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Norwegian Institute for Sustainability Research

Nordic Climate Forum for Construction, 08.09.2022

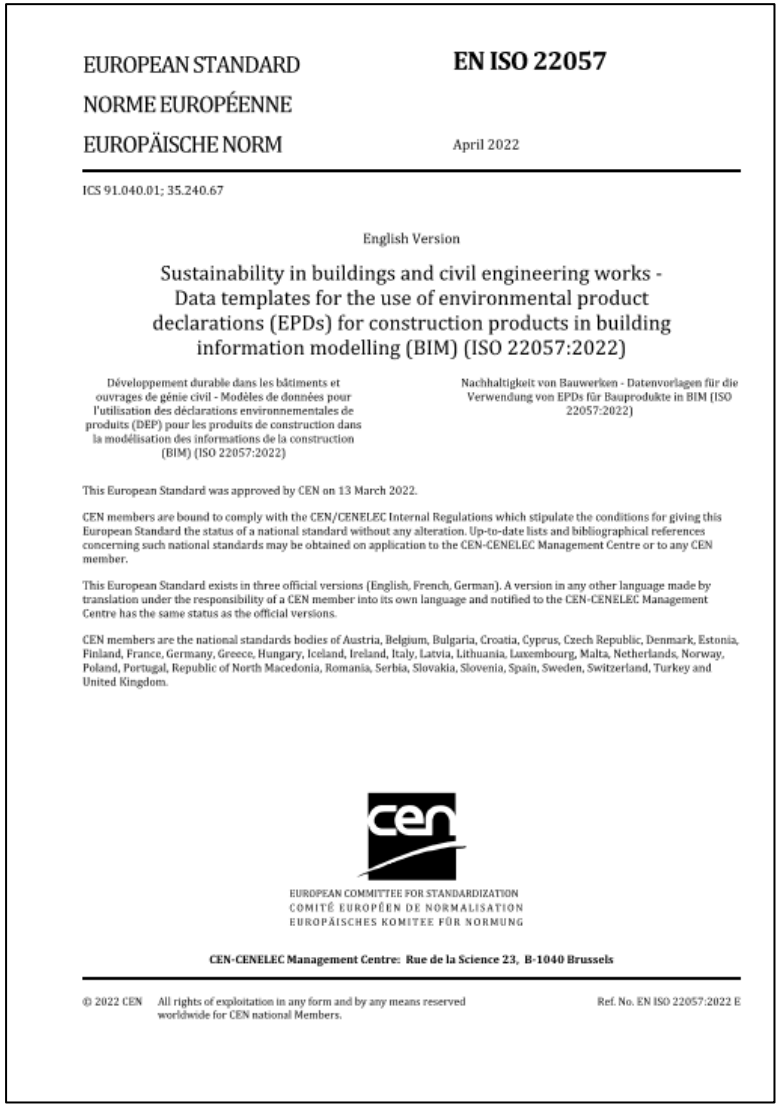
The new standard **“ISO 22057 Data templates for the use of environmental product declarations (EPDs) for construction products in building information modelling (BIM)”**

Anne Rønning

PhD, senior research scientist, NORSUS

EN ISO 22057 Data templates for the use of EPDs for construction products in BIM

- Why is this standard needed
- How it technical solve machine readability and machine interpretabillity



EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 22057

April 2022

ICS 91.040.01; 35.240.67

English Version

Sustainability in buildings and civil engineering works - Data templates for the use of environmental product declarations (EPDs) for construction products in building information modelling (BIM) (ISO 22057:2022)

Développement durable dans les bâtiments et ouvrages de génie civil - Modèles de données pour l'utilisation des déclarations environnementales de produits (DEP) pour les produits de construction dans la modélisation des informations de la construction (BIM) (ISO 22057:2022)

Nachhaltigkeit von Bauwerken - Datenvorlagen für die Verwendung von EPDs für Bauprodukte in BIM (ISO 22057:2022)

