



EN 1090 standard

A guideline on the content of EN 1090
and how it relates to Jansen products.

EN 1090 – Execution of steel structures and aluminium structures

What does EN 1090 regulate?

EN 1090 regulates the execution of steel structures and aluminium structures. The standard is divided into three parts.

EN 1090-1 ...

...lays down the requirements of the conformity assessment, the Factory Production Control, the manufacturer certification and the CE marking for steel and aluminium load-bearing components and kits that are being brought onto the market as construction products.

- The conformity assessment covers the manufacturing characteristics and, if required, the load-bearing characteristics.
- EN 1090-1 also deals with the conformity assessment of steel components that are used in composite steel and concrete structures.
- Components may be used directly, installed in load-bearing structures or used as kits.
- EN 1090-1 applies to load-bearing components that are manufactured in series or non-series production, and to kits.

EN 1090-2 ...

...covers the technical regulations/requirements for the manufacture (mechanical fastening, welding, corrosion protection, installation) and testing of steel load-bearing structures.

EN 1090-3 ...

...specifies the technical requirements for the execution of aluminium load-bearing structures.

[EN 1090-1:2009+A1:2011 (D), p.5]

To which construction products does EN 1090 apply in accordance with the Construction Products Regulation?

EN 1090 only covers those products in metal fabrication that are not already covered by another harmonised product standard. The product must also be a construction product as defined by the Construction Products Regulation (EU) 305/2011, i.e. «Any product or kit which is produced and placed on the market for incorporation in a permanent manner in construction works or parts thereof and the performance of which has an effect on the performance of the construction works with respect to the basic requirements for construction works».

This content is regulated under (see question 31)
http://ec.europa.eu/growth/sectors/construction/product-regulation/faq/index_en.htm;

Example:

There is already a harmonised product standard for curtain walling, external doors and windows, hence EN 1090 does not apply to these construction products.

For roof glazing, such as conservatories or skylights, there is no harmonised product standard which is why these construction products are subject to EN 1090.



Skylight constructions EN 1090



Curtain walling EN 13830



Windows EN 14351-1



External doors EN 14351-1

What are the Execution Classes (EXC)?

Which Execution Classes are there and what is their purpose?

The Execution Class specifies how a load-bearing structure has to be designed in order to satisfy a particular load. The Execution Class also contains information on how the load-bearing structure has been manufactured. Finally, the Execution Class is a categorisation of the damages to be expected if a load-bearing structure or an individual component were to fail. Accordingly, the Execution Class is derived from the following three factors:

- Type of loading
- Production category
- Consequences Class (CC) (refer to Table B.1 of EN 1990 for the Consequences Class)

The above factors are apportioned in a matrix as follows and each combination is allocated an Execution Class (EXC).

It is then the task of the structural engineer to calculate and estimate the Execution Class for the load-bearing structure that is to be designed and built. Different requirements have to be fulfilled for each of the Execution Classes in terms of material selection, quality management and production control, etc.

Note:

Depending on the country-specific regulations, legal requirements, complexity of the load-bearing structure and scope of the entire project, the planning tasks must be carried out by specialist companies (approved and certified).

Recommended matrix for determining the Execution Classes

Consequences Classes		CC 1		CC 2		CC 3	
Types of loading		SC 1	SC 2	SC 1	SC 2	SC 1	SC 2
Production categories	PC 1	EXC 1	EXC 2	EXC 2	EXC 3	EXC 3	EXC 3
	PC 2	EXC 2	EXC 2	EXC 2	EXC 3	EXC 3	EXC 4

EN 1090-2:2008 S.112 - Table B.3



The following three tables show the content of the three individual factors in detail

Suggested criteria for types of loading

Categories	Characteristics
SC 1 Static	Load-bearing structures and components designed for quasi-static actions only (example: buildings)
	Load-bearing structures and components with their connections designed for seismic actions in regions with low seismic activity and in DCL
	Load-bearing structures and components designed for fatigue actions from cranes (class S ₀)
SC 2 Dynamic	Load-bearing structures and components designed for fatigue actions in accordance with EN 1993 (examples: road and railway bridges, cranes (class S ₁ to S ₉), load-bearing structures susceptible to vibrations induced by wind, crowds or rotating machinery).
	Load-bearing structures and components with their connections designed for seismic actions in regions with medium or high seismic activity and in DCM and DCH.

