Digital DoPC

Enabling DPP interoperability with BIM

Espen Schulze, CEN/TC 442

Espen Schulze

Group VP Research, Cobuilder

- Expert in numerous standardization projects in CEN and ISO
- CEN/TC 442
  - Convenor WG12 – Digital DoPC
  - Project leader in WG 7 – Methodology for CEN TCs
  - Project leader of EN ISO 23387 – Data templates
- CEN/CLC/JTC 24 – Digital Product Passport
- Member of buildingSMART Product Domain Steering Committee

A European Green Deal

Striving to be the first climate-neutral continent

Climate change is the biggest challenge of our times.
And it is an opportunity to build a new economic model.

Ecodesign for Sustainable Products Regulation (ESPR)

Making sustainable products in the EU the norm

- the cornerstone of the European Commission's approach to more environmentally sustainable and circular products
  - framework for the setting of **ecodesign requirements**
  - aim of improving the environmental sustainability of products in order to make **sustainable products the norm**
  - reduce the overall **carbon footprint**
  - ensuring the **free movement of sustainable products** within the internal market

Ecodesign for Sustainable Products Regulation (ESPR)

Making sustainable products in the EU the norm

- This Regulation also establishes a **Digital Product Passport (DPP)**

'digital product passport' *means a set of data specific to a product that includes the information specified in the applicable delegated act adopted pursuant to Article 4 and that is accessible via electronic means through a data carrier in accordance with Chapter III;*

(New) Construction Products Regulation

Digital Product Passport

(including Declaration of Performance and Conformity)

Article 75
Construction digital product passport system

The construction digital product passport system shall:

- *be compatible, interoperable and built on the digital product passport established by the regulation (EU) .../... [Regulation on eco design for sustainable products], without compromising interoperability with Building Information Modelling (BIM) while taking into account the specific characteristics and requirements related to construction products;*

Article 77
General requirements for the product passport

all information included in the product passport shall be based on open standards, developed with an interoperable format and shall be, as appropriate, machine-readable, structured, searchable and transferable

(New) Construction Products Regulation

Implementing digitalization through the use of **data dictionary** and **machine-readable format**

It is necessary to establish well-functioning information flows, including via electronic means and in a machine-readable format
Whereas: (4)

To improve machine readability, it is necessary to establish ***a common data dictionary*** *based on European standards, a tool to govern and publish the data structure and their meaningful definitions and descriptions for all relevant construction products. For each product family or category, the data dictionary should include all the essential characteristics and other properties as set out in the harmonised technical specifications as well as other information required according to this regulation. A data dictionary harmonised at the EU level allows for the classification and use of structured definitions by both competent national authorities and in the further digitalisation of the construction sector, in particular in Building Information Modelling, building logbooks, digital passports and registries.*
Whereas: (84a)

BIM standards supporting **Digital Product Passport**

Horisontal (cross-domains) technical framework

- EN ISO 23386 — Expert process, meta data
- EN ISO 23387 — Data templates
- EN ISO 12006-3 — Data dictionaries

Methodology to support domain specific development - **format independent**

- WI 00442061 — Digital DoPC
- WI 00442051 — Guideline for TC
- EN ISO 22057 — Digital EPD

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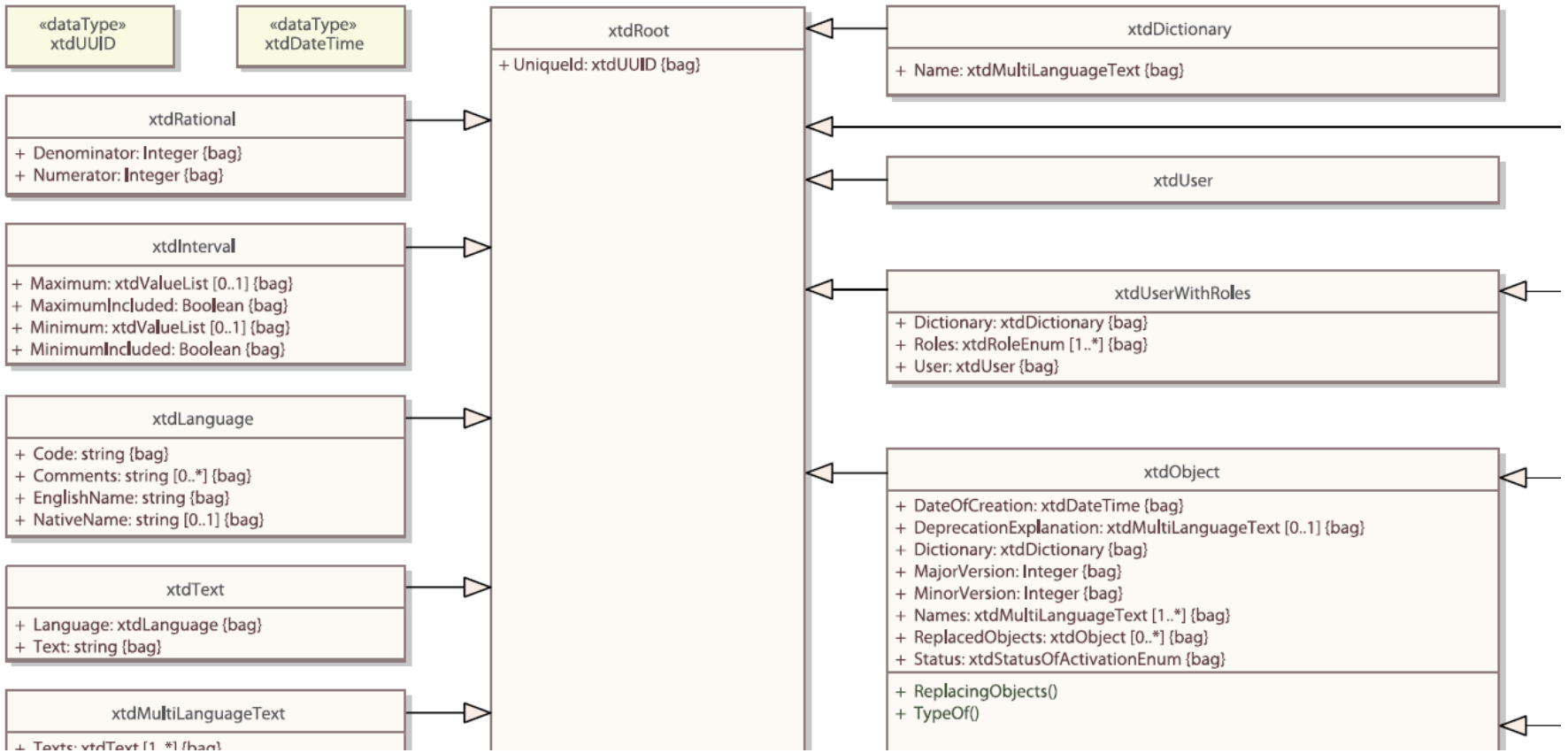
EN ISO 12006-3 – data model for data dictionary implementations