This European Standard was approved by CEN on 13 March 2022.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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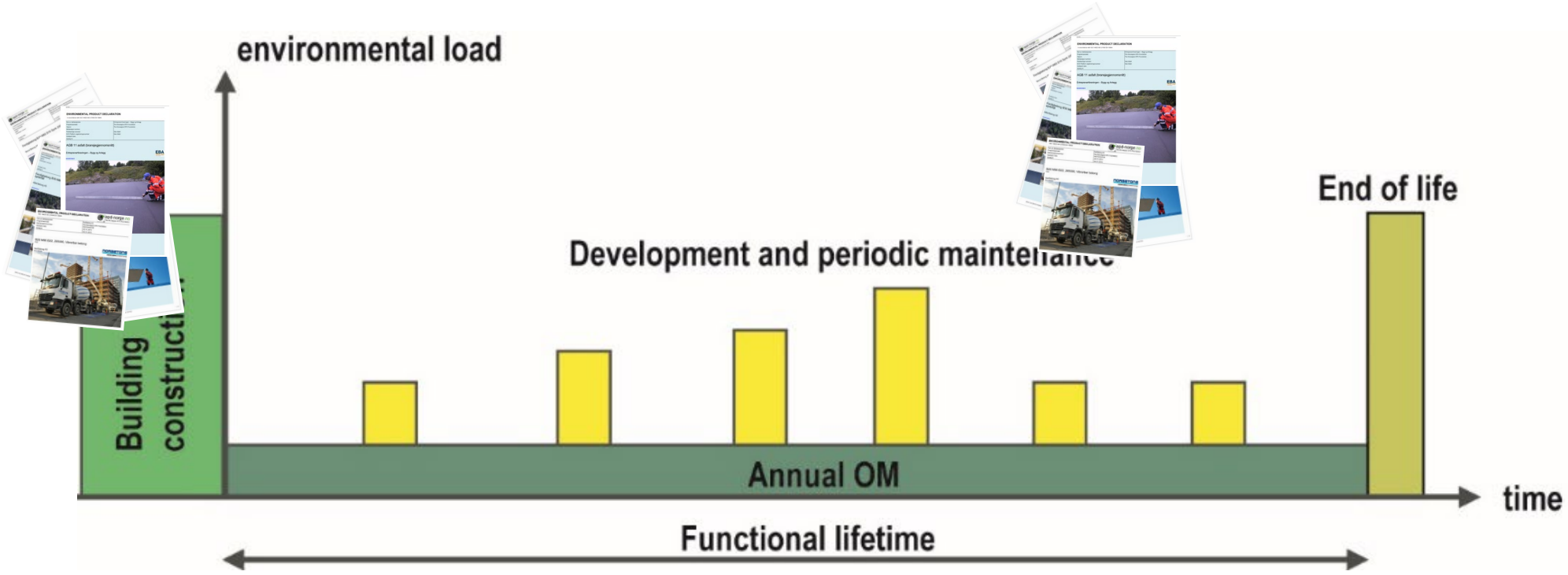
CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN ISO 22057:2022 E

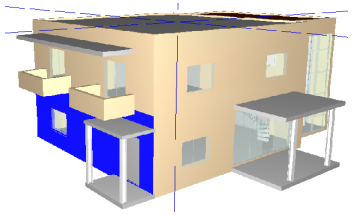
Stepwise development of EPD

1. Static document
2. Digital EPD: machine-readable, but need man-interpretation and often re-calculation of e.g. scenarios by experts
3. ISO 22057: Machine readable AND machine interpretable.

The goal is environmetal assessent of construction works – EPDs are the data source for this assessment

