

## Building product declaration for Prelaq Greencoat as per Ecocycle Council guidelines 2007

Page 1/4

### 1. BASIC DATA

#### 1.1 Product name

Prelaq Greencoat

#### 1.2 Building product declaration issued in

October 2009

### 2. SUPPLIER INFORMATION

Company name SSAB  
Address SE-781 84 Borlänge  
Sweden  
Phone number +46 243 70 000  
Fax +46 243 72 000  
E-mail office@ssabtunnplat.com  
Company ID No. 556313-7941  
Home page www.ssab.com  
Environ.work The company has environmental  
certification to ISO 14001  
Quality work The company has quality certification to  
ISO 9001 and  
ISO/TS 16949

### 3. PRODUCT INFORMATION

Prelaq Greencoat is a continuously prepainted sheet steel with a polyester based paint coat. Prelaq Greencoat is used mainly for roofing and wall cladding.

Greencoat is a patented concept for organic surface coating. A substantial part of conventional solvents has been replaced by a renewable, reactive solvent produced from natural vegetable oils. The benefit of a reactive solvent such as rape methyl ester, RME, is that it acts as a solvent during production, application and until the paint comes into the curing oven. Once there, the role of the RME changes from being a solvent to being a permanent paint component, and it reacts with the polyester binder instead of being evaporated like a conventional solvent. The RME molecule thus becomes part of the finished paint coat. Moreover, the scratch resistance is improved and so is the ability to withstand the elements, since a polyester binder with a higher molecular weight can be used.

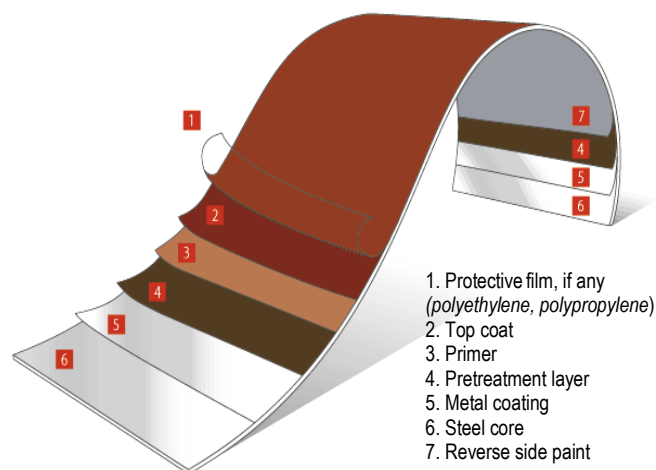
The closely controlled painting process gives the sheet steel better performance than that of sheet steel painted by conventional methods, such as in-situ painting. Better anti-corrosion properties and exceptional gloss and colour retention provide longer functional and aesthetic useful life, which reduces the need for costly and environmentally harmful maintenance.

#### 3.1 Place/country of manufacture

Steel slabs from Luleå and Oxelösund are rolled into sheet in Borlänge and painted in Borlänge or Finspång.

#### 3.2 Classification

The product is not classified as hazardous according to the Swedish Chemicals Inspectorate regulations.



### 4. CONTENTS

Prepainted sheet steel as per SS-EN 10169. The sheet consists of a steel core with a zinc metal coating on each side. Outside this metal coating on the front is a primer and top coat, while the reverse side is coated with reverse side paint.

The sheet is also coated with a chromium-free pre-treatment fluid to protect against corrosion and improve adhesion.

The composition of the paint coat is given in the table 1 on side 2.

### 5. PRODUCTION PHASE

#### 5.1 Energy consumption

The energy consumption (electrical energy and fuels) for producing 1 tonne of steel in the Swedish SSAB steel operations is an average of around 780 kWh or around 3.1 kWh/m<sup>2</sup> of finished sheet steel. The need for oil and electrical energy is minimized mainly by the process gases being recycled. In addition to reducing the in-house needs at SSAB, this also benefits the outside community by supplying heat for district heating.

0.1-0.3 kWh/litre is needed for producing the wet paint, which amounts to less than 0.05 kWh/m<sup>2</sup> of painted steel surface.