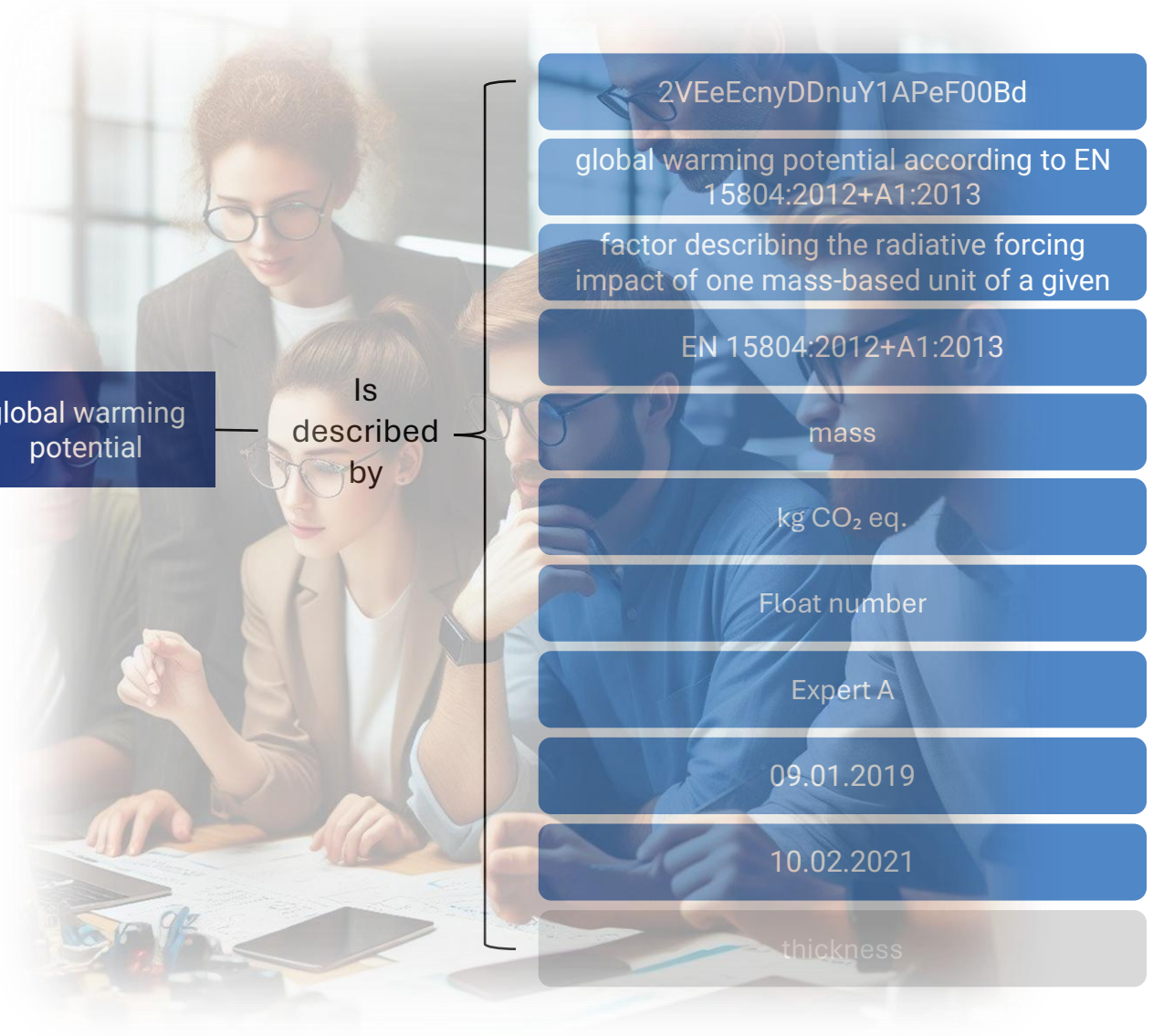


EN ISO 23386 is a standard about ‘properties’ made by domain experts

EN ISO 23386

property — Is described by

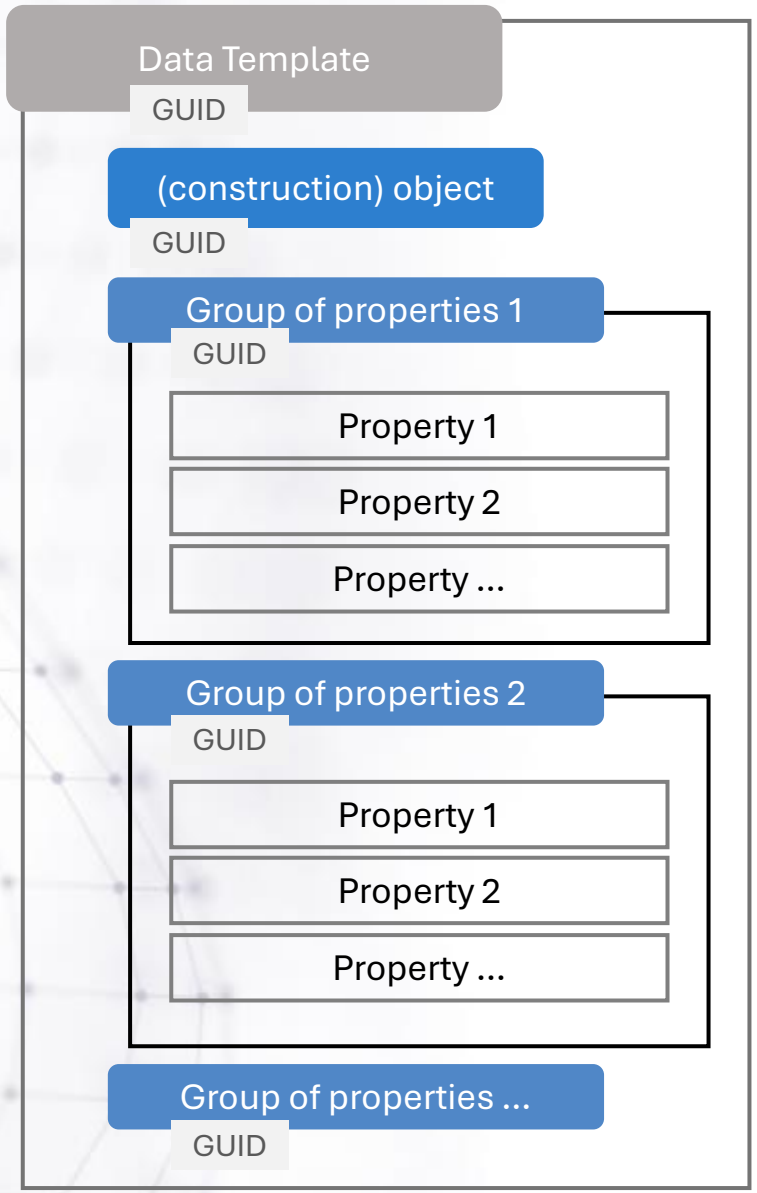
- GUID
- Name
- Definition
- Reference document
- Quantity
- Unit
- Data type
- Creator
- Date of creation
- Date of revision
- Connected properties

