



Characterization, classification and analysis of waste

Waste characterization means the collection of the necessary information to determine its **correct** characteristics for classification and **management and final destination to plants (recycling/disposal)**.

In particular, producers must classify waste to identify the **EWC code in the European Waste Catalogue** and the **hazard class** in the event of hazardous waste. Mérieux NutriSciences supports companies in this process thanks to product assessment and chemical analyses according to current legislation, in particular with “mirror entry” waste whose hazard cannot be defined “a priori” and a specific analysis could become necessary to know the concentration of pollutants. Hazard evaluation is also useful to abide by the **Seveso Directive**: it concerns plants with risk of major accidents and temporary or permanent waste storage.

Mérieux NutriSciences proposes different profiles aiming at obtaining an in-depth examination of the knowledge about solid and liquid waste **thanks to basic profiles to which dedicated parameters or profiles can be added** depending on the manufacturing cycle that generates them and their specific final destiny.

The basic profile for solid and liquid waste includes:

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| <ul style="list-style-type: none"> ✓ Appearance (physical state, color, scent) ✓ Bulk density ✓ Flammability (flammability point for liquid waste) ✓ pH ✓ Alkalinity or acidity ✓ Metals ✓ Hydrocarbons <ul style="list-style-type: none"> 1,3-butadiene aliphatic hydrocarbons C5-C8 hydrocarbons C>10 (C10-C40) dipentene aromatic compounds Polycyclic Aromatic Hydrocarbons (PAH) hydrocarbons C<12 e C>12 | <ul style="list-style-type: none"> ✓ Leaching test ✓ Dry matter (residual matter – 105 °C for liquid waste) ✓ Residual matter (600 °C) ✓ POP – persistent organic pollutants <ul style="list-style-type: none"> PFASs HBCDD Chloroalkanes C10-C13 Chlorinated insecticides PCBs PCDD/PCDF Persistent organohalogens MIREX PBDE-RoHS PCN Toxaphene PBB-RoHS |
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To complete the basic profile, some parameters are added to the waste intended for thermal destruction to guarantee the performance of the plant in terms of yield and control of pollutants.

The integrated profile for waste-to-energy plants includes:

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| ✓ Anions (chlorides, fluorides, sulfides, bromides) | ✓ Calorific value (lower and gross) |
| ✓ Organic chlorine | ✓ Hydrogen elemental analysis |
| ✓ Total fluorine | ✓ XFR elements (bromine, chlorine, iodine, sulfur) |

For waste intended for sewage treatment plants (including, for example, wastewater deriving from agri-food activities), a specific profile is proposed to outline its compatibility with the treatment system.

The profile for sewage treatment plants includes:

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| ✓ Appearance (physical state, color, scent) | ✓ Oily substances (animal and vegetable oils and fats + total hydrocarbons) |
| ✓ Flammability point | ✓ TOC |
| ✓ Bulk density | ✓ TKN |
| ✓ pH | ✓ Ammoniacal nitrogen |
| ✓ Total suspended solids | ✓ Nitrate nitrogen |
| ✓ Residual matter (600 °C) | ✓ Anionic surfactants |
| ✓ Alkalinity or acidity | ✓ Non-ionic surfactants |
| ✓ Metals | |

Leaching Test

When the waste is **destined to landfill or to particular types of recovery, the leaching test is of utmost importance** to assess the mobility of pollutants and their possible future leaching. The test includes the following parameters:

- pH, temperature, electrical conductivity and redox potential of eluate
- total dissolved solids and dissolved organic carbon
- sulfates, chlorides, fluorides
- phenol index
- metals



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