

**ENVIRONMENTAL PRODUCT DECLARATION
AND SAFETY INFORMATION SHEET**

Cold-rolled steel plates, sheets and coils

- **Product description**

Ruukki's extensive product range in cold-rolled steel grades consists of formable and high-strength formable steels, weather-resistant steels and boron steels.

High-strength formable steels provide guaranteed specified strength properties combined with good formability. The strongest option in our range of cold-rolled steels, hardening boron steels, are formable in the delivery condition and very strong and wear-resistant in the quenched condition.

COR-TEN® A is a cold-rolled, weather-resistant steel that protects itself. With anticorrosive properties that slow down corrosion, the range includes grades that, in many applications, are better than those of other structural steels.

Products are delivered as coils and sheet and slit strips cut from coils. Ruukki produces cold-rolled steels in the 0.40–3.0 mm thickness range and our area of expertise is in materials for challenging forming applications. Cold-rolled steels provide a solid basis for metal and colour coated products, precision tubes and sections, as well as for parts and components made of these.

Hot-rolled steel from Ruukki's Raahe steel production is used as raw material in manufacturing Ruukki's cold-rolled and tubular steel products.

- **Product content**

Steel is an alloy consisting mostly of iron and carbon, with small amounts of other elements which are used as an alloying element. These elements improve the chemical and physical properties of steel, such as strength, durability and resistance to corrosion. The alloying elements of steel are firmly bonded in its chemical matrix.

Chemical composition

Ruukki actively tracks and anticipates future changes in environmental, safety and chemical legislation and complies with valid EU chemical regulations, such as REACH (1907/2006/EC) and CLP (1272/2008/EC). Communication and cooperation throughout the supply chain has an important role and Ruukki requires full REACH compliance from its subcontractors. Ruukki controls substances of very high concern and other restricted substances to meet legal and customer requirements.

The following table gives a summary of the elements in steels that are representative of the normal production of cold-rolled formable steel as it is when the product is delivered to the customer, excluding packaging. Production of these steel grades is based on the use of iron ore and 22% of steel scrap as raw materials. Steel composition varies depending on the material standards and customer requirements. The information is based on steel produced at Ruukki's steelworks in Finland.

Composition also discloses the proportion by weight of each constituent controlled substance within the whole product when this equals or exceeds the limits set by EU chemical legislation and by recommendations phasing out hazardous substances in the building sector, such as the requirements of the Swedish BASTA 2010:B, Byggvarubedömningen (BVB) and Swedish Building Product Declarations – Ecocycle Council guidelines, BPD 3, June 2007.

Steel contains extremely small amounts of impurities originating from natural raw materials and not added during the manufacturing process. The amount of the trace elements in the steels is minimal and they do not pose a risk to the environment or human health, based on knowledge of the toxicity of these compounds.

For more information on chemical compositions of different cold-rolled steels, visit www.ruukki.com.

Table 1.
An example of the composition of cold-rolled formable steel (DC01)

Material	Content (%) of total weight of the product	Name of the ingredient	Part maximum content % (w/w) of total weight of the product	CAS number	Warning symbol, R phrases and other data on the ingredient
Cold-rolled formable steel (DC01)	100	Iron (Fe)	> 97.0	7439-89-6	–
		Carbon (C)	0.12	7440-44-0	–
		Manganese (Mn)	0.60	7439-96-5	–
		Sulphur (S)	0.045	7440-50-8	–
		Phosphorus (P)	0.045	12185-10-3	R17-26/28-35-50

Remarks

Physical state: Solid

Odour: Odourless

Colour: Metal grey

Boiling point: 2 750 C°

Melting point: 1 450-1 520 C°

Density of steel: 7 850 kg/m³

More detailed information about the composition of different steels can be found in national and international standards and in the Rautaruukki Sheet Steel Manual. Values are based on EN 10219-1, EN 10025-2, EN 10025-3, EN 10025-4, EN 10025-6 requirements on maximum concentration. Measurements are done to a level 0,02 µg/g (0,0000002%). Concentrations under that cannot be estimated. For example, the amount of common trace elements such as zirconium (Zr), magnesium (Mg) and cobalt (Co) are very low and arsenic (As), cadmium (Cd), zinc (Zn), lead (Pb), antimony (Sb) and tin (Sn) can not even be detected.