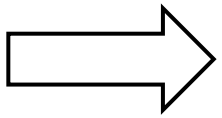


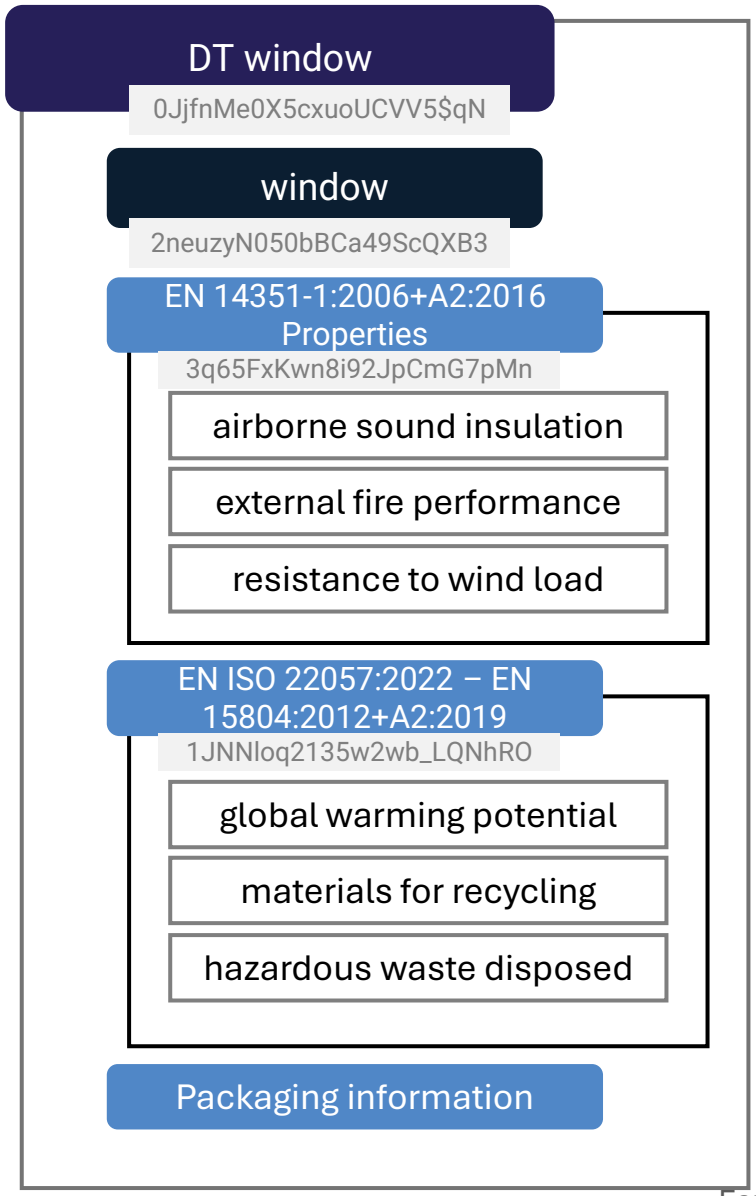
global warming potential — Is described by

- 2VEeEcnyDDnuY1APeF00Bd
- global warming potential according to EN 15804:2012+A1:2013
- factor describing the radiative forcing impact of one mass-based unit of a given
- EN 15804:2012+A1:2013
- mass
- kg CO_2 eq.
- Float number
- Expert A
- 09.01.2019
- 10.02.2021
- thickness

EN ISO 23387 is a standard about ‘data templates’







Methodology for CEN technical committees

TC 442/WG 7 — Horizontal role → TC XXX

Technical framework

- EN ISO 23386
- EN ISO 23387

Expert process

Data model

Methodology (guideline)

WI 00442051

Property table

Name	Definition	Short name	Symbol	Reference document	Quantity kind	Unit	Data type	Possible values	Boundary values	Proxy dependency
maximum hardware operating torque [finger operated] acc. to EN 12046-2				EN 12046-2	torque	Nm	real	user input		
water tightness				EN 14351-1:2006+A2:2016	Inherited	Inherited	Inherited	Inherited	Inherited	classification of water tightness [method A] acc. to EN 1 of water tightness [method B] acc. to EN 12208:1999
classification of water tightness [method A] acc. to EN 12208:1999				EN 12208:1999	nominal	unitless	string	1A; 2A; 3A; 4A; 5A; 6A; 7A; 8A; 9A; E750; E900; E1050; E1200; E1350; E1500; E1650; E1800		
classification of water tightness [method B] acc. to EN 12208:1999				EN 12208:1999	nominal	unitless	string	1B; 2B; 3B; 4B; 5B; 6B; 7B		
water tightness test result acc. to EN 1027:2016				EN 1027:2016	logical	unitless	boolean	pass; fail		
test pressure acc. to EN 1027:2016				EN 1027:2016	pressure	Pa	real	0; 50; 100; 150; 200; 250; 300; 450; 600; 750; 900; 1050; 1200; 1350; 1500; 1650; 1800		
air permeability				EN 14351-1:2006+A2:2016	Inherited	Inherited	Inherited	Inherited	Inherited	classification of air permeability acc. to EN 12210:2016
classification of air permeability acc. to EN 12207:2016				EN 12207:2016	nominal	unitless	string	1; 2; 3; 4		
classification of air permeability related to overall area acc. to EN 12207:2016				EN 12207:2016	nominal	unitless	string	1; 2; 3; 4		
air permeability related to overall area acc. to EN 12207:2016				EN 12207:2016	volume flow surface density	m3/(m2 h)	real	formula		
overall area acc. to EN 12207:2016				EN 12207:2016	area	m2	real	user input		
classification of air permeability related to the length of opening joints acc. to EN 12207:2016				EN 12207:2016	nominal	unitless	string	1; 2; 3; 4		
air permeability related to the length of opening joints acc. to EN 12207:2016				EN 12207:2016	volume flow line density	m3/(m h)	real	formula		
length of opening joints acc. to EN 12207:2016				EN 12207:2016	length	m	real	user input		
air permeability acc. to EN 1026:2016				EN 1026:2016	volume flow	m3/h	real	user input		
total solar energy transmittance		solar factor	g g'	EN 14351-1:2006+A2:2016	Inherited	Inherited	Inherited	Inherited	Inherited	total solar energy transmittance acc. to EN 410:2011; tot transmittance acc. to EN ISO 52022-3:2017
glazing side ID				EN 14351-1:2006+A2:2016	nominal	unitless	string	NULL, left, right		

