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About Us

Fratelli Rotta Trafilerie is an international supplier of drawn wire based in Northern Italy. We have over 60 years' experience supplying reliable products for multiple applications.

WHAT WE DO

We produce low-, medium- and high-carbon steel wire with diameters ranging from 0.8 to 16 mm, in the classes SL, SM, SH, DM and DH, certified according to the Italian standard UNI 3823 and the European standard UNI EN 10270-1.

We offer a variety of heat and surface treatments for the wire, including patenting, annealing, galvanization, phosphating and oil drawing, depending on your needs.

The product can be packaged in various ways, upon request.



INDUSTRIES AND USES OF OUR PRODUCTS

We currently supply specialty drawn wire products to companies all over Europe and our reputation continues to spread across the globe.

The flexibility of our equipment and processes means that we are able to meet the specific needs of customers in a broad range of industries, from furniture and automotive to agriculture, metalworking and food production.

In fact, our versatile steel wires are designed for the most common and varied uses, and in particular for the manufacture of springs, cables, protective metal sheathing, high-pressure reinforced hoses, tubes, hose clamps, and for cold heading and rolling.

Whatever your application, we can meet your needs with a variety of specialty steel wires.

OUR HISTORY

Fratelli Rotta s.n.c. was established in 1956, when its four original founders decided to set up a business for the production of steel wire in Galbiate (Lecco), in Northern Italy.

The Lecco area had long been famous for its excellence in the metalworking industry. The waterways flowing from the surrounding mountains had favoured the development of metalworking from the 1300s and the subsequent industrialization of the territory.

The founding members thus built a wire drawing factory equipped with a pickling system and patenting furnace, which were essential at the time for producing high-carbon steel wire.

In 1968, the factory was relocated to the nearby town of Pescate and extended. It moved again in 1972 to its current site.

Over the years, the company has always invested in new systems for preparing and drawing wire rod, paying particular attention to the environment. As early as the 1980s, it built one of the first "closed-cycle" pickling systems to stop the discharge of waste.

FRT has always invested in new systems for preparing and drawing wire rod, taking particular care to reduce its environmental impact.

Products

Low-, medium- and high-carbon steel wire with diameters ranging from 0.8 mm to 16 mm, compliant with the European Standard EN10270-1

PRODUCT SUMMARY

CARBON CONTENT:	Low, medium and high
DIAMETER RANGE:	From 0.8 to 16 mm
SPECIALTY SECTIONS:	Square, rectangular, trapezoidal or as requested
EU CLASSES:	SL, SM, SH, DM, and DH
CERTIFICATION:	UNI3823 and UNI EN 10270-1
HEAT AND SURFACE TREATMENTS:	Patenting, annealing, galvanization, phosphating, oil drawing
PACKAGING OPTIONS:	Z2, Z3 and DIN 1400 spools, coils with or without core, carriers and metal spools in the sizes and weights requested
COMMON APPLICATIONS:	Springs, cables, sheathing, high-pressure reinforced hose, hose clamps, cold-heading, rolling

STELMOR WIRE:	LEAD PATENTED WIRE:
DIAMETER RANGE: From 0.8 to 14 mm	DIAMETER RANGE: From 0.8 to 9 mm
EU CLASSES: SL, SM, DM, SH, and DH	EU CLASSES: SL, SM, SH, DM, and DH
PHOSPHATING: Yes	GALVANIZATION: Yes

