

Guidance on use of Disposal and Recovery Codes (R&D codes)

This R&D code guidance is intended to assist operators completing waste surveys for the Environmental Protection Agency's (EPA) Environmental Performance Reporting (EPR) module. Descriptions for each R&D code, treatment operations, examples and notes are provided below.

The EPR module on the Environmental Data Exchange Network (EDEN) portal requires a R&D code (e.g. D05) and a waste treatment operation (e.g. specially engineered landfill, non-hazardous waste) to be selected for each waste entered. Where more than one waste treatment operation apply to a code, these are included in a blue list in the description.

For further guidance see Annex I of the Waste Framework Directive 2008/98/EC and the Eurostat Manual for the implementation of regulation (EC) No 2150/2002 on which this guidance is based on, or send an email to queriesofficer@epa.ie.

N.B.: Codes with asterisks (e.g. D08*) refer to pre-treatment operations, and cannot be used for reporting the final treatment or export of waste.

Links:

[Waste Framework Directive 2008/98/EC](#)

[2024 edition of Eurostat's Manual for the implementation of regulation \(EC\) No 2150/2002 on waste statistics](#)

Disposal operations pursuant to Annex I of the Waste Framework Directive (2008/98/EC)		
D Codes	Disposal operations	Description and Examples of Disposal Codes
D01	Deposit into or onto land	Deposit into or onto land (e.g. landfill, etc.) Deposit of overburden, waste rock and tailings on heaps in the extractive industry. <u>Note:</u> All Irish municipal landfills are Specially Engineered Landfills (see D05).
D02	Land treatment	Land treatment (e.g. biodegradation of liquid or sludgy discards in soils, etc.) Spreading of waste on land, often followed by the incorporation of the waste into the soil, <u>which does not result in benefit to agriculture or other ecological improvements (see R10 for beneficial spreading)</u> . Generally, applies to non-hazardous sludge and liquid wastes, e.g. disposal of dredging sludge.
D03	Deep injection	Deep injection (e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.) Injection of waste into natural and artificial cavities (e.g. salt domes, wells, mines), or into porous formations of rock.

D04	Surface impoundment	<p>Surface impoundment (e.g. placement of liquid or sludgy discards into pits, ponds or lagoons, etc.) Deposit of waste in natural or engineered ponds, pits or lagoons (impoundment), which is the predominant method for the management of tailings in mining operations.</p>
D05	Specially engineered landfill	<p>Specially engineered landfill Placement into a specially engineered landfill i.e. lined discrete cells that are capped and isolated from one another and the environment, etc.</p> <p><u>Note:</u> the EPR module on the EDEN portal have the following waste treatment operations for D05:</p> <ul style="list-style-type: none"> - Specially engineered landfill, inert waste - Specially engineered landfill, non-hazardous waste - Specially engineered landfill, hazardous waste <p><u>Note:</u> All Irish municipal landfills are Specially Engineered Landfills.</p>
D06	Release into a water body except seas/oceans	<p>Release into a water body except seas/oceans Restricted by law to only a few types of waste and includes the deposit of non-hazardous sludge (including from dredging) in surface water including the bed and the subsoil.</p>
D07	Release into seas/oceans including sea-bed insertion	<p>Release into seas/oceans including sea-bed insertion Restricted by law to only a few types of waste and includes the discharge of waste at sea in accordance with the OSPAR Convention (e.g. the discharge of fish processing waste and inert materials of natural origin).</p>
D08*	Biological treatment	<p>Biological treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D01 to D12 <u>Pre-treatment</u> operations which use aerobic or anaerobic biological processes in order to prepare the waste for subsequent disposal, e.g. by reducing the amount of biodegradable components or by degradation of organic pollutants.</p> <p>This disposal code includes: Biological-mechanical treatment of municipal waste; Biological treatment of contaminated soil, sludges or mineral wastes, if followed by disposal.</p>

