



EPPA standard for Fencing and Systems

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Introduction

This standard overview has been produced by several leading European Perimeter Protection System Manufacturers, as a result of a growing demand for qualitative Fencing Systems (and a growing need for clarity in this matter).

This overview is intended to provide a useful tool for specifiers, resellers, contractors and final customers to select more adequately and efficiently the ideal fencing system in function of the characteristics of the evaluated project. Additionally, the EPPA association has established a guarantee document for the fencing market.

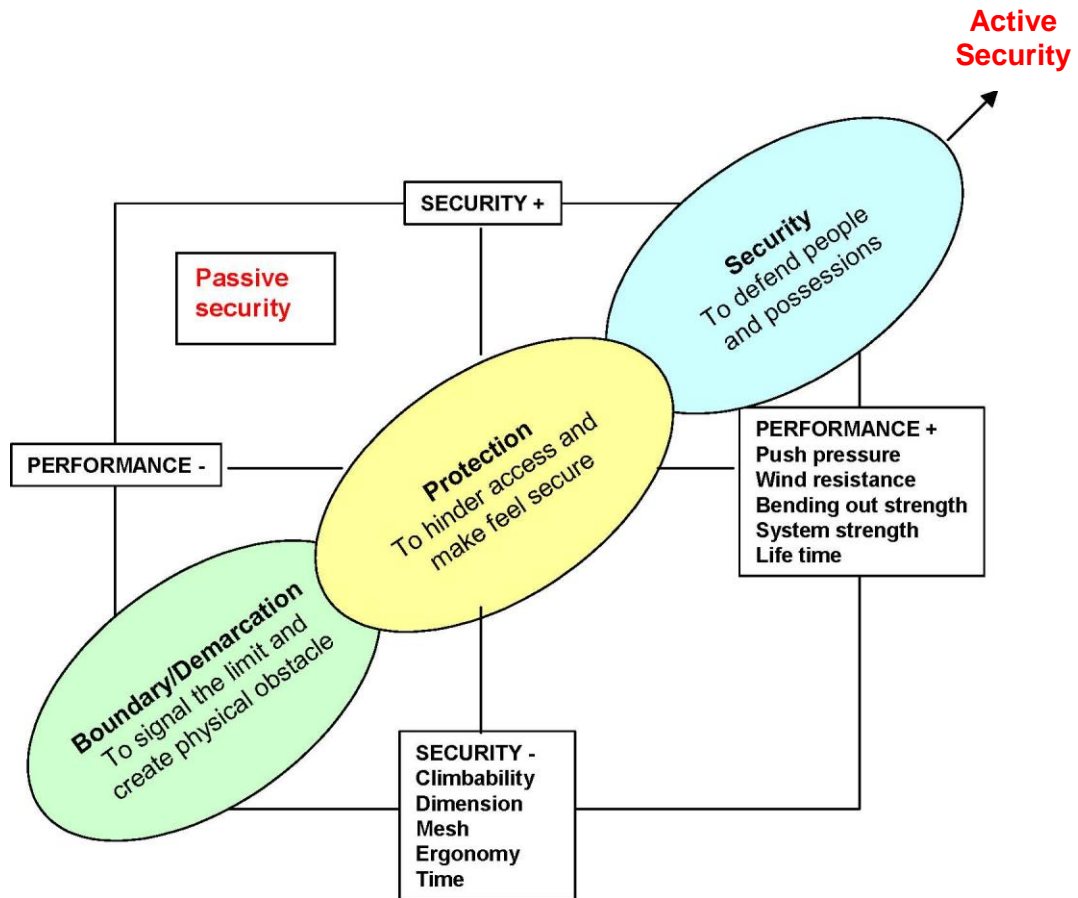
A content summary of the standards of the following fencing systems are included in this document: Railing systems/Palisade Fencing, Welded Mesh Panel Fences, Chain Link Fencing Systems and Metallic Panel Fences.

All the products specified in this booklet offer a combination of long technical lifetime and a high technical performance in function of the use of the fencing system.

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Chapter 1: Scope and Definitions

Drawing Scope



Definitions

A fencing System can be defined as a complete installed fence including posts, specific mesh panel or continuous mesh on rolls made from wire, tubes or other materials. It also includes connection between posts and panels/mesh as well as adequate connection to the ground.

Two criteria are considered to be of importance for the selection of a fencing system:

Security. The following factors/parameters are determining for the security level:

- Climb ability
- Dimension
- Mesh
- Ergonomics and time

Performance. The performance level is depending on factors such as:

- Push pressure
- Wind resistance
- Bending out strength and system strength
- Technical life time

Putting these two criteria security and performance on axes, one obtains the figure below. A classification on the basis of the general purpose of the fencing system can be made. The following typology for fencing systems can be made:

	General purpose
Boundary Demarcation	To mark the limit and create a physical obstacle
Protection	To hinder access and make feel secure
Security	To defend possessions and people
(see picture)	

Scope

The scope of this standard is limited to passive security systems. Active security systems are mostly customer specific.

Chapter 2: General Requirements

In order to provide a concise and clear summary of the minimum requirements, we will use the following terms to be considered of importance for characterizing each type of fencing system.

A fencing system has to fulfill the following general requirements:

- Resistance to intrusion
- Solidity
- Post stability

Measuring terms for the general requirements

RESISTANCE TO INTRUSION	Different characteristics for how resistant the fencing system will be against intrusion
1. Height of fencing system	The total height of a fence, including posts and the stated type of mesh. Measured from ground level to top of fence/post, not including toppings.
2. Mesh dimension	Vertical, horizontal or diagonal size of each mesh, or largest mesh if different sizes occur, in the fencing system.
3. Wire dimension	Dimension of the core wire (not coated) that should be used in fence panels or mesh on rolls.
4. Climb ability	The time one person needs to climb over a fencing system. Slowing down one person without any tools
5. Penetrability	The time one person needs to destroy and penetrate a fencing system with standard hand tools. Slowing down one person with hand tools.
6. Bending out strength of bars	Force that the infill tubes on the panels must be able resist.
7. Bar spacing	Maximum recommended spacing between tubes in a fencing panel.
SOLIDITY	Different characteristics for how resistant the fencing system will be against externally applied forces
8. Wind resistance of fencing system	Speed of wind that a fencing system must resist without any deformation.
9. Horizontal strength of post-panel connection	The static, horizontal force that each fixing must withstand, without any deformation.
10. Vertical strength of post-panel connection	The static, vertical force that each fixing must withstand, without any deformation.
11. Fixings	How difficult it will be for one person to destroy or disassemble and penetrate a fencing system.
12. Wire tensile strength	Tensile strength of each wire in the mesh.
13. Weld strength	Strength of the welded point, where the components are welded together.
14. Panel stiffness	How much a mesh panel or roll will bend out when assembled as a fencing system.
POST STABILITY	Different characteristics for how resistant the post will be against externally applied forces
15. Pull down forces of fencing system	How much torque (height x force of impact) the posts in a fencing system must withstand at the point where the post connects to the ground. All other parts of the fencing system must also withstand the applied force. <i>Nm is torque. As used in this document Nm is the torque at the point where the post comes out of the concrete, not at the top of the post. The torque Nm is the result of N in connection with the height of the force on the post.</i>
16. Post strength	The ability of the post to withstand the forces specified above without any deformation.
LONGEVITY	
17. Minimum technical lifetime	Number of years the fencing system should remain functional. That is ∞ it will serve its purpose without major deformation if installed, used and maintained in accordance to the supplier's specifications.

