Wood for Good Lifecycle Database

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Galvanised Steel Sheet

Key Information

General Process Description	1 kg of hot dip galvanised steel sheet for use in timber structures as fixings, connector plates, joist webs or hangers.
Reference Flow	1 kg of hot dip galvanised steel
Reference Year	2013

Modelling & Assumptions

Hot dip galvanised steel sheets are commonly used within timber structures as general fixings, connector plates, joist webs or hangers. This dataset provides indicative results for the impact of galvanised steel sheet used within a timber structure.

Data on the manufacture of galvanised steel sheet has been taken from the GaBi life cycle database developed by PE International [PE International 2013]. Some of the components described above may require further processing (bending, punching) prior to use. The exact nature of such processes will vary depending on the purpose of the component but generally represent a relatively small part of the overall impact.

Transport of galvanised steel sheet to the building site is modelled as having an average haul of 139km based upon Department for Transport statistics for steel sheets [DfT 2005].

The end-of-life of the steel screws is also modelled with the same three indicative scenarios used for timber: 100% recycling, 100% incineration with energy recovery and 100% landfill. The benefit of steel recycling and the burdens of remelting have been modelled based on the “value of scrap” approach used by the World Steel Association [worldsteel 2011]. As steel does not burn in waste to energy incinerators, no impacts associated with this option have been modelled. Steel in landfill has been modelled based on models for inert material in landfill.

The reference flow is 1 kg of hot dip galvanised steel; users of this data should scale the impacts to the relevant quantity required for their particular application.

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Environmental Parameters Derived from the LCA

Production & Distribution (Cradle-to-Site)

Parameters describing environmental impacts	Units	Production *(A1-A3)*	Distribution and Installation *(A4-A5)*
Global Warming Potential	kg CO2 eq.	2.25	0.00752
Ozone Depletion Potential	kg CFC11 eq.	3.71E-11	3.99E-15
Acidification Potential	kg SO2 eq.	0.00804	3.07E-05
Eutrophication Potential	kg PO4 eq.	0.000696	7.33E-06
Photochemical Ozone Creation Potential	kg Ethene eq.	0.00112	-1.30E-05
Abiotic Depletion Potential (Elements)	kg Sb eq.	0.000143	7.86E-11
Abiotic Depletion Potential (Fossil)	MJ	25.6	0.100

Parameters describing primary energy	Units	Production *(A1-A3)*	Distribution and Installation *(A4-A5)*
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	1.11	8.03E-05
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0
Total use of renewable primary energy resources	MJ, net calorific value	1.11	8.03E-05
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	26.4	0.100
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	26.4	0.100
Use of secondary material	kg	0	0
Use of renewable secondary fuels	MJ, net calorific value	0	0
Use of non-renewable secondary fuels	MJ, net calorific value	0	0
Net use of fresh water	m^3	0.0103	4.57E-07

Other environmental information describing waste categories	Units	Production *(A1-A3)*	Distribution and Installation *(A4-A5)*
Hazardous waste disposed	kg	0.000514	3.16E-07
Non-hazardous waste disposed	kg	0.0293	3.95E-05
Radioactive waste disposed	kg	0.000337	3.00E-07

Other environmental information describing output flows	Units	Production *(A1-A3)*	Distribution and Installation *(A4-A5)*
Components for re-use	kg	0	0
Materials for recycling	kg	0	0
Materials for energy recovery	kg	0	0
Exported energy	MJ per energy carrier	0	0

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Environmental Parameters Derived from the LCA

End-of-Life

Parameters describing environmental impacts	Units	100% Recycling		100% Energy Recovery		100% Landfill	
		End-of-Life Processing (C1-C4)	Material and Energy Credits (D)	End-of-Life Processing (C1-C4)	Material and Energy Credits (D)	End-of-Life Processing (C1-C4)	Material and Energy Credits (D)
Global Warming Potential	kg CO2 eq.	0.0260	-1.54	0.0292	0	0.0386	0
Ozone Depletion Potential	kg CFC11 eq.	1.75E-14	1.11E-11	1.92E-14	0	1.83E-13	0
Acidification Potential	kg SO2 eq.	5.45E-05	-0.00591	6.29E-05	0	0.000133	0
Eutrophication Potential	kg PO4 eq.	1.09E-05	-0.000490	1.28E-05	0	2.18E-05	0
Photochemical Ozone Creation Potential	kg Ethene eq.	1.68E-06	-0.00089	-1.50E-06	0	8.60E-06	0
Abiotic Depletion Potential (Elements)	kg Sb eq.	2.87E-10	-3.10E-08	3.20E-10	0	4.87E-09	0
Abiotic Depletion Potential (Fossil)	MJ	0.357	-14.4	0.400	0	0.524	0

Parameters describing environmental impacts	Units	100% Recycling		100% Energy Recovery		100% Landfill	
		End-of-Life Processing (C1-C4)	Material and Energy Credits (D)	End-of-Life Processing (C1-C4)	Material and Energy Credits (D)	End-of-Life Processing (C1-C4)	Material and Energy Credits (D)
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	0.000302	0.288	0.000336	0	0.0141	0
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0
Total use of renewable primary energy resources	MJ, net calorific value	0.000302	0.288	0.000336	0	0.0141	0
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	0.358	-13.5	0.401	0	0.532	0
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ, net calorific value	0.358	-13.5	0.401	0	0.532	0
Use of secondary material	kg	0	1.00*	0	0	0	0
Use of renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0
Use of non-renewable secondary fuels	MJ, net calorific value	0	0	0	0	0	0
Net use of fresh water	m^3	1.67E-06	-0.000800	1.87E-06	0	-0.000640	0

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Parameters describing environmental impacts	Units	100% Recycling		100% Energy Recovery		100% Landfill	
		End-of-Life Processing (C1-C4)	Material and Energy Credits (D)	End-of-Life Processing (C1-C4)	Material and Energy Credits (D)	End-of-Life Processing (C1-C4)	Material and Energy Credits (D)
Hazardous waste disposed	kg	0.00106	0.000515	0.000522	0.000514	0.0156	-0.222
Non-hazardous waste disposed	kg	-0.0221	0.0294	0.928	0.0293	104	-0.709
Radioactive waste disposed	kg	0.000366	0.000337	0.000340	0.000337	0.00731	-0.214

Parameters describing environmental impacts	Units	100% Recycling		100% Energy Recovery		100% Landfill	
		End-of-Life Processing (C1-C4)	Material and Energy Credits (D)	End-of-Life Processing (C1-C4)	Material and Energy Credits (D)	End-of-Life Processing (C1-C4)	Material and Energy Credits (D)
Components for re-use	kg	0	0	0	0	0	0
Materials for recycling	kg	1.00	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0
Exported energy from Electricity	MJ	0	0	0	0	0	0
Exported energy from Thermal Energy	MJ	0	0	0	0	0	0

*Represents use of secondary material in next product system

References

DfT 2005	Department for Transport, 2005. Continuous Survey of Road Goods Transport. Department for Transport, London, UK.
PE International 2013	PE International, 2013. *GaBi 6 Software and Database for Life Cycle Engineering*. Data on the manufacture of galvanised steel sheet. LBP, University of Stuttgart and PE International, Stuttgart, Germany
worldsteel 2011	World Steel Association, 2011. *World Steel Association Life Cycle Inventory Study for Steel Products*. World Steel Association (worldsteel), Brussels, Belgium

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