



VDMA FLUID POWER

ECLASS for Fluid Power – A practical guide

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Executive Summary

ECLASS is a property- and class-based international standard for consistent product data. For fluid power (hydraulics and pneumatics), ECLASS enables interoperable, lifecycle-ready data models that can be used by enterprise systems and Industrial Digital Twins (Asset Administration Shell – AAS). This guide explains what ECLASS is, how to use it (including BASIC vs ADVANCED), where the fluid power content is stored (Segment 51) and where cross-domain content such as sensors is located, how ECLASS synchronizes with ISO/IEC dictionaries, who to contact, how to contribute changes, and two hands-on use cases (Digital Nameplate and Technical Datasheet).

1. What is ECLASS?

ECLASS provides a four-level classification (Segment – Main group – Group – Class) and a property dictionary with unique identifiers (IRDI). It complies with internationally recognized standards so that ECLASS users can rely on the quality and safety: The data model of the ECLASS Standard is based on the relevant ISO and IEC standards. Every structure element has a globally unique identifier (IRDI, ISO 29002).

BASIC vs. ADVANCED. BASIC delivers flat property lists per class (good for ERP/PIM and simple catalogs). ADVANCED adds structured modelling via Application Classes, Blocks, and Aspects, which are crucial for Industry 4.0 and AAS submodels.

Data formats & languages. ECLASS releases come in CSV/XML and multiple languages. Licenses or membership include both BASIC and ADVANCED exports.

2. Using ECLASS – Licensing & Technical Model

Licensing & pricing. Licenses are purchased via the ECLASS Shop; pricing tiers depend on company size (incl. >50% subsidiaries). Ordinary members receive releases and update files as part of the membership.

For research and educational purposes, the current ECLASS Release is offered for free of charge download via our Shop. The use of the Webservice for research and educational purposes is also free of charge. In both cases, please contact the ECLASS Head Office.

Technical model selection. For simple master data, start with BASIC. For lifecycle and AAS integrations, use ADVANCED to leverage Aspects (e.g., “Nameplate”) and Blocks, enabling reuse and consistency across classes.

3. Fluid Power in ECLASS – Content & Structure

Segment 51 “Fluid Power”. Fluid power content is organized under Segment 51 with hydraulics and pneumatics product classes. Example in production use: “Suction filter, tank mounting (hydraulics)” coded as 51-52-03-01.

Cross-domain content (Sensors). Sensors are usually found in segment 27 (electrical engineering, automation, process control) under 27-27 ‘Sensor technology’.

Why ADVANCED matters in fluid power. Fluid power products are combined into diverse systems. Structured ADVANCED modelling with Aspects/Blocks supports system-level re-use and clean AAS mappings for nameplate, handover, parameters, and technical data.

4. Special features of Fluid Power compared to other ECLASS Segments

Lifecycle & system orientation. Fluid power requires consistent data from component to system levels, often spanning multiple segments (e.g., mechatronics, sensors). This increases the importance of Aspects and Blocks for applicability and interoperability.

ISO anchoring. Fluid power classes and properties are aligned with ISO references (e.g., ISO 18582-2 for pneumatics terminology and properties) to ensure consistency, which is not equally strong in all other segments.

5. Synchronization with ISO/IEC and the AAS (IDTA)

ISO 13584-42 and IEC 61360 alignment. ECLASS follows ISO 13584-42 and IEC 61360 principles (classes/properties, IRDI, advanced constructs), enabling consistent mapping to the IEC CDD (Content Development Platform) and toolchains.

ISO 18582 & ISO 5598 in fluid power. Fluid-power-specific ISO standards provide vocabulary and reference dictionaries used to structure the ECLASS content.

AAS / IDTA. ECLASS properties are directly referenced in AAS submodels. The ECLASS “Asset.xml” bundles Aspects like “Nameplate” and “Handover documentation” for plug-in use with AAS servers and dashboards.

6. Who to Contact

ECLASS Head Office (general content & licensing): info@eclass.de, +49 (0)221 4981 811 (Cologne).

VDMA Fluid Power (coordination & standardization in the sector):

Standardization/ECLASS/ISO coordination: Jörn Dürer; Digitization & AAS: Dr Christian Geis.

