COLOR COATED PRODUCTS

YILDIZ
DEMİR ÇELİK

CONTENTS

1 About Us 1

2 Quality System Certifications 2

3 Production Lines 3

4 Color Coating Line 5

5 Colour Coated Products 7

- 5.1 Product Definition 9
- 5.2 Coating Types 10
- 5.3 Advantages of Colour Coated Products 11
- 5.4 Application Areas of Colour Coated Products by Paint Type 12
- 5.5 Production Limits 15
- 5.6 Colour Coated Products Tolerances 17
- 5.7 Colour Coated Products Dimension and Size Tolerances 18

6 Our Laboratories (Accreditation) 23

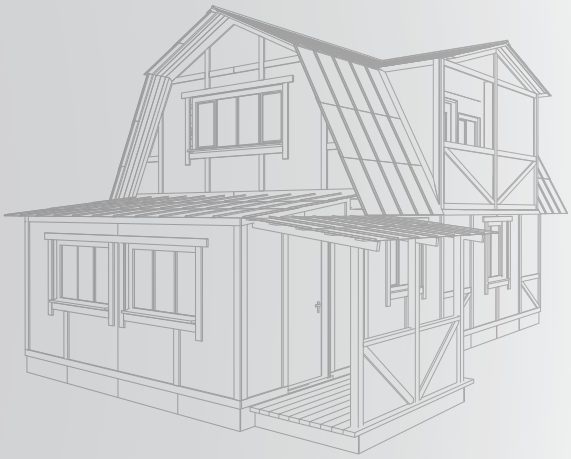
7 Long-Lasting Usage Guide 25

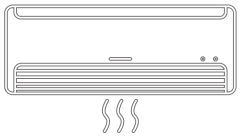
8 Stargate 27

ABOUT US

YILDIZ DEMİR ÇELİK is the investment in the iron and steel sector of YILDIZLAR YATIRIM HOLDİNG that is making major investments in Türkiye and in the world.

Established in 2018, Yıldız Demir Çelik is the first iron and steel facility in Türkiye that uses recycled Gray Water in production.





Our Vision

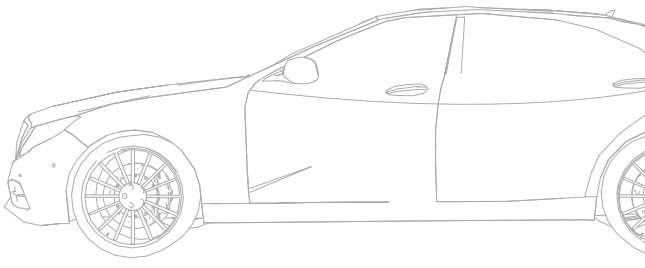
Where are we running?

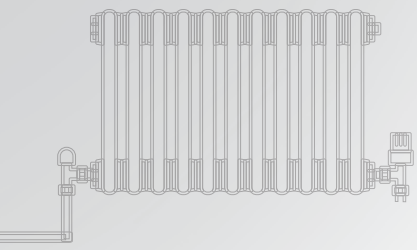
Until 2030, we will become a global brand that has been integrated into iron and steel and leaves a mark in every area **where steel comes to life.**

Our Mission

Why do we exist?

We exist to increase the **competitive advantage** of our business partners with our value- added products.