## Building product declaration for Prelaq Greencoat as per Ecocycle Council guidelines 2007

### 5.2 Raw materials

Steel core to EN 10346:2009. Thickness of 0.4-1.5 mm gives a weight of 3 100-11 700 g/m<sup>2</sup>.

The metal layer nearest to the steel core contains 99.6 % zinc and 0.4 % aluminium. The quantity of zinc depends on the coat thickness and is given as weight/m<sup>2</sup>.

Zinc weight 275 g/m<sup>2</sup> alt 350 g/m<sup>2</sup>  
(total on both sides)

### The sheet is coated with:

Primer 10 µm  
Top coat 30 µm  
Reverse side paint 10 µm

### 5.3 Emissions to water, air and ground

Emissions to the surroundings and management of waste from extraction and refining of raw materials and input goods are governed by the conditions specified in the permission decisions for each activity.

Large-scale industrial strip painting is virtually an enclosed painting process in which the sheet steel is cleaned, pretreated and painted with primer and top coat under controlled conditions, which substantially reduces the environmental impact compared to conventional painting methods, such as in-situ painting.

The stated emissions to water and air relate to the entire production chain: metallurgy, rolling and coating.

Table 1

Contents in the cured paint coat: The particulars are stated for white and black colours when they comprise the highest and lowest proportions respectively of the pigment.						
Type	Substance	White g/m <sup>2</sup>	Black g/m <sup>2</sup>	CAS No.	Classification* Substance Directive	Classification** CLP
Binder	Polyester resin	37-40	42-46			
	Melamine resin	4-6	7-9			
	High-molecular epoxy resin	4-6	4-6			
	RME***	1-5	1-5			
Pigment/Filler	Polyacrylate	1-2	1-2			
	Titanium dioxide	22-27	4-7	13463-67-7		
	Soot	0-1	1-3	1333-86-4		
	Silica ion exchange pigment	1-3	1-3	7631-86-9 1344-95-2		
	Aluminium silicate	0-1	0-1	1327-36-2		
	Zinc phosphate	1-3	1-3	7779-90-0	N; R50/53	Aquatic Acute 1, H400 Aquatic Chronic 1, H410
	Chalk	0-1	0-1	471-34-1		
Additives	Wetting agent	0-1	0-1			
	Acid catalyst	0-1	0-1			

\* Classification according to Council Directive 67/548/ EEC

\*\* Classification according to Regulation (EC) no 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP)

\*\*\* Alkyl fatty acid ester, e.g. RME

## Building product declaration for Prelaq Greencoat as per Ecocycle Council guidelines 2007

### Emissions to water:

Suspended matter	0,02 kg/tonne	< 0,2 g/m <sup>2</sup>
Oxygen depleting substances	0,051 kg/tonne	< 0,6 g/m <sup>2</sup>
Oils and greases	0,004 kg/tonne	< 0,05 g/m <sup>2</sup>

The metal coated steel strip is washed in special cleaning systems before painting. Special treatment plants are installed for cleaning the washing liquids. These collect substances such as metals and solid particles.

### Emissions to air:

Dust	0,28 kg/tonne	< 3 g/m <sup>2</sup>
Sulphur dioxide (SO <sub>2</sub> )	0,57 kg/tonne	< 7 g/m <sup>2</sup>
Nitrogen oxides (NO <sub>x</sub> )	0,52 kg/tonne	< 6 g/m <sup>2</sup>
Total hydrocarbons (THC)*	0,40 kg/tonne	< 5 g/m <sup>2</sup>
Carbon Footprint (CO <sub>2</sub> )**	920 kg/tonne	< 11 g/m <sup>2</sup>

\* Refers only to emissions from the paintin line, curing and paint.

\*\* The calculations do not include carbon dioxide emissions derived from SSAB:s process gases which are burned in the power and heating plant at Lulekraft AB and SSAB:s power and heating plant in Oxelösund.

Solvents are released when metal coated sheet steel is painted. The emissions are cleaned to more than 99 % by incineration at above 700 °C. The energy liberated during incineration is used for heating furnaces and degreasing baths.