Comments on terms used to characterize different fencing systems

High security The column entitled security gives minimum requirements for a basic security fence. Depending on the application security can be increased by the addition of toppings – barbed wire, concertina entanglements, etc., by the use of smaller mesh, thicker wire and/or by adding detection systems. These items may be combined in different ways for different applications and you should consult your perimeter protection supplier.

Wind resistance Wind strengths vary in different countries and locations. Full details are specified in experimental standard ENV 1991-2-4. The resistance specified in these tables refers to average conditions. *It should be noted that if vegetation is allowed to grow up a fence this will reduce its wind resistance.*

Chapter 3: Minimum Requirements for the different Types of Fence

3.1. Railing Systems/Palisade Fencing

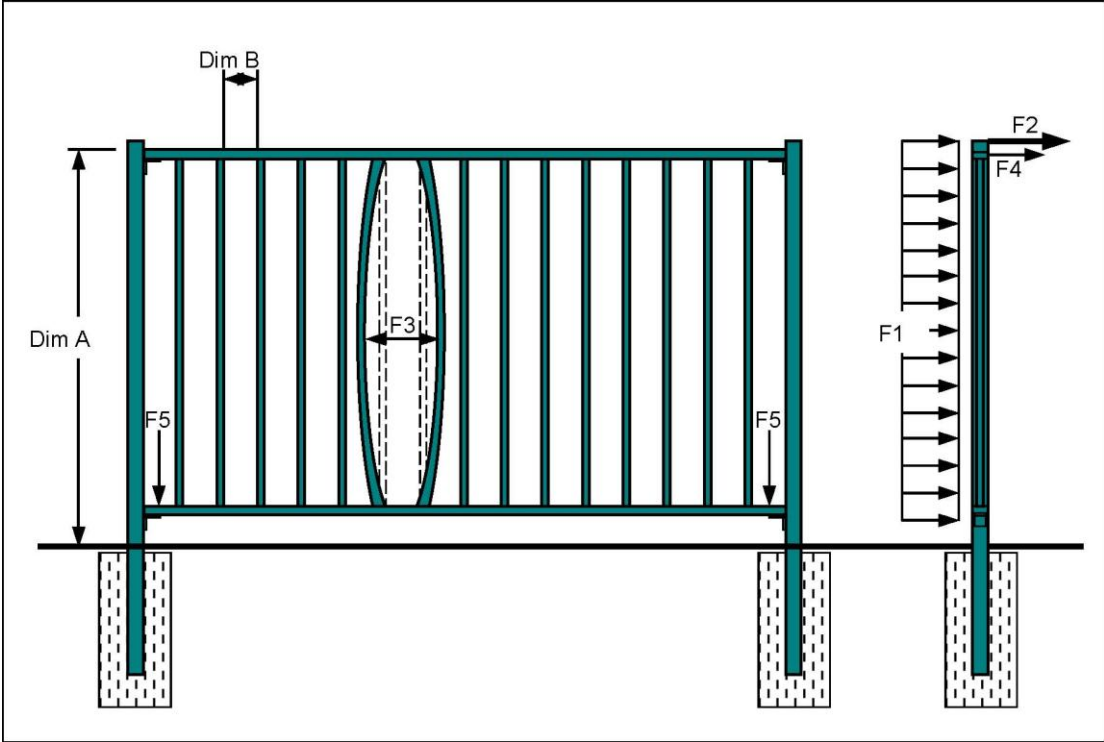
3.1.1. Minimum Requirements

Definition	The framework for railing systems consists of line posts, end posts, corner posts, and possible toppings against climbing. The railing system consists of horizontal layers with vertical bars.		
Function	BOUNDARY DEMARCATION	PROTECTION	SECURITY
Characteristics	Signal the limit and create physical obstacle	To hinder access and make feel secure	To defend possessions and people
Requirements			
Resistance to Intrusion			
1. Height of fencing system (DIM A)	No requirements	≥ 1.5 m	≥ 2m
2. Mesh dimension	Not applicable		
3. Wire dimension	Not applicable		
4. Climb ability. Slowing down one person without any tools	Not applicable	> 10 sec	Customer specification
5. Penetrability. Slowing down one person with hand tools.	Not applicable	> 10 sec	Customer specification
6. Bending out strength of bars. (F3)	Not applicable	1400 N: no plastic deformation	Minimum 1400 N: no plastic deformation. Customer specification
7. Bar spacing (penetrability) (Dim B) ¹	Not applicable	Max 130 mm space between bars	Max 130 mm space between bars
System Solidity			
8. Wind resistance of fencing system (F1) ²	Min 10 Beaufort (25-28 m/s) according to ENV 1991-2-4		
9. Horizontal strength of post-panel connection (F4)	Not applicable	1400 N: no plastic deformation	Minimum 1400 N: no plastic deformation. Customer specification
10. Vertical strength of post-panel connection (4 persons dynamic). (F5)	1200 N (for safety reasons)	2500 N: no plastic deformation	Minimum 2500 N: no plastic deformation. Customer specification
11. Fixings	No requirements	Cannot be loosened without tools	Cannot be loosened without specialized equipment
12. Wire tensile strength	Not applicable		
13. Weld strength	Not applicable		
14. Panel stiffness	AS in EN 10223-7		
Post Stability			
15. Pull down forces of fencing system (F2)	≥ 500 Nm Max torque = F2 x height of impact	≥ 1000 Nm Max torque = F2 x height of impact	≥ 1600 Nm Max torque = F2 x height of impact
16. Post strength	Derivative from: wind resistance push pressure		
Longevity			
17. Minimum technical lifetime	10 years		

¹ Different rules may apply for balustrades, fences near to drops > 1 meter and areas used by children

² Wind resistance for average conditions. For other wind resistance calculations refer to ENV1991-2-4