EPD for BIM

TC 442

Technical framework

EN ISO 23386

EN ISO 23387

Expert process

Data model

EN ISO 22057

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EPD property table

Name	Description	GUID	Unit
iotic depletion potential for fossil sources	defines the decreasing availability of non - renewable resources as a result of their extraction and underlaying scarcity, relating to fossil fuels	3gHt8EnXf4iP2_NVmtSsAW	MJ, net calorific value
iotic depletion potential for non-fossil sources - minerals and metals	defines the decreasing availability of non - renewable resources as a result of their extraction and underlaying scarcity, relating to scarce elements and their ores	3eENUk7RLAZB0VprsH6p2Q	kg Sb eq
idification potential, accumulated ceedance	a measure of the acidification caused to land and water from emissions to air of acidifying substances	2cKXEcnKH2Hx7g$LXSdXX0	mol H^+ eq
pletion potential of the stratospheric one layer	the relative amount of degradation to the ozone layer a product can cause	0R6QcQZJnBqO_cgaZRe09x	kg CFC 11 eq
trophication potential, accumulated ceedance	a measure of the eutrophication caused by emissions	0bxI3NxmHBGhEnAKvHn0gJ	mol N eq
trophication potential, fraction of trients reaching freshwater end mpartment	a measure of the eutrophication caused by emissions reaching freshwater	0fHDpX02rBe90OnECvCyZ9	kg $(PO_4)^{3-}$ eq
trophication potential, fraction of trients reaching marine end mpartment	a measure of the eutrophication caused by emissions reaching marine water	0jIKukBtDF3BVectVvcKJz	kg N eq
bal warming potential - biogenic	covers carbon emissions to air (CO2, CO and CH4) originating from the oxidation and/or reduction of aboveground biomass by means of its transformation or degradation (e.g. combustion, digestion, composting, landfilling) and CO2 uptake from the atmosphere through photosynthesis during biomass growth – i.e. corresponding to the carbon content of products, biofuels or above ground plant residues such as litter and dead wood	1l3TyajTP5AAjWIWyoXlj8	kg CO_2 eq(100 years)
bal warming potential - fossil fuels	it covers greenhouse gas (GHG) emissions to any media originating from the oxidation and/or reduction of fossil fuels by means of their transformation or degradation (e.g. combustion, digestion, landfilling, etc.)	2madygVA50I8lkpTzIuxd6	kg CO_2 eq(100 years)
bal warming potential - land use and d use change	factor describing the potential radiative forcing impact of carbon uptakes and emissions (CO2, CO and CH4) originating from carbon stock changes caused by land use change and land use over a given period of time	0LUvsLL_L17w6_kQbr$wYH	kg CO_2 eq(100 years)
bal warming potential - total	it accounts for the total global warming potential arising from fossil, biogenic and land use and land use change emissions	0q8OlTYA9AMQ262TdhWLUy	kg CO_2 eq(100 years)

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Digital structure for Declaration of Performance and Conformity (DoPC)

TC 442/WG 12

European Commission

TC XXX

Technical framework

EN ISO 23386

EN ISO 23387

WI 00442051

EN ISO 22057

Expert process

Data model

Methodology

Digital DoPC

WI 00442061

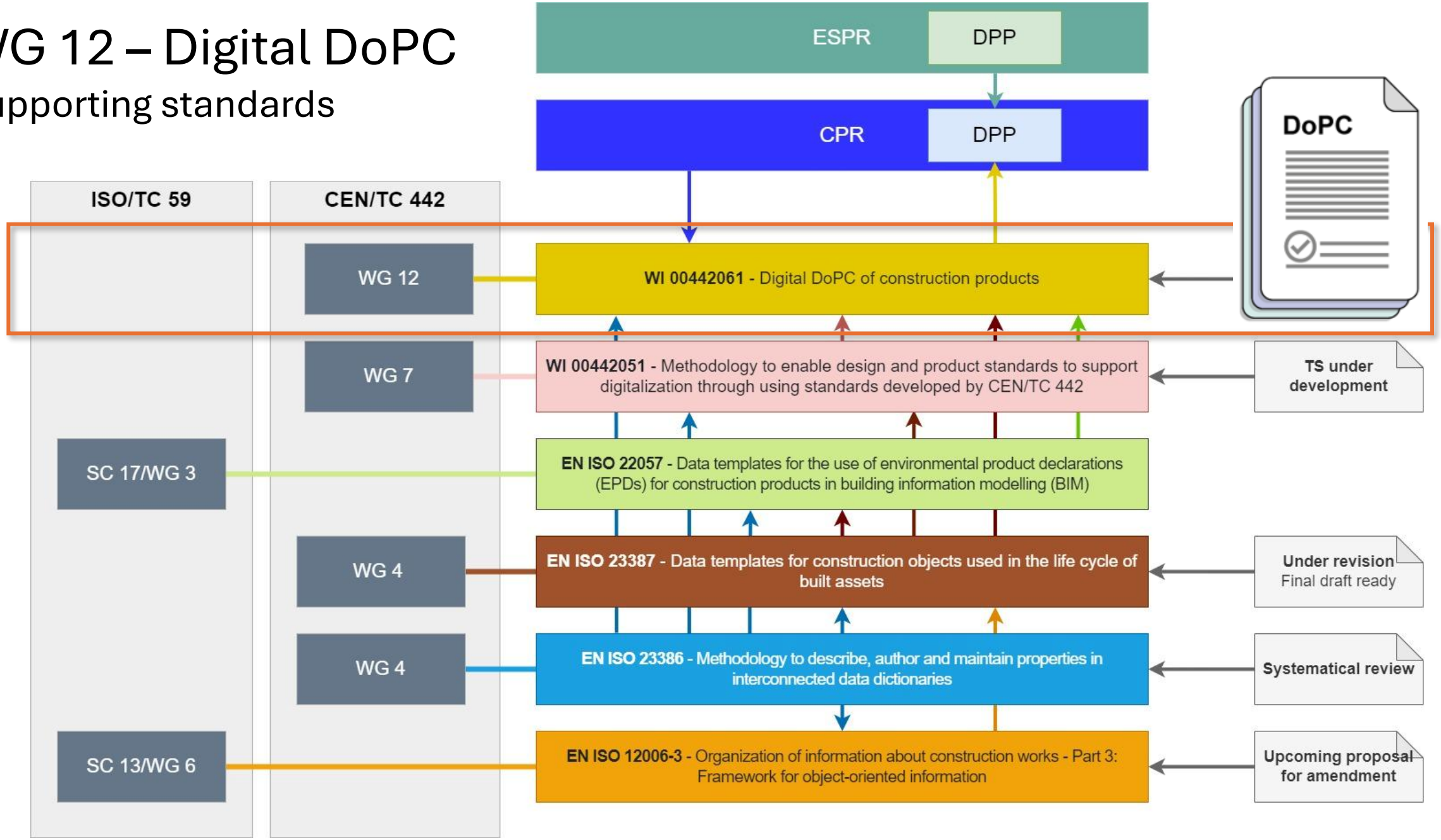
DoPC table (to be developed)