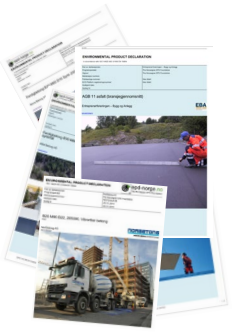


Product and building level – how to transfer data

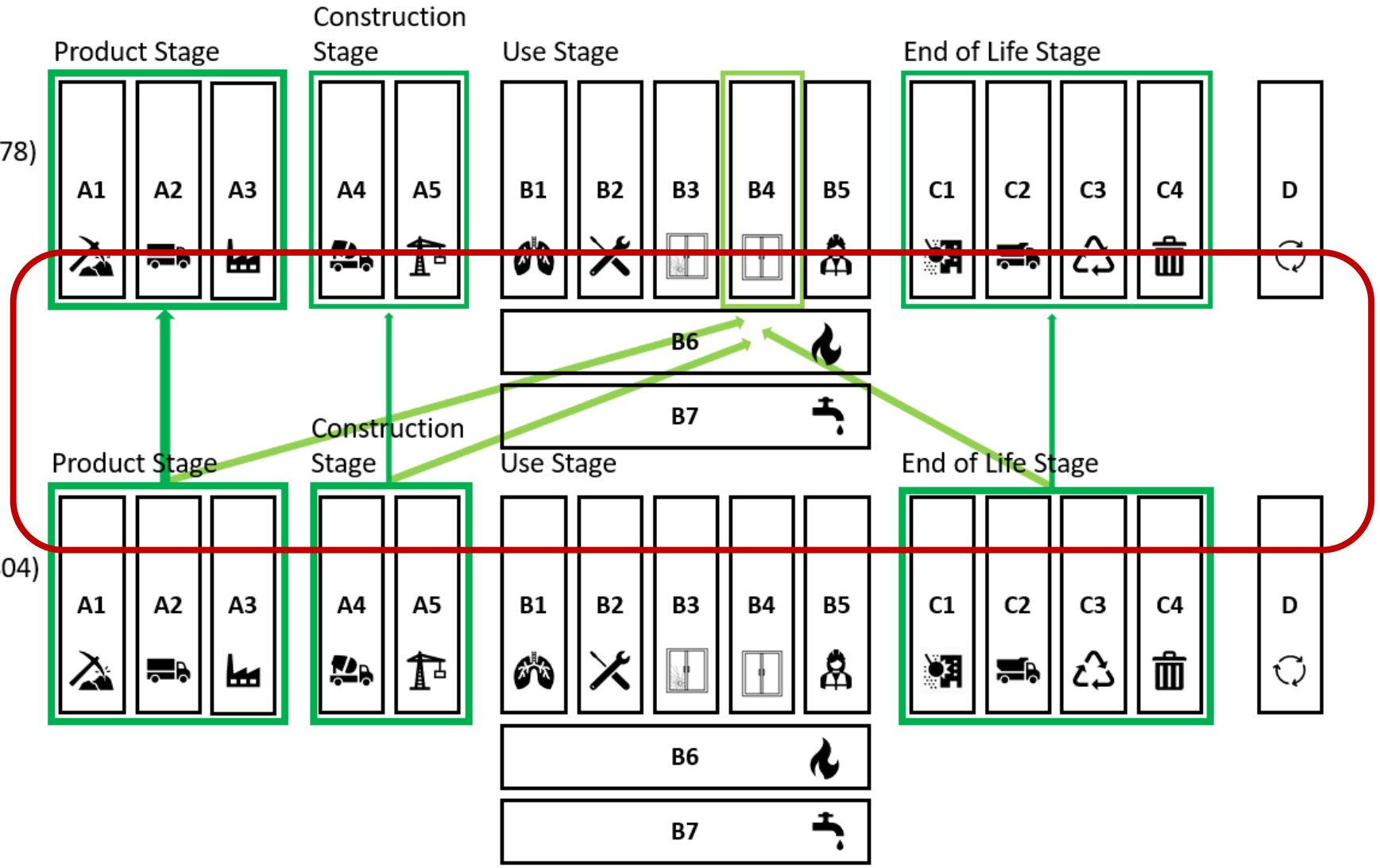


Building Level)
(LCA to EN 15978)

EN ISO 22057



Product Level)
(EPD to EN 15804)



Vienna agreement

ISO/TC 59/SC 17

CEN/TC 350

EN ISO 22057

INTERNATIONAL STANDARD

ISO 21930

Second edition
2017-07

Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services

Développement durable dans les bâtiments et les ouvrages de génie civil — Règles principales pour les déclarations environnementales des produits de construction et des services

Reference number
ISO 21930:2017(E)

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EUROPEAN STANDARD
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EN ISO 22057

April 2022

ICS 91.040.01; 35.240.67

English Version

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Développement durable dans les bâtiments et ouvrages de génie civil - Modèles de données pour l'utilisation des déclarations environnementales de produits (DEP) pour les produits de construction dans la modélisation des informations de la construction (BIM) (ISO 22057:2022)

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Ref. No. EN ISO 22057:2022 E

Norsk Standard

NS-EN 15804:2012+A2:2019

Publisert: 2019-12-01

Språk: Engelsk

Bærekraftige byggverk
Miljødeklarasjoner
Grunnleggende produktkategoriregler for byggevarer