3.1.2. Drawing



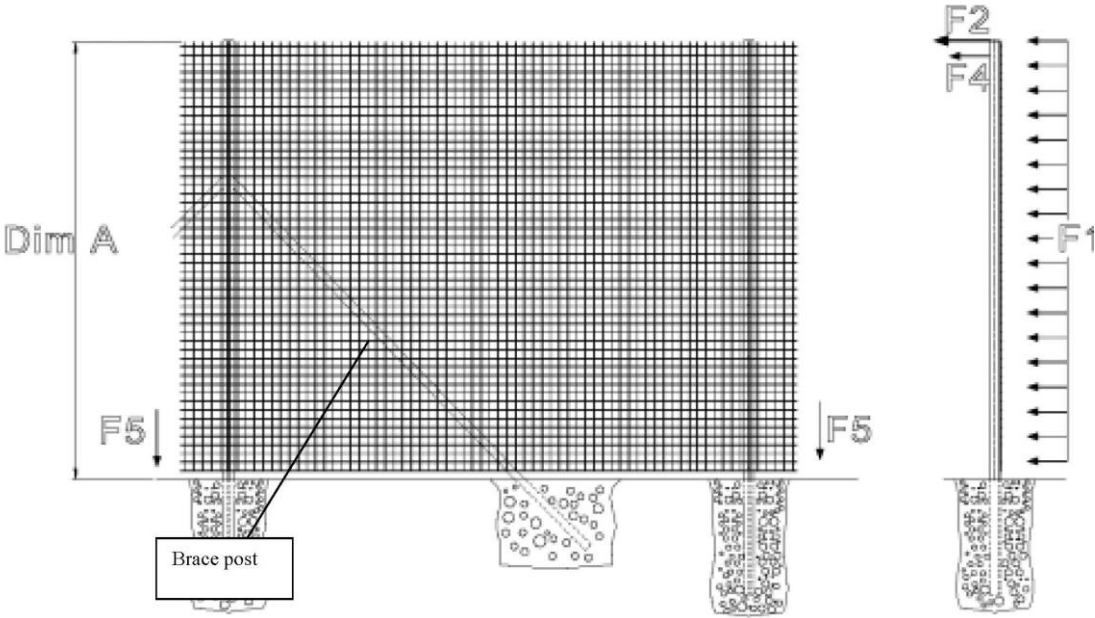
3.2. Welded Mesh Panel Fences

3.1.1. Minimum Requirements

Definition	Welded mesh fence supplied as rolls, including post systems and other accessories. Standard EN 10223-4		
Function	BOUNDARY DEMARCATION	PROTECTION	SECURITY
Characteristics	Signal the limit and create physical obstacle	To hinder access and make feel secure	To defend possessions and people
Requirements			
Resistance to Intrusion			
1. Height of fencing system	No requirements	≥ 1.5 m	≥ 2.0 m
2. Mesh dimension (penetrability)	≤250	≤130	≤50
3. Wire dimension (cutting strength)	Core ≥ 1.60 mm	Core ≥ 2.0 mm	Core ≥ 2.5 mm
4. Climb ability. Slowing down one person without any tools	Not applicable	> 10 sec	Customer specification
5. Penetrability. Slowing down one person with hand tools	Not applicable	> 10 sec	Customer specification
6. Bending out strength of bars	Not applicable (F3)		
7. Bar spacing (penetrability)	Not applicable		
System Solidity			
8. Wind resistance of fencing system ³ (F1)	Min 10 Beaufort (25-28 m/s) according to ENV 1991-2-4		
9. Horizontal strength of post-fence connection (F4)	No requirement	500 N	1000 N
10. Vertical strength of post-fence connection (4 persons dynamic). (F5)	No requirement	500 N	1000 N
11. Fixings	No requirements	Cannot be loosened without tools	Cannot be loosened without specialized equipment
12. Wire tensile strength - horizontal - vertical	≥ 400 N/mm ² ≥ 600 N/mm ²	≥ 400 N/mm ² ≥ 600 N/mm ²	≥ 400 N/mm ² ≥ 600 N/mm ²
13. Weld strength	Not applicable		
14. Panel stiffness	The average weld shear strength of 4 welds selected at random from the specimen for testing, shall be not less than 50% of the breaking strength for the smallest wire. EN 10223-7 §7.5 + Annex A		
Post Stability			
15. Pull down forces of the post-fence system (F2)	> 500 Nm Max torque = F2 x height of impact	> 1000 Nm Max torque = F2 x height of impact	1600 Nm Max torque = F2 x height of impact
16. Post strength	Derivative from: wind resistance push pressure		
Longevity			
17. Minimum technical lifetime	10 years		

³ Wind resistance for average conditions. For other wind resistance calculations refer to ENV1991-2-4