Essential characteristic <Name>	Property level 1 <Name>	Property level 2 <Name>	<Reference Document>	Declaration <Name>	<Value>	<Unit>	<Relation>
Compressive strength	Perpendicular to bed faces	type of specimen	EN 771-2	type	whole unit	unitless	category
		category	EN 771-2	category	I	unitless	category
		mean	EN 772-1	value	18.75	N/mm^2	greater than or equal to
		normalised	EN 772-1	value	15.33	N/mm^2	greater than or equal to
		AVCP		system	2+	unitless	category
	Perpendicular to header	type of specimen	EN 771-2	type		unitless	category
		category	EN 771-2	category		unitless	category
		mean	EN 772-1	value		N/mm^2	greater than or equal to
		normalised	EN 772-1	value		N/mm^2	greater than or equal to
		AVCP		system	2+	unitless	category
	Perpendicular to bed	type of specimen	EN 771-2	type		unitless	category
		category	EN 771-2	category		unitless	category
		mean	EN 772-1	value		N/mm^2	greater than or equal to
		normalised	EN 772-1	value		N/mm^2	greater than or equal to
		AVCP		system	2+	unitless	category

Table from CWA 17316:2018

WG 12 – Digital DoPC

Supporting standards



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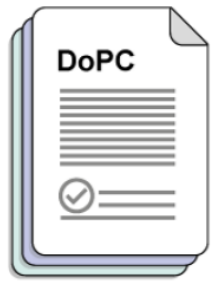
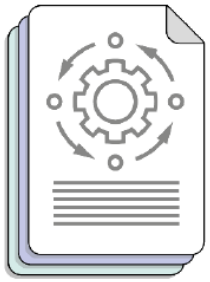
DPP content

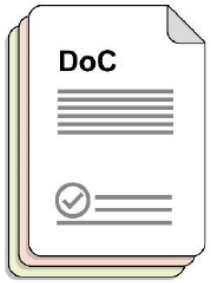


Declaration of performance and conformity

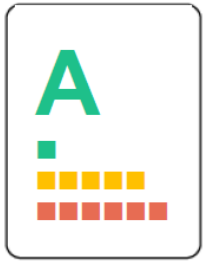
General product information, instructions for use and safety information



Technical documentation



Documentation required under other Union law



Label (when applicable)

