



HAZMATSU

Hazardous Materials Services & Utility

When it comes to handling, storage and disposal of dangerous chemicals and materials, HAZMATSU has the necessary solutions. Hazardous waste is an unavoidable by-product of industrial development. Some of this waste is toxic and detrimental to the environment. HAZMATSU holds itself to the highest environmental and safety standards, both by legal obligation and on principle.

HAZMATSU is a division of Bux Engineering, a **sole proprietorship** company. Employing up to 20 employees depending on the workloads and projects. As a proprietorship, please refer to the Curriculum Vitae of the proprietor for the company portfolio and references.

Current range of services

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A - Dilution:

Non-metallic and biodegradable chemicals with little to no toxic properties can be (further) diluted and discharged into a flowing body of water. Such as river, canal or ocean. Biologically accumulating substances must not be discharged. Dilution is often a final step in Chemical, Neutralization or Encapsulation processes.



Pic 1



Pic 2



Pic 3

Biosite pictures

Pic.1: Custom Discharge Installation into a biopit 30% filled with water.

Pic.2: non-toxic waste water diluted 3 to 1 with water. BioPit in solid clay ground.

Pic.3: CaCO₃ and sawdust are used to remediate the waste water before discharge.

B - Bioremediation:

A process that enables natural processes to "compost" away chemical waste. HAZMATSU operates a Bio remediation site for bio-degradable industrial waste. Bioremediation can take up anywhere from 4 weeks to 6 months depending on the quantity and quality of the chemical waste. Currently the following chemical compound types can be bio-remediated:

- Liquid Oils & Grease/Hydrocarbons/Oil rags
- Aromatic Hydrocarbons
- Activated Carbon(contaminated)



1



2



3

Biosite pictures

Pic.1: Oiled rags on live vegetation.

Pic.2: Sawdust layer on the oiled rags.

Pic.3: Final vegetation layer on the sawdust layer.

*Processes are similar to land Farming, Bioremediation is however more advanced and more complex.

C - Chemical Processing:

For chemical processing to be safe and effective, it is necessary to know exactly what the material to be destroyed consists of. There is a different processing / method for each substance. Chemical processing is sometimes complicated and takes a lot of preparation time and material. Other chemicals are always needed to process the waste and the end product is sometimes also considered chemical waste, although less hazardous or more process able.



Pic. 1



Pic. 2



Pic. 3

Actual Chemical Processing pictures

Pic.1: Sorting lab waste by type & toxicity

Pic.2: Expired Medicine. Sorted, Unpackaged, Processed

Pic.3: Container Puncuring to prohibit re-use

D - Acid/Base Neutralization:

Commonly used as industrial cleaning agents in the food and production sector. Reactive affluent or outdated stock need to be neutralized before discharge. The end products are often neutral or common basic compounds. All non-metallic acids and bases can be treated.



Neutralization of an acid with CaCO_3 based neutralizer.

Pic.1: HAZMAT B personnel preparing the discharge ramp.

Pic.2: Discharge of acid at controlled speed.

Pic.3.: Foaming exothermic reaction as neutralization takes place.

Pic.4: Neutralization pit, to prevent spillover into the environment.

E - Incineration:

Some Industrial en Medicine waste can be destroyed in a furnace or open burners. Not suitable for all types of waste. The right mixture of oxygen, fuel en waste is key to a clean burn. A professional waste furnace is under construction for medical/infectious en chemical waste usage. Emissions gases will be filtered in a condensation smoke stack. Effluent & Slag will be collected for encapsulation.



Pic.1



Pic. 2



Pic. 3

Different Incineration Methodes

Pic.1: AK-01 open head batch burner. Aerated for clean burn up to 950°C. Wood or Oil operated.

Pic.2: Clean(smoke-less) incineration of expired medicine.

Pic.3.: Controlled burning of documents. Airated open pit with agitator mechanism.

F - Mechanical, Encapsulation & Recycling:

Waste that is part of, or attached to other non-chemical or non-hazardous material or parts. These compound waste substances are broken down into recyclable and processable parts. The recyclable materials are handed over for recycling, reusable parts are reused and the remaining waste is then further processed on the basis of methods; A, B, C, D and E. What remains are then encapsulated within concrete.



Pic.1



Pic.2

Real-World Uses of Incapsulation

Pic.1: Carbonconcrete. 30%activated carbon with concrete molded into garden-pots.

Pic.2: Silic-crete. Up to 40% Glass/Concrete mixture road. 3ton axis tested.

Pic.3: Carbonconcrete Blocks for lightweight construction. High insulation value. Non-toxic.



Pic.3

Electronic Waste

E-waste is one of the major waste streams that receive limited attention. BE has 12+ years of experience processing E-waste such as; batteries, ink cartridges & toners, LED & TL-lights, personal computer, home electronics, industrial electronics, vehicle electronics. E-waste is dismantled, sorted on the basis of material and processed. The processing depends on the material. We apply recycling, reuse & encapsulation.



a



b



c



d



e

a : PC parts separated into circuit-board, fans, heat-sinks and battery packs

b : Wiring & Connectors.

c : House hold batteries

d : Printing components

e : Industrial Electric-motors & Machinery

OFFSHORE Waste Management

The HAZMATSU Division of Bux Engineering is investing in infrastructure, logistics and methodology to handle offshore waste from the Oil & Gas Industry. We are working on Infrastructure to handle Skips & Skiploaders. We will be using Bioremediation, Land Farming & Land Treatment to handle Cuttings, Slop, Water-, Oil- & Synthetic Based Mud. HC, Chlorine, Water & Metallic content will determine the best course of action for our clients. As part of our services range, non-hazardous wastes are also included to provide for a One-Stop service for all waste disposal needs.

