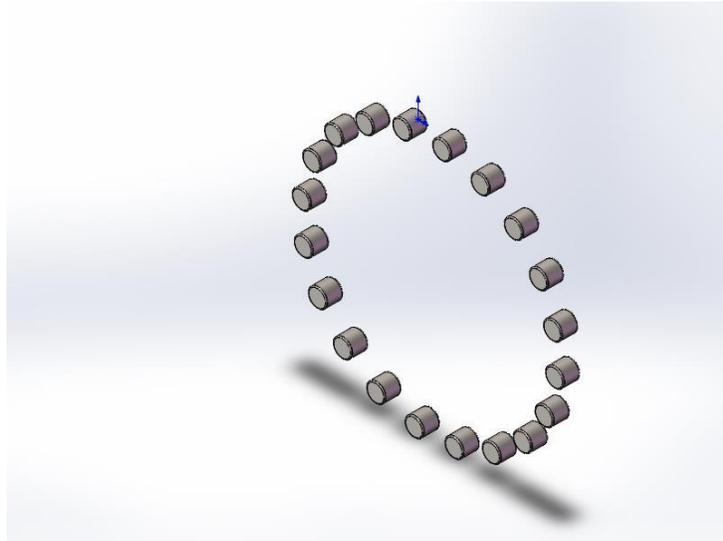




# SOLIDWORKS

## Sustainability Report



**Model Name:** Small cylinders in the drum bearing

**Material:** AISI 1045 Steel, cold drawn

**Recycled content:** 15 %

**Weight:** 0.08 kg

**Manufacturing process:** Milled

**Surface Area:** 6661.70 mm<sup>2</sup>

**Built to last:** 1.0 year

**Duration of use:** 1.0 year



### Manufacturing Region

The choice of manufacturing region determines the energy sources and technologies used in the modeled material creation and manufacturing steps of the product's life cycle.

### Use Region

The use region is used to determine the energy sources consumed during the product's use phase (if applicable) and the destination for the product at its end-of-life. Together with the manufacturing region, the use region is also used to estimate the environmental impacts associated with transporting the product from its manufacturing location to its use location.

### Summary

[Learn more about Life Cycle Assessment](#) 🌐

## Sustainability Report

<b>Model Name:</b>	Small cylinders in the drum bearing	<b>Material:</b>	AISI 1045 Steel, cold drawn	<b>Weight:</b>	0.08 kg	<b>Manufacturing process:</b>	Milled
		<b>Recycled content:</b>	15 %	<b>Surface Area:</b>	6661.70 mm <sup>2</sup>		
				<b>Built to last:</b>	1.0 year		
				<b>Duration of use:</b>	1.0 year		

**Material** AISI 1045 Steel, cold drawn 15 %

**Material Unit Cost** 0.40 USD/kg

### Manufacturing

Region: North America  
Process: Milled  
Electricity consumption: 0.629 kWh/lbs  
Natural gas consumption: 0.00 BTU/lbs  
Scrap rate: 10 %  
Built to last: 1.0 year  
Part is painted: No Paint

### Use

Region: North America  
Duration of use: 1.0 year

### Transportation

Truck distance: 2600 km  
Train distance: 0.00 km  
Ship distance: 0.00 km  
Airplane Distance: 0.00 km

### End of Life

Recycled: 33 %  
Incinerated: 13 %  
Landfill: 54 %

### Comments

## Sustainability Report

<b>Model Name:</b>	Small cylinders in the drum bearing	<b>Material:</b>	AISI 1045 Steel, cold drawn	<b>Weight:</b>	0.08 kg	<b>Manufacturing process:</b>	Milled
		<b>Recycled content:</b>	15 %	<b>Surface Area:</b>	6661.70 mm <sup>2</sup>	<b>Built to last:</b>	1.0 year
				<b>Duration of use:</b>	1.0 year		

### Environmental Impact (calculated using CML impact assessment methodology)

#### Carbon Footprint



0.254 kg CO<sub>2</sub>e

#### Total Energy Consumed



3.3 MJ

#### Air Acidification



1.1E-3 kg SO<sub>2</sub>e

#### Water Eutrophication



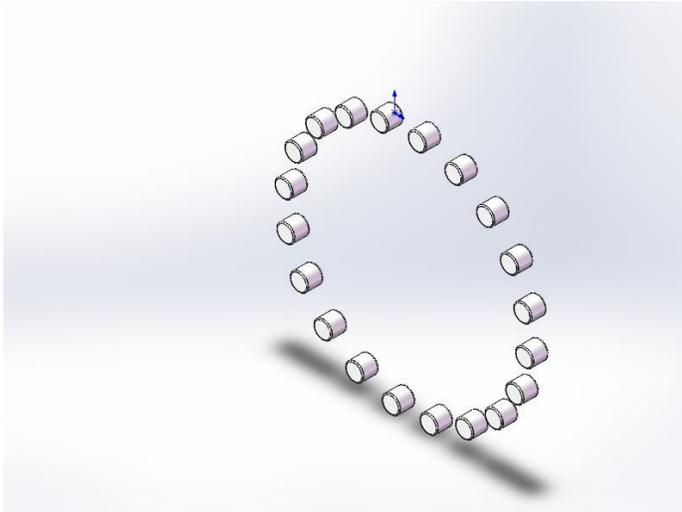
9.9E-5 kg PO<sub>4</sub>e

**Material Financial Impact** 0.03 USD

Comments

[Click here for alternative units such as 'Miles Driven in a Car'](#)

## Baseline



**Model Name:** Small cylinders in the drum bearing

**Material:** AISI 1020

**Recycled content:** 18 %

**Weight:** 0.077 kg

**Manufacturing process:** Milled

**Surface Area:** 6661.70 mm<sup>2</sup>

**Built to last:** 1.0 year

**Duration of use:** 1.0 year



**Manufacturing Region**

The choice of manufacturing region determines the energy sources and technologies used in the modeled material creation and manufacturing steps of the product's life cycle.