### 5.4 Recycled materials

Around 20 % of the steel consists of recycled steel (average figure for SSAB steel production in Sweden). Waste material goes to steel recycling.

## 6. DISTRIBUTION OF FINISHED PRODUCT

### 6.1 Method of transport

Deliveries are transported mainly by rail, but also by road.

### 6.2 Distribution forms

Sheet steel is normally delivered in coils weighing 5-8 tonnes, directly to customers.

### 6.3 Packaging

Only steel straps and steel rings are normally used for transport to customers in Sweden. Board, LDPE plastic and steel edge protection are added for export shipments. The amount of packaging material varies between 5 and 15 kg per tonne of finished product. The packaging, more than 98 % of which consists of steel, must be sorted at source and handed over for recycling.

## 7. CONSTRUCTION PHASE

The environmental impact is considered to be insignificant. Pneumatic or electric hand tools are used for installing the sheets. Fasteners (screws) are used for securing. The sheets are cut to size mainly before delivery, which minimizes material wastage. Hazardous waste does not arise.

Note that care should be taken during the following machining of the sheet, although this is very rare. During grinding of the sheet, inhalation of the dust should be avoided. If the sheet is heated by welding or fire, zinc oxide, smoke from the paint coat, etc. will be emitted, and it is therefore important to avoid inhaling the fumes

## 8. USAGE PHASE

No known environmental impact. A long useful life can be expected if the prepainted sheet is regularly inspected and maintained. There are examples of strip painted sheet steel on buildings, which is more than 40 year old and still meets current standard requirements. The sheet surface should be inspected at least once a year. In most cases, maintenance is confined to washing the sheet with a mild detergent solution in water a few times during its useful life. If the sheet needs to be repainted, which is not normally needed until after about 20 years, recommended painting systems should be used. Washing with a 5 % alkaline water solution is sufficient as pretreatment.

## Building product declaration for Prelaq Greencoat as per Ecocycle Council guidelines 2007

Page 4/4

### 9. DEMOLITION

If secured with fasteners, prepainted sheet steel can be removed and reused in many cases.

### 10. WASTE MANAGEMENT

#### 10.1 Reuse

Undamaged sheet from demolition should be reused.

#### 10.2 Material recycling

All waste material from construction work, repair and demolition should be sorted and returned to the steel industry through well-established scrap trade. The emissions from metal and paint coats are removed during remelting. Zinc, for example, is recovered from the collected dust.

#### 10.3 Energy recovery

The energy content in the paint coats is utilized in the remelting process and is thus recovered. The energy recovery does not give rise to hazardous waste.

#### 10.4 Disposal to landfill

No known environmental impact.

#### 10.5 Waste code

A relevant EWC code as per Waste Directive (2006/12/EG) is "CONSTRUCTION AND DEMOLITION WASTES 17 04 05 Iron and steel".

#### 10.6 Hazardous waste

The product is not classified as hazardous waste.

### 11. INDOOR ENVIRONMENT

The concept of renewable reactive solvents offers a number of benefits throughout the chain extending from the paint manufacturer to final use of the strip painted product. From the working environment viewpoint, the use of RME reduces the amount of irritating and malodorous solvents. Alkyl esters from vegetable oils are also effective solvents, and smaller amounts of RME are sometimes sufficient for obtaining the right viscosity.

#### 11.1 Contents of hygienically hazardous substances

Contact with the sheet during normal handling is harmless. Prelaq Greencoat contains no substances that give rise to allergies during normal handling.

#### 11.2 Construction process

It is not relevant to specify requirements on storage and work procedures for the indoor environment.

#### 11.3 Inherent emissions and odours

The cured paint coat causes no emissions.

#### 11.4/5 Requirements on surrounding building products

It is not relevant to specify requirements on surrounding materials for this product.

#### 11.6 Operation and maintenance

It is not relevant to specify requirements on operation and maintenance from the environmental aspect.

#### 11.7/8 Sound level and electrical/magnetic fields

The product does not give rise to noise or electrical/magnetic fields.

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