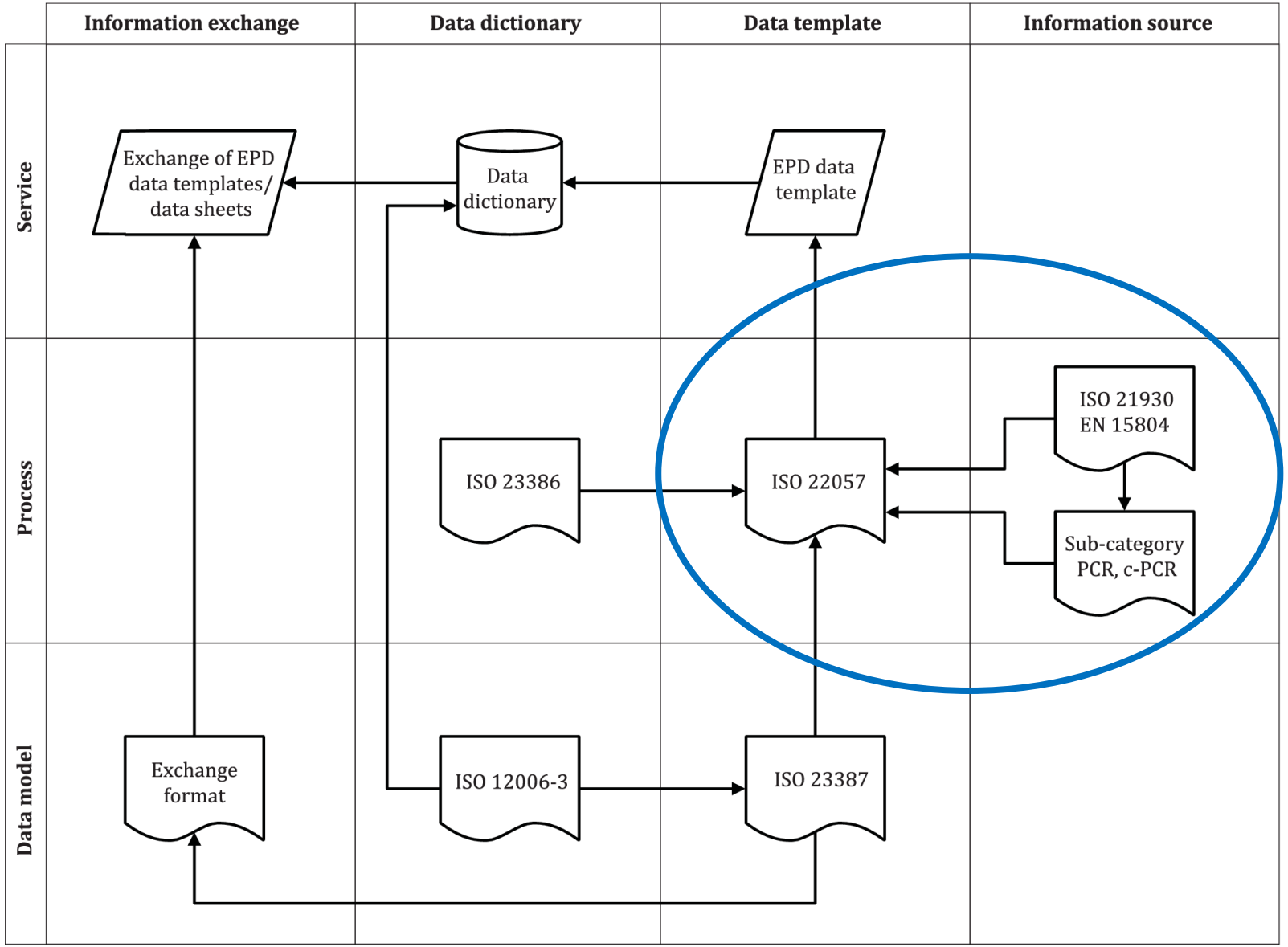
Sustainability of construction works
Environmental product declarations
Core rules for the product category of construction products

standard norge

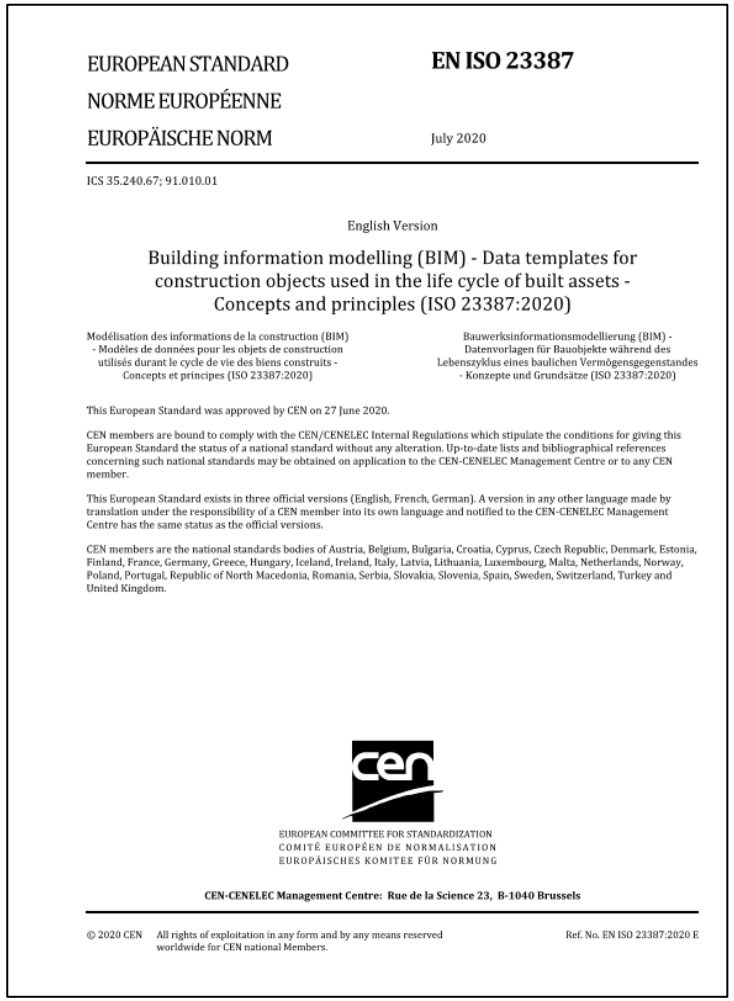
Referansenummer:
NS-EN 15804:2012+A2:2019 (en)

