# Circular Economy Ontology Network (CEON) - Product Module

### Metadata

### IRI

http://w3id.org/CEON/ontology/product/

# Title

Circular Economy Ontology Network (CEON) - Product Module

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### Version Iri

http://w3id.org/CEON/ontology/product/0.5/

#### **Version Info**

0.5

#### **Preferred Namespace Prefix**

product

### **Preferred Namespace Uri**

http://w3id.org/CEON/ontology/product/

### Description

The Product module of CEON (Circular Economy Ontology Network).

### **Covers Requirements**

In addition to requirements covered by imported ODPs, covers the following requirements from Onto-DESIDE D3.1: CVN-Resource-2, CVN-ResrouceType-4, C11-2, C12-1, C13-3, E2-1, T8-3.

In addition to requirements covered by imported ODPs, covers the following requirements from Onto-DESIDE D3.2: CE5-2, C11-2, C12-1, C13-3, E2-1, T8-3.

# Classes

Actor <sup>c</sup>		
IRI	http://w3id.org/CEON/ontology/actorODP/Actor	
Resource F	Relation <sup>c</sup>	
IRI	<pre>http://w3id.org/CEON/ontology/actorODP/ResourceRelation</pre>	
Process <sup>c</sup>		
IRI	http://w3id.org/CEON/ontology/processODP/Process	

Assembly Locati	on <sup>c</sup>
IRI	http://w3id.org/CEON/ontology/product/AssemblyLocation
Sub Class Of	http://w3id.org/CEON/ontology/location/Location
In Domain Of	<u>countryOfAssembly</u> <sup>dp</sup>
In Range Of	hasAssemblyLocation <sup>op</sup>
Restriction	http://w3id.org/CEON/ontology/location/hasCity_max 1 AssemblyLocation <sup>C</sup> http://w3id.org/CEON/ontology/location/hasPostalCode_max 1 AssemblyLocation <sup>C</sup> http://w3id.org/CEON/ontology/location/hasStreetAddress_max 1 AssemblyLocation <sup>C</sup> countryOfAssembly_dp max 1 AssemblyLocation <sup>C</sup>
Compliance <sup>c</sup>	
IRI	http://w3id.org/CEON/ontology/product/Compliance
In Domain Of	<u>complianceWith<sup>op</sup></u> <u>hasCertificate<sup>dp</sup></u>
In Range Of	hasCompliance <sup>op</sup>
Super Class Of	ISOCompliance <sup>C</sup> REACHCompliance <sup>C</sup> RoHSCompliance <sup>C</sup>
Composition <sup>c</sup>	
IRI	http://w3id.org/CEON/ontology/product/Composition
Sub Class Of	actorODP:ResourceParticipation
In Domain Of	<u>compositionOf<sup>op</sup></u> <u>Composition quantity<sup>dp</sup></u>
In Range Of	hasComposition <sup>op</sup>
Super Class Of	Matter composition <sup>c</sup> Product composition <sup>c</sup> ProductObjectComposition <sup>c</sup>
Iso Compliance <sup>c</sup>	
IRI	http://w3id.org/CEON/ontology/product/ISOCompliance
Sub Class Of	<u>Compliance</u> <sup>c</sup>

