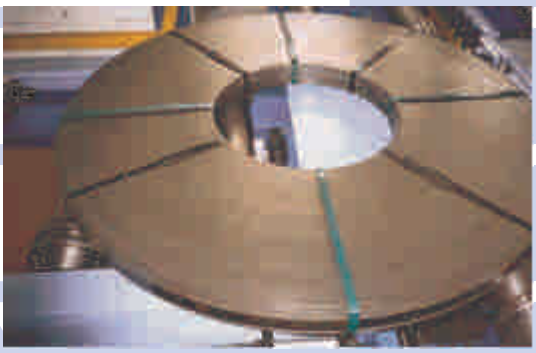

NORPA

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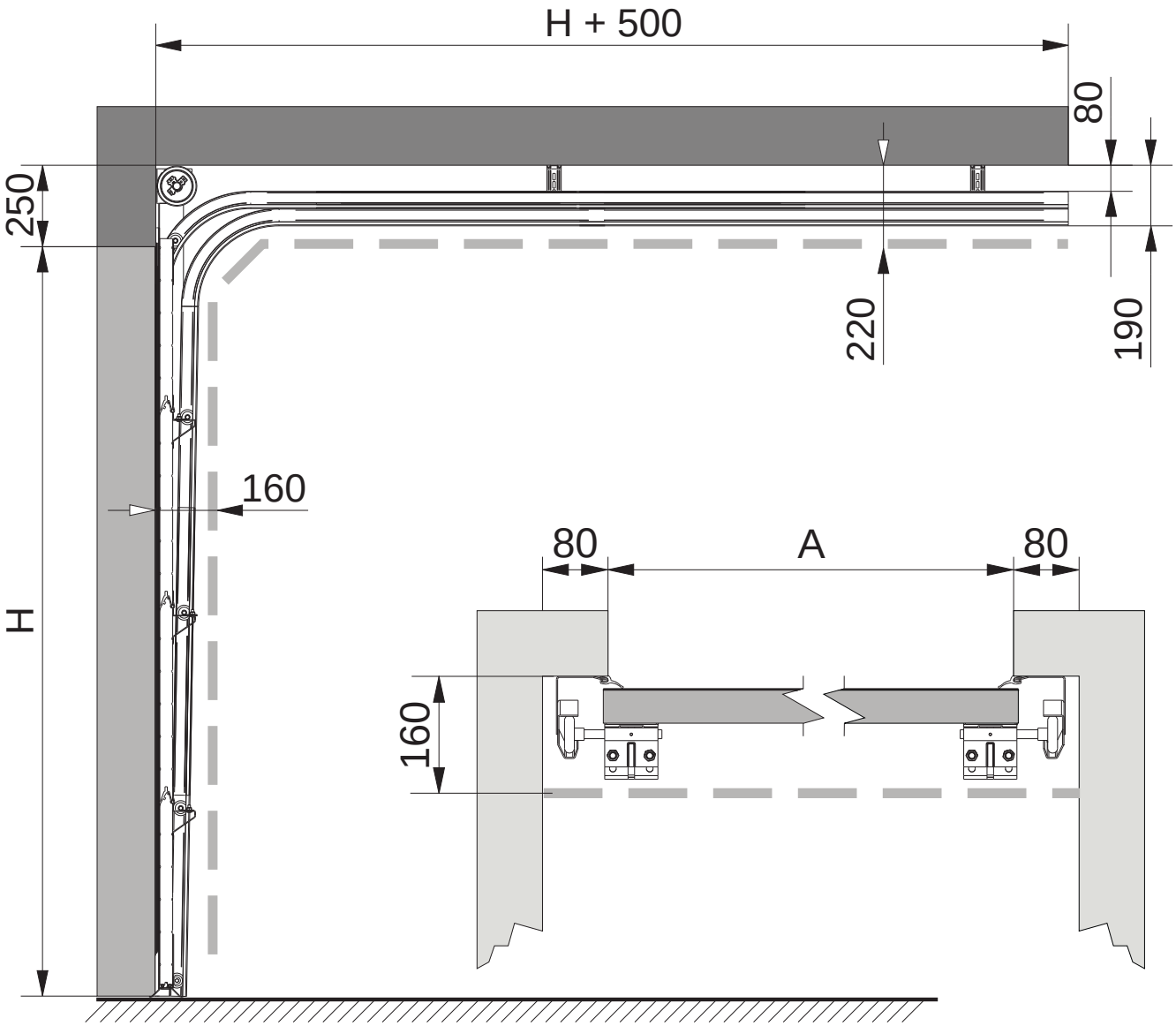
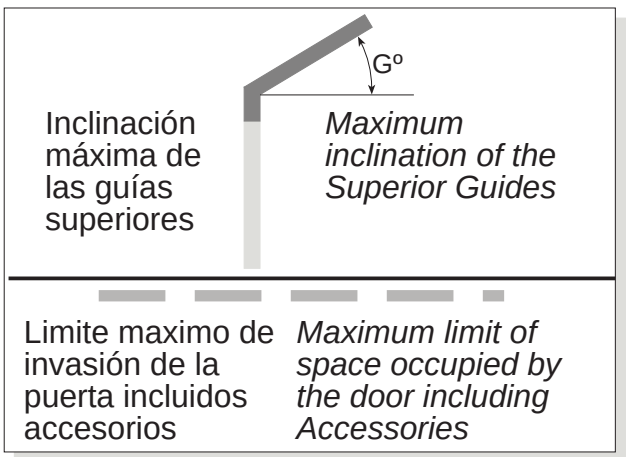
TECHNICAL REPORT