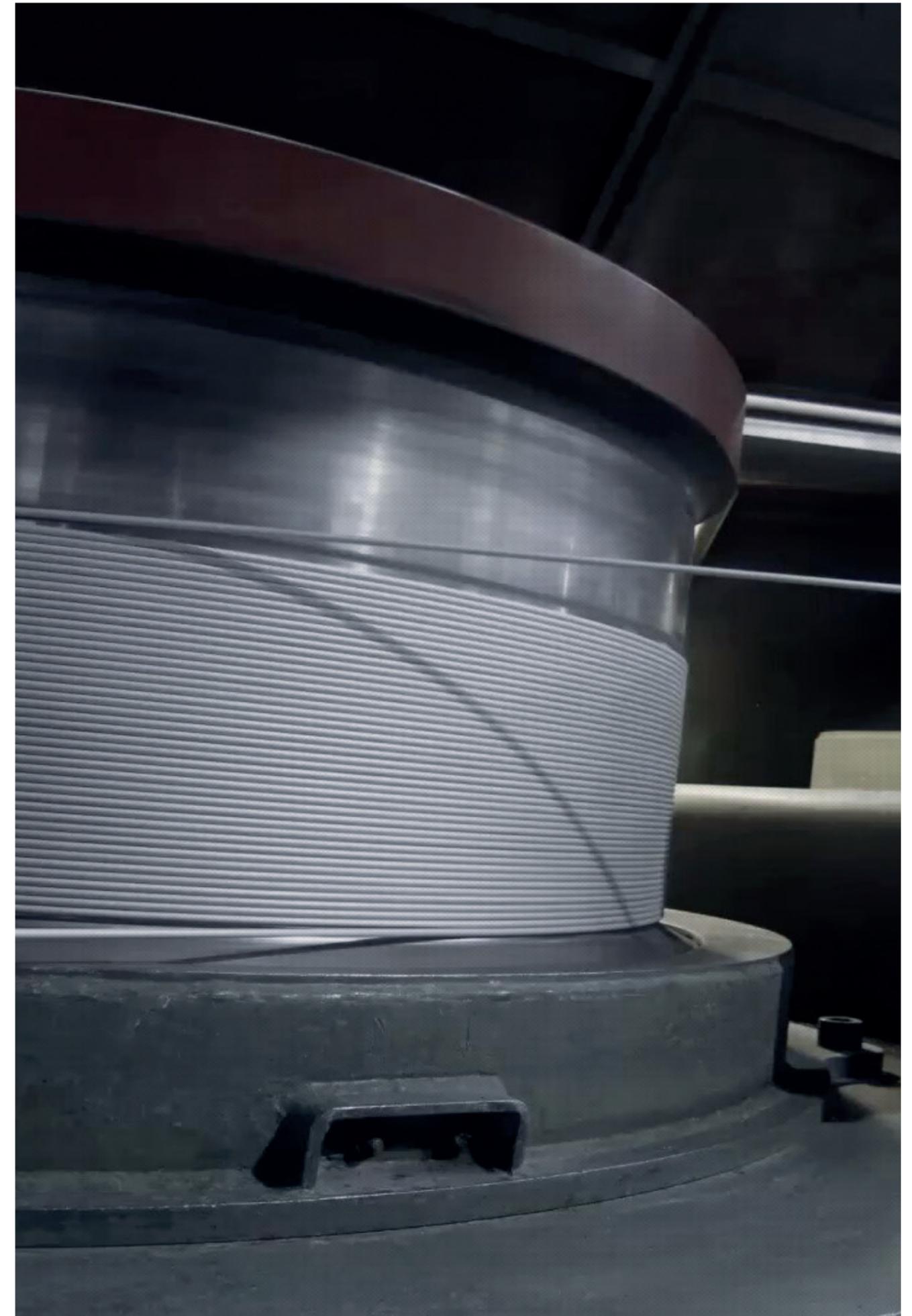
STEEL WIRE FOR MATTRESS SPRINGS

	Nominal size (mm)	Tensile strength (MPa)
Wire for spirals	1.25	1570-1770
	1.30	
	1.35	
	1.40	
Wire for BONNEL springs	1.00	1570-1770
	2.00	
	2.10	
	2.15	
	2.20	
	2.30	
Wire for REKRO springs	1.50	2100+2300
	1.65	1900+2100
	1.80	1900+2100
	2.70	1570+1720
Wire for POCKET springs	1.50	1960+2100
	1.65	
	1.70	
Wire for LFK springs	2.70	1600+1800
	1.65	
	1.80	
Wire for MINI-POCKET springs	1.90	2050+2300
	0.8	
	0.9	
	1.00	2010+2260
		1980+2220

