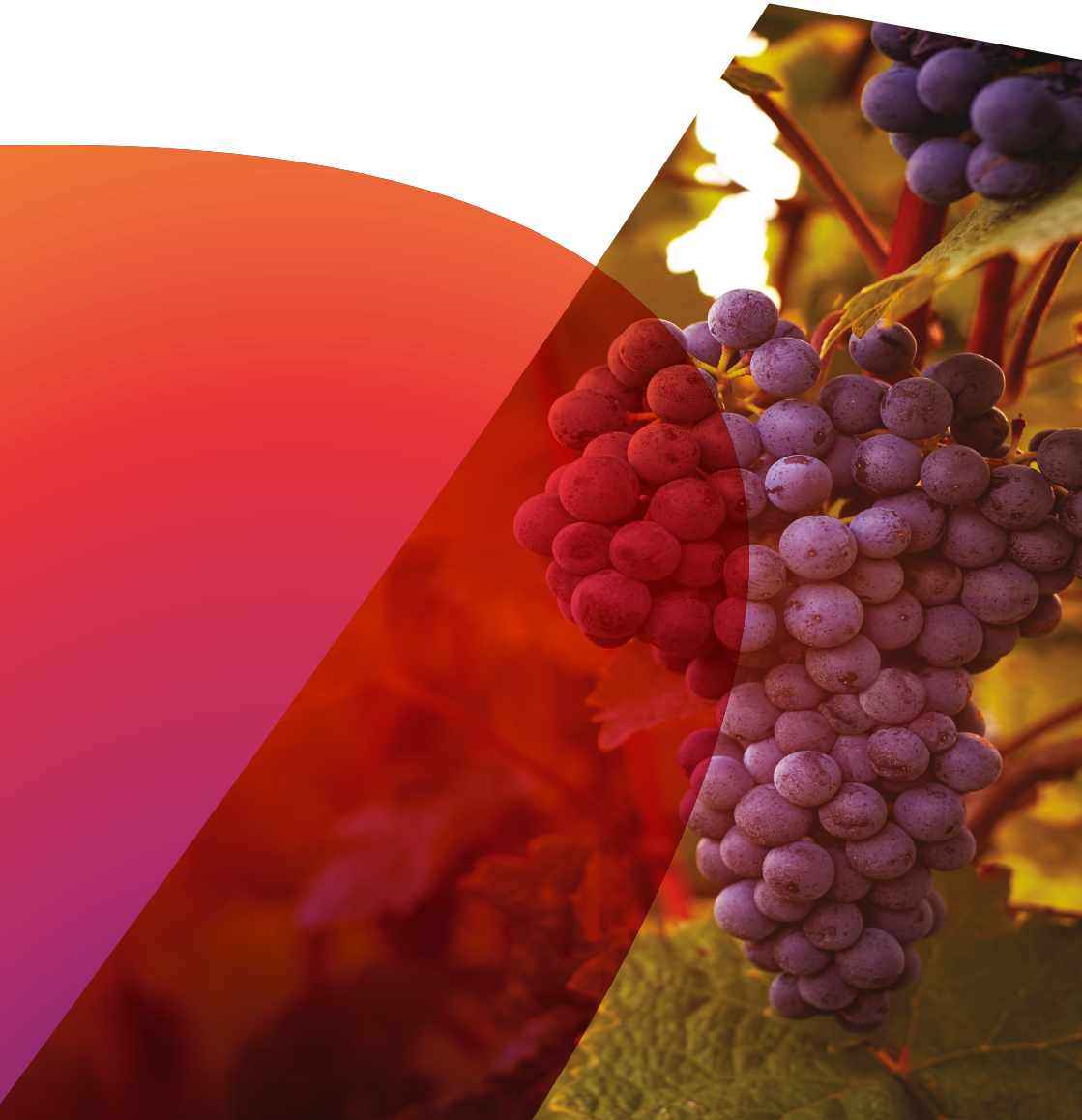
Vineyard wire CRAPAL®

ArcelorMittal



ArcelorMittal Bissen

ArcelorMittal Bissen: A Centenary Plant Nurturing Vineyards and Orchards!

ArcelorMittal Bissen produces high-performance trellising wires featuring our distinctive CRAPAL® coating.

