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Hazardous Medical Waste Management

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Definition of Waste

- Waste is any substance or object that the holder discards, or has the intention or obligation to dispose of, including those identified in the LER List, European Waste List.

(Decreto-Lei n.º 178/2006).



Waste Characterization

- **Medical waste** is waste resulting from medical activities carried out in health care units, in prevention, diagnosis, treatment, rehabilitation and **research activities related to human beings or animals, in pharmacies, in medical-legal activities**, in education and any other activities involving invasive procedures such as acupuncture, piercings and tattoos.

(Law Decree n.º 178/2006).



Presentation

- ▶ Ambipombal, owner of the **Ambiwaste** trade mark, is a company dedicated to the collection of hazardous medical waste .
- ▶ Holder of logistics centres licensed by the DGS for the storage of hospital waste, complemented by its partnership with SUCH and its participation in ACE Somos Ambiente has exclusive of all the treatment units of these companies, presenting environmentally appropriate solutions for waste treatment Group III, IV, Dangerous Liquids and industrial wastes, namely pharmaceuticals, medical devices, cosmetics, perfumery, production residues, as well as others in the pharmaceutical industry. Focusing and specializing in the management of hazardous hospital waste and with the objective of introducing new treatment technologies.
- ▶ **Ambiwaste** currently has autoclaving systems, microwaving and an incineration plant (CIVTRHI) that allow it to achieve total self-sufficiency in relation to hazardous medical waste generated by Ambiwaste



TRANSPORTATION OF HAZARDOUS HOSPITAL WASTE

- ▶ AmbiPombal strictly complies with the National Regulations for the Transport of Dangerous Goods by Road (RPE), in particular regarding to the specific training of the holders of the ADR (**Training Certificate for Drivers of Dangerous Goods Vehicles**), this letter issued to Ambipombal Drivers who transport medical waste.
- ▶ The transport operations of dangerous goods comply with the provisions of **Law Decree n.º 41-A / 2010**, of April 29, and subsequent amendments.



AMBIPOMBAL VEHICLE CHARACTERISTICS

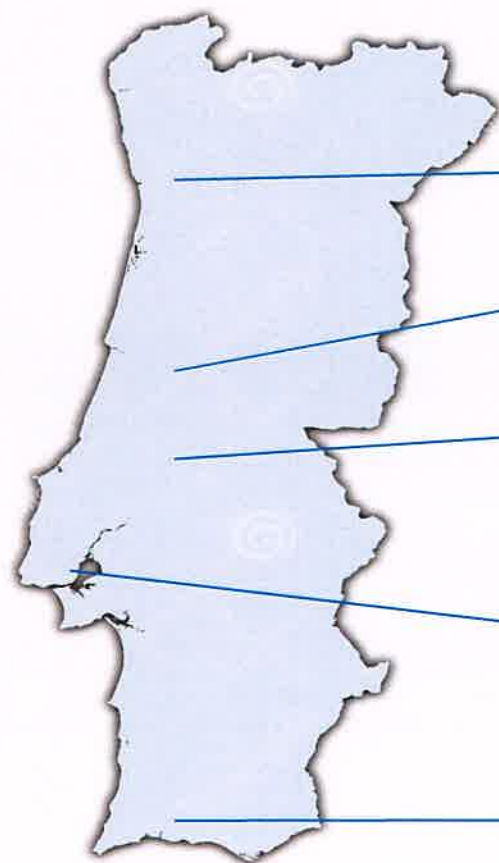
- Dangerous medical waste transport vehicles are exclusively dedicated to the transport of medical waste, with a closed and isothermal box, washable and easily disinfectable and sanitized at the end of each route and before starting a new waste collection. In order to gauge the hygiene process, these vehicles are regularly submitted to analytical (microbiological) control.



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National Presence



→ **Porto** - Commercial Delegation and Logistic Support

→ **Pombal** - Commercial Delegation, Logistic Support and Transfer Station.

→ **Chamusca** - CIVTRHI - Treatment Units for Group III, Group IV, Transfer and Logistic Support Unit

→ **Lisboa** - Commercial Delegation, Transfer Unit and Logistic Support

→ **Algarve** - Commercial Delegation and Logistic Support



Waste Characterization

GRP III – Hospital Waste of Biological Risk

- ▶ They are contaminated or suspected contamination residues, susceptible to incineration or other effective pre-treatment, allowing subsequent disposal as urban waste.