D09*	Physico-chemical treatment	<p>Physico-chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D01 to D12 (e.g. evaporation, drying, calcination, etc.)</p> <p><u>Pre-treatment</u> of mainly fluid and pasty type hazardous waste by a variety of chemical, thermal and physical processes in order to achieve an output which can be recovered or disposed of. Typical treatment steps are detoxification (oxidation/reduction), precipitation, neutralisation, emulsion separation, immobilisation, electrolysis and osmosis.</p> <p>Physico-chemical treatment is typically deployed for: Emulsions and oil/water mixtures; Neutral aqueous organics and inorganics (production specific waste water, leachate, etc.); Cyanides; Acids and alkalis.</p>
D10	Incineration on land	<p>Incineration on land</p> <p>incineration of waste where the main purpose of the incineration is the thermal treatment of waste in order to reduce the volume and the hazardousness of the waste, and to obtain an inert product which can be disposed of. This primarily includes incineration plants dedicated to the thermal treatment of wastes by oxidation or other thermal treatment processes (e.g. pyrolysis, gasification or plasma processes), with or without recovery of the combustion heat generated. D10 also covers the incineration of waste in co-incineration plant where the waste undergoes thermal treatment rather than being used as a fuel.</p> <p>Common examples are: Municipal solid waste incineration plants (unless they fulfil the energy efficiency standards set in Annex II of the Waste Framework Directive, see R01); Hazardous waste incineration plants; Sewage sludge incineration plants; Incineration plants for clinical waste; Incineration plants for animal carcasses.</p> <p><u>Note:</u> the EPR module on the EDEN portal have the following waste treatment operations for D10:</p> <ul style="list-style-type: none"> - Incineration on land, non-hazardous waste - Incineration on land, hazardous waste
(D11)	(Incineration at sea)	<p>(Incineration at sea)</p> <p><i>This operation is prohibited by EU legislation and international conventions</i></p>
D12	Permanent storage	<p>Permanent storage (e.g. emplacement of containers in a mine, etc.)</p> <p>Operation that aims primarily at the safe disposal of the waste and does not fulfil the criteria for backfilling.</p>
D13*	Blending or mixing prior to submission to any of the operations numbered D01 to D12	<p>Blending or mixing prior to submission to any of the operations numbered D01 to D12</p> <p>Preliminary operations prior to disposal including pre-processing such as, among other things: sorting, crushing, compacting, pelletising, drying, shredding, conditioning, separating, blending or mixing <u>prior to submission to any of the operations numbered D1 to D12.</u></p>

D14*	Repackaging prior to submission to any of the operations numbered D01 to D13	Repackaging prior to submission to any of the operations numbered D01 to D13 Preparatory activities whose purpose is the (re)packaging of waste for transport and submission to further disposal operations (e.g. the packaging of asbestos)
D15*	Storage pending any of the operations numbered D01 to D14	Storage pending any of the operations numbered D01 to D14 (excluding storage pending collection on the site where the waste is produced) Temporary storage of waste prior to disposal. Temporary storage for disposal is limited to a period of less than one year, otherwise the provisions of the Landfill Directive apply (Directive 1999/31/EC, Article 2(g)). <u>Note:</u> D15 does not apply to storage of waste prior to collection on the site at which the waste was generated.

Recovery operations pursuant to Annex II of the Waste Framework Directive (2008/98/EC)		
R Codes	Recovery operations	Description and Examples of Recovery Codes
R01	Use principally as a fuel or other means to generate energy	Use principally as a fuel or other means to generate energy Incineration and co-incineration of waste in power stations and industrial facilities such as cement kilns so that the resultant energy can be used to generate heat or electricity. Common examples of energy recovery are: Use of tyres, waste oils, or spent solvents in cement kilns; Co-incineration of sewage sludge or refuse-derived fuel (RDF) from municipal waste in power stations; Incineration of municipal solid waste under the condition that their energy efficiency is equal to or above the level set in Annex II of the Waste Framework Directive <u>Note:</u> the EPR module on the EDEN portal have the following waste treatment operations for R01: <ul style="list-style-type: none"> - Incineration plant (use as fuel), non-hazardous waste - Incineration plant (use as fuel), hazardous waste - Co-Incineration plant (use as fuel), non-hazardous waste - Co-Incineration plant (use as fuel), hazardous waste
R02	Solvent reclamation/regeneration	Solvent reclamation/regeneration All treatment activities whose purpose is the regeneration or recovery of spent solvents. This recovery code includes: Re-refining of solvents in order to separate contaminants and to restore the solvent to its original quality or to a lower grade product (e.g. lacquer thinner); Preparation of secondary liquid fuels.