An unparalleled process that has demonstrated its effectiveness for over six decades, coupled with our acknowledged expertise and skills as attested by our numerous certifications.

We are committed to our values, establishing a customer culture with the greatest respect.

ISO 9001 ISO 14001 ISO 45001

Crapal®

The reference for the protective coating of our wires.

The Crapal® technology combines zinc and aluminum. In the case of Crapal® Optimum, magnesium is added for enhanced corrosion protection.

How does the Crapal® coating work?

Zinc provides active and sacrificial protection, while aluminum offers passive protection by covering the zinc. The addition of magnesium stabilizes the entire molecular structure and provides a more effective, uniform resistance to corrosion, ensuring optimal protection.

The advantages of the coating

- 100% recyclable.
- Durable and smooth surface.
- Consistent coating concentricity.
- Extended lifespan.
- Excellent adhesion without peeling or cracking.
- Exceptional performance under thermal stress.
- Bent or deformed wire remains fully protected. against corrosion.
- Excellent cathodic protection of cut ends.
- Continuous protective layer of the wire core preserves its mechanical characteristics.

Certification process

XCarb®

Recycled and renewably produced

The XCarb® brand is designed to bring together all of ArcelorMittal's low to zero-carbon emission steel products and production activities.

Long Products estimates that XCarb® recycled and renewably produced steel will have a CO2 footprint as low as 0.3 per tonne of finished steel.This is significantly lower than the average for the global steel industry which is around 2.3 tonnes of CO2 emissions per tonne of steel products.

Each tonne of steel produced under the XCarb® recycled and renewably produced label will have its own production certificate. The certificate guarantees that only recycled steel was used in its production, and that the electrical energy used to make the steel came from renewable sources.

Step 1	Step 2	Step 3	Step 4
Purchase of renewable electricity through the European «guarantee of origin» system.	Order system tracking, audited by a third party.	Delivery of the XCarb® certificate for recycled and renewably produced.	Delivery of the finished product to the customer.

CRAPAL® OPTIMUM

XCarb®
De sources recyclées et renouvelables

5X 5 times longer service life than BS EN 10244-2 Class A Zinc galvanised wire.

A high-performance technical wire

- Zinc/Aluminium/Magnesium coating.
- High strength and a breaking load superior to that of traditional galvanised wire.
- Low elongation.
- Long lasting smooth surface.
- Eco-friendly product.
- 6 times less zinc oxide in the soil due to the stability of its corrosion-resistant coating.

An economically priced per linear meter steel wire.

- Up to 50% more length in a 25 kg roll with an equivalent breaking strength compared to a standard galvanised wire.

Packaging

- Coils of 25 kg delivered in bundles of 500 kg.
- Internal diameter of 600 mm.

CRAPAL® OPTIMUM

XCarb®
De sources recyclées et renouvelables

5X 5 times longer service life than BS EN 10244-2 Class A Zinc galvanised wire.

Specifications

- Comparison between Crapal®Optimum and heavily galvanised wire.

Diameter (mm)		Number of ml per coil		Resistance (kg/mm²)		Breaking load (kg - approx.)		Elongation (%)	
Heavily galvanised	Crapal® Optimum	Heavily galvanised	Crapal® Optimum	Heavily galvanised	Crapal® Optimum	Heavily galvanised	Crapal® Optimum	Heavily galvanised	Crapal® Optimum
2.20	**1.80**	830	**1250**	40/50	**70/90**	170	**205**	20	**10**
2.40	**2.00**	700	**1000**	40/50	**70/90**	205	**250**	20	**10**
2.70	**2.20**	550	**830**	40/50	**70/90**	255	**305**	20	**10**
3.00	**2.50**	450	**650**	40/50	**70/90**	315	**395**	20	**10**
3.40	**2.80**	355	**515**	40/50	**70/90**	410	**495**	20	**10**
3.90	**3.15**	275	**410**	40/50	**70/90**	535	**625**	20	**10**

CRAPAL® 2 TOP

2X 2 times longer service life than BS EN 10244-2 Class A Zinc galvanised wire.

A technical wire for a tight budget!

- Corrosion protection with Zn/Al coating.
- Low elongation.
- A surface that is durably smooth and does not harm the plant.
- Good balance between strength and ductility.