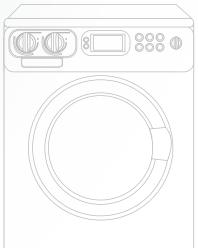




Our Values

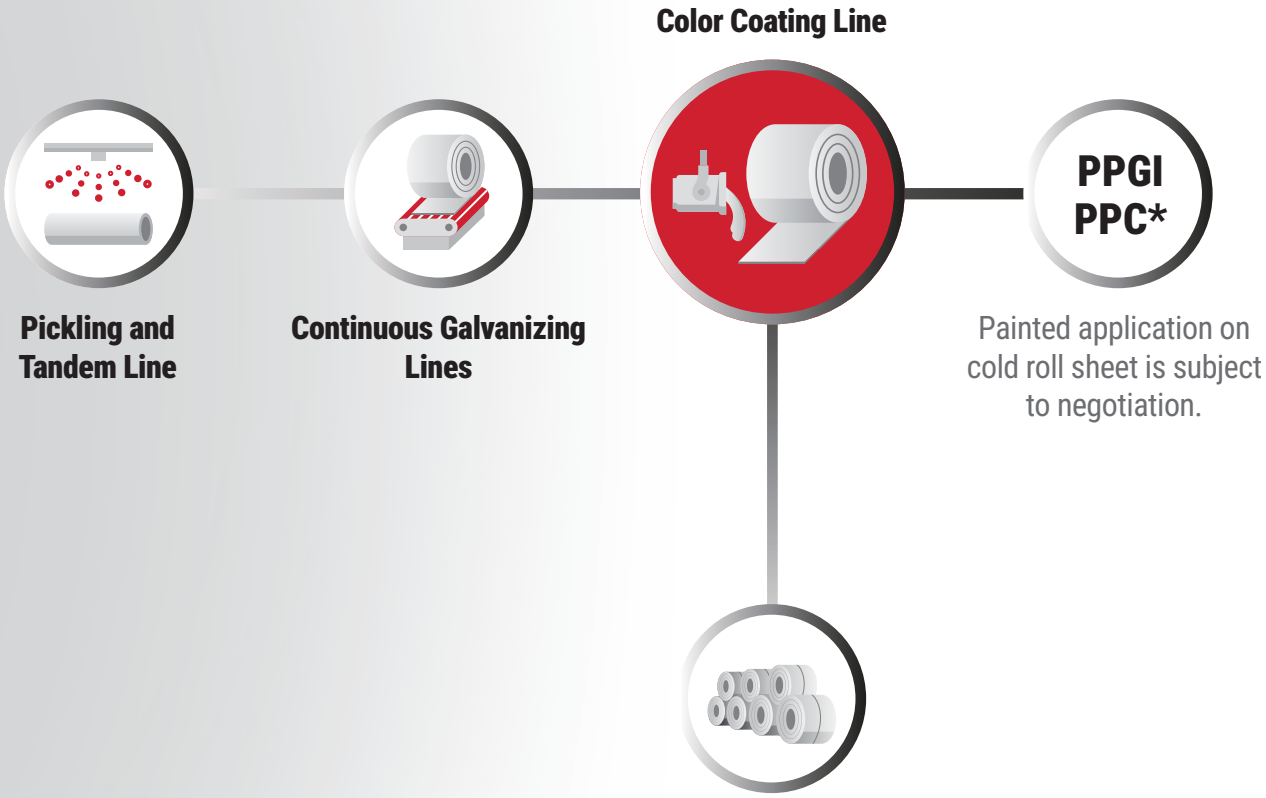
Where do we get our strength from?

From saying **'Human First'.**
From our **innovative perspective.**
From our **passion for quality.**
From our **determination to succeed.**
From being **one heart** for the same goal



Quality System Certifications

Yıldız Demir Çelik Production Lines




BVS
cranes
GS
2

COLOR COATING LINE

Production Limits	
Thickness	0,27-1,23 mm
Width	700-1300 mm
Inner Diameter	508-610 mm
Max.Coil Weight	15 Ton


PACO ENGINEERING

COLOR COATED PRODUCTS

COLOR COATED PRODUCTS

PRODUCT DESCRIPTION

The products that are produced with paint application on galvanized and cold sheet metal.

PRODUCT NAME AND DESCRIPTIONS

PPG: Color Coated Galvanized Coils

PPC: Color Coated Cold Rolled Coils

Top Coat Paint

Paint Type	Paint Type Description
SP	*Polyester
HD SP	High Durable Polyester
PVDF	**Polyvinylidene Fluoride
PVC (P)	Plastisol
PUR-PA	Polyamide Modified Polyurethane
PUR	Polyurethane
SP WR	Polyester Wrinkle

(*/**) Double surface application is possible.

Primer Paint

Primer Type	Primer Type Description
SP (CF)	Polyester Primer Chrome Free
SP (FLCF)	Polyester Flex Primer -Chrome Free
*PVC (P) - PR	Plastisol Primer

(*) Applied with plastisol topcoats.