QUALITY REQUIREMENTS FOR WIRE GRADES SL, SM, DM, SH, AND DH

Nominal size (mm)	TENSILE STRENGTH (MPa)				
	SL	SM	DM	SH	DH
0.75 < d ≤ 0.80		2050-2300	2050-2300	2310-2560	2310-2560
0.80 < d ≤ 0.85		2030-2280	2030-2280	2290-2530	2290-2530
0.85 < d ≤ 0.90		2010-2260	2010-2260	2290-2530	2290-2530
0.90 < d ≤ 0.95		2200-2240	2200-2240	2250-2490	2250-2490
0.95 < d ≤ 1.00	1720-1970	1980-2220	1980-2220	2230-2470	2230-2470
1.00 < d ≤ 1.05	1710-1950	1960-2200	1960-2200	2210-2450	2210-2450
1.05 < d ≤ 1.10	1690-1940	1950-2190	1950-2190	2200-2430	2200-2430
1.10 < d ≤ 1.20	1670-1910	1920-2160	1920-2160	2170-2400	2170-2400
1.20 < d ≤ 1.25	1660-1900	1910-2140	1910-2140	2150-2380	2150-2380
1.25 < d ≤ 1.30	1640-1890	1900-2130	1900-2130	2140-2370	2140-2370
1.30 < d ≤ 1.40	1620-1860	1870-2100	1870-2100	2110-2340	2110-2340
1.40 < d ≤ 1.50	1600-1840	1850-2080	1850-2080	2090-2310	2090-2310
1.50 < d ≤ 1.60	1590-1820	1830-2050	1830-2050	2060-2290	2060-2290
1.60 < d ≤ 1.70	1570-1800	1810-2030	1810-2030	2040-2260	2040-2260
1.70 < d ≤ 1.80	1550-1780	1790-2010	1790-2010	2020-2240	2020-2240
1.80 < d ≤ 1.90	1540-1760	1770-1990	1770-1990	2000-2220	2000-2220
1.90 < d ≤ 2.00	1520-1750	1760-1970	1760-1970	1980-2200	1980-2200
2.00 < d ≤ 2.10	1510-1730	1740-1960	1740-1960	1970-2180	1970-2180
2.10 < d ≤ 2.25	1490-1710	1720-1930	1720-1930	1940-2150	1940-2150
2.25 < d ≤ 2.40	1470-1690	1700-1910	1700-1910	1920-2130	1920-2130
2.40 < d ≤ 2.50	1460-1680	1690-1890	1690-1890	1900-2110	1900-2110
2.50 < d ≤ 2.60	1450-1660	1670-1880	1670-1880	1890-2100	1890-2100
2.60 < d ≤ 2.80	1420-1640	1650-1850	1650-1850	1860-2070	1860-2070
2.80 < d ≤ 3.00	1410-1620	1630-1830	1630-1830	1840-2040	1840-2040
3.00 < d ≤ 3.20	1390-1600	1610-1810	1610-1810	1820-2020	1820-2020
3.20 < d ≤ 3.40	1370-1580	1590-1780	1590-1780	1790-1990	1790-1990
3.40 < d ≤ 3.60	1350-1560	1570-1760	1570-1760	1770-1970	1770-1970

Nominal size (mm)	TENSILE STRENGTH (MPa)				
	SL	SM	DM	SH	DH
3.60 < d ≤ 3.80	1340-1540	1550-1740	1550-1740	1750-1950	1750-1950
3.80 < d ≤ 4.00	1320-1520	1530-1730	1530-1730	1740-1930	1740-1930
4.00 < d ≤ 4.25	1310-1500	1510-1700	1510-1700	1710-1900	1710-1900
4.25 < d ≤ 4.50	1290-1490	1500-1680	1500-1680	1690-1880	1690-1880
4.50 < d ≤ 4.75	1270-1470	1480-1670	1480-1670	1680-1860	1680-1860
4.75 < d ≤ 5.00	1260-1450	1460-1650	1460-1650	1660-1840	1660-1840
5.00 < d ≤ 5.30	1240-1430	1440-1630	1440-1630	1640-1820	1640-1820
5.30 < d ≤ 5.60	1230-1420	1430-1610	1430-1610	1620-1800	1620-1800
5.60 < d ≤ 6.00	1210-1390	1400-1580	1400-1580	1590-1770	1590-1770
6.00 < d ≤ 6.30	1190-1380	1390-1560	1390-1560	1570-1750	1570-1750
6.30 < d ≤ 6.50	1180-1370	1380-1550	1380-1550	1560-1740	1560-1740
6.50 < d ≤ 7.00	1160-1340	1350-1530	1350-1530	1540-1710	1540-1710
7.00 < d ≤ 7.50	1140-1320	1330-1500	1330-1500	1510-1680	1510-1680
7.50 < d ≤ 8.00	1120-1300	1310-1480	1310-1480	1490-1660	1490-1660
8.00 < d ≤ 8.50	1110-1280	1290-1460	1290-1460	1470-1630	1470-1630
8.50 < d ≤ 9.00	1090-1260	1270-1440	1270-1440	1450-1610	1450-1610
9.00 < d ≤ 9.50	1070-1250	1260-1420	1260-1420	1430-1590	1430-1590
9.50 < d ≤ 10.00	1060-1230	1240-1400	1240-1400	1410-1570	1410-1570
10.00 < d ≤ 10.50		1220-1380	1220-1380	1390-1550	1390-1550
10.50 < d ≤ 11.00		1210-1370	1210-1370	1380-1530	1380-1530
11.00 < d ≤ 12.00		1180-1340	1180-1340	1350-1500	1350-1500
12.00 < d ≤ 12.50		1170-1320	1170-1320	1330-1480	1330-1480
12.50 < d ≤ 13.00		1160-1310	1160-1310	1320-1470	1320-1470
13.00 < d ≤ 14.00		1130-1280	1130-1280	1290-1440	1290-1440
14.00 < d ≤ 15.00		1160-1260	1160-1260	1270-1410	1270-1410
15.00 < d ≤ 16.00		1090-1230	1090-1230	1240-1390	1240-1390
16.00 < d ≤ 17.00		1070-1210	1070-1210	1220-1360	1220-1360



