

# Circular Economy Ontology Network (CEON) - Product Module

## Metadata

### IRI

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

### Title

Circular Economy Ontology Network (CEON) - Product Module

### Creator

Huanyu Li

### Contributor

Eva Blomqvist

Mikael Lindecrantz

Robin Keskisärkkä

### Date Created

2023-03-16

### License

<https://creativecommons.org/licenses/by/4.0/>

### Version Iri

<http://w3id.org/CEON/ontology/product/0.4/>

### Version Info

0.4

### 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-ResourceType-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 Relation<sup>C</sup>

#### IRI

<http://w3id.org/CEON/ontology/actorODP/ResourceRelation>

#### Super Class Of

[resourceODP:Composition<sup>C</sup>](#)

## Process<sup>C</sup>

**IRI** <http://w3id.org/CE0N/ontology/processODP/Process>

## Compliance<sup>C</sup>

**IRI** <http://w3id.org/CE0N/ontology/product/Compliance>

**In Domain Of** [complianceWith](#)<sup>op</sup>  
[hasCertificate](#)<sup>dp</sup>

**In Range Of** [hasCompliance](#)<sup>op</sup>

## Item<sup>C</sup>

**IRI** <http://w3id.org/CE0N/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>

## Matter composition<sup>C</sup>

**IRI** <http://w3id.org/CE0N/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** [resourceODP:Composition](#)<sup>C</sup>

**In Domain Of** [associated with matter](#)<sup>op</sup>

**Restriction** [associated with matter](#)<sup>op</sup> *exactly* 1 [Matter composition](#)<sup>C</sup>

## Product<sup>C</sup>

<b>IRI</b>	<a href="http://w3id.org/CEON/ontology/product/Product">http://w3id.org/CEON/ontology/product/Product</a>
<b><u>Is Defined By</u></b>	ISO 59004:2024 -3.2.2 product
<b><u>Description</u></b>	<p>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).</p> <p>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.</p>
<b><u>Sub Class Of</u></b>	<a href="#">Solution<sup>C</sup></a>
<b><u>In Domain Of</u></b>	<a href="#">has product component<sup>OP</sup></a>
<b><u>In Range Of</u></b>	<a href="#">associated with product model<sup>OP</sup></a> <a href="#">batch of products<sup>OP</sup></a> <a href="#">has product component<sup>OP</sup></a> <a href="#">modelled by<sup>OP</sup></a>
<b><u>Restriction</u></b>	<a href="#">hasComposition<sup>OP</sup></a> some <a href="#">Product<sup>C</sup></a> <a href="#">hasComposition<sup>OP</sup></a> some <a href="#">Product<sup>C</sup></a>

## Product composition<sup>C</sup>

<b>IRI</b>	<a href="http://w3id.org/CEON/ontology/product/ProductComposition">http://w3id.org/CEON/ontology/product/ProductComposition</a>
<b><u>Description</u></b>	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.
<b><u>Sub Class Of</u></b>	<a href="#">resourceODP:Composition<sup>C</sup></a>
<b><u>In Domain Of</u></b>	<a href="#">associated with product model<sup>OP</sup></a>
<b><u>Restriction</u></b>	<a href="#">associated with product model<sup>OP</sup></a> <i>exactly</i> 1 <a href="#">Product composition<sup>C</sup></a>

## Product Object Composition<sup>C</sup>

<b>IRI</b>	<a href="http://w3id.org/CEON/ontology/product/ProductObjectComposition">http://w3id.org/CEON/ontology/product/ProductObjectComposition</a>
<b><u>Sub Class Of</u></b>	<a href="#">resourceODP:Composition<sup>C</sup></a>
<b><u>In Domain Of</u></b>	<a href="#">associatedWithProductObject<sup>OP</sup></a>
<b><u>Restriction</u></b>	<a href="#">associatedWithProductObject<sup>OP</sup></a> <i>exactly</i> 1 <a href="#">ProductObjectComposition<sup>C</sup></a>