RAW MATERIALS

SINGLE METAL SHEET SECTIONAL DOOR

PRN-23





A	H	G	**Superficie Máx.** *Surface Max*
6.500mm.	3.100mm.	30º	15m²

Volver a índice

TECHNICAL REPORT
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SINGLE METAL SHEET SECTIONAL DOOR

CONTENTS

PRESENTATION

The Norpa sectional door, made of a single sheet of metal is Norpa, S.L.'s safe option to close garages which do not need thermal and acoustic insulation. Despite its simplicity, it maintains all the same quality and safety characteristics and services provided by the rest of the wide range of sectional doors manufactured by Norpa, S.L.

A. RAW MATERIALS

1.- SINGLE METAL SHEET PANEL

The panel for the single metal sheet section doors has the *same* format as the outer side of the monolithic isotropic *sandwich* panel we use to make the other models in our wide range of sectional doors and it is built based on an outer sheet of galvanised steel DX53D Z-275 MAC pre-varnished RAL 9010 (4.5µ polyurethane paint on grey surface primer 7016) and 0.60mm thick *timber* embossing in compliance with UNI EN 10327/10143 standards (*low carbon steel sheets and strips for cold shaping, continuously coated –galvanised- by heat immersion. This standard also considers a possible coating – iron/zinc alloy (ZF) - thickness from 100 to 600µ in different*

finishes: normal star (N), minimum star (M), ordinary finish (A), improved finish (B) and superior finish (C)), reinforced along the sides with galvanised steel closure corner pieces DX51D Z-275 MAC which are 0.80mm thick in compliance with UNI EN 10327/10143 standards and, in their intermediate section, using vertically fitted reinforcements made of the same material as the side closing corner pieces.

Both the upper and lower ends of the panel are strengthened inside with profiling made out of the same material - stainless steel DX53D Z-275 MAC pre-varnished RAL 9010 (4.5µ polyurethane paint on grey surface primer 7016) – 0.60mm thick and 30mm wide to make the plate fixing screws grip effectively (*clarandela self-threading screw* 6'3 x 19 Zn * D/7504-K) which hold intermediate hinges and side hinges and prevent machining on these areas from weakening the panel.

The panel format is variable in length (it is shaped to fit each door), with standard widths (500mm and 610mm) and thickness of 0.60mm.