Item <sup>c</sup>	
IRI	http://w3id.org/CEON/ontology/product/Item
Description	An item is a physical object put into a market for sale, i.e. corresponding to an individual of a product. The item can be a thing that grows naturally or produced through some chemical or manufacturing processes.
Sub Class Of	resourceODP:PhysicalObject <sup>c</sup>
In Domain Of	hasProductObjectComponent <sup>op</sup> modelled by <sup>op</sup>
In Range Of	associatedWithProductObject <sup>op</sup> hasProductObjectComponent <sup>op</sup>
Restriction	modelled by <sup>op</sup> exactly 1 Item <sup>c</sup>
Manufacture Lo	cation <sup>c</sup>
IRI	http://w3id.org/CEON/ontology/product/ManufactureLocation
Sub Class Of	http://w3id.org/CEON/ontology/location/Location
In Domain Of	<u>countryOfManufacture</u> <sup>dp</sup>
In Range Of	hasManufacturerLocation <sup>op</sup>
<u>Restriction</u>	http://w3id.org/CEON/ontology/location/hasCity_max 1 ManufactureLocation <sup>c</sup> http://w3id.org/CEON/ontology/location/hasPostalCode_max 1 ManufactureLocation <sup>c</sup> http://w3id.org/CEON/ontology/location/hasStreetAddress_max 1 ManufactureLocation <sup>c</sup> countryOfManufacture <sup>dp</sup> max 1 ManufactureLocation <sup>c</sup>
Matter composi	tion <sup>c</sup>
IRI	http://w3id.org/CEON/ontology/product/MatterComposition
Description	A product composition is the composed information of a product in terms of a specific component, in which such a component is also a matter.
Sub Class Of	<u>Composition<sup>C</sup></u>
In Domain Of	associated with matter <sup>op</sup>
Restriction	associated with matter op exactly 1 Matter composition c

Origin Location <sup>C</sup>	
IRI	<pre>http://w3id.org/CEON/ontology/product/OriginLocation</pre>
Sub Class Of	http://w3id.org/CEON/ontology/location/Location
In Domain Of	<u>countryOfOrigin</u> <sup>dp</sup>
In Range Of	hasOriginLocation <sup>op</sup>
Restriction	http://w3id.org/CEON/ontology/location/hasCity_max 1 OriginLocation <sup>C</sup> http://w3id.org/CEON/ontology/location/hasPostalCode_max 1 OriginLocation <sup>C</sup> http://w3id.org/CEON/ontology/location/hasStreetAddress_max 1 OriginLocation c
	<u>countryOfOrigin<sup>dp</sup> max 1 OriginLocation<sup>c</sup></u>
Product <sup>c</sup>	
IRI	<pre>http://w3id.org/CEON/ontology/product/Product</pre>
Is Defined By	ISO 59004:2024 -3.2.2 product
Description	Physical-based object designed for or utilized with a purpose. A product can be, for example: goods of any type; hardware (e.g. engine mechanical part, spare parts, consumables); electrical or electronic hardware devices or components (e.g. computers, communication equipment and sensors); processed materials (e.g. lubricant, cement).
	Represents the common sense notion of a product, i.e. the abstract notion of a product type, which is a model that is used for manufacturing items of that product.
Sub Class Of	Solution <sup>C</sup> resourceODP:Resource
In Domain Of	has product component <sup>op</sup>
In Range Of	associated with product model <sup>op</sup> batch of products <sup>op</sup> has product component <sup>op</sup> modelled by <sup>op</sup>
Restriction	hasComposition <sup>op</sup> some Product <sup>c</sup> hasComposition <sup>op</sup> some Product <sup>c</sup> hasAssemblyLocation <sup>op</sup> only Product <sup>c</sup> hasManufacturerLocation <sup>op</sup> only Product <sup>c</sup> hasOriginLocation <sup>op</sup> only Product <sup>c</sup>

