequate waste storage capacity.
- Use separate containers for recyclable and non-recyclable pellets.
- Use only covered containers or vehicles without leaks.
- Inspect and confirm proper handling and storage procedures if an outside vendor is used for waste removal.
  - Stress the need for “no loss to the environment” procedures.



(Photo: H. Taylor, 2013)

PROCEDURES: DUST AND POWDER

Methods to Help Minimise Generation and Release of Plastic Dust and Powder

This specifically focuses on methods to help minimise generation and release of plastic dust and powder. There are several approaches that can be taken. You may wish to consider whether other ways are more appropriate for your operations. Consult with the manufacturer of the resin you are handling for specific handling, containment and disposal information.

For the purpose of this discussion:

Plastic Dust is particulate matter that may be formed when plastics are handled, conveyed and/or processed. One of the most common means of generation is via abrasion during the air conveying of plastic pellets. In addition to conveying, plastic dust may be generated when plastic raw materials or finished products are:

- Granulated;
- Pelletised;
- Cut;
- Machined;
- Filed; or
- Transported.

Plastic Powder is a form of plastic raw material used in operations where a fine particle size is critical for processing. Plastic powder can escape plastic handling or processing equipment. If that occurs; handling, containment and recovery considerations are similar to plastic dust. Typically powders may escape through:

- Leaks in storage silos, tanks and containers;
- Leaks in pneumatic or mechanical conveyor;
- Leaks in blenders or other processing equipment; or
- During loading/unloading operations or transfer operations.

Methods to Consider for Minimising the Generation of Plastic Dust

The best way to control dust is to minimise its creation in the first place. There are several approaches that can be taken to help minimise the generation of plastic dust. For example:

- When pelletising, keep cutting equipment in good condition with sharp blades.
- Design conveying systems to treat the plastic gently and take other steps to help avoid collisions and impacts with hard surfaces and other pellets, thereby avoiding plastic fracture. Methods to consider can include use of long sweep elbows and avoid having the plastic pass through a blower.
- Use appropriately sized granulators.
- When machining plastics, use an appropriate machine set up for the material and provide appropriate waste collection equipment.
- Store plastics and additives in appropriate containers maintained in good condition.
- Promote awareness to employees of methods of handling and processing of the plastic to help minimise dust creation.

Methods to Consider for Minimising the Release of Plastic Dust and Powder

There are several approaches that can be taken to help minimise the release of plastic dust and powder. For example:

- Keep storage silos, tanks and containers in good condition, to help avoid holes, cracks or leaks.
- Maintain loading/unloading and transfer equipment with good seals to help avoid leaks.
- Conveying equipment should be appropriate for the task and maintained in good condition.
- Place collection trays under discharge/loading valves and connection points when making or breaking connections.
- Use processing equipment (and the equipment that feeds it) that helps minimise the release of dust/powder.
- Clean-up all spills promptly; wind and traffic can quickly disperse dusts and powders.
- Encourage employees and/or contractors to look for dust/powder leaks and to correct any that occur.
- Promote employee awareness of training and reminders regarding the need to prevent dust/powder from escaping into the environment.

Methods to Consider for the Capture and Containment of Plastic Dust

Plastic dust creation can be minimised but not eliminated entirely. There are several approaches that can be taken to help in the capture and containment of plastic dust.

For example:

- Use properly designed and sized dust collection equipment in all operations that generate or liberate plastic dust.
- Maintain the dust collection equipment according to manufacturers' recommendations.
- Use the recommended filters for the type and amount of dust generated.
- Clean or replace filters or other collection equipment as needed.
- Promote awareness of procedures for clean-up of plastic dust spills, or plastic dust that has settled on surfaces in and around the plant.
- Promote maintenance/housekeeping procedures that minimise dust accumulation around the facility.
- Store captured plastic dust in containers that are designed to help minimise leaks.
- Promote employee awareness in procedures for handling plastic dust, including industrial hygiene considerations.
- Comply with applicable federal, state and local regulations for containment systems.