## Solution<sup>c</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/product/Solution">http://w3id.org/CE0N/ontology/product/Solution</a>
<b><u>Is Defined By</u></b>	ISO 59004:2024 - 3.2.1 solution
<b><u>Description</u></b>	Product or service, or a combination thereof, that fulfils a need of an interested party.
<b><u>Super Class Of</u></b>	<a href="#">Product<sup>c</sup></a>

## Batch Of Objects<sup>c</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/resourceODP/BatchOfObjects">http://w3id.org/CE0N/ontology/resourceODP/BatchOfObjects</a>
<b><u>In Domain Of</u></b>	<a href="#">batch of products<sup>op</sup></a>
<b><u>Restriction</u></b>	<a href="#">batch of products<sup>op</sup></a> <i>exactly</i> 1 <a href="#">resourceODP:BatchOfObjects<sup>c</sup></a>

## Composition<sup>c</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/resourceODP/Composition">http://w3id.org/CE0N/ontology/resourceODP/Composition</a>
<b><u>Sub Class Of</u></b>	<a href="#">actorODP:ResourceRelation<sup>c</sup></a>
<b><u>In Domain Of</u></b>	<a href="#">compositionOf<sup>op</sup></a> <a href="#">Composition quantity<sup>dp</sup></a>
<b><u>In Range Of</u></b>	<a href="#">hasComposition<sup>op</sup></a>
<b><u>Super Class Of</u></b>	<a href="#">Matter composition<sup>c</sup></a> <a href="#">Product composition<sup>c</sup></a> <a href="#">ProductObjectComposition<sup>c</sup></a>

## Matter<sup>c</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/resourceODP/Matter">http://w3id.org/CE0N/ontology/resourceODP/Matter</a>
<b><u>In Range Of</u></b>	<a href="#">associated with matter<sup>op</sup></a>

## Physical Object<sup>c</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/resourceODP/PhysicalObject">http://w3id.org/CE0N/ontology/resourceODP/PhysicalObject</a>
<b><u>Super Class Of</u></b>	<a href="#">Item<sup>c</sup></a>

## Object Properties

### associated with matter<sup>op</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/product/associatedWithMatter">http://w3id.org/CE0N/ontology/product/associatedWithMatter</a>
<b>Description</b>	associatedWithMatter intends to represent the matter to which a matter composition information regards to.
<b>Domain</b>	<a href="#">Matter composition</a> <sup>c</sup>
<b>Range</b>	<a href="#">resourceODP:Matter</a> <sup>c</sup>

### associated with product model<sup>op</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/product/associatedWithProductModel">http://w3id.org/CE0N/ontology/product/associatedWithProductModel</a>
<b>Description</b>	associatedWithProductModel intends to represent the product model to which a product composition information regards to.
<b>Domain</b>	<a href="#">Product composition</a> <sup>c</sup>
<b>Range</b>	<a href="#">Product</a> <sup>c</sup>

### associated with product object<sup>op</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/product/associatedWithProductObject">http://w3id.org/CE0N/ontology/product/associatedWithProductObject</a>
<b>Sub Property Of</b>	<a href="#">topObjectProperty</a> <sup>op</sup>
<b>Domain</b>	<a href="#">ProductObjectComposition</a> <sup>c</sup>
<b>Range</b>	<a href="#">Item</a> <sup>c</sup>

### batch of products<sup>op</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/product/batchOfProduct">http://w3id.org/CE0N/ontology/product/batchOfProduct</a>
<b>Description</b>	batchOfProduct intends to represent what is the model product of a batch of objects.
<b>Domain</b>	<a href="#">resourceODP:BatchOfObjects</a> <sup>c</sup>
<b>Range</b>	<a href="#">Product</a> <sup>c</sup>

### compliance with<sup>op</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/product/complianceWith">http://w3id.org/CE0N/ontology/product/complianceWith</a>
<b>Domain</b>	<a href="#">Compliance</a> <sup>c</sup>