Product compos	sition <sup>c</sup>
IRI	http://w3id.org/CEON/ontology/product/ProductComposition
Description	A product composition is the composed information of a product in terms of a specific component, in which such a component is also a product.
Sub Class Of	<u>Composition<sup>c</sup></u>
In Domain Of	associated with product model <sup>op</sup>
Restriction	associated with product model <sup>op</sup> exactly 1 Product composition <sup>c</sup>
Product Object	Composition <sup>C</sup>
IRI	<pre>http://w3id.org/CEON/ontology/product/ProductObjectComposi tion</pre>
Sub Class Of	<u>Composition</u> <sup>c</sup>
In Domain Of	associatedWithProductObject <sup>op</sup>
Restriction	associatedWithProductObject <sup>op</sup> exactly 1 ProductObjectComposition <sup>c</sup>
Production Loca	tion <sup>c</sup>
Production Loca	ntion <sup>C</sup> http://w3id.org/CEON/ontology/product/ProductionLocation
IRI	http://w3id.org/CEON/ontology/product/ProductionLocation
IRI Sub Class Of	http://w3id.org/CEON/ontology/product/ProductionLocation http://w3id.org/CEON/ontology/location/Location countryOfProduction <sup>dp</sup>
IRI Sub Class Of In Domain Of	http://w3id.org/CEON/ontology/product/ProductionLocation http://w3id.org/CEON/ontology/location/Location countryOfProduction <sup>dp</sup> productionSite <sup>dp</sup> http://w3id.org/CEON/ontology/location/hasCity_max 1 ProductionLocation <sup>c</sup> http://w3id.org/CEON/ontology/location/hasPostalCode_max 1 ProductionLocation <sup>c</sup> http://w3id.org/CEON/ontology/location/hasStreetAddress_max 1 ProductionLocation <sup>c</sup> countryOfProduction <sup>dp</sup> max 1 ProductionLocation <sup>c</sup> productionSite <sup>dp</sup> max 1 ProductionLocation <sup>c</sup>
IRI Sub Class Of In Domain Of Restriction	http://w3id.org/CEON/ontology/product/ProductionLocation http://w3id.org/CEON/ontology/location/Location countryOfProduction <sup>dp</sup> productionSite <sup>dp</sup> http://w3id.org/CEON/ontology/location/hasCity_max 1 ProductionLocation <sup>c</sup> http://w3id.org/CEON/ontology/location/hasPostalCode_max 1 ProductionLocation <sup>c</sup> http://w3id.org/CEON/ontology/location/hasStreetAddress_max 1 ProductionLocation <sup>c</sup> countryOfProduction <sup>dp</sup> max 1 ProductionLocation <sup>c</sup> productionSite <sup>dp</sup> max 1 ProductionLocation <sup>c</sup>
IRI Sub Class Of In Domain Of Restriction	http://w3id.org/CEON/ontology/product/ProductionLocation http://w3id.org/CEON/ontology/location/Location countryOfProduction_dp productionSite_dp http://w3id.org/CEON/ontology/location/hasCity_max 1 ProductionLocation <sup>c</sup> http://w3id.org/CEON/ontology/location/hasPostalCode_max 1 ProductionLocation <sup>c</sup> http://w3id.org/CEON/ontology/location/hasStreetAddress_max 1 ProductionLocation <sup>c</sup> countryOfProduction_dp max 1 ProductionLocation <sup>c</sup> productionSite_dp max 1 ProductionLocation <sup>c</sup>

Regulation <sup>c</sup>	
IRI	<pre>http://w3id.org/CEON/ontology/product/Regulation</pre>
Named Individuals	REACH <sup>ni</sup> RoHS <sup>ni</sup>
Ro Hs Complianc	e <sup>c</sup>
IRI	http://w3id.org/CEON/ontology/product/RoHSCompliance
Sub Class Of	<u>Compliance<sup>c</sup></u>
Equivalentclass	<u>complianceWith<sup>op</sup> value RoHS<sup>c</sup></u>
Solution <sup>C</sup>	
IRI	http://w3id.org/CEON/ontology/product/Solution
Is Defined By	ISO 59004:2024 - 3.2.1 solution
<b>Description</b>	Product or service, or a combination thereof, that fulfils a need of an interested party.
Super Class Of	Product <sup>C</sup>
Supplier Location	c
IRI	<pre>http://w3id.org/CEON/ontology/product/SupplierLocation</pre>
Sub Class Of	http://w3id.org/CEON/ontology/location/Location
Batch Of Objects	c
IRI	<pre>http://w3id.org/CEON/ontology/resourceODP/BatchOfObjects</pre>
In Domain Of	batch of products <sup>op</sup>
Restriction	batch of products <sup>op</sup> exactly 1 resourceODP:BatchOfObjects <sup>C</sup>
Matter <sup>c</sup>	
IRI	http://w3id.org/CEON/ontology/resourceODP/Matter
In Range Of	associated with matter <sup>op</sup>