Backcoat Paint

Backcoat	Backcoat Type Description
EP	Epoxy
EP-SP	Epoxy Polyester

Coating Types

PROTECTIVE FILM COATING (COLD LAMINATION)

These films are applied to protect PVC (Polyvinyl Chloride) coated sheet metal or painted surfaces from external factors such as scratches, contamination etc. during transportation forming, assembly etc. operation processes. They can be applied in various thicknesses (standart 35 microns) as transparent or coloured. They are used temporarly to be removed from the painted surface after the transportation, forming or assembly.

PVC FILM COATING (HOT LAMINATION)

PVC film laminated on the sheet surface can be used in indoor or outdoor environments. It offers a wide range of usage possibilities with smooth surface, textured and patterned alternatives. With the paint applied on the back surface of the metal, the polyurethane foam adheres better to the metal. On request, the coated metal surface can be covered with a removable transparent protective film for additional protection.

PET FILM COATING (HOT LAMINATION)

PET film (Polyethylene Terephthalate), which can be applied to sheet metal surfaces, offers a wide range of colours and patterns. This product, which can be used in indoors and outdoors, is one the most popular products in today's coating industry with its excellent chemical resistance, stain resistance for refrigerators, easy cleaning and high scratch resistance.

Comparable Characteristics of Paint Types

Specifications	Polyester (PE)	PVDF	Plastisol (PVC)	Pur-PA	HD SP
Color Durability	★★★	★★★★★	★★★	★★★★	★★★★★
Gloss Durability	★★★	★★★★★	★★★	★★★★	★★★★★
Chalking Resistance	★★★	★★★★★	★★★	★★★	★★★★★
Corrosion Resistance	★★★	★★★★	★★★★★	★★★★	★★★★
Moisture Resistance	★★★	★★★★★	★★★★★	★★★★★	★★★★
Formability	★★★	★★★★★	★★★★★	★★★★★	★★★★★
Friction Resistance	★★★	★★★★	★★★★★	★★★★★	★★★★★

Excellent: ★★★★★ Very Good: ★★★★ Good: ★★★

Advantages of Colour Coated Products

ADVANTAGES OF PVDF TOP COATS

- Outdoor resistance
- Color resistance
- Gloss resistance
- Chalking
- Flexibility
- Impact resistance
- Abrasion resistance
- Oil resistance
- Solvent resistance
- Ease of implementation
- Corrosion resistance

ADVANTAGES OF POLYESTER PAINTS

- Flexibility
- Abrasion resistance
- Pencil Hardness
- Corrosion resistance
- Moisture Resistance
- Interface Adhesion
- Color and gloss options
- Ease of implementation
- Impact resistance

ADVANTAGES OF PURPA PAINTS

- High scratch resistance
- High flexibility capability

ADVANTAGES OF PVC PAINTS

- Very high corrosion and moisture resistance
- Suitable for bending and forming

Usage Areas of Pre-Painted Steel

Sheets Depending on Paint Type

APPLICATION AREAS OF POLYESTER TOPCOAT PAINTS

- Sandwich panels
- Prepainted garage doors
- Rainwater drainage systems
- White goods products
- Suspended ceiling
- Clamp construction
- Tool bag

APPLICATION AREAS OF PVDF TOPCOATS

- Roof and facade cladding
- Sandwich panels
- Composite panel
- Billboards
- Where color and gloss stability is required

USAGE AREAS OF PLASTISOL (PVC) TOPCOATS

- Roof and facade cladding
- Areas where corrosion resistance is required

APPLICATION AREAS OF POLYAMIDE MODIFIED POLYURETHANE TOPCOATS

- Roof and facade cladding
- Blinds and pull-down shutter systems
- Prepainted garage doors
- Where high scratch resistance is required

