

Verisav DPP ↔ ECLASS IRDI Mapping (Material Provenance)

Objective: Enable interoperability between the Verisav DPP vocabulary (`dpp:MaterialProvenance` , `dpp:materialName` , etc.) and **ECLASS** material classifications via **IRDI** identifiers.

Audience: AAS/ECLASS integrators, DPP solution providers, manufacturers using ECLASS for material composition.

1. Verisav Side (RDF/OWL)

1.1 Verisav Model

Class / Property	URI	Type	Role
<code>dpp:MaterialProvenance</code>	<code>https://ns.verisav.fr/dpp#MaterialProvenance</code>	Class	Entity for one material's provenance for a product.
<code>dpp:hasMaterialProvenance</code>	<code>https://ns.verisav.fr/dpp#hasMaterialProvenance</code>	ObjectProperty	Link ProductPassport → MaterialProvenance.
<code>dpp:materialName</code>	<code>https://ns.verisav.fr/dpp#materialName</code>	DatatypeProperty	Material name (free text, e.g. "Aluminum", "Steel").
<code>dpp:massFraction</code>	<code>https://ns.verisav.fr/dpp#massFraction</code>	DatatypeProperty	Mass fraction (0–1).
<code>dpp:originCountry</code>	<code>https://ns.verisav.fr/dpp#originCountry</code>	DatatypeProperty	Country code (ISO 3166-1 alpha-2/3).
<code>dpp:originRegion</code>	<code>https://ns.verisav.fr/dpp#originRegion</code>	DatatypeProperty	Region of origin (optional).

No Verisav property currently carries an **ECLASS code** natively. Mapping relies on:

- **Option A:** Keep `dpp:materialName` (text) and add a dedicated field for IRDI in AAS or RDF (see AAS template `materialClassificationIRDI`).
- **Option B (future):** Add a DPP property such as `dpp:materialClassificationCode` with IRDI value, alongside `materialName` .

2. ECLASS IRDI Format (reminder)

- **IRDI** = *International Registration Data Identifier* (ISO/IEC 11179-6).
- **General structure:** `ICD-OI#CSI-CC#VVV`
 - **ICD / OI:** Organisation (ECLASS = **0173**).
 - **CSI** (Code Space Identifier): Object type (e.g. **01** = Classification class, **02** = Property, **07** = Property value).
 - **CC:** Concept code (6 characters).
 - **VVV:** Version number (e.g. 001).

Useful prefixes:

- Properties: `0173-1#02-...`
- Values (material): `0173-1#07-...` (value list).
- Classification classes: `0173-1#01-...`

In ECLASS, **materials** are typically **values** (Property value, CSI 07) linked to a “material” or “base material” property. The material IRDI is therefore often a “value” IRDI (07), not only a property (02).

2.1 Verified IRDI examples (official sources)

Element	IRDI	Source
Property "Manufacturer name"	0173-1#02-AA0677#002	Catena-X CX-0044 ECLASS
Block "Material declaration" (substances/materials labelling)	0173-1#01-AKA421#001	ECLASS Release 16.0 (Nov. 2025)
Value format (material)	0173-1#07-CCCCC#00X	ECLASS spec (TypeOfSE = 07)

Block 0173-1#01-AKA421#001 is used for substances or materials subject to labelling requirements in chemical compounds (material declaration expansion available from Release 16).

3. MaterialProvenance ↔ ECLASS Mapping

3.1 Principle

- **dpp:materialName** (string) ↔ ECLASS **label** or **IRDI** (value).
- **dpp:massFraction** : No direct ECLASS equivalent as a standard “mass fraction” property; keep as numeric data in Submodel / RDF.
- **dpp:originCountry** : Can be aligned with ECLASS “country of origin” properties if available; otherwise keep in Verisav/ISO.

For **semantic identification** of the material (AAS/ECLASS interop), we recommend an **optional “ECLASS material code”** field (IRDI value) alongside `materialName` .