3.2.2. Drawing



3.3. Chain Link Fencing System

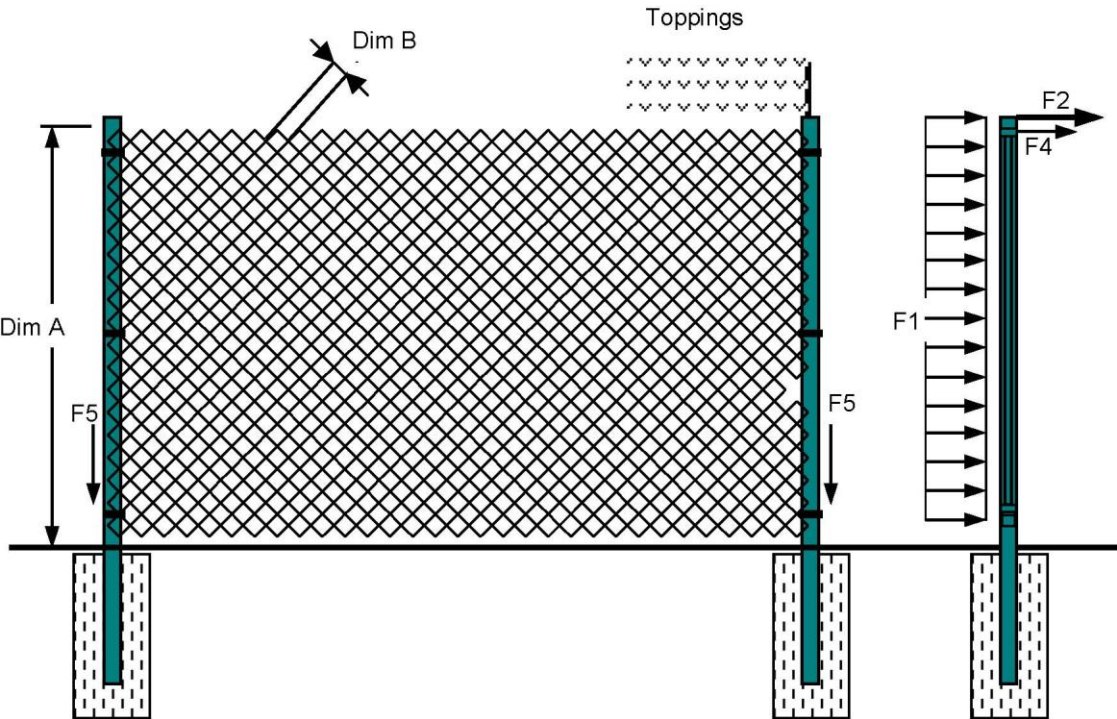
3.3.1. Minimum Requirements

Definition	The framework for a Chain Link fence consists of the line posts, end posts, corner posts, gate posts and if required top, mid, bottom or brace rail as well as toppings against climbing. The Chain Link itself is a fencing material from steel wire helically wound and interwoven in such a manner as to provide a continuous mesh without knots or ties except in the form of knuckling or of twisting the ends of the wires to form the selvage of the fabric. Standard EN 10223.6.
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Function	BOUNDARY DEMARCATION	PROTECTION	SECURITY
Characteristics	Signal the limit and create physical obstacle	To hinder access and make feel secure	To defend possessions and people
Requirements			
Resistance to Intrusion			
1. Height of fencing system (DIM A)	No requirements	≥ 1.5 m	≥ 2.0 m
2. Mesh dimension (penetrability) (DIM B)	≤ 60 mm	≤ 50 mm	≤ 30 mm with Core ≥ 2.15 mm OR ≤ 50 mm with Core ≥ 2.5 mm
3. Wire dimension (cutting strength)	Core ≥ 1.8 mm	Core ≥ 2.0 mm	
4. Climb ability. Slowing down one person without any tools	Not applicable	> 10 sec	Customer specification
5. Penetrability. Slowing down one person with hand tools	Not applicable	> 10 sec	Customer specification
6. Bending out strength of bars	Not applicable		
7. Bar spacing	Not applicable		
System Solidity			
8. Wind resistance of fencing system ⁴ (F1)	Min 10 Beaufort (25-28 m/s) according to ENV 1991-2-4		
9. Horizontal strength of post-fence connection (F4)	Not applicable	500 N	800 N
10. Vertical strength of post-fence connection (4 persons dynamic). (F5)	Not applicable	500 N	800 N
11. Fixings	No requirements	Cannot be loosened without tools	Cannot be loosened without specialized equipment
12. Wire tensile strength	> 450 N/mm ²	> 450 N/mm ²	> 450 N/mm ²
13. Weld strength	Not applicable	Not applicable	Not applicable
14. Panel stiffness	Not applicable	Not applicable	Not applicable
Post Stability			
15. Pull down forces of fencing system (F2)	> 500 Nm Max torque = F2 x height of impact	> 1000 Nm Max torque = F2 x height of impact	1600 Nm Max torque = F2 x height of impact
16. Post strength	Derivative from: wind resistance push pressure		
Longevity			
17. Minimum technical lifetime	10 years		

⁴ Wind resistance for average conditions. For other wind resistance calculations refer to ENV1991-2-4