EN 1090-2:2008 S.111 - Table B.2

Suggested criteria for production categories

Categories	Characteristics
PC 1	Non-welded components manufactured from any steel grade products
	Welded components manufactured from any steel grade products below S355
PC 2	Welded components manufactured from any steel grade products from S355 and above
	Components essential for structural integrity that are assembled by welding on the construction site.
	Components with hot forming manufacturing or receiving thermic treatment during manufacturing.
	Components of circular hollow section lattice girders requiring end profile cuts.

EN 1090-2:2008 S.111 - Table B.2

KIConsequences Classes

Consequences Classes	Characteristics	Examples of buildings and civil engineering works
CC 3	High consequences for loss of human life, or economic, social or environmental consequences very	Grandstands, high-rises, public buildings where consequences of failure are high (e.g. a concert hall)
CC 2	Medium consequences for loss of human life, economic, social or environmental consequences considerable	Residential and office buildings, public buildings where consequences of failure are medium (e.g. an office building)
CC 1	Low consequences for loss of human life, and economic, social or environmental consequences small or negligible	Agricultural buildings where people do not normally enter (e.g. storage buildings, greenhouses)

EN 1990:2010 S.82 - Table B.1

Example

If a conservatory was to be built with a welded construction for a family home, then the assessment would probably be similar to the following:

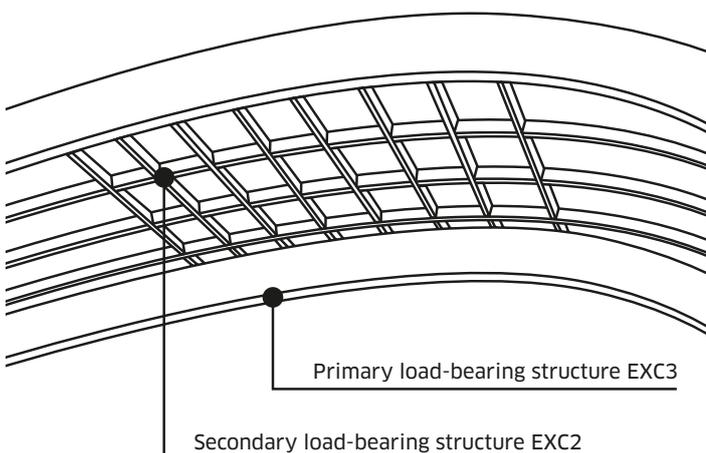
- *Service category SC 1 ...*
because, in general, construction products made from Jansen articles are load-bearing structures or building components that take up static actions.
- *Production category PC 1 ...*
because Jansen profiles are below S355.
- *Consequences Class CC 1 ...*
because the consequences of failure are very low.

Impact of the Execution Classes on the building costs

Can a construction have multiple Execution Classes and what does this have to do with costs?

Yes. For large-scale roof glazing there is usually a primary and a secondary load-bearing structure which generally do not have the same Execution Class – for both technical and economic reasons. The primary load-bearing structure, as the name indicates, has the task of stabilising the entire construction while the secondary load-bearing structure is only responsible for the stability of individual fields.

The Execution Class therefore has a direct impact on the pricing of the products. Execution Classes that are too high lead to components that are excessively expensive, as the expenditure for implementation in accordance with EN 1090 is increased.



Which articles from Jansen may be subject to EN 1090?

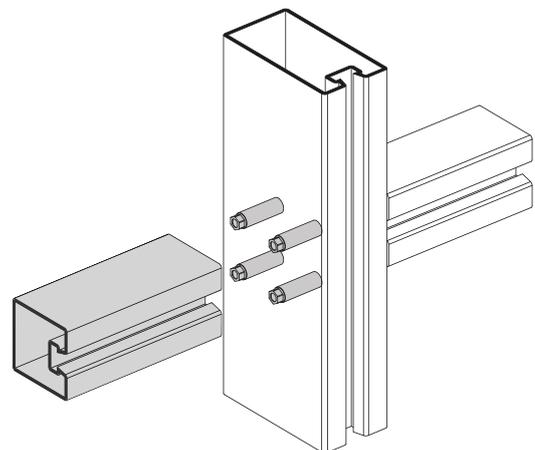
As remarked at the beginning, there is no harmonised product standard for roof glazing, which is why EN 1090 applies to roof glazing.