MECHANICAL PROPERTIES

FORCE	DYNAMIC	STATIC
LIGHT		CLASS SL (EN 10270 1/01) CLASS A (DIN 17223 1/84) CLASS B (DIN 17223 1/84) CLASS C (DIN 17223 1/84)
MEDIUM	CLASS DM (EN 10270 1/01)	CLASS SM (EN 10270 1/01)
HIGH	CLASS D (DIN 17223 1/84)	CLASS SH (EN 10270 1/01)
VERY HIGH	CLASS DH (EN 10270 1/01)	

Processes

We carefully monitor every step in the process to ensure consistent and unfailing quality.

RAW MATERIALS

We use reliable wire rod from certified companies all over the world, selecting carbon grades ranging from 0.04 to 0.88%, and starting diameters of between 5.5 and 15 mm.

Both the initial diameter and carbon content of the raw material contribute to determining the final properties of the drawn wire, including its malleability and tensile strength.

Our experience, expertise, and careful documentation allow us to accurately select the best wire rod to be drawn every time, thus supplying our customers with a consistently superior product.

At FRT, we understand metallurgy and will be happy to give you customized advice.



PICKLING

The rolling of wire rod leaves residual impurities on its surface so our first step is to carry out a chemical cleaning process known as "pickling".

The coil is immersed in a sulphuric acid solution that descales the steel by breaking apart the oxide layer. A surface treatment called phosphating can then be carried out. The product is then bathed in lime in a procedure called passivation.

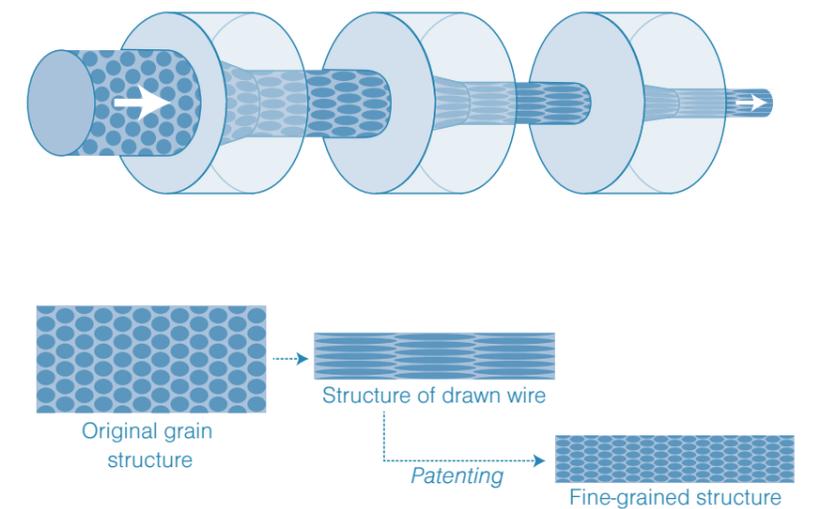
Our pickling department is controlled automatically by a PLC that moves the material in accordance with precise immersion times and types of treatment. The concentration and temperature of the solutions are also carefully monitored to guarantee that the chemical reactions occur correctly and surface problems are avoided.

Our pickling tanks are equipped with a modern and efficient fume extraction and abatement system, which neutralizes all waste products of this process.

WIRE DRAWING

Wire drawing involves pulling steel rod through a series of dies to reduce its diameter. As it passes through the die, the grain of the material is flattened and elongated, raising the tensile and yield strength of the wire and making it suitable for many applications.