Weights for single metal sheet panel with internal strengthening:

- in 500mm wide format 10.4 kg/m², 5.2 kg/ml
- in 610mm wide format 11.2 kg/m², 5.6 kg/ml

Tolerances table for 40mm panel with internal strengthening:

- in 500mm wide format thickness ±2, length ±5, outside of bracket ±3, weight ±3%
- in 610mm wide format thickness ±2, length ±5, outside of bracket ±3, weight ±3%

2.- STEEL GUIDE SYSTEMS

Galvanised steel guides made up of curves, half curves, guides and vertical profiles, horizontal profiles, joining parts and final parts, profiled, curved and assembled in the factory in a production process (profiler, curving machine, robot-crimper and manual crimper) working from steel coils provided with widths between 770mm and 1980mm (depending on profile development) and 1.5 thick made of DX51D Z-200 material with MAC/MB finish according to EN10327 and EN10326 standards.

This cold lamination and deep inlayed galvanised steel is formed by a steel substrate on which a zinc coating is applied using a continuous galvanisation process by immersion in a hot bath.
The heat galvanised steel offers excellent corrosion resistance and good shaping ability; also the process model used for coating it can deposit zinc thicknesses up to 725 g/m² (total on both sides)


EQUIVALENCE ACCORDING TO STANDARDS

	EN 10142:1991 - EN 10147:1991	DIN 17162/1 - DIN 17162/2	NF A36-321 - NF A36-322	BS 2989	ASTM A653	EN 10142:2000	PN-89/H-92125:1989
DX51D +Z EN 10327	FeP02 G	St 01Z / St 02Z		Z1 G / Z2 G	A653 CQ	DX51D+Z	P,T,G
DX52D +Z EN 10327	FeP03 G	St 03Z	GC	Z3 G	A653 LFQ	DX52D+Z	

MECHANICAL CHARACTERISTICS

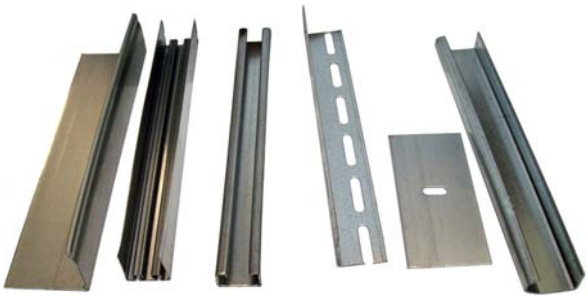
	Direction	Thickness (mm)	R_e (MPa)	R_m (MPa)	A_{80} (%)	A 5,65√S_o (%)	r 90	n 90
DX51D +Z EN 10327	T	0,2 - 0,7	≥ 140	270 - 500	≥ 20	-	-	-
		0,7 - 3			≥ 22			
		3 - 6			-	≥ 26		
DX52D +Z EN 10327	T	0,2 - 0,5	-	-	≥ 24	-	-	-
		0,5 - 0,7	140 - 300	270 - 420				
		0,7 - 3			≥ 26			
		3 - 6	140 - 350	270 - 430	-	≥ 28		

CHEMICAL ANALYSIS

	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Nb (%)	Ti (%)
DX51D +Z EN 10327	≤ 0,120	≤ 0,60	≤ 0,100	≤ 0,045	≤ 0,50	-	-	≤ 0,300
DX52D +Z EN 10327	≤ 0,120	≤ 0,60	≤ 0,100	≤ 0,045	≤ 0,50	-	-	≤ 0,300

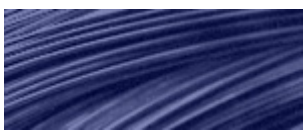
COATING CHARACTERISTICS

Designation EN 10326	Weight of coating – both sides (g/m²)	Coating thickness (µm per side)
Z80	80	5,5
Z100	100	7,0
Z140	140	10,0
Z200	200	14,0
Z225	225	16,0
Z275	275	20,0



3.- SPRINGS UNDER TORSION STRESS

Springs under torsion stress manufactured out of white zinced phosphated wire (C DIN 17223C spring wire – material classification: 1.1002) with diameters Ø5mm, Ø5.5mm, Ø6mm, Ø6.5mm and Ø7mm based on standards **DGT 18204, DGT 18205, BS 4637, BS 4638, BS 5216, DIN 17223, ASTM A 417M, ASTM A 227M and ASTM A 228M.**



The phosphated wire on our springs complies with EN10088-3, ISO 6931 and EN 10270-3 standards. It follows Montreal rules concerning C.F.C. and it complies with the European ruling on heavy metals. Certificates: ISO TS 16949, ISO 9001 version 2000 and ISO 14001.