Dust from plastics may combine with dust from other materials within the plant site. Review MSDS for information on the proper capture, containment and disposal equipment and procedures.

Any dust, no matter what the material, can be explosive if in the proper concentration in air. When handling dusts take precautions not to aerate it and to keep ignition sources away.

Disposal

Proper disposal of plastic dust and powder can be critical to help minimise the amount released to the environment. Choosing a disposal method involves considering the materials that constitute the dust /powder and the disposal requirements of those materials.

- Review the MSDS for each type of plastic used in the process.
- Dispose of dust or powder using a method that complies with all federal, state and local regulations and guidelines and/or applicable codes and standards.



Disclaimer:

Methods to Help Minimise the Generation and Release of Plastic Dust and Powder is a part of The Operation Clean Sweep® program, a joint program of the ACC and PLASTICS (collectively, "Operation Clean Sweep® Sponsors").

The Operation Clean Sweep® program and manual contains guidelines to help plastics industry operations managers reduce the loss of pellets to the environment. Each procedure contained herein may or may not be applicable to your specific operation. Manual users are free to implement the sections and steps that help achieve your company's specific goals. None of the guidelines are intended as a mandate. Compliance with state and local regulations is mandatory.

These guidelines may help you to achieve compliance and avoid penalties. Operation Clean Sweep® Sponsors do not make any warranty or representation either express or implied, with respect to the accuracy or completeness of the information contained in this document nor do Operation Clean Sweep® Sponsors assume any liability of any kind resulting from the use or reliance upon anything contained in this document. Compliance with applicable laws and regulations remains the full responsibility of the parties to which the law or regulation applies.

PLEDGE TO PREVENT RESIN PELLET LOSS

Take the Pledge for Your Company

To demonstrate your commitment to a clean environment, please complete the Pledge to Prevent Resin Pellet Loss and email it to info@opcleansweep.org.au or post it to:

Operation Clean Sweep® Australia, PO Box 757, Port Douglas, 4877 QLD.

The pledge must be signed by an officer of the company. In return, your company will receive a certificate suitable for display affirming your commitment to being an Operation Clean Sweep® Partner.

Signing this pledge will qualify your company's name to be added (unless otherwise specified) to the list of Operation Clean Sweep® Program Partners on the Operation Clean Sweep® website www.opcleansweep.org.au Listed partner company names may be used in publicity for the program.

Have Your Employees Take the Pledge

- Individual personal commitment of every employee is the key to success.
- Encourage every employee to be fully engaged and committed to the following Operation Clean Sweep® principles every day.
- Having each employee sign a personal pledge is an effective way to gain their commitment.

Checklists

We have provided a number of checklists to assist you in implementing Operation Clean Sweep®. The checklists are divided into two categories: Management and Employee. The checklists have been created so they are customisable for your company. For example, you can insert your company logo and specific process steps may be added or removed to reflect those involved in a particular operation. These enhancements will make it easy to create and copy forms that have the greatest value for your company. To customise the checklists visit www.opcleansweep.org.au.

Management Checklists

- ❑ Site Audit
- ❑ Implementation & Training
- ❑ Facility Equipment
- ❑ Employee Equipment

Employee Checklists

- ❑ Processor Operations
- ❑ Warehouse
- ❑ Car, Truck and Container Cleaning/Loading
- ❑ Railroad
- ❑ Transloader

Operation Clean Sweep®

Company Pledge to Prevent Plastic Resin Pellet Loss

Our company recognises the importance of preventing the loss of resin pellets into the environment and we are committed to implementing the Operation Clean Sweep® program.

We will be an Operation Clean Sweep® Program Partner, strive towards zero pellet loss and make changes wherever possible and practical to:



- ✓ Improve our worksite set-up to prevent and address spills;
- ✓ Create and publish internal procedures to achieve zero pellet loss goals;
- ✓ Provide employee training and accountability for spill prevention, containment, clean-up and disposal;
- ✓ Audit our performance regularly; and
- ✓ Comply with all applicable local, state and national regulations governing pellet containment.