7. How to Contribute or Change ECLASS Content

Change Requests (CR) via CDP. Submit proposals in the ECLASS ContentDevelopmentPlatform (CDP). CRs undergo formal checks and expert-group review (e.g., EG 51).

Best practice to avoid rework. Coordinate drafts in the VDMA working groups before CDP submission; include definitions, data types, units, and cross-references to ISO/AAS where relevant.

8. Use Cases & Step-by-Step

A) Digital Nameplate (AAS submodel)

Steps:

- Identify the ECLASS class of your product (e.g., pump, valve, filter) in Segment 51.
- Download/consult the ECLASS Asset.xml to reuse the "Nameplate" Aspect (pre-bundled IRDIs).
- Fill the AAS "Nameplate" submodel with the referenced ECLASS IRDIs and values; validate in your AAS server/viewer.
- Optional: combining with "Handover documentation" Aspect for commissioning and transfer.

Tip: Publish a QR code on the device that redirects to the AAS endpoint. Demonstrators at Hannover Messe proved cross-vendor feasibility.

B) Technical Datasheet from ECLASS Data

Steps:

- Use the free ECLASS content search to inspect classes/properties; acquire the licensed CSV/XML for production use.
- Map ECLASS IRDIs to your PIM/PLM. For complex products, model ADVANCED Blocks to structure repeated property groups.
- Auto-generate datasheets (PDF/HTML) with IRDI references for each field to keep them machine-readable.
- Maintain a change log tied to ECLASS release versions to track property set evolution.

9. Quick Start Checklist

- Decide BASIC (flat) vs ADVANCED (structured) based on your downstream use (ERP/PIM vs AAS/automation).
- Locate your classes in Segment 51; identify cross-domain dependencies (e.g., sensors in Segment 27).
- Set up a governance flow: VDMA working group review → ECLASS CDP CR submission.

- Plan for licensing/membership; align the ECLASS release cadence with your internal data model versioning.
- Pilot with two products: create AAS Nameplate submodels and generate technical datasheets from ECLASS data.

Annex - EXAMPLES

Nameplate

AAS Nameplate (ECLASS-mapped)

Property	ECLASS IRDI
Manufacturer name	0173-1#02-AAO677#004
Manufacturer product designation	0173-1#02-AAW338#003
Address	0173-1#02-AAW338#001
Manufacturer Product Family	0173-1#02-AAU731#001
Serial Number	0173-1#02-AAM556#004
Country	0173-1#02-AAO259#007
Year of construction	0173-1#02-AAP906#001
Specific properties	Several properties available

Axial Piston Pump, Bent Axis Design, variable

Technical Datasheet Template Examples

- Nominal size (ECLASS IRDI: 0173-1#02-ABL783#001)
- Rated pressure (ECLASS IRDI: 0173-1#02-ABL809#001)
- Nominal hydraulic power (ECLASS IRDI: 0173-1#02-ABC682#003)
- Nominal mechanical power (ECLASS IRDI: 0173-1#02-ABC692#003)
- Specified maximum rotational speed (ECLASS IRDI: 0173-1#02-ABL787#001)
- Nominal flow rate (ECLASS IRDI: 0173-1#02-ABC551#003)
- Mounting dimension (ECLASS IRDI: 0173-1#02-ABL806#001)

Proportional directional control valve, spool design

Technical Datasheet Template Examples

- Rated pressure (ECLASS IRDI: 0173-1#02-ABL809#001)
- Number of flow paths (ECLASS IRDI: 0173-1#02-ABC962#003)
- Specified maximum electrical power consumption (ECLASS IRDI: 0173-1#02-ABC673#003)
- Specified maximum flow rate (ECLASS IRDI: 0173-1#02-ABC550#003)
- Mounting pattern (0173-1#02-AAZ405#003)
- Specified maximum ambient temperature (ECLASS IRDI: 0173-1#02-ABC746#003)



Contact:

Jörn Dürer
VDMA Fluid Power
Lyoner Str. 18
60528 Frankfurt am Main
Germany
joern.duerer@vdma.eu

Authors:

Jörn Dürer & Dr. Christian Geis, VDMA Fluid Power

vdma.eu