4.- SISTEMAS DE SEGURIDAD

All the safety systems used on our doors are patented and comply with European safety standards: Council Directive 89/106/CEE dated 21st December 1988 relating to the approximation of legal, regulation and administrative conditions from Member States on construction products.
Norpa, S.L. uses the following safety system on the simple sheet metal door:

- Residential spring anti-breaking safety for Ø25.4mm axes. Distance between the axis centre and wall: 67mm. Suitable for 50mm torsion parts. TÜV Tor Fv 7/127 Certificate. For axis with and without keyway. L shaped support. Max torsion: 34 Nm for a one spring door
  53 Nm for a two-spring door.

5.- CABLES

The single metal sheet doors are raised by means of the rolling action of a Ø3mm or Ø4mm steel cable (towline) around elevation drums. This steel cable is zinced; its maximum extension force is 1770 N/mm² and it is type 7X19+0. Its weight per linear metre is 0.034 kg for the Ø3mm and 0.05 kg for the Ø4mm.

TECHNICAL CHARACTERISTICS DEFINING THE STEEL CABLES

CONSTRUCTION
The cable is constructed in the following way:
•1-Central wire, 2-Strand, 3-Wire, 4-Cable, 5-Core

MASS OF STEEL CABLE PROVIDED

•Mass per unit of Length: Indicates the approximate weight per metre of the cable. Possible lubrication, type of grease and possible existence of coating and/or filling, will give variations in the mass per unit of length.

ROLLING:

•Taking into account the direction of the wires in the strand and the strands in the cable:
•sZ crossed right. The strands are rolled to the right and the wires in each strand to the left

DIAMETER

•The diameter of a cable is understood to be the diameter of the circumference around its straight section, expressed in millimetres.
• Nominal cable diameter. This is the dimension used to characterise the cable in question.
• Effective cable diameter. This is obtained by measuring it according to a determined method. Its value must fall within the admitted tolerances. Different International Standards tells us how to measure the effective diameter of a cable and give us the tolerances which we must apply in each case.

UNIT:

•From stranding, this is the length of the helix formed by the axis of an external wire measured on the strand's longitudinal axis.
•From wiring, this is the unit of the helix formed by the strand axis measured on the cable's longitudinal axis.

METAL SECTION:

•Nominal metal section of the cable is the sum of the nominal sections of cable from all the wires in the cable.
•The nominal straight metal section of cable A is calculated from its nominal diameter d and the straight section factor "c". The "c" factor is a value established for each cable composition.
•The quotient between the nominal straight metal section of cable A and the area of the perimeter of cable AU is called the filling factor and is designated using the letter "f". The "f" factor is used to determine the transverse section factor "c".

BREAKING LOAD FOR A CABLE

•Minimum Breaking Load (Fmin): Value specified in kN, which the Measured Breaking Load (Fm) must pass in a traction test.
•Cable quality (Rr) Breaking load requisite level, designated for no. (1770, 1960). (N/mm2).

CABLE WIRE FINISH

•Not coated (shiny or black): U
•Galvanised: Class B or class A (more g/m2 of zinc than B).