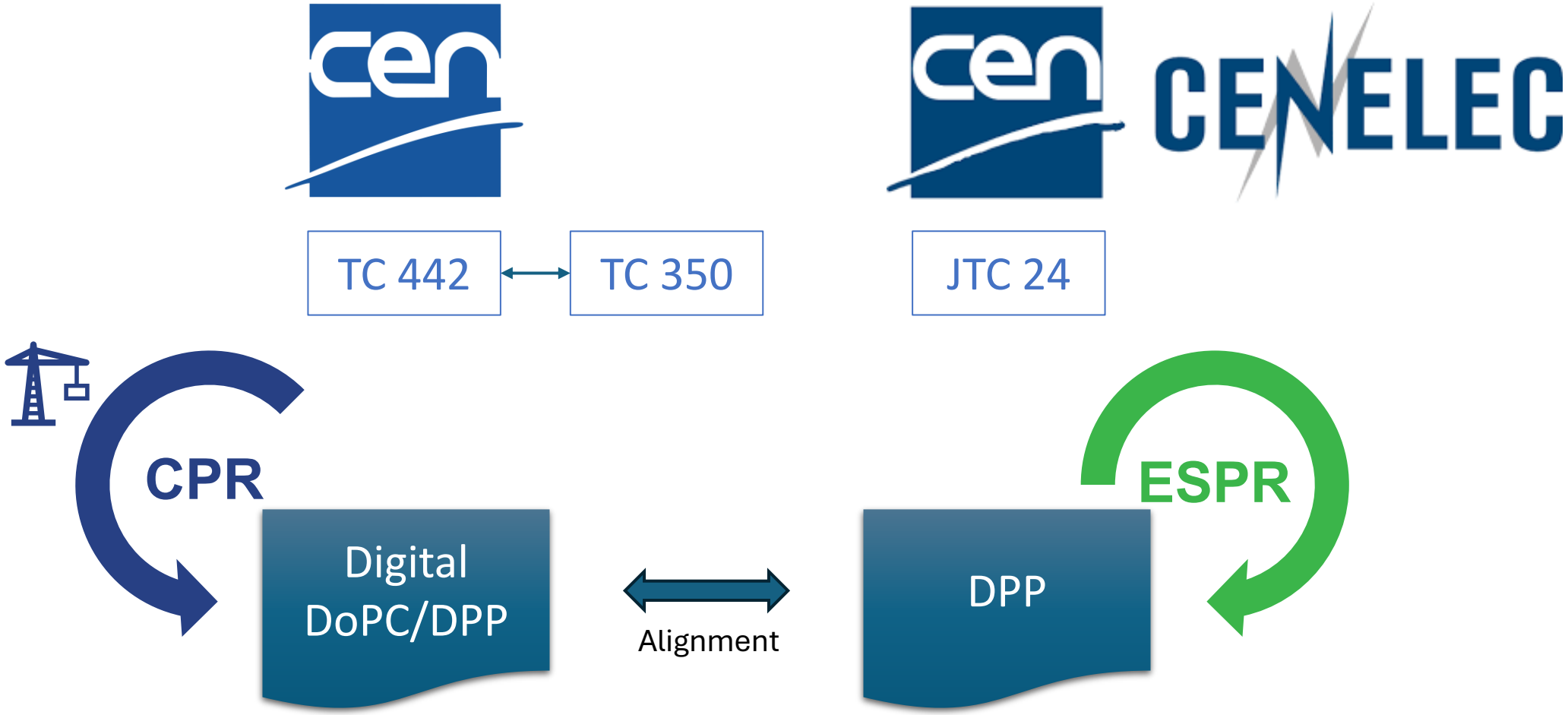
Unique product identifier
dpp:GTIN:**3234567890126**

