

# ÜRÜN GRUPLARI

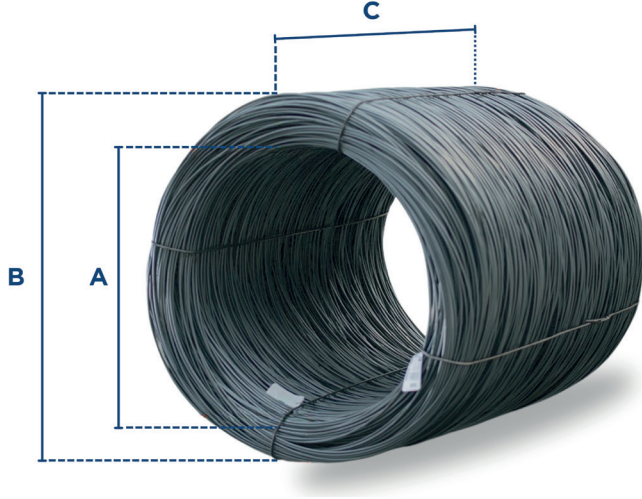
## PRODUCT GROUPS

## FİLMAŞIN FİZİKSEL ÖZELLİKLERİ

PHYSICAL PROPERTIES OF WINE RODS

### FİLMAŞIN FİZİKSEL ÖZELLİKLERİ

PHYSICAL PROPERTIES OF WIRE RODS



#### Filmaşın boyutları

Coil dimensions;

- (A) İç çap: 850 mm (max)**  
Internal diameter
- (B) Dış çap: 1250 mm (max)**  
External diameter
- (C) Genişlik: 1300 mm (max)**  
Width
- Ağırlık: 1550 kg**  
Weight

Kangal filmaşın ürünlerimiz 5,5 ile 16 mm arasında EN ve ASTM standartlarına göre üretilmektedir.

Talep edilmesi durumunda analiz değişiklikleri mümkündür.

Wire rods are produced in diameters between 5,5 and 16 mm according to ASTM and EN standards.

Alternative steel grades and special analysis are possible as per customer request.