3.3.2. Drawing



3.4. Metallic Panel Fence

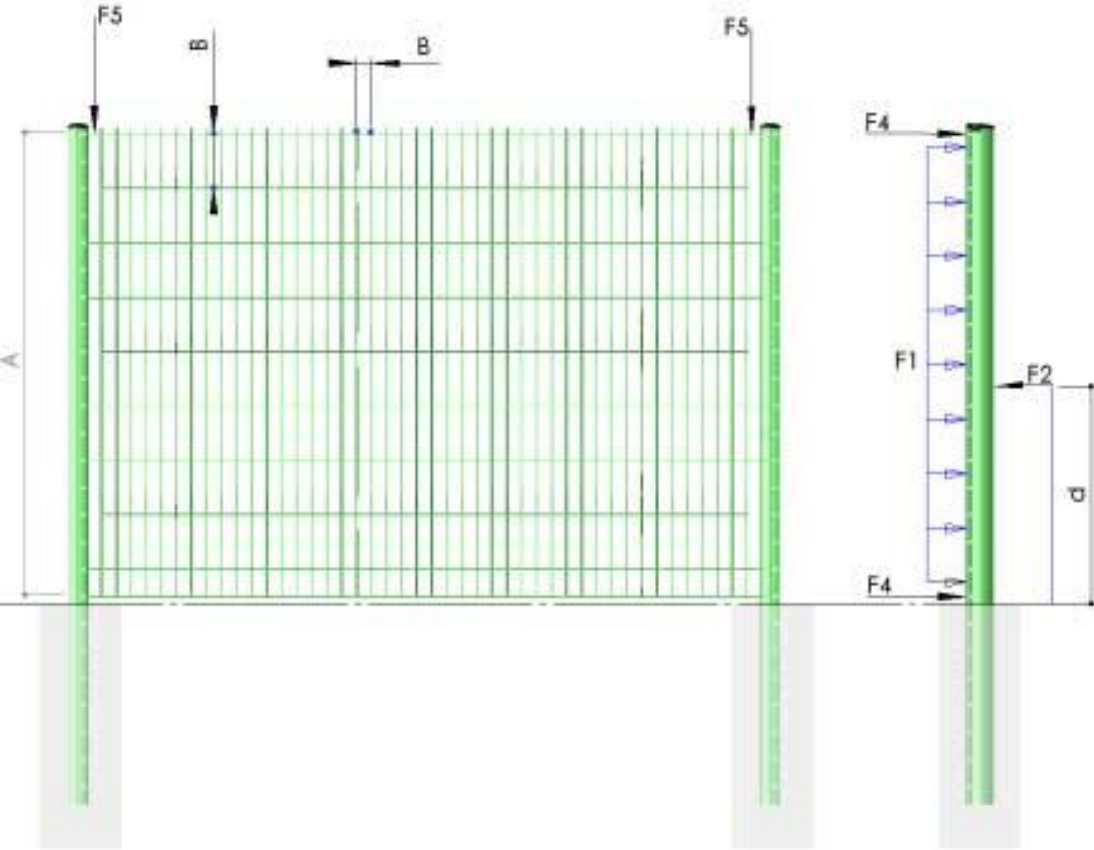
3.4.1. Minimum Requirements

Definition	The framework for welded panel fence consists of line posts, end, corner posts and possible additional equipment against intrusion. The panels consist of welded steel wires. The steel materials are metallic and organic coated. Standard EN 10223-7.
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Function	BOUNDARY DEMARCATION	PROTECTION	SECURITY
Characteristics	Signal the limit and create physical obstacle	To hinder access and make feel secure	To defend possessions and people
Requirements			
Resistance to Intrusion			
1. Height of fencing system	No requirement	≥ 1.5 m	≥ 2.0 m
2. Mesh dimension (penetrability)	Min 100 x 200 mm centre to centre	Min 50 x 200 mm centre to centre	Min 50 x 200 mm centre to centre
3. Wire dimension (cutting strength)	Core dia ≥ 3 mm	Core dia ≥ 3.5 mm	Core dia ≥ 3.5 mm
4. Climb ability. Slowing down one person without any tools	No requirement	> 10 sec	Customer specification
5. Penetrability. Slowing down one person with hand tools	No requirement	> 10 sec	Customer specification
6. Bending out strength of bars	Not applicable		
7. Bar spacing	Not applicable		
System Solidity			
8. Wind resistance of fencing system ⁵ (F1)	Min 10 Beaufort (25-28 m/s) according to ENV 1991-2-4		
9. Horizontal strength of post-fence connection (F4)	Not applicable	500 N	800 N
10. Vertical strength of post-fence connection (4 persons dynamic). (F5)	Not applicable	500 N	800 N
11. Fixings	No requirements	Cannot be loosened without tools	Cannot be loosened without specialized equipment
12. Wire tensile strength	> = 400 N/mm ²		
13. Weld strength	The average weld shear strength of 4 welds selected at random from the specimen for testing, shall be not less than 50% of the breaking strength for the smallest wire. EN 10223-7 §7.5 + Annex A		
14. Panel stiffness	Product of EI Modules of elasticity & moment of inertia EN 10223-7 §3.3		
Post Stability			
15. Pull down forces of fencing system (F2)	> 500 Nm Max torque = F2 x height of impact	> 1000 Nm Max torque = F2 x height of impact	1600 Nm Max torque = F2 x height of impact
16. Post strength	Derivative from: wind resistance push pressure		
Longevity			
17. Minimum technical lifetime	10 years		

⁵ Wind resistance for average conditions. For other wind resistance calculations refer to ENV1991-2-4

3.4.2. Drawing



Chapter 4: Testing Methods for Fencing Systems

4.1. Pull Down Force in the attack direction of the fence (Force 2)

4.2. Bending out strength of bars (Force 3)

4.3. Horizontal strength of post panel connection (Force 4)

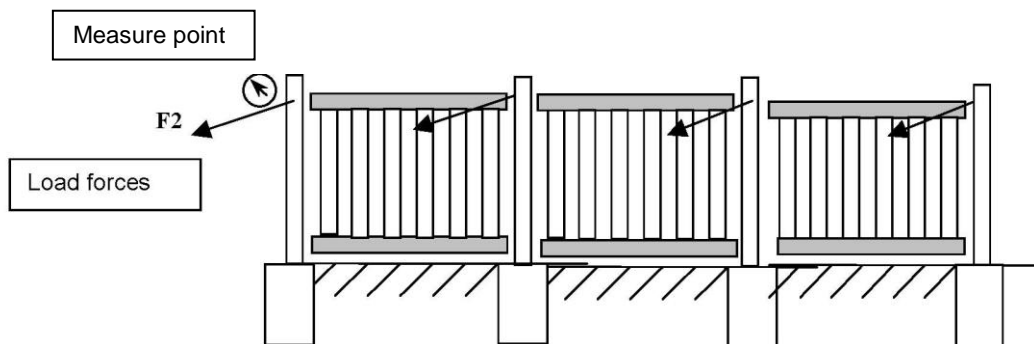
4.4. Vertical strength of post panel connection (Force 5)

4.5. Wind Load Test (should be carried out in accordance with BS1722 Part 14 Annex F)

4.1. Pull Down Force in the attack direction of the fence (F2)

a) Apply force on the post (see minimum requirements)

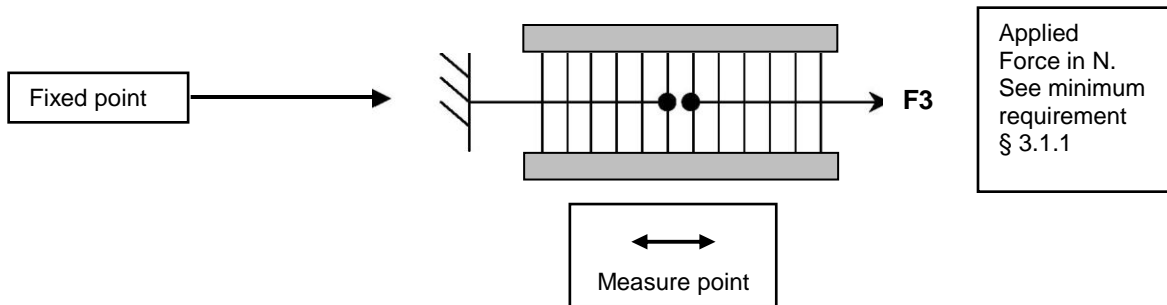
b) Measuring position: < 10 cm below the top of the post.



Type of fencing	Sample N°	
F2 force in N	Bending out in mm	Remaining deformation in mm
0		
500		
750		
1000		
1250		
1500		
Maximum torque (F2 x height of impact)	See chapter 3	See chapter 3
Minimum requirement	See chapter 3	

4.2. Bending out strength of bars (F3)

- a) Apply force on 2 bars (see minimum requirements)
- b) Measuring position: define the bending out of the bars in the middle of the panel either one bar fixed and the next one a force applied

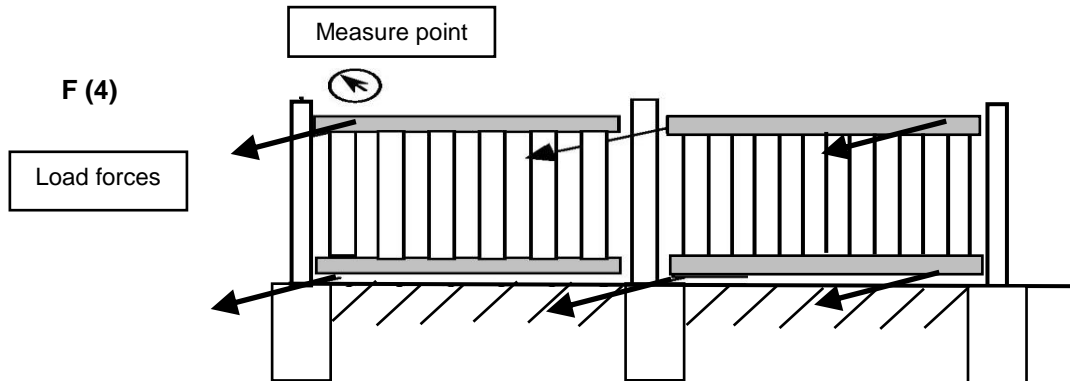


Type of fencing		
Sample N°		
F3 force in N	Bending out in mm	Remaining deformation in mm
250		
500		
750		
1000		
1250		
1500		
Minimum requirement	See chapter 3	See chapter 3

Note: It is important to take notice of the height and width of the tested panels for later references.