Unique operator identifier
dpp:VAT:**AT U14589505**

Unique facility identifier
dpp:ISO3166-2:**BE**

Data carriers
Key parts

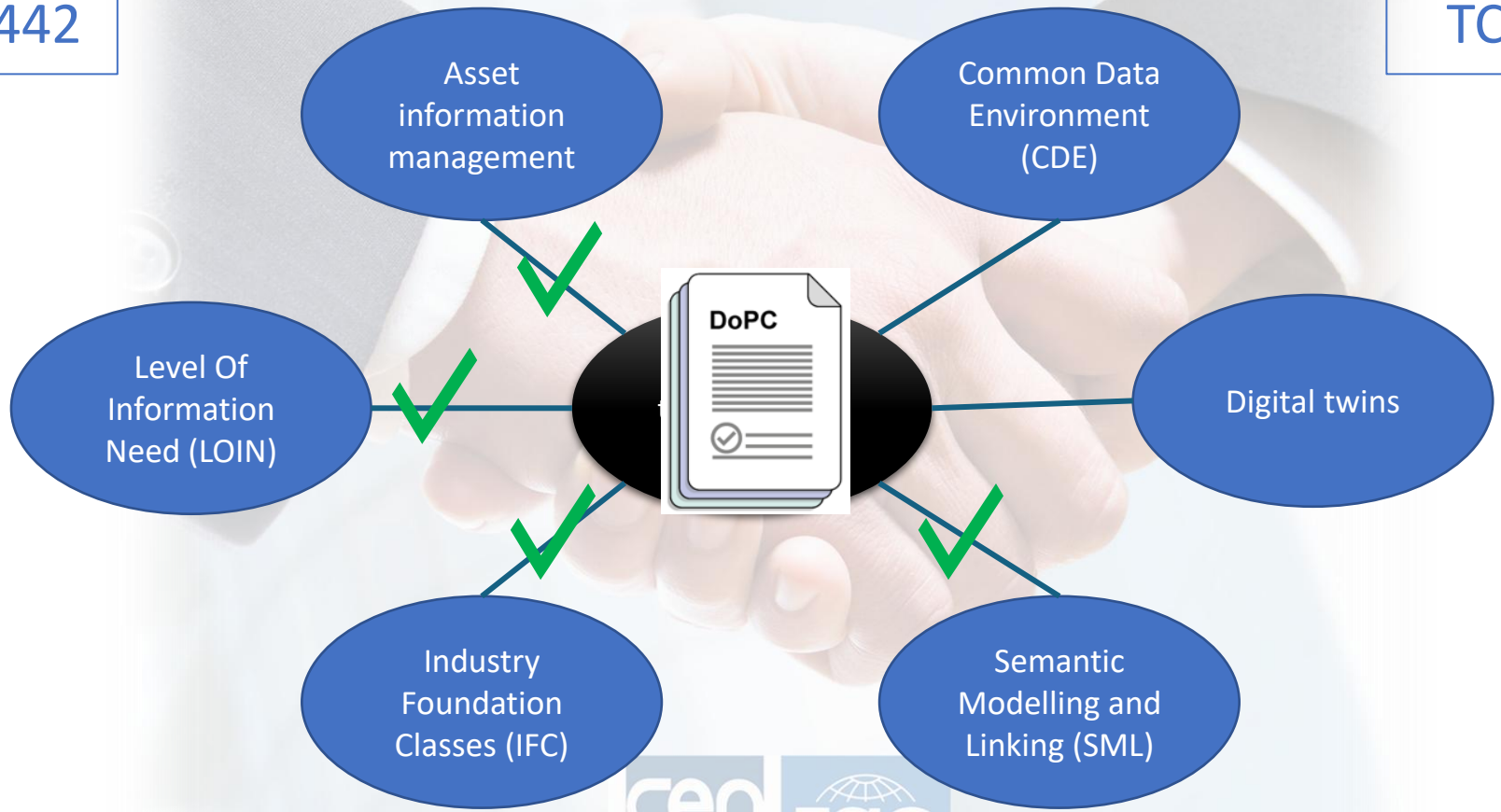
European Commission


TC 442
TC 350
JTC 24
CPR
Digital
DoPC/DPP
Alignment
DPP