# Physical Object<sup>C</sup>

IRI

http://w3id.org/CEON/ontology/resourceODP/PhysicalObject

Super Class Of Item<sup>c</sup>

# **Object Properties**

associated with r	matter <sup>0</sup> D
IRI	http://w3id.org/CEON/ontology/product/associatedWithMatter
Description	associatedWithMatter intends to represent the matter to which a matter compopsition information regards to.
Domain	Matter composition <sup>c</sup>
Range	resourceODP:Matter <sup>C</sup>
associated with p	product model <sup>op</sup>
IRI	http://w3id.org/CEON/ontology/product/associatedWithProduc tModel
Description	associatedWithProductModel intends to represent the product model to which a product compopsition information regards to.
Domain	Product composition <sup>c</sup>
Range	Product <sup>C</sup>
associated with p	product object <sup>op</sup>
IRI	http://w3id.org/CEON/ontology/product/associatedWithProduc tObject
Sub Property Of	topObjectProperty <sup>op</sup>
Domain	ProductObjectComposition <sup>C</sup>
Range	<u>Item<sup>c</sup></u>
batch of products	Sob
IRI	http://w3id.org/CEON/ontology/product/batchOfProduct
Description	batchOfProduct intends to represent what is the model product of a batch of objects.
Domain	resourceODP:BatchOfObjects <sup>c</sup>
Range	Product <sup>c</sup>

compliance with <sup>c</sup>	p
IRI	<pre>http://w3id.org/CEON/ontology/product/complianceWith</pre>
Domain	<u>Compliance <sup>C</sup></u>
composition of <sup>op</sup>	
IRI	http://w3id.org/CEON/ontology/product/compositionOf
Domain	<u>Composition<sup>C</sup></u>
Range	Product <sup>c</sup> or resourceODP:Matter <sup>c</sup> or Item <sup>c</sup>
has assembly loc	cation <sup>op</sup>
IRI	http://w3id.org/CEON/ontology/product/hasAssemblyLocation
Sub Property Of	http://w3id.org/CEON/ontology/location/hasLocation
Domain	Product <sup>c</sup> or Item <sup>c</sup>
Range	AssemblyLocation <sup>C</sup>
has compliance <sup>0</sup>	p
IRI	http://w3id.org/CEON/ontology/product/hasCompliance
Domain	Item <sup>c</sup> or Product <sup>c</sup> or http://w3id.org/CEON/ontology/processODP/Process <sup>c</sup> or actorODP:Actor <sup>c</sup>
Range	<u>Compliance <sup>C</sup></u>
has composition	qq
IRI	http://w3id.org/CEON/ontology/product/hasComposition
Description	hasComposition intends to represent that a product model or physical object can have compostition information.
Domain	Product <sup>c</sup> or resourceODP:PhysicalObject <sup>c</sup>
Range	<u>Composition</u> <sup>C</sup>
has manufacture	r location <sup>op</sup>
IRI	<pre>http://w3id.org/CEON/ontology/product/hasManufacturerLocat ion</pre>
Sub Property Of	http://w3id.org/CEON/ontology/location/hasLocation
Domain	<u>Item<sup>c</sup> or Product<sup>c</sup></u>
Range	ManufactureLocation <sup>C</sup>

has origin locatio	n <sup>op</sup>
IRI	http://w3id.org/CEON/ontology/product/hasOriginLocation
Sub Property Of	http://w3id.org/CEON/ontology/location/hasLocation
Domain	Product <sup>c</sup> or Item <sup>c</sup>
Range	<u>OriginLocation<sup>C</sup></u>
has product com	ponent <sup>op</sup>
IRI	http://w3id.org/CEON/ontology/product/hasProductComponent
Description	hasProductComponent intends to represent that a product can have other product components.
Domain	Product <sup>C</sup>
Range	Product <sup>c</sup>
has product obje	ct component <sup>op</sup>
IRI	<pre>http://w3id.org/CEON/ontology/product/hasProductObjectComp onent</pre>
Domain	<u>Item<sup>c</sup></u>
Range	<u>Item<sup>c</sup></u>
modelled by <sup>op</sup>	
IRI	http://w3id.org/CEON/ontology/product/modelledBy
Description	modelledBy intends to represent that product objects follow particular product models.
Domain	<u>Item</u> <sup>c</sup>
Range	Product <sup>c</sup>