Production Limits

Cold Rolled and Continuous Galvanized Color Coated Products

Product Type	Low Carbon Grades for Cold Forming and Structural Steels					
Grade	DX51D+Z S220GD+Z S250GD+Z S280GD+Z SS Grade 33* CS Type B*		DX52D+Z		DX53D+Z DX54D+Z	
Painted Thickness (mm)	Width (mm)		Width (mm)		Width (mm)	
	min.	max.	min.	max.	min.	max.
0,27 - 0,29	700	1150	-	-	-	-
0,30 - 0,34	700	1250	-	-	-	-
0,35 - 0,42	700	1250	700	1150	-	-
0,43 - 0,52	700	1300	700	1250	700	1000
0,53 - 0,62	700	1300	700	1300	700	1100
0,63 - 0,72	700	1300	700	1300	700	1200
0,73 - 1,23	700	1300	700	1300	700	1300

Production Limits

Production Limits

Cold Rolled and Continuous Galvanized Color Coated Products

Grade	Structural Steels			
Painted Thickness (mm)	S320GD+Z		S350GD+Z	
	Width (mm)		Width (mm)	
	min.	max.	min.	max.
0,43 - 0,52	700	1250	-	-
0,53 - 0,62	700	1300	-	-
0,63 - 0,72	700	1300	700	1300
0,73 - 1,23	700	1300	700	1300

Production Limits

REMARKS

1. The minimum order width is 700 mm.
2. Galvanized and color coated steel grades are produced in accordance with EN 10346:2015 and EN 10169:2010 standards. Production of DX53D+Z and DX54D+Z grades is subject to negotiation.
3. Coil inner diameter is 508 mm. 610 mm is subject to negotiation.
4. The maximum package weight for coil products is 8,000 kg. Maximum 2,500 kg for cold laminated coils (protective film-coated products).
5. Total zinc coating weight of PPG products are maximum 275 gr/m² and minimum 50 gr/m². Coating requests over 275 gr/m² are subject to negotiation. Impact resistance, bending and deep drawing are not guaranteed for coatings mass of 200 g/m² and above.
6. Surface flatness tolerance is applied for sheets not for coils.
7. Unless otherwise specified by the customer for coated products, the top coat color is RAL9002 (Off-White) and the back surface backcoat (White) is applied. Unless otherwise specified, topcoat paint is applied on primer for the top surface and only backcoat is applied for the back surface. In painted products, standard SP(CF) primer type is used as primer on the top surface and SemiGloss SP is used as top coat paint type. For painted products, only backcoat paint type EP-SP is used on the back surface. Epoxy backcoat can also be applied upon request.
8. Unless otherwise specified, 5 micron primer, 20 micron topcoat, 7 micron backcoat are applied. Painted product guarantee is not given for requests below the specified thicknesses. The expected corrosion resistance, paint flaking, color and gloss loss are not guaranteed for requests with paint type PVC(P) with paint thickness below 150 microns.
9. Order thicknesses for plastisol type painted products are galvanized coated product thicknesses. Paint coating thickness is excluded.
10. When protective film is requested, 35 micron and transparent film is applied unless otherwise specified. Wrinkle and cold laminated products are produced with cardboard sleeves.
11. For project continuation productions, no color shade guarantee is given unless the order is specified as a continuation of the relevant project production (production batch).
12. Production with inner bore protection (sleeve) are subject to negotiation.
13. Please contact with Customer Technical Services Department for quality and dimensions not specified in the table.