(Despacho nº 242/96)

- ▶ This Group is comprised of:
- ▶ All wastes from rooms or wards of infected or suspected patients, hemodialysis units, operating rooms, treatment rooms, autopsy rooms and pathological anatomy, clinical pathology and **research laboratories, with the exception of group IV.**



Waste Characterization

GRP III – Medical Waste of Biological Risk

- ▶ All the material used in dialysis
- ▶ **Unidentifiable anatomical parts**
- ▶ **Wastes resulting from the administration of blood and its derivatives**
- ▶ **Systems used for the administration of serums and medicaments other than those of group IV**
- ▶ Collecting bags of organic fluids and their respective systems
- ▶ Orthopedic material: splints, plasters and bandages contaminated or contaminated with traces of blood; prosthesis material taken from patients
- ▶ **Disposable diapers and guards contaminated or with traces of blood**
- ▶ **Personal Protective Equipment used for health care and general support services in contact with contaminated products (such as gloves, masks, aprons and others).**



Waste Characterization

GRP IV – Specific Medical Waste

- ▶ They are contaminated or suspected contamination residues, susceptible to incineration or other effective pre-treatment, allowing subsequent disposal as urban waste.

(Despacho nº 242/96)

- ▶ Cytostatics and all material used for its handling and administration
- ▶ Rejected Chemicals and Drugs
- ▶ Identifiable anatomical parts, fetuses and placentas
- ▶ Carcasses of animals from laboratory experience
- ▶ Sharpening and puncturing materials: needles, catheters and all invasive material



Waste Disposal

- ▶ **Primary Packaging**
- ▶ Hospital waste should be placed in the plastic bag that will be placed in an appropriate container, according to the group to which it belongs and according to the associated hazard and always in the place where they are produced.
- ▶ According to **Dispatch nº 242/96**, the bags to be used for the packaging of the different types of waste are the following:

Group		Color of Plastic Bag
Group I e II		Black Color Bag
Group III		White Color Bag
Group IV		Red Color Bag



HAZARDOUS MEDICAL WASTE – GRUPO III

- ▶ The white bags, after being filled and closed, must be collected by the Producer's employees and sent to their respective waste area or other place established by the Producer for centralization of waste, where they will be placed in the transport containers made available for this purpose.
- ▶ The picking of the containers at the place designated for the packaging will be carried out by **Ambiwaste** staff on a regular basis with the tender awarded.



HAZARDOUS MEDICAL WASTE – GRUPO IV

- ▶ Group IV Hospital Waste shall be packed in multi-use containers of 60 liters or in single-use containers of 60 liters **depending on the specificity of the waste to be collected.**
- ▶ Containers for sharp and puncture material in the capacities according to the requests of the producer.



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HAZARDOUS MEDICAL WASTE – LIQUIDS



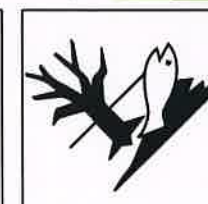
RESÍDUOS LÍQUIDOS PERIGOSOS

Produtor _____

Designação do Resíduo _____

Código LER _____

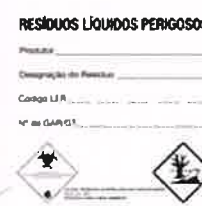
Nº de GARRAFAS _____



HAZARDOUS MEDICAL WASTE - LIQUIDS

- ▶ The sorting and packaging of the Liquid Waste must be carried out by the producing service and always according to the physical and chemical characteristics of the waste in question. Portaria 209/2004 that approves the European Waste List must always be considered, according to the respective **LER Code**.
- ▶ The different Hazardous Liquid Residues **will be collected separately**, in **specific Jerricans for each residue**. Each of these jerricans will be **labeled and identified with the hazardous chemical / liquid in it** (self-adhesive labels on thermal paper, with dimension as a function of its volume). – **THIS IDENTIFICATION IS MANDATORY TO SAFE WASTE DISPOSAL**