© Standard Norge 2019

Relationship between BIM standards and sustainability standards



EN ISO 23387 – Data structure for data templates



EUROPEAN STANDARD
NORME EUROPÉENNE
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EN ISO 23387

July 2020

ICS 35.240.67; 91.010.01

English Version

Building information modelling (BIM) - Data templates for construction objects used in the life cycle of built assets - Concepts and principles (ISO 23387:2020)

Modélisation des informations de la construction (BIM) - Modèles de données pour les objets de construction utilisés durant le cycle de vie des biens construits - Concepts et principes (ISO 23387:2020)

Bauwerksinformationsmodellierung (BIM) - Datenvorlagen für Bauobjekte während des Lebenszyklus eines baulichen Vermögensgegenstandes - Konzepte und Grundsätze (ISO 23387:2020)

This European Standard was approved by CEN on 27 June 2020.

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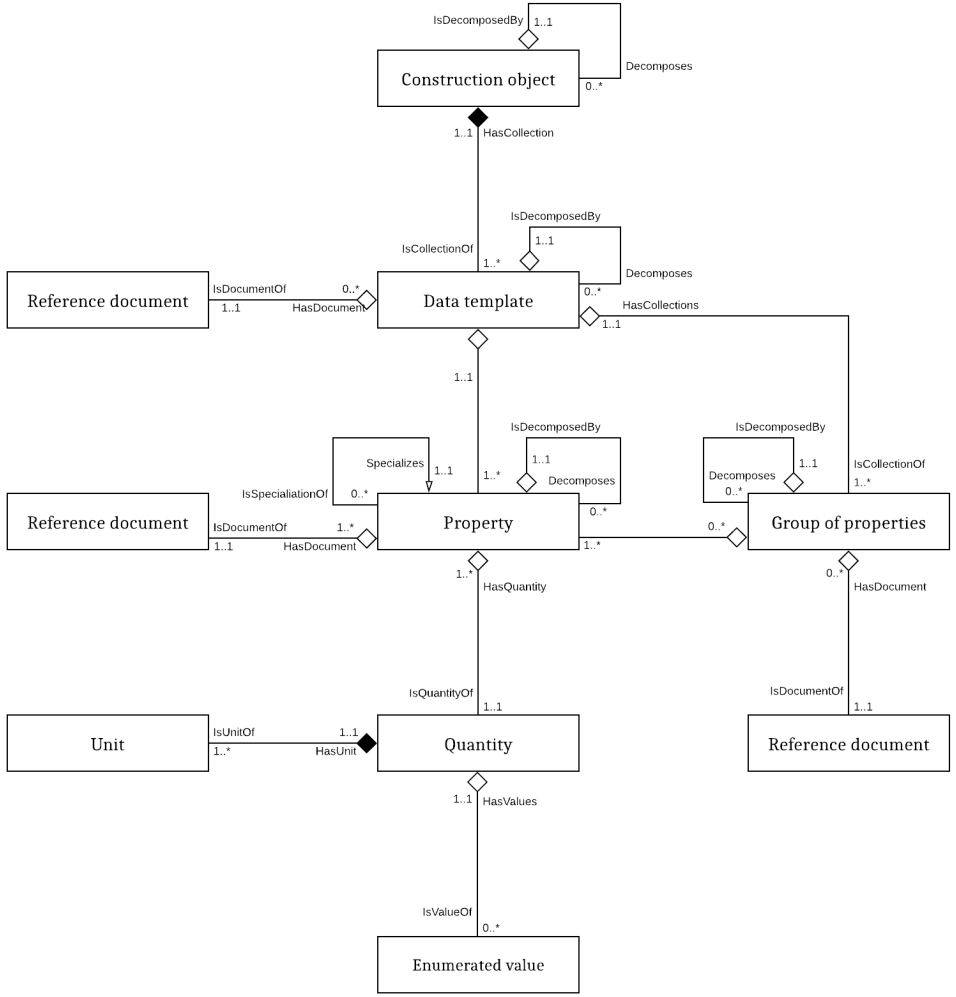
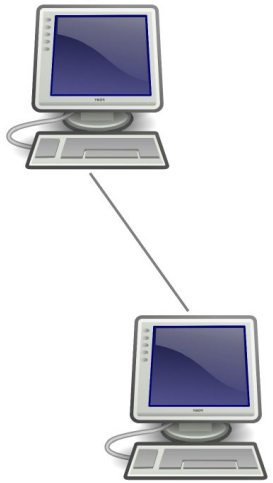
Ref. No. EN ISO 23387:2020 E