Please tick where appropriate:

☐ Please do not include my company on the website listing of Operation Clean Sweep® partners.

Company name: _____

Address: _____

City: _____ State: _____

Company Officer Name and Title: _____

Email Address: _____ Phone: _____

Signature: _____ Date: _____

Operation Clean Sweep® TANGAROA BLUE AUSTRALIAN MARINE DEBRIS INITIATIVE nsw SOO NSW GOVERNMENT VICTORIA State Government

Pledge To Prevent Resin Pellet Loss

Operation Clean Sweep®
www.opcleansweep.org.au

Employee Pledge to Prevent Resin Pellet Loss

I recognise our company's commitment to Operational Clean Sweep® and the goal of preventing pellet loss into the environment. I will do my daily job in a manner that strives to:

- Prevent Pellet Loss;
- Contain Spills;
- Clean-up Swiftly and Effectively; and
- Dispose of Pellets Appropriately

Company Name: _____

Department/Crew: _____

Employee Name: _____

Signature: _____ Date: _____

Site Audit Management Checklist

Operation Clean Sweep®
www.opcleansweep.org.au

Company: _____

Department: _____

Bulk Hopper Car/Truck/ Container Unloading Area

Spill Problem: ☐ Yes ☐ No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Receiving Dock - Bags And Boxes

Spill Problem: ☐ Yes ☐ No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Silo Area

Spill Problem: ☐ Yes ☐ No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Transfer Equipment - Blower

Spill Problem: ☐ Yes ☐ No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Audited By: _____

Audit Date: _____

Transfer Equipment - Bag House

Spill Problem: ☐ Yes ☐ No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Transfer Equipment - Line Connectors

Spill Problem: ☐ Yes ☐ No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Box/Bag Handling

Spill Problem: ☐ Yes ☐ No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Blending Equipment

Spill Problem: ☐ Yes ☐ No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Processing Line - Extrusion Feed Hoppers

Spill Problem: ☐ Yes ☐ No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Audited By: _____

Audit Date: _____

Sampling Areas

Spill Problem: ☐Yes ☐No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Packaging Areas - Bulk Box

Spill Problem: ☐Yes ☐No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Packaging Areas - Bag

Spill Problem: ☐Yes ☐No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Warehouse/Storage

Spill Problem: ☐Yes ☐No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Shipping Dock

Spill Problem: ☐Yes ☐No

Cause of Spill: _____

Solution: _____

Implementation Date: _____

Audited By: _____

Audit Date: _____

Manager: _____

Signature: _____

Implementation & Training Checklist

Operation Clean Sweep®
www.opcleansweep.org.au

Company: _____

Department: _____

Procedures

- Signed the “Pledge”
- Conduct site audit
- Review or create written procedures
- Assign responsibility for each crew/individual
- Put management inspection program in place
- Plan follow up and review

Training

Crew training meetings conducted

Shift #1 _____

Shift #2 _____

Shift #3 _____

Shift #4 _____

Manager: _____

Signature/Date: _____

Facility Equipment Checklist

Operation Clean Sweep®
www.opcleansweep.org.au

Company: _____

Department: _____

Storm Drain Screens

Number of drains: _____

Number of drains with screens: _____

Target date to complete screen installation: _____

Drain screen inspection/cleaning frequency: _____

Screen repairs required: _____

Unloading Areas

Paved

Unpaved

- Tarps/catch pans available in area
- Disposal receptacles in area

Transfer Systems

Bag house/filters OK

Pipe, hoses and connections leak free

Disconnects with auto closing valves

Sweepings Disposal

Contractor agrees to zero loss disposal procedures

Proper interim storage containers available

Inspected By: _____

Inspection Date: _____

Employee Equipment Checklist

Operation Clean Sweep®
www.opcleansweep.org.au

Company: _____

Department: _____

Available For Use

- Brooms
- Dust pans
- Repair tape
- Vacuum system
  - Central
  - Portable
  - Catch pans
- Sample containers
- Scrap pellet container
- Elastic cord
- Buckets for forklift clean-up