Color Coated Product Tolerances

Tests	Polyester, Pvdf, Polyurethane Paints		Plastisol
Top Coat Paint Thickness	Standart: 20 ± 2mm Talep edilirse: 15 ± 2mm Metalik Renklerde: 18 ± 2mm	Toplam Üst Boya Kalınlığı: 25 ± 3mm	Sipariş Boya Kalınlığı: ± %10
Top Coat Primer Thickness	5 ± 1µm	Metalik, Fosforlu ve Sedefimsi Renklerde Toplam Üst Boya Kalınlığı: 23 ± 3mm	5 ± 1µm
Backcoat Paint Thickness	7 ± 1mm		
Top Coat Color Difference	ΔE ≤1 (Metalik, Fosforlu ve Sedefimsi renkler için ΔE ≤2)		ΔE ≤2
60° Top Paint Gloss %	Matt ≤12 12 < Low Gloss ≤ 22 23 ≤ Semi gloss ≤ 45 46 ≤ Gloss ≤ 75 75< High Gloss		
Top Coat MEK Rub Test	≥ 100 (Metalik, Fosforlu ve Sedefimsi Renkli Boyalarda ≥ 50)		Uygulanmaz
Backcoat MEK Rub Test	≥ 50		≥ 50
Top Coat Adhesion Test After Deep Drawing	≥ 6mm - 0 % ≥ 6,5mm - 0 % PVDF		≥ 7mm - 0 %
Backcoat Adhesion Test After Deep Drawing	≥ 6mm - 0 %		≥ 6mm - 0 %
Top Coat Pencil Hardness*	Min. F		Uygulanmaz
Top Coat T-Bend Test	Max. 2T		Max. 0,5T
Reverse Impact Test	≥ 10 J		Uygulanmaz

*For polyurethane paints, pencil hardness is not considered. For plastisol paints, pencil hardness and MEK Rub are not considered.

Colour Coated Products
Dimension and Size Tolerances

THICKNESS TOLERANCE

Nominal Thickness (t) mm	Nominal Tolerances			Special Tolerances		
	Width (w) mm			Width (w) mm		
	w ≤ 1200	1200 ≤ w < 1500	>1500	w ≤ 1200	1200 ≤ w < 1500	>1500
0,20 < t ≤ 0,40	±0,04	±0,05	±0,06	±0,030	±0,035	±0,040
0,40 < t ≤ 0,60	±0,04	±0,05	±0,06	±0,035	±0,040	±0,045
0,60 < t ≤ 0,80	±0,05	±0,06	±0,07	±0,040	±0,045	±0,050
0,80 < t ≤ 1,00	±0,06	±0,07	±0,08	±0,045	±0,050	±0,060
1,00 < t ≤ 1,20	±0,07	±0,08	±0,09	±0,050	±0,060	±0,070

Thickness tolerances for grades with minimum yield strength Re < 260 N/mm²

Nominal Thickness (t) mm	Nominal Tolerances			Special Tolerances		
	Width (w) mm			Width (w) mm		
	w ≤ 1200	1200 ≤ w < 1500	>1500	w ≤ 1200	1200 ≤ w < 1500	>1500
0,20 < t ≤ 0,40	±0,05	±0,06	±0,07	±0,035	±0,040	±0,045
0,40 < t ≤ 0,60	±0,05	±0,06	±0,07	±0,040	±0,045	±0,050
0,60 < t ≤ 0,80	±0,06	±0,07	±0,08	±0,045	±0,050	±0,060
0,80 < t ≤ 1,00	±0,07	±0,08	±0,09	±0,050	±0,060	±0,070
1,00 < t ≤ 1,20	±0,08	±0,09	±0,11	±0,060	±0,070	±0,080
1,20 < t ≤ 1,60	±0,11	±0,13	±0,14	±0,070	±0,080	±0,090

Thickness tolerances for grade DX51D and grades with yield strength 260 ≤ Re < 360 N/mm²

Remarks

1. Thickness is measured at any point at a minimum distance of 40 mm from the edges.
2. In slitted coils or cut-to-length sheets with a width of 80 mm, the thickness measurement is made from the center of the axis.
3. Production with 25% thickness tolerance is subject to negotiation.

Colour Coated Products Dimension and Size Tolerances

WIDTH TOLERANCES

Standart: EN 10143:2006

For products with a width of 600mm and wider

Nominal Width (w)	Tolerances (mm)	
	min.	max.
600 < w ≤ 1200	0	5
600 < w ≤ 1200	0	6

Slitted products with a width less than 600 mm

Nominal Width (w)	Tolerances (mm)							
	w ≤ 125		125 < w ≤ 250		250 < w ≤ 400		400 ≤ w < 600	
	min.	max.	min.	max.	min.	max.	min.	max.
t < 0,60	0	0,4	0	0,5	0	0,7	0	1,0
0,6 ≤ t < 1,0	0	0,5	0	0,6	0	0,9	0	1,2

Note: Width measurement is made perpendicular to the length and axis of the product.