# TEL - ÇUBUK ÜRETİMİNE YÖNELİK FİLMAŞIN

## WIRE ROD FOR WIRE AND BAR PRODUCTION

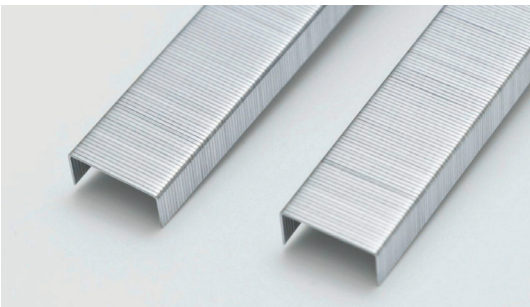
| SAE J403 | EN ISO 16120-2 | %C        | %Si       | %Mn       | %P max | %S max | %Cu max | %Cr max | %Ni max | %Mo max | %Al max |
|----------|----------------|-----------|-----------|-----------|--------|--------|---------|---------|---------|---------|---------|
| TELLİK 4 | C4D            | 0.06 max  | 0.07 max  | 0.40 max  | 0.020  | 0.020  | 0.25    | 0.20    | 0.20    | 0.030   | 0.020   |
| SAE 1006 | C7D            | 0.07 max  | 0.10 max  | 0,40 max  | 0.025  | 0.025  | 0.27    | 0.20    | 0.20    | 0.030   | 0.020   |
| SAE 1008 | C9D            | 0.09 max  | 0.30 max  | 0,45 max  | 0.025  | 0.030  | 0.30    | 0.30    | 0.25    | 0.030   | 0.020   |
| SAE 1008 | C9D            | 0.08 max  | 0.30 max  | 0.50 max  | 0.025  | 0.030  | 0.30    | 0.30    | 0.25    | 0.030   | 0.020   |
| SAE 1010 | C10D           | 0.07-0.10 | 0.30 max  | 0.50 max  | 0.025  | 0.030  | 0.40    | 0.30    | 0.25    | 0.030   | 0.020   |
| SAE 1010 | C10D           | 0.06-0.08 | 0.30 max  | 0.50 max  | 0.025  | 0.030  | 0.30    | 0.30    | 0.25    | 0.030   | 0.020   |
| SAE 1012 | C12D           | 0.10-0.15 | 0.30 max  | 0.30-0.60 | 0.025  | 0.030  | 0.30    | 0.20    | 0.20    | 0.030   | 0.020   |
| SAE 1015 | C15D           | 0.13-0.17 | 0.30 max  | 0.30-0.60 | 0.025  | 0.030  | 0.30    | 0.20    | 0.20    | 0.030   | 0.020   |
| SAE 1018 | C18D           | 0.17-0.21 | 0.30 max  | 0.60-0.80 | 0.025  | 0.025  | 0.30    | 0.15    | 0.18    | 0.030   | 0.020   |
| SAE 1020 | C20D           | 0.18-0.22 | 0.30 max  | 0.60-0.80 | 0.025  | 0.030  | 0.30    | 0.20    | 0.20    | 0.030   | 0.020   |
| SAE 1022 |                | 0.18-0.23 | 0.30 max  | 0.70-1.00 | 0.025  | 0.030  | 0.30    | 0.20    | 0.20    | 0.030   | 0.020   |
| SAE 1023 |                | 0.18-0.25 | 0.30 max  | 0.70-1.00 | 0.025  | 0.030  | 0.30    | 0.20    | 0.20    | 0.030   | 0.020   |
| SAE 1026 | C26D           | 0.24-0.27 | 0.30 max  | 0.55-0.75 | 0.025  | 0.030  | 0.25    | 0.15    | 0.18    | 0.030   | 0.020   |
| SEA 1030 | C32D           | 0.30-0.35 | 0.15-0.30 | 0.50-0.70 | 0.020  | 0.020  | 0.30    | 0.20    | 0.20    | 0.030   | 0.020   |
| SAE 1038 | C38D           | 0.35-0.40 | 0.15-0.30 | 0.50-0.70 | 0.020  | 0.020  | 0.30    | 0.20    | 0.20    | 0.030   | 0.020   |
| SAE 1045 | C48D           | 0.43-0.48 | 0.15-0.30 | 0.50-0.70 | 0.020  | 0.020  | 0.25    | 0.20    | 0.20    | 0.030   | 0.020   |
| SAE 1050 | C50D           | 0.48-0.53 | 0.15-0.30 | 0.60-0.90 | 0.020  | 0.020  | 0.25    | 0.10    | 0.10    | 0.030   | 0.020   |
| SAE 1060 | C60D           | 0.58-0.63 | 0.15-0.30 | 0.60-0.90 | 0.020  | 0.020  | 0.25    | 0.10    | 0.10    | 0.030   | 0.020   |
| SAE 1062 | C62D           | 0.60-0.63 | 0.15-0.30 | 0.50-0.60 | 0.025  | 0.025  | 0.35    | 0.20    | 0.20    | 0.050   | 0.020   |
| SAE 1065 | C66D           | 0.63-0.68 | 0.15-0.30 | 0.50-0.70 | 0.020  | 0.020  | 0.25    | 0.08    | 0.10    | 0.030   | 0.020   |
| SAE 1070 | C70D           | 0.68-0.73 | 0.15-0.30 | 0.50-0.80 | 0.020  | 0.020  | 0.25    | 0.08    | 0.10    | 0.030   | 0.020   |
| SAE 1072 | C72D           | 0.70-0.75 | 0.15-0.30 | 0.50-0.80 | 0.020  | 0.020  | 0.25    | 0.08    | 0.10    | 0.030   | 0.020   |

**Tel ve çubuk üretimine yönelik filmaşın ürünlerimiz, geniş kalite yelpazesinde çeşitli son ürünlerin imalatına uygun şekilde üretilmektedir.**

Our wire rod products are suitable for a vast spectrum of final products across a wide range of applications in wire and bar manufacturing.