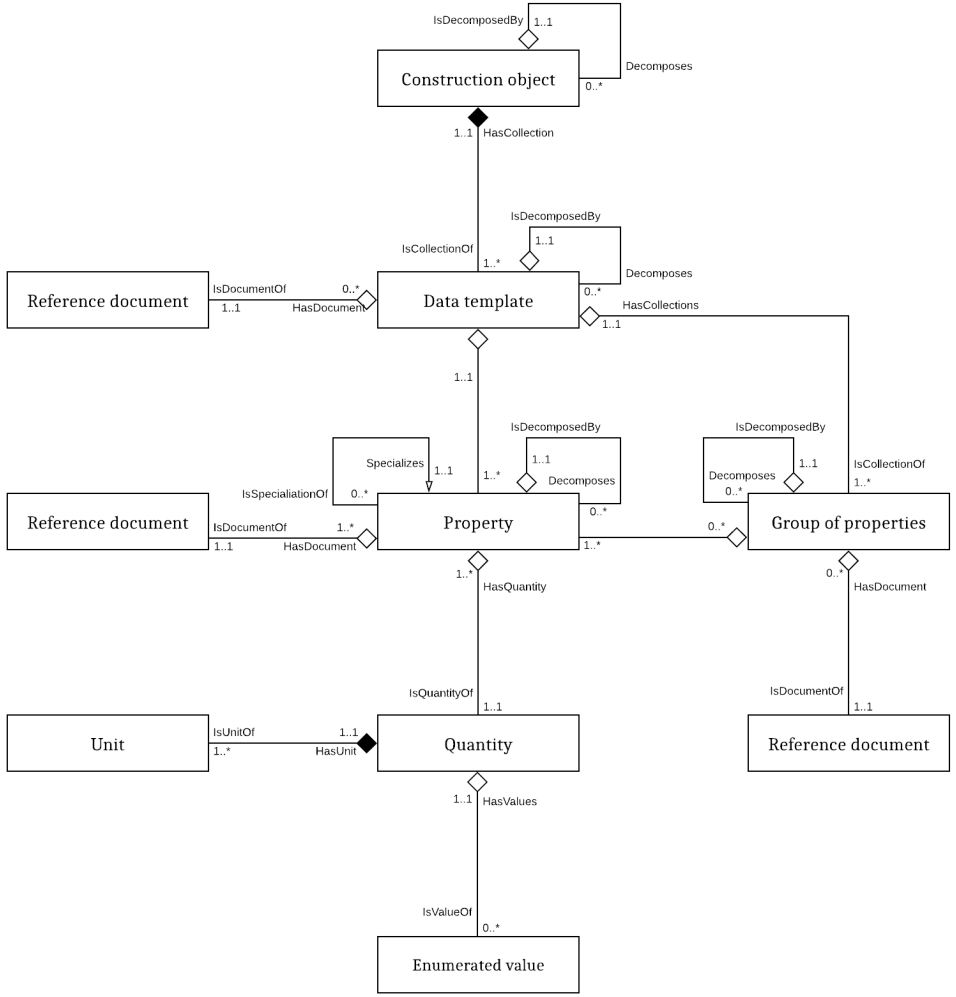
Provides



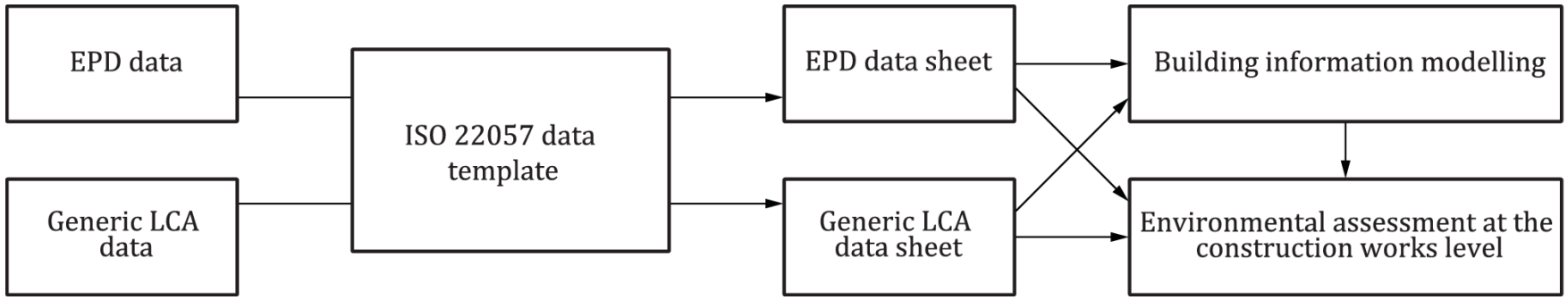
EN ISO 23387 – Data structure for data templates