Packaging

- Coils of 25 kg delivered in bundles of 500 kg.
- Internal diameter of 600 mm.

Specifications

- Comparison between Crapal®2 TOP and heavily galvanised wire.

Diameter (mm)		Number of ml per coil		Resistance (kg/mm²)		Breaking load (kg - approx.)		Elongation (%)	
Heavily galvanised	Crapal® 2 Top	Heavily galvanised	Crapal® 2 Top	Heavily galvanised	Crapal® 2 Top	Heavily galvanised	Crapal® 2 Top	Heavily galvanised	Crapal® 2 Top
2.70	**2.00**	550	**1000**	40/50	**75/95**	255	**295**	20	**9**
3.00	**2.20**	450	**830**	40/50	**75/95**	315	**355**	20	**9**
3.50	**2.50**	325	**650**	40/50	**75/95**	430	**450**	20	**9**

CRAPAL® COLOR

6X 6 times longer service life than BS EN 10244-2 Class A Zinc galvanised wire.

The wire that colours your projects

- Crapal®Optimum quality + pigmented resin.
- Excellent adhesion of the coating.
- High resistance to UV-rays.
- Classified and registered coating according to European standards.
- 2 colors available : Yellow in medium hard steel and white in low carbon quality.

Packaging

- Coils of 25 kg delivered in bundles of 500 kg.
- Internal diameter of 600 mm.

Specifications

Diameter (mm)	Length (m)	Steel quality	Resistance (kg/mm²)	Breaking load (kg - approx.)	Elongation (%)	Color available
2.10	975	Low carbon	40/60	160	20	White
2.10	975	Medium hard	70/90	250	10	Yellow

TRM®

5X 5 times longer service life than BS EN 10244-2 Class A Zinc galvanised wire.

Mechanized vineyard TRM®

- **Low elongation :** The wire's design, featuring a high elastic limit, obviates the need for re-tensioning, and limits the use of accessories on the row.
- **Exceptional mechanical strength:** TRM® can withstand extremely heavy loads or tension without breaking.
- A surface that maintains its smoothness throughout its lifespan.
- Crapal Optimum coating.
- It is not recommended to use turnbuckles at the head of the row with a twist mode of operation.

Packaging

- Coils of 25 kg delivered in bundles of 500 kg.
- Internal diameter of 600 mm.

Specifications

Diameter (mm)	Number of ml per coil	Resistance (kg/mm²)	Breaking load (kg)	Elongation (%)
3.00	450	140	990	6/8

CRAPAL® 2

2X 2 times longer service life than BS EN 10244-2 Class A Zinc galvanised wire.

The characteristics of a traditional steel wire with Crapal® protection

- A classic low carbon wire coated with pure zinc.
- For fans of flexible wires with large diameters.
- Long lifetime.

Packaging

- Coils of 25 kg delivered in bundles of 500 kg.
- Internal diameter of 600 mm.

Specifications

Diameter (mm)	Number of ml per coil	Resistance (kg/mm²)	Breaking load (kg)	Elongation (%)
1.80	1250	40/60	130	20
2.00	1000	40/60	160	20
2.20	825	40/60	190	20
2.40	700	40/60	225	20
2.70	550	40/60	290	20
3.00	450	40/60	350	20
3.50	325	40/60	480	20
3.90	275	40/60	600	20
4.50**	210	40/60	795	20

CRAPO®

Zn+ Rich galvanising process according to EN 10244-2

The reference amongst galvanised wires

- Patented galvanisation process.
- Life span upper than EN 10244-2 heavily galvanised wire.
- The perfect adhesion of zinc allows Crapo® to be coiled up on its own diameter. without flaking

Packaging

- Coils of 25 kg delivered in bundles of 500 kg.
- Internal diameter of 600 mm.

Specifications

Diameter (mm)	Number of ml per coil	Resistance (N/mm²)	Breaking load (kg)	Elongation (%)
1.80	1250	40/60	125	20
2.00	1000	40/60	155	20
2.20	825	40/60	190	20
2.40	700	40/60	225	20
2.70	550	40/60	290	20
3.00	450	40/60	350	20
3.50	325	40/60	480	20
3.90	275	40/60	600	20

Basic+

Zn Galvanising in accordance with EN 10244-2 standard

Entry-level vineyard wire

- Conventional steel wire no longer aligns with contemporary standards for cost-effective vineyard trellising. Nonetheless, it is still accessible upon request.
- Good quality.