| OFFSHORE WASTE MANAGEMENT | | | |
|---------------------------|--------------------------------------------------------------------------------|-----------------|-------------------------------------------|
| Waste Class | Description | Unit of Measure | Waste Processing Method(s) & Options |
| Non-Hazardous | Domestic Wastes | Metric Tons | Landfill |
| | Scrap Wood | Metric Tons | Shredder, compost or furnace |
| | Scrap Metal | Metric Tons | Separation and recycling |
| | Recyclables (Glass, Paper, Plastic & Aluminum) | Metric Tons | Recycling, Landfill or Encapsulation |
| | Miscellaneous Non-Hazardous Wastes | Metric Tons | Separation, recycling, encapsulation |
| | Residual synthetic based mud from tank cleaning | Metric Tons | Bioremediation |
| | Non-Hazardous Solids | Metric Tons | Separation, recycling or landfill |
| Hazardous | Oil/Fuel Filters | Metric Tons | Separation, recycling, encapsulation |
| | Waste Oil | Metric Tons | Bioremediation or furnace |
| | Oily Rags/Gloves | Metric Tons | Bioremediation or furnace |
| | Oil Contaminated Sludge | Metric Tons | Bioremediation |
| | Batteries | Kg | Recycling or encapsulation |
| | Medical Waste | Kg | Incineration |
| | Fluorescent Tubes | L.F | Crushing and encapsulation |
| | Empty Oil/Chemical Drums | Metric Tons | Steam wash or shredding and encapsulation |
| | Empty Paint Cans | Metric Tons | Compacting and encapsulation |
| | Paints/Thinners/Spent Chemicals | Metric Tons | Neutralization |
| | E-Waste (Phones, Computers, Monitors, UPS Batteries, etc.) & Toner Cartridges | Kg | Recycling or encapsulation |
| | Waste Chemicals | Metric Tons | Various, dependent on hazard |
| | Cooking Oil | Metric Tons | Bioremediation |
| | Synthetic Based mud Cuttings in Excess of 6.9% Residual Oil Content (optional) | Metric Tons | Bioremediation |
| | Residual Synthetic Based Mud (optional) | Metric Tons | Bioremediation |
| | wash water from tank cleaning operations (optional) | Metric Tons | Bioremediation |

Specialized Services

Radio Active Container: Clean-up & Certification



Heights Work & Custom Scaffolding



Confined Spaces & Tank Cleaning Services



Bux Engineering also provides training for confined spaces, Tank cleaning, heights work and use of atmospheric analysers.

HAZMAT Operations:

As our speciality, HAZMATSU has more experience than any other company (in Suriname) or organization in handling chemical waste spills and disasters. By first creating an Containment & Mitigation plan and consolidating necessary PPE, personnel, containers and logistics, HAZMATSU has been able to manage up to 35 hazmat B personnel (not counting secondary personal) and contain, mitigate and package up to 65 tonnes of chemical waste in 8 days from a single disaster site.



Field footage

Pic.1: 3 tons of burnt medicine and lab chemicals.

Pic.2: idem location Pic.1 after hazmat operations.

Pic.3: Hazmat B personnel shoveling chemical waste.

Pic.4: Steel 200liter drums used for chemical waste storage.

HAZMAT Training:

HAZMAT A & B, with or without certification. Trainees learn how to properly use their PPE and mitigate chemical spills and disasters.



Products & Personal protective Equipment:

- HAZMATSU provides Emergency Spill Response Packages (Spill Kits) from 5 to 200 litre, Complete with absorber, PPE and clean-up tools.
- Bux Engineering can source PPE directly. Everything from regular working attire to full HAZMAT suites can be purchased and delivered on a regular basis. As an added service, HAZMATSU provides PPE maintenance for any buyer. Proper PPE maintenance improves hygiene and usability of any item.
- HAZMATSU also provides safety documentation, custom guidelines and warning signs.



Environmental & Safety Analytics:

Independently or as support service to any and all HAZMAT operations, HAZMATSU will use and maintain portable environmental analysers for:

- Radioactivity (beta/gamma),
- Gasses (ambient, explosive & suffocating)
- Water quality (O₂, BOD, COD, pH, T)
- Particulate matter
- Sound



Laboratory Services

- Designs, Construction, Repair, Retrofit & Supply of Environmental, Food & Medical Laboratories.
- Advising on Forensics Analytics
- Sample Preparations & Handling
- Analysis through secondary Laboratories
- Toxicity Characteristic Leaching Procedure (TCLP) Analysis
- Chemical & Biological Oxygen Demand Analysis
- Waste Water, Ground & Air Analysis based on suspected pollutants Analysis & Outsourcing
- Tool & Device Calibration

Design



Repair & Refit



Future range of services...

Incineration:

HAZMATSU has designed its own high-temperature chemical waste incinerator. Currently a prototype is being constructed. It will have the following features:

- 800-1000°C primary chamber temperature
- 1200-1300°C secondary chamber temperature
- 0.75m³ internal volume.
- Batch operated for 3 to 6 hrs of incineration.
- 400liter or 200kg max load per batch.
- Mobile and Modular construction for easy upgrades and repairs.

Will be usable for destroying confidential documents, medical & chemical waste, empty chemical containers like spray cans, (de)pressurized canisters, HDPE buckets and barrels.

Customers may also order an incinerator for their own use, either an HAMATSU model or purchase a turnkey model from abroad via Bux Engineering as an agent or operator.



Emergency Spill Response(ESR)

Handbook: method of handling small spills of dangerous material or chemicals. Specific to a company and the chemicals they use.



Thank you for going through our portfolio. We are sure you have questions...we are well prepared for that too. Best regards, Anwar Alibux. Director of Bux Engineering.



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