- The **Data Template** is a “standardized template used for exchanging product/system data through an asset life cycle”
- The Data Template does not provide any information related to how the structure is to be implemented or the means (technologies) that are needed to implement the data structure, but it rather provide the ‘skeleton’ which to built upon





Relationship between data, data templates, data sheets, BIM and environmental assessment at the construction works level



Data template with values = Data sheet

Properties for all the «shall»-requirements from EN15804+A1, EN15804+A2 and ISO 21930

Every single property has its own identifictor (GUID)

Systemgrenser (X = inkludert, MID = modul ikke deklarert, MIR = modul ikke relevant)

Produktfase			Konstruksjon Installasjon fase		Bruksfase							Sluttfase				Etter endt levetid
Råmaterialer	Transport	Tilvirkning	Transport	Konstruksjon installasjon fase	Bruk	Vedlikehold	Reparasjon	Utskiftinger	Renovering	Operasjonell energibruk	Operasjonell vannbruk	Demontering	Transport	Avfallsbehandling	Avfall til sluttbehandling	Gjenbruk-gjenvinning-resirkulering-potensiale
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	MIR	MIR	X	X	X	X	X

Miljøpåvirkning

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5
GWP	kg CO_2-ekv	-9.17E+00	4.17E-01	4.95E-01	0.00E+00	0.00E+00	9.54E-01	0.00E+00	0.00E+00
ODP	kg CFC11-ekv	9.18E-07	8.44E-08	5.18E-08	0.00E+00	0.00E+00	1.09E-07	0.00E+00	0.00E+00
POCP	kg C_2H_4-ekv	2.54E-03	6.54E-05	1.34E-04	0.00E+00	0.00E+00	2.80E-04	0.00E+00	0.00E+00
AP	kg SO_2-ekv	4.40E-02	1.11E-03	2.34E-03	0.00E+00	0.00E+00	4.91E-03	0.00E+00	0.00E+00
EP	kg PO_4^{3-}-ekv	7.60E-03	2.26E-04	4.27E-04	0.00E+00	0.00E+00	8.96E-04	0.00E+00	0.00E+00
ADPM	kg Sb-ekv	4.71E-05	1.01E-06	2.44E-06	0.00E+00	0.00E+00	5.11E-06	0.00E+00	0.00E+00
ADPE	MJ	1.01E+02	6.83E+00	6.06E+00	0.00E+00	0.00E+00	1.27E+01	0.00E+00	0.00E+00

Miljøpåvirkning

Parameter	Unit	B6	B7	C1	C2	C3	C4		D
GWP	kg CO_2-ekv	0.00E+00	0.00E+00	1.67E-04	1.14E-01	1.77E+01	1.37E-03		-7.92E-01
ODP	kg CFC11-ekv	0.00E+00	0.00E+00	1.57E-11	2.13E-08	1.11E-08	4.85E-10		-8.77E-08
POCP	kg C_2H_4-ekv	0.00E+00	0.00E+00	3.46E-08	1.87E-05	4.46E-05	3.75E-07		-4.30E-04
AP	kg SO_2-ekv	0.00E+00	0.00E+00	7.55E-07	3.71E-04	1.30E-03	8.73E-06		-4.37E-03
EP	kg PO_4^{3-}-ekv	0.00E+00	0.00E+00	1.89E-07	6.13E-05	4.39E-04	1.59E-06		-1.16E-03
ADPM	kg Sb-ekv	0.00E+00	0.00E+00	2.62E-09	3.15E-07	2.08E-07	2.27E-09		-3.13E-06
ADPE	MJ	0.00E+00	0.00E+00	1.77E-03	1.86E+00	1.14E+01	4.60E-02		-1.06E+01

GWP Global oppvarmingspotensial; ODP Potensial for nedbryting av stratosfærisk ozon; POCP Potensial for fotokjemisk oksidantdanning; AP Forsurningspotensial for kilder på land og vann; EP Overgjødslingspotensial; ADPM Abiotisk uttømmingspotensial for ikke-fossile ressurser; ADPE Abiotisk uttømmingspotensial for fossile ressurser