## composition of<sup>op</sup>

<b>IRI</b>	<a href="http://w3id.org/CEON/ontology/product/compositionOf">http://w3id.org/CEON/ontology/product/compositionOf</a>
<b><u>Domain</u></b>	<a href="#">resourceODP:Composition</a> <sup>C</sup>
<b><u>Range</u></b>	<a href="#">resourceODP:Matter</a> <sup>C</sup> or <a href="#">Product</a> <sup>C</sup> or <a href="#">Item</a> <sup>C</sup>

## has compliance<sup>op</sup>

<b>IRI</b>	<a href="http://w3id.org/CEON/ontology/product/hasCompliance">http://w3id.org/CEON/ontology/product/hasCompliance</a>
<b><u>Domain</u></b>	<a href="#">Item</a> <sup>C</sup> or <a href="http://w3id.org/CEON/ontology/processODP/Process">http://w3id.org/CEON/ontology/processODP/Process</a> <sup>C</sup> or <a href="#">actorODP:Actor</a> <sup>C</sup> or <a href="#">Product</a> <sup>C</sup>
<b><u>Range</u></b>	<a href="#">Compliance</a> <sup>C</sup>

## has composition<sup>op</sup>

<b>IRI</b>	<a href="http://w3id.org/CEON/ontology/product/hasComposition">http://w3id.org/CEON/ontology/product/hasComposition</a>
<b><u>Description</u></b>	hasComposition intends to represent that a product model or physical object can have composition information.
<b><u>Domain</u></b>	<a href="#">resourceODP:PhysicalObject</a> <sup>C</sup> or <a href="#">Product</a> <sup>C</sup>
<b><u>Range</u></b>	<a href="#">resourceODP:Composition</a> <sup>C</sup>

## has product component<sup>op</sup>

<b>IRI</b>	<a href="http://w3id.org/CEON/ontology/product/hasProductComponent">http://w3id.org/CEON/ontology/product/hasProductComponent</a>
<b><u>Description</u></b>	hasProductComponent intends to represent that a product can have other product components.
<b><u>Domain</u></b>	<a href="#">Product</a> <sup>C</sup>
<b><u>Range</u></b>	<a href="#">Product</a> <sup>C</sup>

## has product object component<sup>op</sup>

<b>IRI</b>	<a href="http://w3id.org/CEON/ontology/product/hasProductObjectComponent">http://w3id.org/CEON/ontology/product/hasProductObjectComponent</a>
<b><u>Domain</u></b>	<a href="#">Item</a> <sup>C</sup>
<b><u>Range</u></b>	<a href="#">Item</a> <sup>C</sup>

modelled by<sup>op</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/product/modelledBy">http://w3id.org/CE0N/ontology/product/modelledBy</a>
<b>Description</b>	modelledBy intends to represent that product objects follow particular product models.
<b>Domain</b>	<a href="#">Item</a> <sup>c</sup>
<b>Range</b>	<a href="#">Product</a> <sup>c</sup>

## Datatype Properties

Composition quantity<sup>dp</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/product/compositionQuantity">http://w3id.org/CE0N/ontology/product/compositionQuantity</a>
<b>Domain</b>	<a href="#">resourceODP:Composition</a> <sup>c</sup>
<b>Range</b>	<a href="#">xsd:double</a>

country of assembly<sup>dp</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/product/countryOfAssembly">http://w3id.org/CE0N/ontology/product/countryOfAssembly</a>
<b>Sub Property Of</b>	<a href="#">locationOfAssembly</a> <sup>dp</sup>

country of manufacture<sup>dp</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/product/countryOfManufacture">http://w3id.org/CE0N/ontology/product/countryOfManufacture</a>
<b>Sub Property Of</b>	<a href="#">locationOfManufacture</a> <sup>dp</sup>