Packaging

- Coils of 25 kg delivered in bundles of 500 kg.
- Internal diameter of 600 mm.

Specifications

Diameter (mm)	Number of ml per coil	Resistance (N/mm²)	Breaking load (kg)	Elongation (%)
2.00	1000	40/60	155	20
2.20	830	40/60	190	20
2.40	700	40/60	225	20
2.70	550	40/60	290	20
3.00	450	40/60	350	20
3.50	325	40/60	480	20
3.90	270	40/60	600	20

ARBOLU®

5X 5 times longer service life than BS EN 10244-2 Class A Zinc galvanised wire.

Orchard high-performance wire

- Zinc/Aluminium/Magnesium coating.
- **Exceptional mechanical strength:** Arbolu® can withstand extremely heavy loads or tension without breaking.
- **Low elongation:** The wire's design, featuring a high elastic limit, obviates the need for re-tensioning.
- A surface that maintains its smoothness throughout its lifespan.

Packaging

- Coils of 25 kg delivered – smooth wire delivered by 20 in bundles of 500 kg, undulated wire delivered by 8 in bundles of 200 kg.
- Internal diameter of 600 mm.

Specifications

Wire	Diameter (mm)	Number of ml per kg	Resistance (kg/mm²)	Resistance (N/mm²)	Breaking load (kg)	Elongation (%)
Smooth	2.40	28	700	1300/1500	635	6/8
Smooth	2.70	22	550	1300/1500	800	6/8
Smooth	3.00	18	450	1300/1500	990	6/8
Smooth	3.50	13	325	1300/1500	1345	6/8
Smooth	3.90	11	275	1300/1500	1670	6/8
Undulated	2.40	26	640	1300/1500	635	6/8**

* Unsliced roll for this diameter
** On smooth wire non undulated

- Undulation length: 30 mm – Undulation height: 5 mm
- Max. tensile strength recommended during installation: half the breaking load indicated in thistable

TOP 50 PLUS

5X 5 times longer service life than BS EN 102442 Class A Zinc galvanised wire.

A versatile and high-performing wire suitable for orchard

- Zinc/Aluminium/Magnesiumn coating.
- **Elevated breaking strength with minimal elongation.**
- Significant ductility facilitates more straightforward tensioning.
- Flawless adherence of the coating.
- Its consistently smooth surface safeguards against premature net wear.

Packaging

- 400 kg wooden reels : external diam 600 mm. Inner hub diam 80mm.
- Coils of 25 kg delivered into 500 kg bundles.
- Internal diameter of 600 mm.

Specifications

Diameter (mm)	Number of ml per coil	Resistance (N/mm²)	Breaking load (kg)	Elongation (%)
2.20	830	1000/1300	430	5/7
2.50	650	1000/1300	540	5/7
2.80	525	1000/1300	680	5/7
3.15	410	1000/1300	850	5/7
3.40	350	1000/1300	998	5/7
3.80	280	1000/1300	1247	5/7
4.00	253	1000/1300	1380	5/7

Coiled wire
for multiple applications

Packaging in traditional 5 kg rolls bound in 25 kg bundles (= 125 kg)

- On pallet : 750 kg (6 standard coils of 125 kg).
- 125 kilos standard coil without pallet.

Specifications

Diameter	Inside outside diam of the roll	Roll weight Kg	Standard coil Kg	Pallet weight Kg	Length linear meter ±
1,40	320/420 mm	5 kg	125 kg	750 Kg	415 ml
1,50	320/420 mm	5 kg	125 kg	750 Kg	362 ml
1,60	320/420 mm	5 kg	125 kg	750 Kg	318 ml
1,80	320/420 mm	5 kg	125 kg	750 Kg	251 ml
2,00	320/420 mm	5 kg	125 kg	750 Kg	204 ml
2,20	320/420 mm	5 kg	125 kg	750 Kg	168 ml
2,40	320/420 mm	5 kg	125 kg	750 Kg	142 ml
2,70	320/420 mm	5 kg	125 kg	750 Kg	112 ml
3,00	320/420 mm	5 kg	125 kg	750 Kg	91 ml
3,40	320/420 mm	5 kg	125 kg	750 Kg	71 ml
3,80	320/420 mm	5 kg	125 kg	750 Kg	57 ml

Staples

4X 4 times longer service life than BS EN 10244-2 Class A Zinc galvanised wire.