**Use Region**

The use region is used to determine the energy sources consumed during the product's use phase (if applicable) and the destination for the product at its end-of-life. Together with the manufacturing region, the use region is also used to estimate the environmental impacts associated with transporting the product from its manufacturing location to its use location.

### Comments

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## Sustainability Report

<b>Model Name:</b>	Small cylinders in the drum bearing	<b>Material:</b>	AISI 1020	<b>Weight:</b>	0.077 kg	<b>Manufacturing process:</b>	Milled
<b>BASELINE</b>		<b>Recycled content:</b>	18 %	<b>Surface Area:</b>	6661.70 mm <sup>2</sup>		
				<b>Built to last:</b>	1.0 year		
				<b>Duration of use:</b>	1.0 year		

**Material** AISI 1020 18 %

**Material Unit Cost** 0.40 USD/kg

### Manufacturing

Region: North America  
Process: Milled  
Electricity consumption: 0.629 kWh/lbs  
Natural gas consumption: 0.00 BTU/lbs  
Scrap rate: 10 %  
Built to last: 1.0 year  
Part is painted: No Paint

### Use

Region: North America  
Duration of use: 1.0 year

### Transportation

Truck distance: 2600 km  
Train distance: 0.00 km  
Ship distance: 0.00 km  
Airplane Distance: 0.00 km

### End of Life

Recycled: 33 %  
Incinerated: 13 %  
Landfill: 54 %

### Comments

## Sustainability Report

Model Name:	Small cylinders in the drum bearing	Material:	AISI 1020	Weight:	0.077 kg	Manufacturing process:	Milled
BASELINE		Recycled content:	18 %	Surface Area:	6661.70 mm <sup>2</sup>	Built to last:	1.0 year
				Duration of use:	1.0 year		

### Environmental Impact Comparison

New Design:

■ Better

■ Worse

Original Design:

■ Baseline

#### Carbon Footprint - Comparison

Total | AISI 1045 Steel, cold drawn : 0.254 kg CO<sub>2</sub>e  
| AISI 1020 : 0.307 kg CO<sub>2</sub>e

#### Total Energy Consumed - Comparison

Total | AISI 1045 Steel, cold drawn : 3.3 MJ  
| AISI 1020 : 3.8 MJ

#### Air Acidification - Comparison

Total | AISI 1045 Steel, cold drawn : 1.1E-3 kg SO<sub>2</sub>e  
| AISI 1020 : 1.3E-3 kg SO<sub>2</sub>e

#### Water Eutrophication - Comparison

Total | AISI 1045 Steel, cold drawn : 9.9E-5 kg PO<sub>4</sub>e  
| AISI 1020 : 1.3E-4 kg PO<sub>4</sub>e

#### Material Financial Impact Comparison



Comments

[Click here for alternative units such as 'Miles Driven in a Car'](#)





## Glossary

**Air Acidification** - Sulfur dioxide, nitrous oxides other acidic emissions to air cause an increase in the acidity of rainwater, which in turn acidifies lakes and soil. These acids can make the land and water toxic for plants and aquatic life. Acid rain can also slowly dissolve manmade building materials such as concrete. This impact is typically measured in units of either kg **sulfur dioxide equivalent (SO<sub>2</sub>)**, or **moles H<sup>+</sup> equivalent**.

**Carbon Footprint** - Carbon-dioxide and other gasses which result from the burning of fossil fuels accumulate in the atmosphere which in turn increases the earth's average temperature. Carbon footprint acts as a proxy for the larger impact factor referred to as Global Warming Potential (GWP). Global warming is blamed for problems like loss of glaciers, extinction of species, and more extreme weather, among others.

**Total Energy Consumed** - A measure of the non-renewable energy sources associated with the part's lifecycle in units of megajoules (**MJ**). This impact includes not only the electricity or fuels used during the product's lifecycle, but also the upstream energy required to obtain and process these fuels, and the embodied energy of materials which would be released if burned. Total Energy Consumed is expressed as the net calorific value of energy demand from non-renewable resources (e.g. petroleum, natural gas, etc.). Efficiencies in energy conversion (e.g. power, heat, steam, etc.) are taken into account.

**Water Eutrophication** - When an over abundance of nutrients are added to a water ecosystem, eutrophication occurs. Nitrogen and phosphorous from waste water and agricultural fertilizers causes an overabundance of algae to bloom, which then depletes the water of oxygen and results in the death of both plant and animal life. This impact is typically measured in either kg **phosphate equivalent (PO<sub>4</sub>)** or **kg nitrogen (N) equivalent**.

**Life Cycle Assessment (LCA)** - This is a method to quantitatively assess the environmental impact of a product throughout its entire lifecycle, from the procurement of the raw materials, through the production, distribution, use, disposal and recycling of that product.

**Material Financial Impact** - This is the financial impact associated with the material only. The mass of the model is multiplied by the financial impact unit (units of currency/units of mass) to calculate the financial impact (in units of currency).

[Learn more about Life Cycle Assessment](#) 