The deformed grain structure, however, also increases the brittleness of the material and the drawing process must be carefully carried out so that the material retains its desirable mechanical properties.



Multiple dies of diminishing diameters are used to progressively lower the cross-section of the wire. If necessary, patenting can be carried out between passes to relax the internal stresses and restore ductility. The drawing speed and tension are meticulously determined and kept constant to ensure that the diameter of the whole batch remains consistent.

The wire is lubricated during drawing by powder or oil to boost the range of product uses.

We have an array of drawing machines and dies that are capable of producing steel wire for a wide variety of applications, in diameters ranging from 0.8 to 16 mm, and in the classes SL, SM, SH, DM and DH (in compliance with European Standard EN10270-1).

Our machines employ the latest technologies. They are also equipped with sophisticated cooling systems, as rapid, controlled cooling of the drawn wire is crucial to ensure the consistent quality of the product.

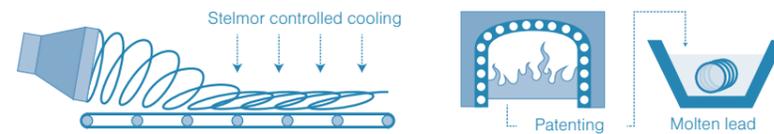
Treatments

We offer a variety of heat and surface treatments for the wire, depending on your needs.

Upon request, heat treatments are carried out externally or on site.

Stelmor controlled cooling is the standard method used to cool steel wire. The wire rod is formed into loops by a laying head, before being uniformly air-cooled on a conveyor. The process largely retains the grain structure of the material, giving it high-performance properties, particularly for medium to large diameter wires.

Optionally, the wire can be patented. Patenting is a treatment whereby the wire is heated to about 970°C by passing it through tubes in a furnace. This gives it a fine-grained structure. The material is then rapidly cooled by quenching in molten lead. Patented steel provides greater performance, particularly for fine wire. Patenting may be carried out prior to drawing, or between consecutive drawing stages, to remove stresses in the material and improve its structure.

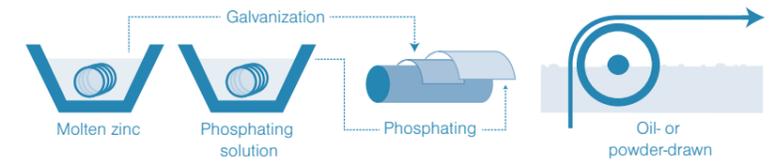


Annealing is a high-temperature heat treatment that gives the material an optimal hardness and structure for workability. This is particularly carried out on wire destined for use in cold heading as it softens the metal, preparing it for further work.

Oil drawing produces wire with a shiny surface finish that allows the galvanic plating of the components obtained.

Galvanization is a surface treatment whereby the wire is submerged in molten zinc to form a protective coating and prevent corrosion of the steel. The thickness of the zinc coating can vary depending on the intended use of the wire and on the customer's specifications.

Phosphating is a surface treatment carried out by immersion after the pickling phase and prior to drawing. The clean metal surface of the wire reacts with a dilute solution of phosphoric acid. This reaction forms an insoluble crystalline coating that provides effective lubrication for high-speed drawing and increased protection against corrosion.



SUMMARY OF AVAILABLE TREATMENTS

PATENTING:	Ensures superior performance, particularly for fine wire by removing stresses in the material and improving its structure.
GALVANIZATION:	Forms a protective barrier against corrosion.
PHOSPHATING:	Forms an insoluble crystalline coating that provides effective lubrication.
ANNEALING:	Gives the material an optimal hardness and structure for workability in cold heading applications.
OIL DRAWING:	Produces wire with a shiny surface finish, allowing galvanic plating.





Testing

At FRT, we always test the finished product to guarantee that it complies with the customer's specifications.

The testing department is equipped with instruments and machines that are periodically calibrated by their manufacturers for maximum accuracy.

We provide all our customers with a batch test certificate, together with the delivery docket. This gives the diameter, tensile strength, chemical breakdown of the steel, zinc coating weight, and number of torsions.

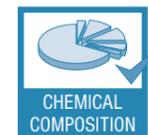
Our rigorous testing procedure is typically carried out as follows:

- A micrometer is used to measure the actual diameter of the wire, which must lie within the tolerance levels laid down by European standards.
- A sample from the first batch is tested using the tensile testing machine and subjected to controlled tension until it breaks or permanently deforms.