Accessories to match with our Crapal® wire

- Double bevel cut round wire.
- Crapal® 4 coating ensures a non-reactive contact with our wires.
- Barb designed option available to prevent its removal.
- 5 kg bucket.

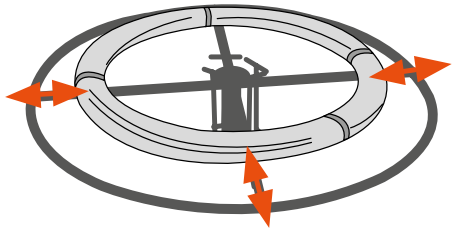
Specifications

Smooth staples			Barb staples		
Ø x Lg (mm)	Packaging	Number of pieces per bucket (approx)	Ø x Lg (mm)	Packaging	Number of pieces per bucket (approx)
2.70 x 27	5 Kg bucket	± 2000 pieces /bucket	3.00 x 30	5 Kg bucket	± 1550 pieces /bucket
3.00 x 30		± 1550 pieces /bucket	3.50 x 35		± 1000 pieces /bucket
3.50 x 35		± 1000 pieces /bucket	4.00 x 40		± 650 pieces /bucket
4.50 x 40		± 550 pieces /bucket	4.00 x 50		± 500 pieces /bucket
5.00 x 50		± 330 pieces /bucket			

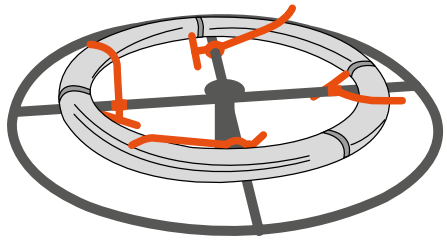
Unwinding device with tripod

For 25 Kg coils

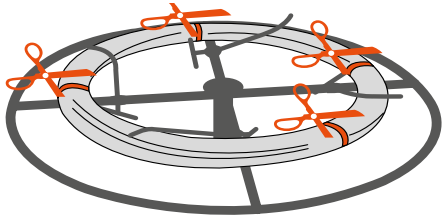
- Steel wire unwinding device with brake composed of two parts (stable tripod and wheel).
- Easy to transport.
- Tightening tabs hold the coil and stabilise the whole system.
- For optimal unwinding, the compression spring slows down and regulates the flow in order to avoid the formation of knots.



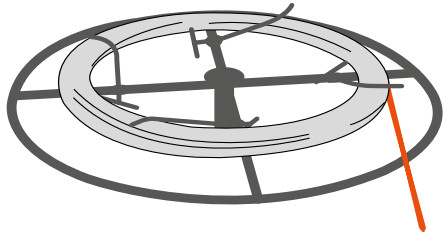
1. Place the coil in the middle of the unwinding device



2. Fix the brackets in unwinding direction



3. Cut the straps once the coil is secured



4. Smoothly unwind the steel wire

How to compare vineyard wires

The right question to ask yourself.

What is the breaking load? It enables the assessment of wire resistance based on factors such as fruit load, wind resistance, slope of the land, mechanization level, and more. The higher the breaking load, the stronger the wire.

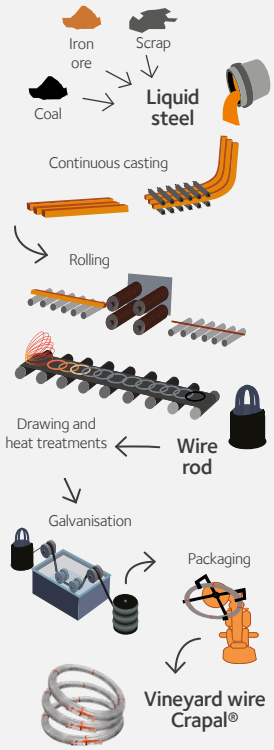
At an equivalent breaking load, what is the length of wire per coil with the same weight? Is this weight guaranteed? A greater length of wire per coil leads to a lower cost per meter.