4.3. Horizontal strength of post panel connection (F4)

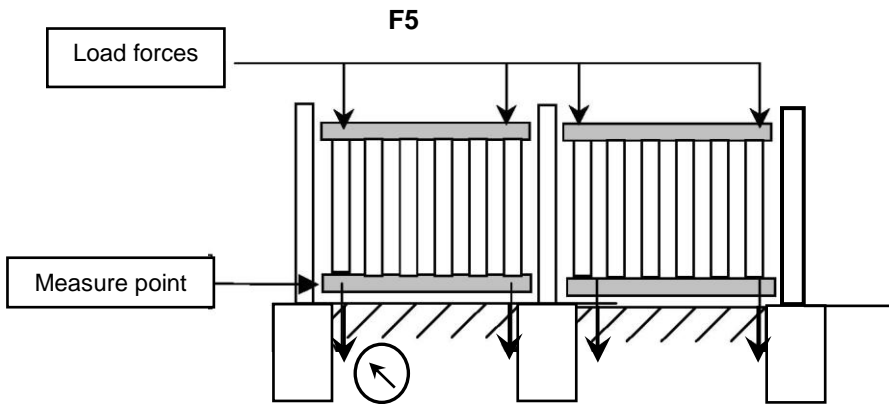
- a) Apply force on the panel near the connection (see minimum requirements)
- b) Measuring position: < 10 cm out of the post / panel connection



Type of fencing		
F4 force in N	Sample N°	
	Bending out in mm	Remaining deformation in mm
0		
500		
750		
1000		
1250		
1500		
1750		
Minimum requirement	See chapter 3	See chapter 3

4.4. Vertical strength of post panel connection (F5)

- a) Apply force on the panel near the connection (see minimum requirements)
- b) Measuring position: < 10 cm out of the post / panel connection



Type of fencing		
	Sample N°	
F5 force in N	Bending out in mm	Remaining deformation in mm
0		
1500		
1750		
2000		
2250		
2500		
2750		
Minimum requirement	See chapter 3	See chapter 3

4.5. Wind Load Test

The wind loading simulation for particular fence systems shall be established in accordance with the following method.

4.5.1 Test layout

Three panels or spaces of fencing shall be tested in either the vertical or the horizontal position (see figure). The width and height of fence shall be the maximum dimension used for the fencing system.

The two inner posts and the middle mesh of fencing shall comprise the test.

Fence posts shall be mounted in the manner that represents the most onerous service support condition.

The fencing system shall be installed in accordance with installation manual.

The displacements of the fence posts and the mesh shall be measured at the location shown in figure.

4.5.2 Procedure

Zero all displacement measuring devices, which shall be positioned at the top of the inner fence posts, the top of the test mesh on the centre line and at position H/2 on the centre line (see figure). Apply uniform loading, to all three intervals, in five increments up to the design. Wind load calculated in accordance with general and particular requirements.

Record displacements at each load increment.

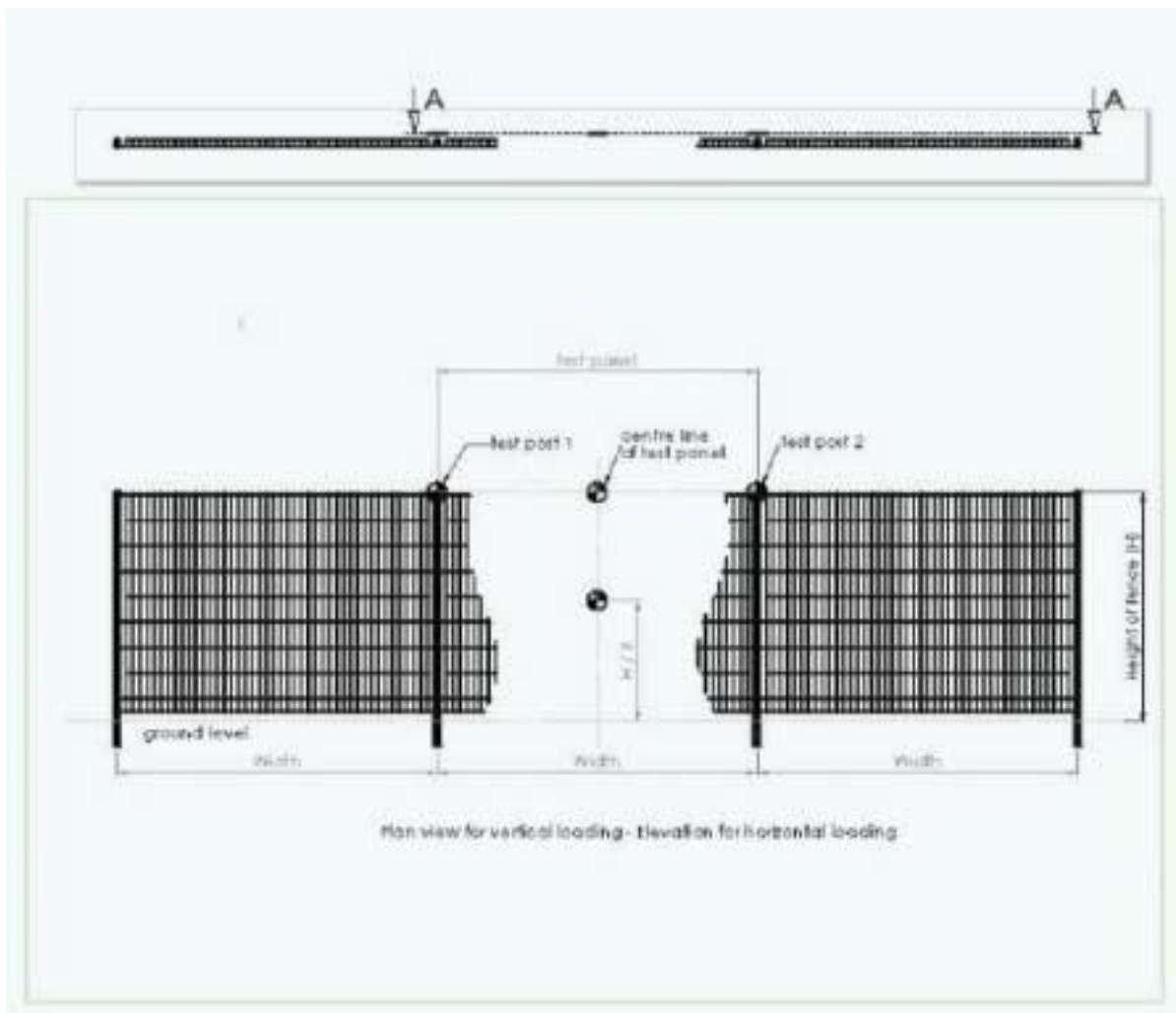
Leave loaded with the design wind load for 30 min. Record displacements after this period and then unload. Record displacements on unload.