In accordance with our documentation, roof glazing can only be constructed using VISS system profiles, which is why these are subject to EN 1090, provided that they are used to construct roof glazing and not a curtain wall.

Seeing as, for roof glazing, a joint using universal T-cleats may be present in addition to a welded mullion/transom joint, the universal T-cleats are also subject to EN 1090.

The corresponding certificates and documents are available for these articles.

As we as a systems provider do not always know whether our profiles are going to be used to construct a curtain wall or roof glazing, the necessary documents for EN 1090 can be downloaded at any time from our extranet page.



EN 1090

Which documents are made available by Jansen?

Jansen provides the requisite Declaration of Performance and the CE marking for the abovementioned VISS profiles and connecting spigots.

Where can I download these documents?

The Declaration of Performance, the CE marking and the test report can be downloaded from our extranet page.

Declaration of Performance and CE marking:

<http://extranet.jansen.com/en/architecture-catalogue-extranet/intern/ce-documentation/jansen-articles/>

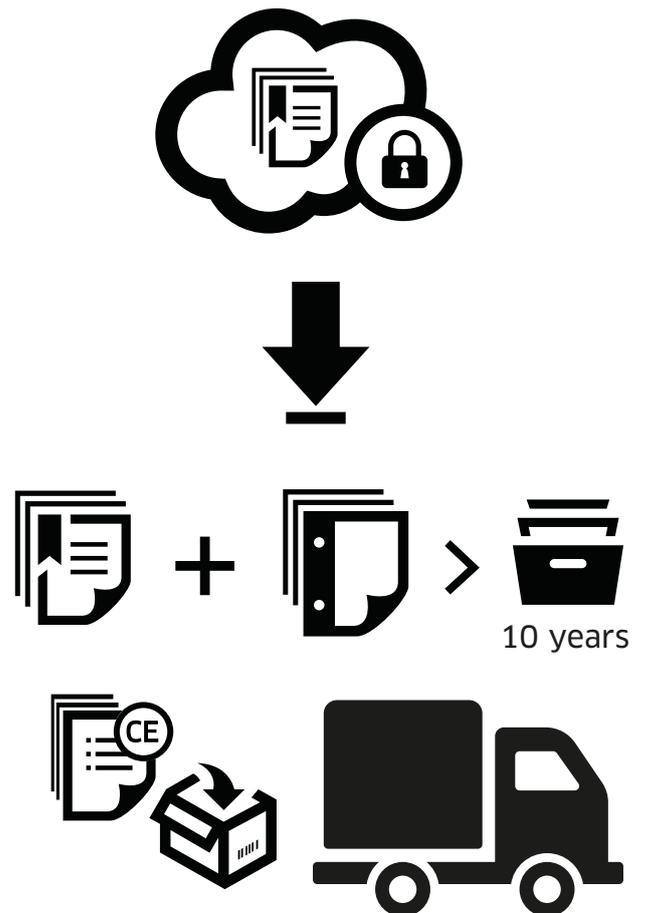
Test report:

<http://extranet.jansen.com/en/architecture-catalogue-extranet/intern/data-sheets/reports/>

Download the relevant Declaration of Performance, CE marking and test report. The CE marking must be included with the accompanying documentation, e.g. delivery note. The Declaration of Performance and test report remain with the manufacturer, i.e. the metal fabricator, who must retain this with the technical documentation and the FPC (Factory Production Control) for at least 10 years from the date the product was placed on the market.

Important:

Jansen only provides documents for specific profiles and articles. The complete construction product, e.g. the entire roof glazing construction, must be certified by the metal or steel fabricator themselves. Welded joints and welding work (e.g. welding of a top plate) also require certification. This means that the manufacturer (metal or steel fabricator) themselves must be certified in accordance with EN 1090.



Note:

This information only provides indications in a simplified form. Precise knowledge of the requirements with regard to the Construction Products Regulation and EN 1090 as well as other standards is essential.

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