LENGTH TOLERANCE

Nominal Length (L) mm	Normal Tolerances (mm)	
	min.	max.
L < 2000	0	6,0
L ≥ 2000	0	0,3 x L

Note: The length is measured along the long side of the sheet.

Colour Coated Products
Dimension and Size Tolerances

SURFACE FLATNESS TOLERANCE

Surface flatness tolerances for grades with yield strength Re < 260 N/mm²

Tolerans Sınıfı	Nominal Genişlik (w) Toleransı	Nominal Kalınlık (t) mm için Max Dalga Yüksekligi (mm)	
		t < 0,7	0,7 ≤ t < 1,6
Normal	w < 1200	10	8
	1200 ≤ w < 1500	12	10
	w ≤ 1500	17	15
Özel (FS)	w < 1200	5	4
	1200 ≤ w < 1500	6	5
	w ≤ 1500	8	7

Note: Flatness can be guaranteed for materials shipped as cut to length. Surface flatness requirements for coils are subject to negotiation.

Surface flatness tolerances for grades with minimum yield strength 260 ≤ Re < 360 N/mm² and for DX51D+Z

Tolerance Class	Nominal Width (w) Tolerance	Max Wave Height (mm) for Nominal Thickness (t) mm	
		t < 0,7	0,7 ≤ t < 1,6
Normal	w < 1200	13	10
	1200 ≤ w < 1500	15	13
Special (FS)	w ≤ 1200	8	6
	1200 ≤ w < 1500	9	8

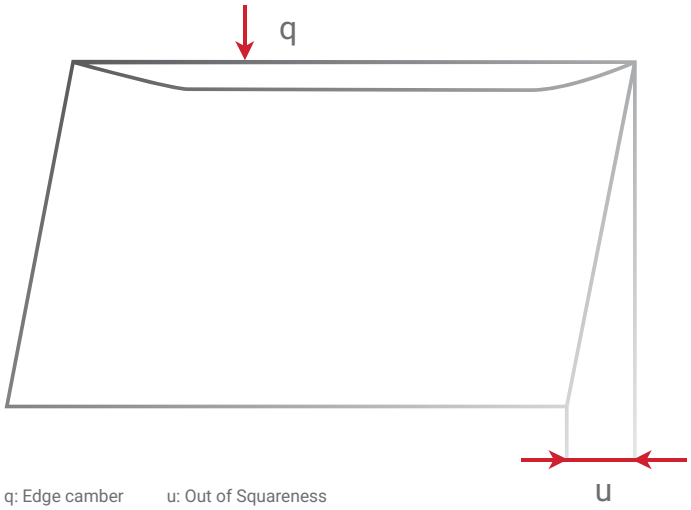
Colour Coated Products Dimension and Size Tolerances

EDGE CAMBER TOLERANCE

- Edge camber is the maximum length between a straight line connecting both ends of the long edges and this long edge.
- The edge camber measurement is made on the concave edge of the product.
- Edge camber measurement length is the length measured from any point on the edge.
- For sheet products with a width greater than 600 mm, for sheet lengths of 2000 mm and more, the length of measurement is taken as 2000 mm and a tolerance of 5 mm is applied.
- If the sheet length is less than 2000 mm, the actual length of the product is taken as the measurement length and an additional tolerance of 0.25% of the actual length is added.
- For coil products, the length measurement is 2000 mm and 5 mm tolerence is applied.

OUT OF SQUARENESS TOLERANCE

- Out of Squareness is the deviation determined by orthogonal projection of the transverse edge onto the longitudinal edge.
- Out of Squareness tolerance can be a maximum 1 % of the actual width of the sheet.



q: Edge camber u: Out of Squareness

Our Laboratories (Accreditation)

MULTISERVICE

YILDIZ DEMİR ÇELİK A.Ş. Laboratories provide services to both internal and external customers with their Chemistry, Mechanics, Paint and Color Laboratories.

REGISTERED

YILDIZ DEMİR ÇELİK A.Ş. Laboratories are accredited by TÜRKAK according to the TS EN ISO/IEC 17025 standard for tensile testing, zinc coating weight, and tests applied to painted sheets.