<p>R03</p>	<p>Recycling/reclamation of organic substances</p>	<p>Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) Operations whose purpose is the recovery of biodegradable and non-biodegradable organic materials.</p> <p>This recovery code includes the following: Preparing for re-use of organic materials (e.g. of wooden building elements like windows, doors, beams, planks); Recycling of waste paper and cardboard; Reprocessing and recycling of plastic waste; Composting of bio waste and green waste; Anaerobic digestion of biodegradable waste; Gasification and pyrolysis of waste using the components as chemical (chemical recycling); Recovery of organic materials in the form of backfilling.</p> <p><u>Note:</u> the EPR module on the EDEN portal have the following waste treatment operations for R03:</p> <ul style="list-style-type: none"> - Composting (aerobic). - Anaerobic digestion. - Gasification or pyrolysis (other than incineration or co-incineration plant). - Preparing for reuse of organic substances. - Recovery of organic materials in the form of backfilling. - Other recycling or reclamation of organic substances which are not used as solvents (to end-of-waste).
<p>R04</p>	<p>Recycling/reclamation of metals and metal compounds</p>	<p>Recycling/reclamation of metals and metal compounds Operations whose purpose is the recycling of metal waste, and of complex products with metals as the predominant material. These operations include a variety of mechanical, thermal and chemical treatment steps and processes.</p> <p>This recovery code includes: Recycling of scrap and production waste in steelworks; Shredding and reprocessing of end-of-life vehicles (ELVs) and waste electrical and electronic equipment (WEEE); Thermal treatment of cables or oil-contaminated metals; Battery recycling; Electrolytic recovery of silver from photo chemicals.</p> <p><u>Note:</u> R08 is a dedicated recovery code for catalysts, such as catalytic converters.</p> <p><u>Note:</u> the EPR module on the EDEN portal have the following waste treatment operations for R04:</p> <ul style="list-style-type: none"> - Preparing for reuse of metal and metal compounds. - Metal and metal component recycling or reclamation (to end-of-waste).

R05	Recycling/reclamation of other inorganic materials	<p>Recycling/reclamation of other inorganic materials Operations whose purpose is the recovery of inorganic non-metal wastes and <u>which are not covered by other more specific operations</u> (e.g. R06, R08, R10). The main groups of inorganic waste are waste from thermal processes (slag, ashes, sands, dust, etc.), construction and demolition (C&D) waste, and waste from mining and quarrying.</p> <p>This recovery code covers: Preparing for re-use of waste (e.g. bricks, stones or concrete elements from selective deconstruction of buildings); Reprocessing of construction and demolition waste; Reprocessing and recycling of glass waste; Use of wastes as secondary raw material in cement kilns; Asphalt mixing plants using reclaimed asphalt and other mineral wastes; Recovery of inorganic materials in the form of backfilling.</p> <p><u>Note: the EPR module on the EDEN portal have the following waste treatment operations for R05:</u></p> <ul style="list-style-type: none"> - Inorganic materials recycling or reclamation (to end-of-waste) - Preparing for reuse of inorganic materials. - Recovery of inorganic materials in the form of backfilling.
R06	Regeneration of acids or bases	<p>Regeneration of acids or bases Operations whose purpose is the regeneration and subsequent reuse of spent acids/bases for the original purpose or for other purposes.</p> <p>Such operations include: Re-concentration of spent acids; Thermal decomposition of spent sulphuric acid for use as feedstock in sulphuric acid production.</p>
R07	Recovery of components used for pollution abatement	<p>Recovery of components used for pollution abatement Operations whose purpose is the regeneration of pollution abatement materials such as activated carbon and ion exchange resins.</p> <p>Common applications are: Regeneration of activated carbon from water purification and flue gas treatment, mainly by thermal treatment; Regeneration of resins by solvent washing.</p>
R08	Recovery of components from catalysts	<p>Recovery of components from catalysts Operations whose purpose is: Regeneration of catalysts to be reused as catalysts; Recovery of catalyst components, e.g. recycling of precious metals from catalytic converters in vehicle exhausts.</p>