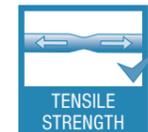
During the test, a graph records the elongation at the yield point and the ultimate tensile strength (actual breaking load). An analysis of this graph and of the necking (localized strain visible on the tested wire) gives us a good indication of how malleable the product is and how it is likely to perform in an application.



DIAMETER



CHEMICAL COMPOSITION



TENSILE STRENGTH



NUMBER OF TORSIONS



ZINC COATING WEIGHT



CAST & HELIX



Packaging

We always dedicate due care to ensuring that the integrity of the wire is maintained during transportation and use on our customers' sites.

We can package our products in various ways, depending on your needs. The products are suitably labelled for recognition and accompanied by a test certificate.



COIL Ø 460
50-150 kg
Wire diameter:
0.8 mm to 2 mm



Z2 SPOOL
Up to 500 kg
Standard inner diameter
and height
On pallets or EUR-pallets
Cardboard core
Wire diameter:
0.8 mm to 3 mm



Z3 SPOOL
500-1000 kg
Standard inner diameter
and height
On pallets or EUR-pallets
Metal/cardboard core/
without core
Wire diameter:
2.5 mm to 6 mm



COIL Ø 760
300-500 kg
Wire diameter:
2.5 mm to 8 mm



FL760 METAL SPOOL
500 kg
Outer diameter 760
Wire diameter:
0.8 mm to 3 mm



COIL Ø 600
100-300 kg
Wire diameter:
1.2 mm to 2.5 mm



CARRIER Ø 760
Up to 1500 kg
Wire diameter:
2.5 mm to 8 mm



CARRIER Ø 900
Up to 1500 kg
Wire diameter:
3.8 mm to 12 mm



CARRIER Ø 600
Up to 600 kg
Wire diameter:
1.2 mm to 2.5 mm



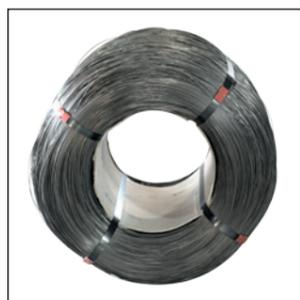
CARRIER Ø 600
Up to 1000 kg
Wire diameter:
1.2 mm to 3 mm



COIL Ø 900
300-600 kg
Wire diameter:
3.8 mm to 12 mm



COIL Ø 1200
500-750 kg
Wire diameter:
5 mm to 14 mm



COIL WITH CORE Ø 600
700-1000 kg
metal/cardboard core/
without core
Wire diameter:
1.2 mm to 3 mm



**GALVANIZED AND
PATENTED WIRE
COIL Ø 900**
300-600 kg
Wire diameter:
3.8 mm to 12 mm



DIN 1400
1000-1500 kg
Inner diameter 800
Height 550
On wooden beams
Wire diameter:
3.5 mm to 13 mm
Metal core



DIN 1400
1500-3000 kg
Inner diameter 800
The outer diameter varies
depending on the weight
Height 750 mm
On wooden beams
Wire diameter:
3.5 mm to 13 mm

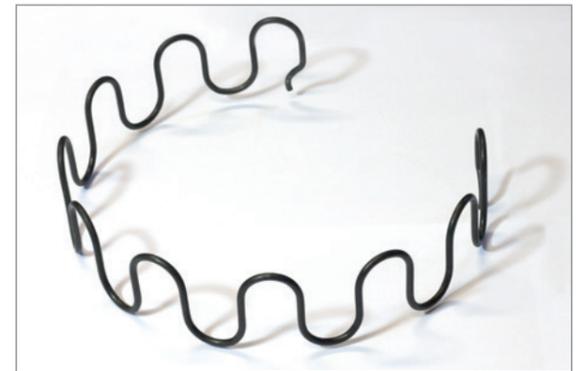
Applications

FRT drawn wire is versatile, as proven by the myriad of different applications in which it is used.

Such uses include the manufacture of springs, cables, protective sheathing, high-pressure reinforced hoses, pipes, and in cold heading and rolling. In fact, our customers span many industries, from furniture and automotive to agriculture, metalworking, and food production.

COMMON APPLICATIONS

INDUSTRY	Wire for rolling Industrial springs Pipes
MATTRESS SPRINGS	Bonnel Rekro Pocket Mini-pocket LFK
AUTOMOTIVE	Springs Metal sheathing
AGRICULTURE	Springs High-pressure pipes
FOOD PRODUCTION	Pipes
COLD HEADING	
FURNITURE	
APPLIANCES	



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