# Datatype Properties

Composition quantity dp	
IRI	http://w3id.org/CEON/ontology/product/compositionQuantity
Domain	<u>Composition<sup>C</sup></u>
Range	xsd:double

country of assem	bly <sup>dp</sup>
IRI	http://w3id.org/CEON/ontology/product/countryOfAssembly
Sub Property Of	http://w3id.org/CEON/ontology/location/hasCountry
Domain	AssemblyLocation <sup>C</sup>
Range	<u>xsd:string</u>
country of manuf	acture <sup>dp</sup>
IRI	http://w3id.org/CEON/ontology/product/countryOfManufacture
Sub Property Of	http://w3id.org/CEON/ontology/location/hasCountry
Domain	ManufactureLocation <sup>C</sup>
Range	xsd:string
country of origin <sup>c</sup>	dp
IRI	http://w3id.org/CEON/ontology/product/countryOfOrigin
Sub Property Of	http://w3id.org/CEON/ontology/location/hasCountry
Domain	<u>OriginLocation</u> <sup>C</sup>
Range	<u>xsd:string</u>
country of produc	ction <sup>dp</sup>
IRI	http://w3id.org/CEON/ontology/product/countryOfProduction
Sub Property Of	http://w3id.org/CEON/ontology/location/hasCountry
Domain	ProductionLocation <sup>c</sup>
Range	xsd:string
has brand <sup>dp</sup>	
IRI	http://w3id.org/CEON/ontology/product/hasBrand
Range	<u>xsd:string</u>
has certificate <sup>dp</sup>	
IRI	<pre>http://w3id.org/CEON/ontology/product/hasCertificate</pre>
Domain	<u>Compliance<sup>C</sup></u>

has global trade item number <sup>dp</sup>	
IRI	http://w3id.org/CEON/ontology/product/hasGlobalTradeItemNu mber
Range	<u>xsd:string</u>
has product r	name <sup>dp</sup>
IRI	http://w3id.org/CEON/ontology/product/hasProductName
Range	<u>xsd:string</u>
production sit	te <sup>dp</sup>
IRI	http://w3id.org/CEON/ontology/product/productionSite
Domain	ProductionLocation <sup>C</sup>
Range	<u>xsd:string</u>

# Annotation Properties

contributor <sup>ap</sup>	
IRI	http://purl.org/dc/terms/contributor
created <sup>ap</sup>	
IRI	http://purl.org/dc/terms/created
creator <sup>ap</sup>	
IRI	http://purl.org/dc/terms/creator
description <sup>ap</sup>	
IRI	http://purl.org/dc/terms/description
license <sup>ap</sup>	
IRI	http://purl.org/dc/terms/license
title <sup>ap</sup>	
IRI	http://purl.org/dc/terms/title

preferred namespace prefix <sup>ap</sup>		
IRI	<pre>http://purl.org/vocab/vann/preferredNamespacePrefix</pre>	
preferred n	amespace uri <sup>ap</sup>	
IRI	http://purl.org/vocab/vann/preferredNamespaceUri	
covers requ	uirements <sup>ap</sup>	
IRI	<pre>http://www.ontologydesignpatterns.org/schemas/cpannotation schema.owl#coversRequirements</pre>	

## Namespaces

```
:
```

http://w3id.org/CEON/ontology/product/

### actorODP

http://w3id.org/CEON/ontology/actorODP/

### dcterms

http://purl.org/dc/terms/

# odp

http://www.ontologydesignpatterns.org/schemas/cpannotationschema.owl#

### owl

http://www.w3.org/2002/07/owl#

# prov

http://www.w3.org/ns/prov#

# rdf

http://www.w3.org/1999/02/22-rdf-syntax-ns#

### rdfs

http://www.w3.org/2000/01/rdf-schema#

### resourceODP

http://w3id.org/CEON/ontology/resourceODP/

# vann

http://purl.org/vocab/vann/

# xsd

http://www.w3.org/2001/XMLSchema#

# Legend

С	Classes
ор	Object Properties
dp	Datatype Properties
ap	Annotation Properties