R09	Oil re-refining or other reuses of oil	<p>Oil re-refining or other reuses of oil Processes whose purpose is the reuse of waste oil.</p> <p>The two main options are: Re-refining of waste oils into base oils which can be used to manufacture lubricating products; Preparation of fuel from waste oils, which can be used as a substitute for coal, diesel and light fuel, for example.</p>
R10	Land treatment resulting in benefit to agriculture or ecological improvement	<p>Land treatment resulting in benefit to agriculture or ecological improvement Comprises of the use of organic and mineral wastes as fertilisers or soil conditioners in agriculture.</p> <p>In practice, the following land treatments are assigned to R10: Use of sewage sludge in agriculture in compliance with the Sewage Sludge Directive (86/278/EEC); Use of manure in compliance with agricultural regulations (Regulation No. 1069/2009); Use of mineral wastes as fertilisers in compliance with national legislation.</p>
R11*	Use of wastes obtained from any of the operations numbered R01 to R10	<p>Use of wastes obtained from any of the operations numbered R01 to R10 Comprises the recovery of residual waste from previous recovery operations. It is a redundant entry as it covers only treatment operations that could be assigned to one of the more specific codes R2 to R10.</p>
R12*	Exchange of wastes for submission to any of the operations numbered R01 to R11	<p>Exchange of wastes for submission to any of the operations numbered R01 to R11 Preliminary operations prior to recovery including pre-processing such as, among other things: dismantling, sorting, crushing, compacting, pelletising, drying, shredding, conditioning, repackaging, separating, blending or mixing <u>prior to submission to any of the operations numbered R1 to R11 provided that there is no other R code appropriate.</u></p> <p>This includes: Shredding of wood waste prior to energy recovery; Biostabilisation of organic fines; Production of fuel from waste incl Solid Recovered Fuel (SRF) and Refuse-Derived Fuel (RDF); Depollution or dismantling of waste vehicles incl end-of-life vehicles (ELVs); Exchange of waste for submission to any of the operations numbered R1 to R11.</p> <p><u>Note: the EPR module on the EDEN portal have the following waste treatment operations for R12:</u></p> <ul style="list-style-type: none"> - Biostabilisation of organic fines - Production of fuel from waste incl SRF and RDF - Depollution or dismantling of waste vehicles incl ELVs - Exchange of waste for submission to any of the operations numbered R1 to R11

R13*	Storage of wastes pending any of the operations numbered R01 to R12	Storage of wastes pending any of the operations numbered R01 to R12 (excluding storage pending collection on the site where it is produced) Temporary storage of waste prior to recovery. Temporary storage for recovery is limited to a period of less than three years. <u>Note:</u> R13 does not apply to storage of waste prior to collection on the site at which the waste was generated.
-------------	--	--

Backfilling:

Backfilling means any recovery operation where suitable non-hazardous waste is used for purposes of reclamation in excavated areas or for engineering purposes in landscaping. Waste used for backfilling must substitute non-waste materials, be suitable for the aforementioned purposes, and be limited to the amount strictly necessary to achieve those purposes. Backfilling does not have a clear assignment to the recovery (R) codes. Depending on the wastes used for backfilling it may be assigned to R3 and R5. Note however that backfilling is not a recycling operation.

(See Article 3, Directive 2008/98/EC "Waste Framework Directive" of the European Parliament, as amended)

* Codes with asterisks (e.g. D08*) refer to pre-treatment operations, and cannot be used for reporting the final treatment or export of waste.