ESPR

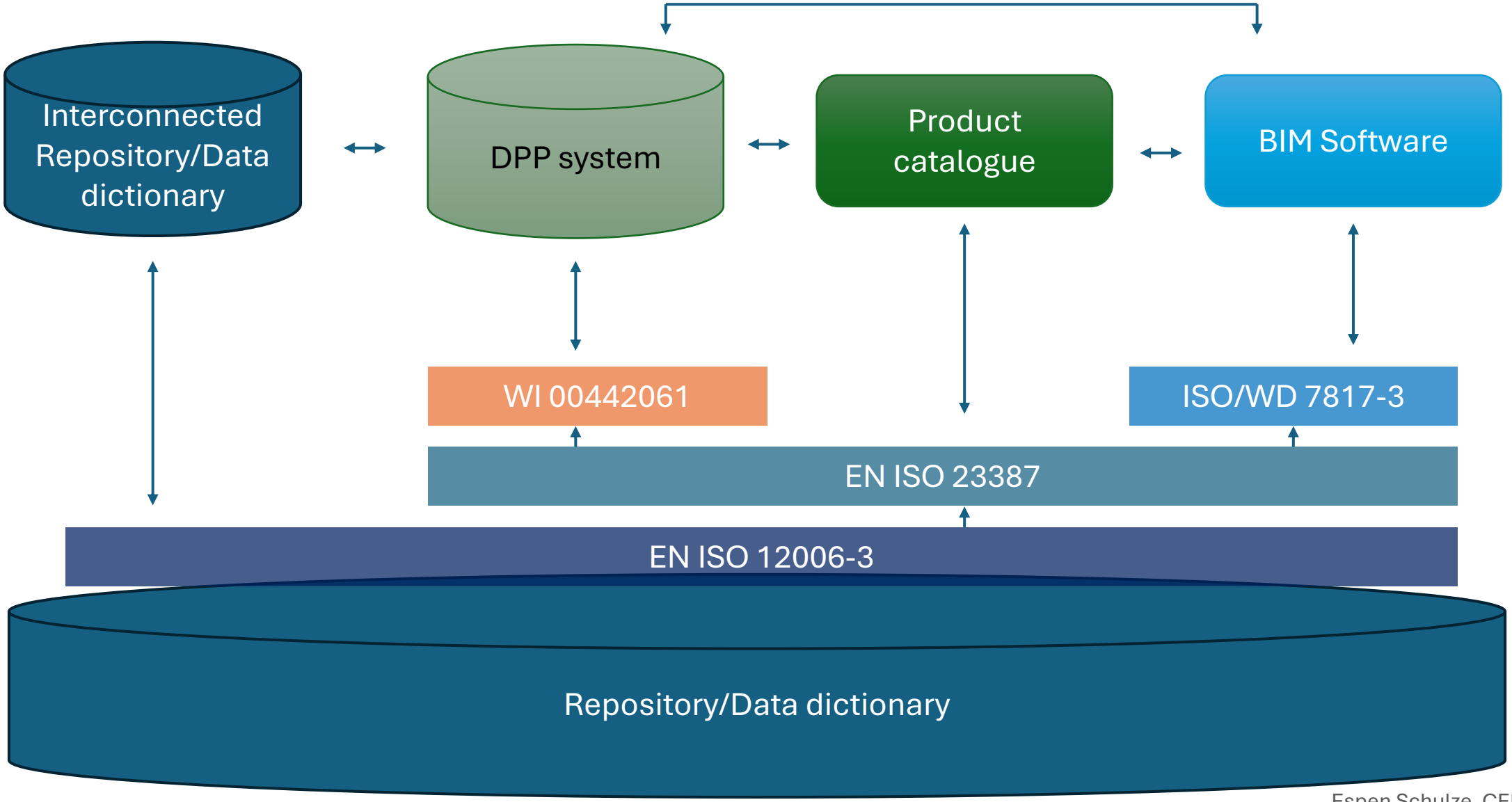
DPP shall be interoperable with BIM

TC 442

TC 59



BIM standards implementation



Thank you!

Contact me for further information and discussions

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