Inspected By: _____

Inspection Date: _____

Processor Operations Checklist

Operation Clean Sweep®
www.opcleansweep.org.au

Company: _____

Department: _____

Operation: _____

Crew/Shift: _____

Inspector: _____

Date: _____

	Condition at START of Shift			Condition at END of Shift		
	Excellent	Good	Poor	Excellent	Good	Poor
Silos	○	○	○	○	○	○
Transfer Lines	○	○	○	○	○	○
Bag/Box Feeding	○	○	○	○	○	○
Dryer	○	○	○	○	○	○
Extruder Hoppers	○	○	○	○	○	○
Problem Areas						
Spill Recovered	Yes ○ No ○ If not, why:					
Sweeping Properly **Disposed of**	Yes ○ No ○ If not, why:					
Samples Taken	Number:					

Inspected By: _____

Inspection Date: _____

Warehouse Checklist

Operation Clean Sweep®
www.opcleansweep.org.au

Company: _____

Department: _____

Operation: _____

Crew/Shift: _____

Inspector: _____

Date: _____

Receiving Area

- Loading dock catch pans in place for receipt of container shipments
- Rail truck unloading valve catch pans in place before openings
- Samples collected in approved containers
- Container trucks cleaned after unloading
- Hopper car/truck/ container valve covers in place before moving
  - Full walk around conducted
  - Transfer lines flushed and clean
- Dock area swept clean
- Car/Truck/Container unloading area clean
- Raw Material Storage area clean
- Aisles in clean condition
- No leaking boxes
- No leaking bags
- Waste collection containers emptied
- Boxes cleaned and flattened
- Bags fully emptied prior to disposal
- Broken pallets repaired or replaced

Inspected By: _____

Inspection Date: _____

Car, Truck and Container Cleaning / Loading Checklist

Operation Clean Sweep®
www.opcleansweep.org.au

Company: _____

Department: _____

Operation: _____

Crew/Shift: _____

Inspector: _____

Date: _____

Receiving Area

- Containment for wash area operational
- Compartments empty and clean
  - Air lance operational
  - Unloading outlet tubes totally clean
  - Pellet recovery from wash water 100%

Car/Truck/Container Loading

- No line blockages or clogging
- Catch pans in place for connections
- Transfer lines flushed after each car loading completed
- All outlets secure and sealed after filling (seals are all 1/8 inch braided steel or stronger)
  - Top
  - Bottom
- Top of car/truck clear before release

Inspected By: _____

Inspection Date: _____

Railroad Checklist

Operation Clean Sweep®
www.opcleansweep.org.au

Company: _____

Department: _____

Operation: _____

Crew/Shift: _____

Inspector: _____

Date: _____

Storage in Transit Areas

Secure

Fenced

Adequate lighting

Regular Inspections

Car valve covers and seals in place or shipper notified

Inspected By: _____

Inspection Date: _____

Transloader Checklist

Operation Clean Sweep®
www.opcleansweep.org.au

Company: _____

Department: _____

Operation: _____

Crew/Shift: _____

Inspector: _____

Date: _____

Receiving Area

- Wash system containment operational
- Compartments empty and clean
  #1 ◯ #2 ◯ #3 ◯ #4 ◯
- Unloading outlet tubes totally clean

Transfer (Transfer area: Gravel Asphalt)

- Car seals in place before start of transfer
- Catch pans in place prior to valve opening
- Transfer lines flushed and clean after transfer
- All outlets secure and sealed at completion and prior to moving

Car	Top	Bottom
Truck	Top	Bottom
Container	Top	Bottom

- Spills cleaned and disposed of properly
- Samples taken without material loss
- Unloading problems experienced

Inspected By: _____

Inspection Date: _____



Making zero pellet loss your goal

Operation Clean Sweep®

TANGAROA BLUE

AUSTRALIAN MARINE DEBRIS INITIATIVE

nswcpo

NSW GOVERNMENT

VICTORIA State Government

This project is a NSW Environment Protection Authority Waste and Sustainable Materials Strategy initiative, funded from the waste levy.