COMPOSITION:
•Cable composition is designated by how many strands it has, their composition and the type of core, for example:
- Seven strand cable each strand made up of 19 wires and a textile core. 6x 19+ FC.
- Eight strand cable each strand made up of 25 wires and metal core. 8x 25+ (7x 7+ 0) Filling
- Depending on the no. of wires in each layer of the strand, this could be:
•Warrington (W) –Outer layer with 2 diameters of wires-
•Seale (S) –Same number of wires in last layers -
•Warrington -Seale (WS) –combination of the last 2 types-
•Filling (F) –Includes fine filling lines-
- Depending on the type of core, this might be:
•Fibre core (FC)
•Metal Core (IWRC)
•Strand core (WRC)

6.- IRONWORK

The whole set of iron fittings which are used on a simple sheet metal sectional door meets the European standard CE EN-13241-1. This set of iron fittings comprises:

400-8 RH/LH drums for rolling aluminium for axis of ø25mm and elevation cable of ø3mm. Weight per unit 0.23 kg (one is assembled on the left and another on the right). The maximum height of the door will be 2550mm at 0.5 safety turns of the elevation cable and 2080mm at safety 2.0 turns of the elevation cable. Maximum weight of the door: 240 kg. Total external diameter of the drum: 112.5mm. Total internal diameter of the drum: 120.4mm. Height of the drum: 41.7mm. Bearing distance: 67mm.

400-12 RH/LH drums for rolling aluminium for axis of ø25mm and elevation cable of ø4mm. Weight per unit 0.38 kg (one is assembled on the left and another on the right). The maximum height of the door will be 3070mm at 0.5 safety turns of the elevation cable and 2558mm at safety 2.0 turns of the elevation cable. Maximum weight of the door: 340 kg. Total external diameter of the drum: 117.5mm. Total internal diameter of the drum: 121.9mm. Height of the drum: 56.8mm. Bearing distance: 67mm.

Residential coupling in stainless steel for ø25.4mm axis. Weight: 0.18 kg.

Intermediate hinges for panel with finger protection in zinced steel, 2.5 mm thick.

Side hinges in zinced steel, 2.5mm thick for panel with finger protection with roller holder for ø11mm rollers.

Zinced steel roller with ø46mm nylon wheel and steel ball bearing and ø11mm axis. Weight: 0.2 kg. Maximum load: 35 kg at 750,000 revolutions.

Upper adjustable roller holder made of 3 mm thick zinced steel for ø11mm rollers.

RH/LH lower base plate made of 3 mm zinced steel with ø11mm roller support and clamp for the elevation cable mounted with thimbles.

Inner-outer zinced steel lock (inner lock), external black PVC plate, European type zinced steel cylinder and zinced steel latch. Weight of the inner lock: 0.52 kg. Weight of inner/outer trim: 0.30 kg (including fastening screws). Cylinder weight: 0.22 kg. Latch weight: 0.31 kg









B. CONSTRUCTION FEATURES

Norpa, S.L. supplies their single metal sheet residential door with all the necessary components for easy and safe installation on site.

Profiled, assembled and machined PANELS arranged for fast and simple fitting of different iron fittings which make assembly possible.

Rolling GUIDES perfectly assembled, machined and arranged for clamping to site/steel pre-frame and for receiving panels.

PERIMETER SEALS: All the lower and upper seals that will make it possible to seal the door tightly are included in the closure profiles and their corresponding panels. The side seals are provided in the iron fittings box so that, making the most of the simplicity of assembly in the guides given profiles, any possible damage from packaging and transport processes is avoided .

SPRINGS: Norpa, S.L. provides all residential sectional doors with two compensation springs thereby achieving equal distribution of force during raising and lowering. It has to be taken into account that there are exceptions, as cases can occur where the width of the door limits us to using just one spring or, on the contrary, in doors over 5000mm wide up to four compensation springs have to be used.
In its standard version for this sectional door model, the springs always have identical dimensions and they are calculated for a minimum of 20000 cycles.

C. TECHNICAL FEATURES ACCORDING TO EUROPEAN STANDARDS CE EN-13241-1

Norpa, S.L. has verification and certification for its single metal sheet residential door which give the following data:

WIND RESISTANCE:	CLASS 3
AIR PERMEABILITY:	CLASS 1
WATER TIGHTNESS:	CLASS 0

D. VARIATIONS AMONG THE GUIDES.

For perfect adaptation of the door to the site where it has to be installed, Norpa makes its single metal sheet residential door in 5 standardised guide versions, creating a perfect fit between the door and the garage space (see dimensioned plans in the annexe E).