After unloading visually inspect the fencing systems for signs of distortion of any components. Repeat the test with the loading in the opposite direction.

Apply a line load, to all three panels, in five increments up to the maximum posts stability requirements. Continue with the procedure of 1.1 to complete the test.

To be sure, you have to make a static calculation on wind resistance of the total fence in compliance with national standards.

4.5.3 Drawing Test Posts



Chapter 5: Overview References of Fencing Standards

Some General Remarks

A few of the existing national and international standards have been summarised below. The summary has been built up as follows:

1. European standards

Fences

Coatings : on wire and wire products

Metallic : zinc and zinc alloy

Organic : PVC, PE, polyester

2. British standards

BS 1722,12 parts specifying

Components : fence gates, posts, erection of the fence

3. ISO

Group of standards related with defects caused by ageing and weathering of both metallic (corrosion) and organic coated products

5.1 European Standards

5.1.1 Fences

Designation	Title	Scope
EN 10223-1	Steel wire and wire products for fences Part 1: Zinc and zinc-alloy coated steel barbed wire	Specifies zinc and zinc alloy coated steel barbed wire, conventional and reverse twist consisting of two stranded line wires, around which the barbs are tightly wound
EN 10223-2	Steel wire and wire products for fences Part 2: Hexagonal steel wire netting for agricultural, insulation, and fencing purposes	Specifies requirements for the dimensions and coating of steel wire having meshes of hexagonal shape
EN 10223-3	Steel wire and wire products for fences Part 3: Hexagonal steel wire netting for engineering purposes	Specifies requirements for the dimensions and coating of steel wire having meshes of hexagonal shape and used for engineering purposes
EN 10223-4	Steel wire and wire products for fences Part 4: Steel wire welded mesh fencing	Specifies the general characteristics of welded mesh fencing supplied as rolls or panels, coatings, properties and tolerances.
EN 10223-5	Steel wire and wire products for fences Part 5: Steel wire woven hinged joint and knotted mesh fencing	Specifies preferred dimensions, properties and coatings of zinc and zinc alloy coated steel wire woven hinged joint and knotted mesh fencing.
EN 10223-6	Steel wire and wire products for fences Part 6: Steel wire chain link fencing	Specifies dimensions , properties and coatings of steel wire chain link fencing
EN 10223-7	Steel wire and wire products for fences Part 7: Steel wire welded panels -for fencing	Specifies the general characteristics of welded mesh supplied as panels and recommended coatings, properties and tolerances.
ENV 1991-2-4	Basis of design and actions on structures Part 2-4 :Actions on structures - Wind actions	This part gives rules and methods for calculating : * wind loads on building structures up to a height of 200m, their components and appendages * chimneys and other cantilevered structures * highway and railway bridges up to 200m span

ENV stands for European Prestandard An ENV standard has a limited period of validity. After 2 to 3 years the members of CEN are requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard Conflicting national standards can be kept in force until the final decision about the possible conversion of the ENV

5.1.2 Coatings

5.1.2.1 Metallic coatings

Designation	Title	Scope
EN 10244-1	Steel wire and wire products - Non-ferrous metallic coatings on steel wire Part 1: General principles	Specifies the requirements for the mass, other properties and testing of non-ferrous metal coatings on steel and steel wire products
EN 10244-2	Steel wire and wire product - Non-ferrous metallic coatings on steel wire Part 2: Zinc or zinc alloy coatings	Specifies the requirements for the mass, other properties and testing of non-ferrous metal coatings on steel and steel wire products
EN ISO 1461	Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods	Specifies general properties of and test methods for coatings applied by hot dipping in zinc on fabricated iron and steel articles

5.1.2.2 Organic coatings

Designation	Title	Scope
EN 10245-1	Steel wire and wire products - Organic coatings on steel wire Part 1: General rules	Specifies the requirements for the characteristics and testing methods for coatings of organic material suitable for the application on to steel wire and wire products
EN 10245-2	Steel wire and wire products - Organic coatings on steel wire Part 2: PVC finished wire	Specifies the characteristics and requirements for steel wire and wire products coated with PVC
EN 10245-3	Steel wire and wire products - Organic coatings on steel wire Part 3: PE coated wire	Specifies the characteristics and requirements for steel wire and wire products coated with PE
EN 10245-4	Steel wire and wire products - Organic coatings on steel wire Polyester coated wire	Specifies the characteristics and requirements for steel wire and wire products coated with polyester
prEN 13438	Powder organic coatings for galvanised steel products for construction purposes	Specifies performance requirements for powder coatings applied to galvanised steel products , for architectural , fencing and construction purposes

5.2 ISO Standards

ISO-standards related with defects caused by ageing and weathering of both metallic (corrosion) and organic coated products have been summarized. Some of these standards have the status of European Standard.

5.2.1 Organic Coated Products

Designation	Title	Scope
ISO 4628/1	Paints and varnishes – Evaluation of degradation of paint coatings Designation of intensity, quantity and size of common types of defects. Part 1: General principles and rating schemes	A general system for designating the intensity, quantity and size of common types of defects of paint coatings
ISO 4628/2	Paints and varnishes – Evaluation of degradation of paint coatings Designation of intensity, quantity and size of common types of defects. Part 2: Designation of degree of blistering	Provides pictorial standards for designating the degree of blistering of paint coating
ISO 4628/3	Paints and varnishes – Evaluation of degradation of paint coatings Designation of intensity, quantity and size of common types of defects . Part 3: Designation of degree of rusting	Provides pictorial standards for designating the degree of rusting of paint coatings
ISO 4628/4	Paints and varnishes – Evaluation of degradation of paint coatings Designation of intensity, quantity and size of common types of defects. Part 4: Designation of degree of cracking	Provides pictorial standards for designating the degree of cracking of paint coatings
ISO 4628/5	Paints and varnishes – Evaluation of degradation of paint coatings Designation of intensity, quantity and size of common types of defects. Part 5: Designation of degree of flaking	Provides pictorial standards for designating the degree of flaking of paint coatings
ISO 4628/6	Paints and varnishes – Evaluation of degradation of paint coatings Designation of intensity, quantity and size of common types of defects. Part 6: Rating of degree of chalking by tape method	Provides pictorial standards for designating the degree of flaking of paint coatings

5.2.2 Metallic Coated Products

Designation	Title	Scope
ISO 9223	Corrosion of metals and alloys Corrosivity of atmospheres Classification	Specifies the key factors in the atmospheric corrosion of metals and alloys
ISO 12944-2	Paints and varnishes Corrosion protection of steel structures by protective paint systems	Deals with the classification of the principal environments to which steel structures are exposed and the corrosivity of these environments
prEN 12500	Protection of metallic materials against corrosion Corrosion likelihood in atmospheric environment classification determination and estimation of corrosivity of atmospheric environments	Establish a classification system for the corrosivity of atmospheric environments Defines corrosivity categories Describes the determination of corrosivity based on assessment of mass loss

5.3 British Standards

The standard BS 1722 establishes the minimum requirements for the most common fences. It specifies the requirements for the different components that make up a fence (e.g. welded mesh, posts, gates) their combination and erection.

