

## SSAB Naval 700F

### General Product Description

SSAB Naval is a structural steel with a minimum yield strength of 690 MPa.

Typical applications are naval applications where high strength, very good welding and bending properties are required. SSAB Naval 700F is available as plate in thicknesses of 5 - 80 mm.

Benefits include:

- Superior bendability and surface quality
- Weldability with excellent HAZ strength and toughness
- Exceptional consistency within a plate guaranteed by close tolerances
- High impact toughness which provides for good resistance to fractures

### Dimension Range

SSAB Naval 700F is available as plate in thicknesses of 5 - 80 mm. More detailed information on dimensions can be obtained from the SSAB Protection sales team.

### Mechanical Properties

Thickness (mm)	Yield strength R <sub>p0.2</sub> (MPa)	Elongation A <sub>5</sub> (min %)
5.0 - 17.9	690 - 830	16
18.0 - 80.0	690 - 795	16

Transversal testing.

### Mechanical Testing

Tensile testing according to EN ISO 6892 on each heat and thickness.

Charpy impact testing according to EN ISO 148.

### Ultrasonic testing

According to EN ISO 10 160 Class E<sub>3</sub>S<sub>3</sub>.

### Impact Properties

Product	Min transversal, impact energy, Charpy V 10x10 mm test specimen
SSAB Naval 700F	75 J / -60 °C

For thicknesses between 6 - 11.9 mm, sub-size Charpy V-specimens are used. The specified minimum value is then proportional to the cross-sectional area of the specimen compared to a full-size specimen (10 x 10 mm).

### Chemical Composition (heat analysis)

C <sup>*)</sup> (max %)	Si <sup>*)</sup> (max %)	Mn <sup>*)</sup> (max %)	P (max %)	S (max %)	Cr <sup>*)</sup> (max %)	Ni <sup>*)</sup> (max %)	Mo <sup>*)</sup> (max %)	B <sup>*)</sup> (max %)
0.16	0.60	1.50	0.020	0.009	0.80	1.50	0.70	0.005

The steel is grain refined. <sup>\*)</sup> Intentional alloying elements.

### Carbon Equivalent CET(CEV)

Thickness (mm)	5.0 - 80.0
Typ CET(CEV)	0.31 (0.54)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40}$$

$$CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

## Tolerances

More details are given in SSAB's brochure 41-General product information Strenx<sup>®</sup>, Hardox<sup>®</sup>, ArmoX<sup>®</sup> and Toolox<sup>®</sup>-UK or on [www.ssab.com](http://www.ssab.com).

## Thickness

Tolerances according to SSAB Thickness Guarantees.

SSAB Naval 700F meet the requirements of EN 10 029 Class A, but offers narrower tolerances.

## Length and Width

According to SSAB's dimension program. Tolerances conform with EN 10 029 or to SSAB's standard after agreement.

## Shape

SSAB offers tolerances according to EN 10 029.

## Flatness

Tolerances according to EN 10 029 Class N, steel type L.

## Bending

Rolling direction	Min. Inside bending radius	Min. Die opening
Transversal to final rolling direction	2.0 x t	7.0 x t
Parallel to final rolling direction	3.5 x t	9.5 x t

## Delivery Conditions

The delivery condition is Quenched and Tempered. The plates are delivered with sheared or thermally cut edges. Untrimmed edges after agreement. SSAB Naval 700F can be hot formed at maximum 580 °C. Delivery requirements can be found in SSAB's brochure 41-General product information Strenx<sup>®</sup>, Hardox<sup>®</sup>, ArmoX<sup>®</sup> and Toolox<sup>®</sup>-UK or on [www.ssab.com](http://www.ssab.com).

## Fabrication and Other Recommendations

### Welding, bending and machining

Recommendations are found in SSAB's brochures at [www.ssab.com](http://www.ssab.com) or consult Protection team at [protectionplate@ssab.com](mailto:protectionplate@ssab.com).

SSAB Naval 700F has obtained its mechanical properties by quenching and subsequent tempering. The properties of the delivery condition cannot be retained after exposure to temperatures in excess of 580°C.

Appropriate health and safety precautions must be taken when welding, cutting, grinding or otherwise working on this product. Grinding, especially of primer coated plates, may produce dust with a high particle concentration.

## Contact Information

[www.armoxplate.com](http://www.armoxplate.com) or [protectionplate@ssab.com](mailto:protectionplate@ssab.com).