According to supplier notifications, none of the constituent substances within the whole product exceeds the limits set by EU chemical legislation and recommendations phasing out hazardous substances in the building sector, such as the requirements of the Swedish BASTA 2010:B, Byggarubedömningen (BVB) and Swedish Building Product Declarations - Ecocycle Council guidelines, BPD 3, June 2007.

● **Production and transportation**

Cold-rolled steel sheets and coils are made at Ruukki’s Hämeenlinna Works in Finland. The raw material used is hot-rolled steel coils manufactured at Ruukki’s Raahе Steel Works, Finland. Depending on the grade of steel being made, Ruukki uses approximately 22% of scrap steel as a raw material in steelmaking. The use of raw materials and energy used in manufacture of steel is highly researched and optimised.

Ruukki’s steel production ranks among the world’s most carbon dioxide efficient, with coal and energy consumption approaching the minimum possible using current technology. The company is actively involved also in developing new ways to reduce emissions. Most of the energy used in ore-based production comes from coal, which is used as a reducing agent. The mineral products formed in the iron and steel production process and by-products generated in the coking process are recycled as industrial raw material or material to replace natural resources. A high percentage of the process dust is returned to the process, thus considerably reducing amounts of waste.

Most of the transportation is operated by the Ruukki Logistics unit, which manages environmental issues through a certified environmental management system. The unit’s environmental objectives are to lower energy consumption in transportation, to minimise shipping risks and to reduce damage sustained during transportation.

The operation aims at optimised transportation and domestic raw materials. Finished products are transported by truck and rail combined. Ruukki seeks high payloads. The aim is to also combine transport of material for the same project as effectively as possible.

Also other steel suppliers are used. Although steel must meet the requirements of EN standards for steel quality.

Supplies of raw materials are managed by responsible sourcing practices with reliable partners. Ruukki’s Code of Conduct is taken into account in the general terms and conditions of sourcing contracts. Ethical values, environmental matters and energy efficiency are also weighed up when choosing suppliers.

- **Packaging**

For detailed guidance and information on the marking and packing of hot-rolled steel sheets, plates and coils, visit www.ruukki.com.

- **Recycling and disposal**

Steel is 100% recyclable. Steel is part of an integrated life cycle and can be fully recycled. Thus surplus and scrap steel are valuable and in demand for the production of prime new steel.

Recycling routes are well-established and recycling is therefore the preferred disposal route. While disposal to landfill is not harmful to the environment, it is a waste of resources and therefore less desirable than recycling.

Waste material from Ruukki's own production processes and material sourced on the scrap steel market are used in production. Using scrap steel to replace the raw materials used in iron production thus results in a considerable decrease in carbon dioxide emissions in the steelmaking process.

All packaging materials of hot-rolled steel products are recyclable. No hazardous waste is formed from end products.

The code for the product according to the European waste classification is 17 04 05 (iron and steel).

- **Information on safe use**

Steels are stable, insoluble to water and non-reactive under normal ambient atmospheric conditions. Only when molten or during welding operations (i.e. heated to very high temperatures), may fumes be produced.

Dust and fumes may be generated during processing e.g. in welding, cutting and grinding. If airborne concentrations of dust and fume are excessive, inhalation over long periods may affect workers' health, primarily of the lungs. Dust and fume quantity and composition depend on specific practice.

The process of welding should only be performed by trained workers with the personal protective equipment and sufficient ventilation in accordance with the safety legislation of each country. Guidance on the welding of metals and alloys is provided on the EUROFER (the European Confederation of Iron and Steel Industries) website at www.eurofer.org.

Steel applications do not endanger humans or the environment. Thus, there are no specific occupational exposure limits, first aid / fire fighting / accidental release measures nor measures for steel handling and storage. However, specific occupational exposure limits have been established for some constituent elements and compounds. Exposure is minor when the total amount of dust is under 5 mg/m³. The limits e.g. in Finland are shown in the table below.