Name	GUID	Unit
eutrophication potential, fraction of nutrients reaching marine end compartment	0jIKukBtDF3BVectVvcKJz	kg N eq
global warming potential - biogenic	1l3TyajTP5AAjWIWyoXlj8	kg CO_2 eq(100 years)
global warming potential - fossil fuels	2madygVA50I8lkpTzIuxd6	kg CO_2 eq(100 years)
global warming potential - land use and land use change	0LUvsLL_L17w6_kQbr$wYH	kg CO_2 eq(100 years)
global warming potential - total	0q8OlTYA9AMQ262TdhWLUy	kg CO_2 eq(100 years)

Every single property has its own identifictor (GUID)

Technical information for the relevant information module describing scenarios

Transport; A4 or C2

Name	GUID	Unit	Enumerated values
bulk density	0aT5NVUKrBsBDtlO3FKfIm	kg/m³	
transport type	3_mgczxUP9vf7N9e8CPkLT	unitless	railway; air; road; inland water; coastal shipping; sea freight
capacity utilisation	2Mvjet6QT6zR9h2yuSanrP	percent	
fuel consumption	1ET2TBWwD1Jfv8TmuDJQTD	liters per 100 kilometers	
fuel type	2gj7RUy9b41x9w1nJ9Fjxb	unitless	diesel; petrol; CNG; hydrogen; fuel oil; electricity
power consumption	3Xf1mtcXb0zuXMtP2MBEMP	kilowatthour per 100km	
transport distance	0hMXbHqzHA4geHi4BQTl5v	kilometre	
vehicle type	3Q$Cr8XFX7a8op10gKcv3k	unitless	
volume capacity utilisation factor	1y00tVbXT8keZ2KA_eVC9I	percent	

EN ISO 22057 - advantages

- Follows PDT concept as for all «other» information related to construction products – no stand-alone approach
- Force EPD to «follow all requirements» in the EN 15804
- Machine interpretable, less need for re-calculation

Technical the data exchange is solved, no tools/implementations exist

Verified data sets


epd-norge.no

ENVIRONMENTAL PRODUCT DECLARATION

Balkongdør

Norgesvinduet Kompetanse AS

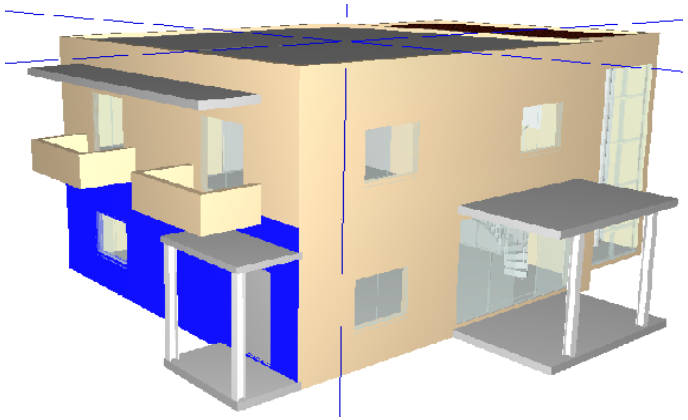
LCA rapport

Other Sources

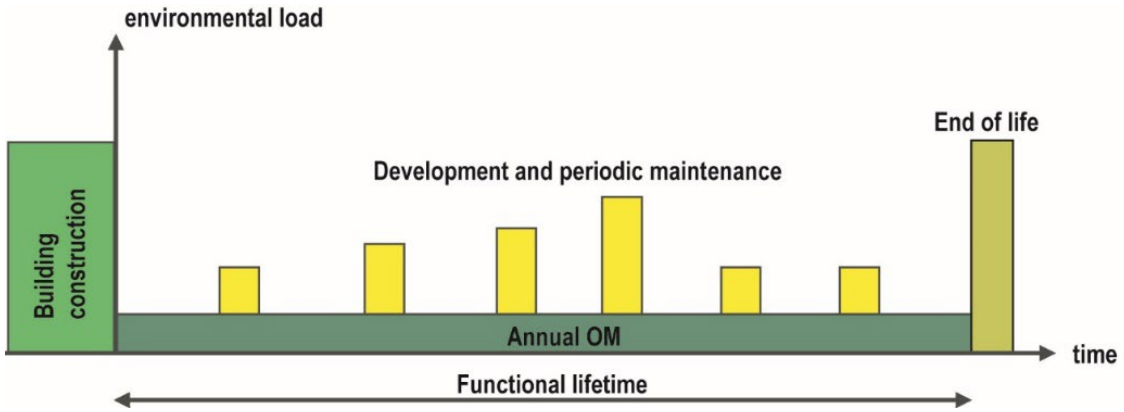
DOP PDS

EN ISO 22057 PDS

BIM



Environmetal assessment of construction works



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