STATE OF THE ART TECHNOLOGY

Since 2018, our laboratories, with a focus on high customer satisfaction and providing accurate and reliable services, have been conducting control tests on all raw materials that directly affect product quality, as well as trials of alternative new raw materials and research activities. These tests are performed in accordance with standards using state-of-the-art equipment and experienced personnel.

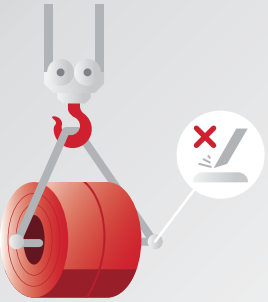
Painted Steel Tests

- Dry Film Thickness
- Gloss
- Color Deviation
- Pencil Hardness
- Reverse Impact Resistance
- Deep Drawing
- Adhesion After Cupping
- Bending /T-Bend
- MEK Rub

Long-Lasting Usage Guide

GUIDELINES

PAINT WARRANTY LETTERS (QR KOD)

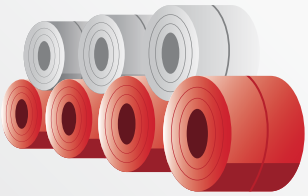


Transportation and Handling

Material transfers must be carried out using appropriate equipment (forklifts, C-hooks, electromagnets, etc.).

Lifting/transport equipment should have rubber, rubber, felt, or other suitable materials on the surfaces that contact the material to increase resistance to impacts.

Steel ropes that could potentially cause damage through internal wrapping should not be used.



Product Selection and Storage

Materials should be stored in closed and temperature-controlled environments to prevent moisture and condensation.

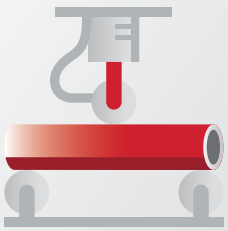
To avoid condensation, the temperature change in the environment should not be too high (maximum 5-10°C), and the relative humidity should not exceed 70%. Materials should be stored on clean and smooth surfaces that will not cause defects like dents or impact marks.

Materials should not make direct contact with the ground; they should always be placed on saddles, pallets, or wedges.

There must be continuous air circulation in the storage area. To support air circulation, a space should be left between stacks or rolls.

FIFO (First In, First Out) method is recommended for storage practices.

When determining the mechanical warranty periods of materials, the warranty periods specified in the relevant standard for the steel grade should be taken into account.



Cutting and Shaping

Use of Correct Equipment:
When cutting and shaping products, use special cutting tools that will not damage the coating.

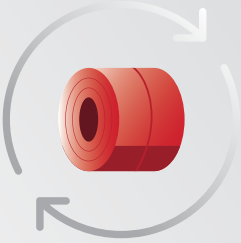
Long-Lasting Usage Guide

Packaging

During packaging, pallets, corner protectors, and wedges suitable for the product type should be used to protect materials from damage.

Maintenance and Cleaning

It is recommended that the packaging not be opened and the materials not be put into use until they reach room temperature.



Environmental Factors

Products with protective film coatings should be stored away from sunlight and should be used without prolonged waiting to prevent adhesive residues on the surface.

Products should not be stored outdoors.

CONCLUSION

To ensure the longevity and efficient use of your painted products, it is advised to follow the above recommendations.

Proper storage and usage will enhance the performance and durability of your products, helping you achieve maximum efficiency in your projects.

For any questions or further information, please contact **ydc.mth@yildizdemircelik.com.tr**

YILDIZ
DEMİR ÇELİK

STEEL IN EVERY STEP

www.yildizdemircelik.com.tr/en/

İstanbul Office
Küçükbakkalköy Mah. Tevfik Fikret Cad.
No:34 34750 Ataşehir İstanbul/Türkiye

Production Facilities
Alikahya O.S.B. 2. Cadde No:2
İzmit/Kocaeli

YILDIZLAR
YATIRIM
HOLDİNG

Yıldız Demir Çelik A.Ş. Is a Subsidiary of Yıldızlar Yatırım Holding