Element	OEL, 8h (mg/m ³)
Iron oxide, vapour	5.0
Manganese (Mn)	0.5
Chromium (II)	0.5
Nickel (Ni), metal	1.0
Silicon oxide, amorphous	5.0
Aluminium, welding fume	1.5
Sulphur dioxide	5.0
Phosphorus, white and yellow	0.1

Normal precautions should be taken to avoid physical injuries produced mainly by heavy products or by sharp edges. Personal protective equipment, e.g. special gloves and eye protection, must be worn.

Steel poses no hazards to the environment in the forms supplied.

Some steel grades contain alloying elements such as manganese, chromium, nickel, copper and silicon may be present. None of these substances are intended to be released under normal or reasonable foreseeable conditions of use. Exposure to humans or the environment during normal or reasonably foreseeable conditions of use including disposal is excluded.

Hot-rolled steel is not classified as “dangerous” under the EU chemical regulations, so Safety Data Sheet or hazardous material packaging, marking or transport rules and regulations do not apply.

Safety

- Always wear gloves and protective clothing when handling steel products.
- Be careful of sharp edges and corners.
- Always use official lifting equipment when moving steel products.
- Do not use binding straps to lift a product.
- Straps under tension may cause injuries when cut and the outer ring of a coil may rebound outwards.
- Do not go under steel products when they are being moved.
- Make sure that the slings are strong and firmly attached.
- Always follow the occupational safety provisions in force and find out whether the working site is subject to any particular safety requirements before beginning work.

● **Environmental profile**

The eco-profile includes the lifecycle stages from the sourcing of raw materials to the factory gate, cradle to gate, including end-of-life recycling rate of 90% for steel. This means a loading is given for the steel scrap used as an input in the steelmaking process and a credit for the end-of-life (EoL) steel that is recycled.

The effect of recycling has been calculated from worldsteel’s (World Steel Association) LCA data so that the compensation is the difference between primary and secondary production of steel slab perceived with the acquisition of the recycling process. 1.07 kg of recycled steel is needed to produce 1 kg of steel in secondary production.

All values are for 1 kg of cold-rolled steel from Ruukki's Hämeenlinna Works in Finland.

Use of resources

Use of energy	MJ/kg
Non-renewable energy resource	15
Renewable energy resource	1.7
Total consumption of energy resource in processes and transport (HHV, higher heating value / gross calorific value)	16.7

Consumption of raw materials (water is not included)	g/kg
Non-renewable natural materials	322
Renewable natural materials	0
Total consumption of raw materials	964

Emissions

Emissions to air	g/kg
Carbon dioxide, CO ₂	850
Carbon monoxide, CO	8.3
Sulphur oxides, SO ₂	2.2
Nitrogen oxides, NO _x	0.4
Methane, CH ₄	1.1
Nitrous oxide (laughing gas), N ₂ O	6.2 x 10 ⁻³
Non-methane volatile organic compounds, NMVOC	15 (also CH ₄)
Heavy metals (Hg, Cd, Cr, Cu, Pb, Ni, V, Zn)	1.6
Dust	1.8

Emissions to fresh water	g/kg
Chemical oxygen demand (COD)	62 x 10 ⁻³
Phosphorus, P _{tot}	4.5 x 10 ⁻³
Nitrogen, N _{tot}	44 x 10 ⁻³
Solids	1.3

Process waste	g/kg
Waste to landfill	290
Hazardous waste	1.2

Ruukki supplies metal-based components, systems and integrated systems to the construction and engineering industries. The company has a wide selection of metal products and services.

Management of corporate responsibility is defined in the safety management principles, environmental policy, principles of social responsibility and quality policy. Ruukki's production sites operate in conformance with certified ISO 14001 environmental management and ISO 9001 quality management systems. Ruukki aims at continuous improvement and energy efficiency in operations and customer solutions.

An Environmental Product Declaration (EPD) provides information on the environmental performance of Ruukki's products. The declaration is based on the basic principles stated in the ISO standard series 14040 and 14020 and covers, among other things, the use of raw materials, energy consumption and emissions arising from production, as well as product recyclability. The product information is based on steel produced at Ruukki's steelworks in Finland.

For the latest, updated information on Ruukki products and services, including environmental and social responsibility, visit www.ruukki.com.