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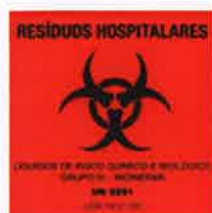


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HAZARDOUS HOSPITAL WASTE – LIQUIDS - Incompatibilities



Bromo e Cloro	Benzeno; Hidróxido de amônio; benzina de petróleo; Hidrogênio; acetileno; etano; propano; butadienos; pós-metálicos;
Carvão ativo	Dicromatos; permanganatos; Ácido nítrico; Ácido sulfúrico; Hipoclorito de sódio;
Cloro sódio; do	Amônia; acetileno; butadieno; butano; outros gases de petróleo; Hidrogênio; Carbeto de turpentine; benzeno; metais finamente divididos; benzinas e outras frações petróleo;
Cianetos	Ácidos e álcalis;
Cloratos; percloratos; clorato de potássio	Sais de amônio; ácidos; metais em pó; matérias orgânicas particuladas; substâncias combustíveis
Cobre metálico	Acetileno; Peróxido de hidrogênio; azidas;
Dióxido de cloro	Amônia; metano; Fósforo; Sulfeto de hidrogênio;

RESÍDUOS LÍQUIDOS PERIGOSOS

Produtor: _____

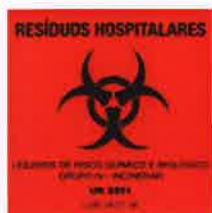
Designação do Resíduo: _____

Código LER: _____

RF de GABRIEL: _____



HAZARDOUS HOSPITAL WASTE – LIQUIDS – Incompatibilities



Peróxido de sódio	Ácido acético; Anidrido acético; benzaldeído; etanol; metanol; etilenoglicol; Acetatos de metila e etila; furfural;
Prata e sais de Prata	Acetileno; Ácido tartárico; Ácido oxálico; compostos de amônio;
Sódio	Dióxido de carbono; Tetradoreto de carbono; outros hidrocarbonetos dorados; água;
Sulfeto de hidrogênio	Ácido nítrico fumegante; gases oxidantes.

RESÍDUOS LÍQUIDOS PERIGOSOS

Produtor _____

Designação do Resíduo _____

Código LTR _____

Nº de GARANT _____



Treatment Units - CIVTRHI

- ▶ The construction and operation of an Integrated Center for Energy Enhancement, Recycling and Waste Treatment (Medical, Industrial and Animal) - CIVTRHI, was born with a view to an sustainable solution for the treatment of hazardous waste, in line with the best practices promoting the improvement of environmental performance in the Health and Industry sectors as well as the improvement of environmental practices throughout the waste management chain.
- ▶ Treat hazardous wastes by decontamination / disinfection and incineration,
- ▶ Treat hazardous industrial waste by incineration,
- ▶ Promote recycling and recovery of materials after decontamination, and packaging of medicines.
- ▶ Energy recovery on the path to the principle enshrined in the Waste to Energy Community Directives,



Treatment Units – CIVTRHI

Treatment of Group III Residues by Micro Waves



- Built from scratch and made up of innovative and unique technology in Portugal, it receives from all over the country, Medical waste of group III, with biological risk such as bandages or dressings with blood, prosthetics, plasters and urine bags. Waste after treatment can be sent to landfill.



Treatment Units – CIVTRHI

Treatment of Group III Residues by Autoclaving



- ▶ CIVTRHI has a Group III hazardous medical waste decontamination unit using autoclaving technology, taking advantage of existing resources and energy surpluses, minimizing the ecological footprint of the treatment.
- ▶ The autoclaved residues are sent to landfills of banal industrial waste.



Treatment Units – CIVTRHI

Treatment of Group IV Residues by Incineration



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- ▶ Decontamination by Incineration where the Residues are subjected to a temperature equal to or greater than 850 degrees in a first Combustion chamber.
- ▶ The gases resulting from the burning of the residues remain in a second combustion chamber for a minimum period of 2 seconds at a temperature of 1100 Degrees.



Treatment Units – CIVTRHI

Container Cleaning and Decontamination Unit



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- The reusable 60 liter containers are washed, disinfected and dried with the application of a disinfectant followed by a drying solution and the process is finished with the application of a smell neutralizing solution.





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