This standard is published in 12 parts, only a few once are summarised in the table below. A lot of normative references are given in each of these parts.

Designation	Title	Scope
BS 1722-1	Fences Part 1: Specification for chain link fences	Specifies requirements for chain link fences, and gates and gateposts for use with chain link fences. Requirements for the material components and for the erection of the fences are specified
BS 1722-10	Fences Part 10: Specification for anti-intruder fences in chain link and welded mesh	Specifies requirements for chain link or welded mesh fences and gates for anti-intruder purposes. It also includes requirements for the erection of the fencing at the specified location.
BS 1722-12 ⁽¹⁾	Fences Part 12: Specification for steel palisade fences	Specifies requirements for steel palisade fences and gates for general purposes for heights up to 2,4mm security for heights of 2,4mm, 3,0m and 3,6m
BS 1722-13	Fences Part 13: Specification for chain link fences for tennis courts surrounds.	Specifies minimum requirements for chain link fencing and steel posts for tennis court surrounds
BS 1722-14	Fences Part 14: Specification for open mesh steel panel fences.	Specifies requirements for open mesh steel panel fences for general purposes fences up to 2 400mm high security fences at least 2 400mm high high security fences at least 3 000mm high extra high security fences at least 3 000mm high
BS 1722-16	Fences Part 16: Specification for organic powder coatings to be used as a plastics finish to components and mesh.	Specifies performance requirements and describes test methods for organic coating powder and organic powder coatings for use as a finish to fence components and mesh

(1) There is not a new edition of BS1722-12:1999, however, a substantial amendment has been made to the standard in February 2003. This amendment has been incorporated into the standard, and is not available separately. As is the standard has been amended rather than revised, this has not changed the publication date.

Chapter 6: Corrosion Protection

Introduction

In order to establish a guarantee EPPA label, a classification has been made for different surface treatment systems according to the standards.

Table 1: Surface Treatment System Classification

System	Material	Metallic coating	Organic coating
P1	Posts & fence	Hot-dip galvanised steel material according to EN ISO 1461 EN 10240.	Without organic coating
P2	Posts	Hot-dip galvanised steel according to EN ISO 1461 and EN 10240.	Painted according to DIN EN ISO 12499-5
P3	Posts	Hot-dip galvanised steel according to EN ISO 1461 and EN 10240.	Painted 2 components primer + 2 components top layer according to EN ISO 12499-5
P4	Posts	Hot-dip galvanised steel according to EN ISO 1461 and EN 10240.	Powder organic coated (polyester) according to prEN 13438
P5	Posts	Flat galvanised steel material (sendzimir) according to EN 10142 / EN 10147	Powder organic coated (polyester) according to prEN 13438
P6	Fence	Zinc or zinc alloy coated wires, class A, according to EN 10244-2	Without organic coating
P7	Fence	Welded mesh panel of zinc or zinc alloy steel wires according to EN 10223-4/7	Powder coated (polyester) according to prEN 13438
P8	Fence	Welded mesh panel out of bright wire according to EN 10223-7 hot-dip galvanized according to EN ISO 1461	Powder coated (polyester) according to prEN 13438
P9	Fence	Welded mesh rolls & panel of zinc or zinc alloy steel wires according to EN 10223-4/7	Powder coated (PVC) according to EN 10245-2
P10	Fence	Chain link zinc alloy coated wire according to EN 10223-6	Powder coated (PVC extruded) according to EN 10245-2

When one takes the above classification of surface treatment systems, a corrosion protection classification can be made. This table serves as a starting point for the Guarantee label (chapter 7)

Table 2: Corrosion Protection Classification

Surface treatment system	Environmental conditions/Atmospheric corrosivity according to EN ISO 12944-2				
	C1 (very low) Interior dry	C2 (low) Outside; rural environment	C3 (medium) Interior wet/outside: urban and industrial atmospheres with moderate sulfur dioxide pollution, excl. coastal areas	C4 (high) Outside; industrial areas, excl. coastal areas	C5 (very high) Outside; industrial and coastal areas with high humidity and aggressive atmospheres
P1	++	++	+	+/-	-
P2	++	++	+	+/-	-
P3	++	++	+	+	-
P4	++	++	+	+	+/-
P5	++	++	+	+	+/-
P6	++	+	+/-	-	-
P7	++	++	+	+	+/-
P8	++	++	++	+	+/-
P9	++	++	++	+	+/-
P10	++	++	++	+	+/-

Corrosion protection classification for 5 years lifetime (maximum degree of rusting: Ri4, according to ISO 4628/3)

- ++ very good (more than 5 years technical lifetime)
- + good (5 years technical lifetime)
- +/- mediate
- not advised
- not applicable

Chapter 7: Guarantee document

EPPA FENCE GUARANTEE STANDARD MODEL FORM

Guarantee

[Insert name of company] offers a guarantee against corrosion and technical performance of 5 years for all mechanical parts of organic coated fencing systems erected in environments C1-C3 as defined in EN 12944-2.

Period

The guarantee period commences on the day of delivery of the products.

Cover

The guarantee provides free material for replacement for any accepted claim made before the end of the guarantee period.

Accepted Claims

- * Corrosion claims
Claims for corrosion will be checked according to ISO 4628-3 level Ri 4 before a decision is taken regarding acceptance.
- * Technical performance claims
- * Claims will be evaluated in function of our general technical requirements.

Exclusions

Excluded from this guarantee are defects as a result of the following:

- If the fence is not installed and maintained according to the method(s) we have described
- Mechanical damage or use other than that for which the object was intended.
- Hidden defects in the surrounding structure
- Far reaching deterioration in the environment and/or environmental conditions in comparison to the conditions at the time of order
- The direct effects of aggressive substances of salt water
- Long-term exposure to temperatures higher than 70°C
- Insufficient and/or improper cleaning of coatings (see our instructions)
- Natural disasters, war, fire, explosions, war risk or other unanticipated circumstances (including those based on the fault or intent of the customer) which shall occur beyond our sphere of influence.
- The failure to inform us in writing, or to inform in good time, of the defect
- The application of coating systems from other suppliers without our written permission
- Complete or partial replacement of/by objects of parts of objects not delivered by us
- Permanent effects of moisture and condensation
- Mechanical damage which occurs during transport and handling if not notified to us within 3 days of receipt.
- Damage caused by vegetation being allowed to grow up the fence.