country of origin<sup>dp</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/product/countryOfOrigin">http://w3id.org/CE0N/ontology/product/countryOfOrigin</a>
<b>Sub Property Of</b>	<a href="#">locationOfOrigin</a> <sup>dp</sup>

has certificate<sup>dp</sup>

<b>IRI</b>	<a href="http://w3id.org/CE0N/ontology/product/hasCertificate">http://w3id.org/CE0N/ontology/product/hasCertificate</a>
<b>Domain</b>	<a href="#">Compliance</a> <sup>c</sup>

location of assembly<sup>dp</sup>

**IRI** <http://w3id.org/CE0N/ontology/product/locationOfAssembly>

**Super Property Of** [countryOfAssembly](#)<sup>dp</sup>

**Domain** [Product](#)<sup>c</sup> or [Item](#)<sup>c</sup>

**Range** [xsd:string](#)

location of manufacture<sup>dp</sup>

**IRI** <http://w3id.org/CE0N/ontology/product/locationOfManufacture>

**Super Property Of** [countryOfManufacture](#)<sup>dp</sup>

**Domain** [Item](#)<sup>c</sup> or [Product](#)<sup>c</sup>

**Range** [xsd:string](#)

location of origin<sup>dp</sup>

**IRI** <http://w3id.org/CE0N/ontology/product/locationOfOrigin>

**Super Property Of** [countryOfOrigin](#)<sup>dp</sup>

**Domain** [Item](#)<sup>c</sup> or [Product](#)<sup>c</sup>

**Range** [xsd:string](#)

## 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	<a href="http://purl.org/dc/terms/license">http://purl.org/dc/terms/license</a>
title <sup>ap</sup>	
IRI	<a href="http://purl.org/dc/terms/title">http://purl.org/dc/terms/title</a>
preferred namespace prefix <sup>ap</sup>	
IRI	<a href="http://purl.org/vocab/vann/preferredNamespacePrefix">http://purl.org/vocab/vann/preferredNamespacePrefix</a>
preferred namespace uri <sup>ap</sup>	
IRI	<a href="http://purl.org/vocab/vann/preferredNamespaceUri">http://purl.org/vocab/vann/preferredNamespaceUri</a>
covers requirements <sup>ap</sup>	
IRI	<a href="http://www.ontologydesignpatterns.org/schemas/cannotation-schema.owl#coversRequirements">http://www.ontologydesignpatterns.org/schemas/cannotation-schema.owl#coversRequirements</a>

## Namespaces

:	<a href="http://w3id.org/CE0N/ontology/product/">http://w3id.org/CE0N/ontology/product/</a>
actorODP	<a href="http://w3id.org/CE0N/ontology/actorODP/">http://w3id.org/CE0N/ontology/actorODP/</a>
dcterms	<a href="http://purl.org/dc/terms/">http://purl.org/dc/terms/</a>
odp	<a href="http://www.ontologydesignpatterns.org/schemas/cannotationschema.owl#">http://www.ontologydesignpatterns.org/schemas/cannotationschema.owl#</a>
owl	<a href="http://www.w3.org/2002/07/owl#">http://www.w3.org/2002/07/owl#</a>
prov	<a href="http://www.w3.org/ns/prov#">http://www.w3.org/ns/prov#</a>
rdf	<a href="http://www.w3.org/1999/02/22-rdf-syntax-ns#">http://www.w3.org/1999/02/22-rdf-syntax-ns#</a>
rdfs	<a href="http://www.w3.org/2000/01/rdf-schema#">http://www.w3.org/2000/01/rdf-schema#</a>
resourceODP	<a href="http://w3id.org/CE0N/ontology/resourceODP/">http://w3id.org/CE0N/ontology/resourceODP/</a>
vann	<a href="http://purl.org/vocab/vann/">http://purl.org/vocab/vann/</a>
xsd	<a href="http://www.w3.org/2001/XMLSchema#">http://www.w3.org/2001/XMLSchema#</a>

## Legend

c	Classes
op	Object Properties
dp	Datatype Properties
ap	Annotation Properties