3.2 Correspondence table (materialName → IRDI)

Each row gives the **recommended ECLASS preferred name** for search, the **typical ECLASS property** to target, and the **IRDI format** to use. The 6-character concept code is assigned by ECLASS and must be retrieved via the [ECLASS Content Search](#) (see § 3.4).

dpp:materialName (Verisav)	ECLASS preferred name (search)	Typical ECLASS property	IRDI value format	Current version (e.g.)
Aluminum / Aluminium	Aluminium	Base material / Material	0173-1#07-____#002	Replace _____ with concept code from value list (Content Search)
Steel / Acier	Steel	Base material / Material	0173-1#07-____#002	Same
Copper / Cuivre	Copper	Base material / Material	0173-1#07-____#002	Same
Plastic / Plastique	Plastic	Base material / Material	0173-1#07-____#002	Or subtypes: Polyethylene (PE), Polypropylene (PP), etc.
Glass / Verre	Glass	Base material / Material	0173-1#07-____#002	Same
Lithium (Battery)	Lithium	Base material / Material	0173-1#07-____#002	Or "Lithium compound" depending on property used
Gorilla Glass (reinforced glass)	Glass (then refine)	Base material / Material	0173-1#07-____#002	Often mapped to Glass or specific value if available
Plastic (Recycled)	Recycled plastic / Plastic	Base material / Material	0173-1#07-____#002	Check if "Recycled" value exists in list

Rule: The final IRDI has the form `0173-1#07-CCCCC#00X` where `CCCCC` is the 6-character concept code of the "value" element in the property's value list. The version `#00X` (e.g. 001, 002) depends on the ECLASS release.

3.4 How to obtain real IRDIs (procedure)

1. Open ECLASS Content Search

<https://eclass.eu/en/eclass-standard/search-content>

2. **Select** the release (e.g. Advanced, latest release) and language (EN or DE).

3. **Target "Values"** (and optionally "Properties" to find the "Base material" or "Material" property).

4. **Search** by term (e.g. "Aluminium", "Steel", "Base material"). In the results, open the property that holds the value list (e.g. "Base material") and copy the **IRDI** of the value (format `0173-1#07-CCCCC#00X`).

5. **Use** this IRDI in the `materialClassificationIRDI` field of the Verisav AAS template or in your RDF/JSON-LD export.

ECLASS reference: [Value \(structure\)](#) — TypeOfSE = 07 for values; [IRDI](#).

3.3 Where to Put the IRDI in Verisav / AAS

- **In the Verisav DPP/SAV AAS template:** The Submodel defines a **MaterialProvenance** collection with a `materialClassificationIRDI` (string) property. Use it for the ECLASS material IRDI (value or property, per your convention).
- **In Verisav RDF:** Until a property such as `dpp:materialClassificationCode` exists, you can:
 - expose the IRDI in a dedicated **JSON-LD or AAS fragment**, or
 - document an **extension** (e.g. owl:AnnotationProperty or another vocabulary) pointing to the IRDI until the DPP vocabulary evolves.

4. Worked Example (RDF → AAS with IRDI)

RDF (Verisav), excerpt:

```
<#material-aluminum> a dpp:MaterialProvenance ;
  dpp:materialName "Aluminum" ;
  dpp:massFraction 0.35 ;
  dpp:originCountry "FR" .
```

Equivalent in AAS Submodel (with optional IRDI):

- `materialName` = "Aluminum"
- `materialClassificationIRDI` = "0173-1#07-____#002" (replace `_____` with ECLASS concept code for value "Aluminium" — see § 3.4)
- `massFraction` = 0.35
- `originCountry` = "FR"

RDF ↔ AAS transformation can be implemented with a declarative mapping or a small script; the table above and the ECLASS portal support filling `materialClassificationIRDI` for common materials.

5. References

- **Verisav DPP:** <https://ns.verisav.fr/dpp> — DPP vocabulary README
- **ECLASS IRDI:** eclass.eu — Structure and elements (IRDI)
- **ECLASS Value (TypeOfSE 07):** eclass.eu — Value
- **ECLASS Content Search:** eclass.eu — Search content
- **ECLASS Release 16:** eclass.eu — Releases (material declaration block 0173-1#01-AKA421#001)
- **Catena-X CX-0044 ECLASS:** catenax-ev.github.io — CX-0044 (e.g. property 0173-1#02-AAO677#002)

- **IEC 63278-1:2023:** Asset Administration Shell structure
 - **Verisav AAS template:** docs/AAS_VERISAV_DPP_SAV/verisav-dpp-sav-submodel-template.json
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