How long will the wire last to minimize maintenance and replacement costs? Corrosion is the primary reason for trellis wire replacement. Long-lasting wire is more cost-effective. The coating preserves the wire's mechanical properties.

What types of steel are used, and how is the wire and its coating manufactured? A «low carbon » wire may stretch under stress, requiring frequent re-tensioning and leading to breakages. Conversely, a simple «mild carbon» wire can be challenging to install and prone to structural weakening. Crapal® is purpose-built for vine applications, made from a specific steel type and subjected to heat treatments, ensuring optimal performance and durability.

How many manufacturers offer carbon-free wire? Recycled and Renewable XCarb® is ArcelorMittal's latest brand within their ongoing global steel innovation program, with the goal of achieving carbon-neutral steel by 2050.

From iron to trellising wire



How to compare vineyard wires?

The coating that covers steel wire must meet specific criteria.

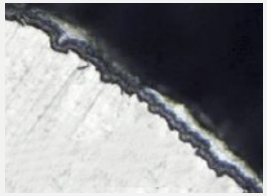
The coating must adhere to the steel wire. If the surface cracks when the wire is bent, corrosion will quickly reach the steel itself and the wire will break much faster.

The layer that links the steel and coating should be as thin as possible to avoid deformation when the wire is manipulated. The **CrapalOptimum® coating optimises this layer** in order to perfectly meet this constraint.

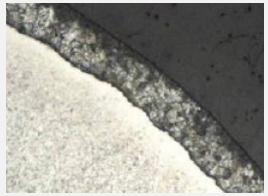
The coating should be uniformly distributed around the steel wire. The reference of a coating weight per square metre is not sufficient to guarantee the quality of the coating. Unfortunately, current standards do not take the concentricity of the coating into account, only the coating weight per square metre. This is a cleverly disguised important aspect that needs to be considered.

For over 30 years, Crapal® has been installed in some vineyards next to heavily galvanised wires. Samples are taken and analysed on a regular basis. Whilst the heavily galvanised have had to be replaced over several years, the most recent analyses of Crapal® show that is still substantial and sufficient enough to prevent corrosion for many years.
These are facts, not laboratory tests.

Heavily galvanised wire replaced after 20 years

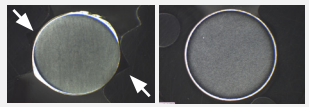


Crapal® wire still in use after 30 years



Did you know ?

Excessive zinc thickness on the wire is harmful to good adhesion. Crapal® has been used with satisfaction for over 30 years in a real situation and ensures durability beyond the vineyard lifespan.

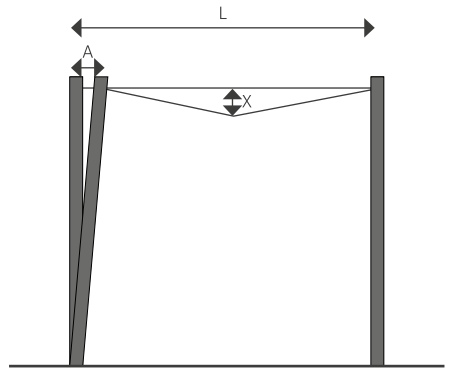


Bad concentrcity

Good concentricity

How to compare vineyard wires?

Some trellising tips



Check anchor strength and holding. For a length L of 100 m, if the end post moves only A = 2 cm, then the wire will have a deflection due to lost tension of X = 1 m! Spectacular!

Check the notches of metallic posts. If they have sharp edges, they will act like a saw with every movement of the wire (wind, harvest, etc.) and over time the wire will break. Quality is everywhere!

Stretching a vineyard wire like a piano wire is useless and will reduce the wire lifespan. A wire is like an elastic band. If it is stretched properly, it will return to its original position after harvest. If it is too taut, it will lengthen and will need to be re-tensioned. It will lengthen again and so on until the wire
finally breaks. The tensile strength generally accepted is equal to half the breaking load.

When it is necessary to attach the wire to itself, do not wind it in joined turns but in spaced turns. It will also be solid and the wire will not be damaged.

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