### Kullanım Alanları / Applications

- **Tel / Wire**
- **Zımba Teli / Staple Wire**
- **Çubuk / Bar**
- **Çelik Hasır / Steel Mesh**
- **Çivi / Nails**
- **Transmisyon Mili / Transmission Rod**
- **Zırh Teli / Armour Wire**



# YÜKSEK KARBONLU ÇELİKLER

## HIGH CARBON STEELS

### YÜKSEK KARBONLU ÇELİKLER

#### HIGH CARBON STEELS

| DIN 17140-1 | EN ISO 16120-2 | %C        | %Si       | %Mn       | %P max | %S max | %Cu max | %Cr max | %Ni max | %Mo       | %Al       |
|-------------|----------------|-----------|-----------|-----------|--------|--------|---------|---------|---------|-----------|-----------|
| D45         | C46D           | 0.43-0.48 | 0.15-0.30 | 0.50-0.70 | 0.020  | 0.020  | 0.15    | 0.10    | 0.10    | 0.050 max | 0.020 max |
| D65         | C66D           | 0.63-0.68 | 0.15-0.30 | 0.50-0.70 | 0.020  | 0.020  | 0.10    | 0.08    | 0.10    | 0.050 max | 0.020 max |
| D70         | C70D           | 0.68-0.73 | 0.15-0.30 | 0.50-0.80 | 0.020  | 0.020  | 0.10    | 0.08    | 0.10    | 0.050 max | 0.020 max |
| D72         | C72D           | 0.70-0.75 | 0.15-0.30 | 0.50-0.80 | 0.020  | 0.020  | 0.10    | 0.08    | 0.10    | 0.050 max | 0.020 max |
| D75         | C76D           | 0.73-0.78 | 0.15-0.30 | 0.50-0.80 | 0.020  | 0.020  | 0.10    | 0.08    | 0.10    | 0.050 max | 0.020 max |
| D80         | C80D           | 0.78-0.82 | 0.15-0.30 | 0.50-0.80 | 0.020  | 0.020  | 0.10    | 0.08    | 0.10    | 0.050 max | 0.020 max |

**Yüksek karbonlu filmaşın grubu yay, halat, elek gibi ürün imalatlarında ana girdi olarak kullanılmaktadır. Bu çeliklerin üretiminde bakır başta olmak üzere istenmeyen empürite elementlerinin kontrolü özel hurda kullanımı ile sağlanmaktadır.**

The high-carbon wire rod group is utilized as a primary input (feedstock) in industries such as spring manufacturing, wire rope production, and screen/mesh fabrication. In these steels, the control of undesirable residual elements (impurities), particularly copper, is ensured through the utilization of special scrap charge.

#### Kullanım Alanları / Applications

- Yatak Yayı / Mattress Spring
- Zigzag Yay / Zigzag Spring
- Endüstriyel Yaylar / Industrial Springs
- Çelik Halat / Steel Wire Rope



# DÜŞÜK VE ORTA KARBONLU SOĞUK KAFA ŞİŞİRME ÇELİKLERİ

## LOW AND MEDIUM CARBON COLD HEADING STEELS

### DÜŞÜK KARBONLU SOĞUK KAFA ŞİŞİRME ÇELİKLERİ

#### LOW CARBON COLD HEADING STEELS

| DIN 1654 | EN 10263-2 | %C        | %Si max | %Mn       | %P max | %S max | %Cu max | %Cr max | %Ni max | %Mo max | %Al         | ppm B |
|----------|------------|-----------|---------|-----------|--------|--------|---------|---------|---------|---------|-------------|-------|
| QSt 32-3 | C4C        | 0.02-0.06 | 0.10    | 0.30-0.40 | 0.015  | 0.015  | 0.10    | 0.08    | 0.10    | 0.030   | 0.025-0.040 | -     |
| QSt 34-3 | C8C        | 0.06-0.09 | 0.10    | 0.30-0.45 | 0.015  | 0.015  | 0.10    | 0.08    | 0.10    | 0.030   | 0.025-0.040 | -     |
| QSt 36-3 | C10C       | 0.08-0.12 | 0.10    | 0.30-0.45 | 0.015  | 0.015  | 0.10    | 0.08    | 0.10    | 0.030   | 0.025-0.040 | -     |
| Cq 15    | C15C       | 0.13-0.17 | 0.10    | 0.40-0.50 | 0.015  | 0.015  | 0.10    | 0.08    | 0.10    | 0.030   | 0.025-0.040 | -     |
| 15B2     | 15B2       | 0.13-0.15 | 0.15    | 0.60-0.80 | 0.015  | 0.015  | 0.10    | 0.08    | 0.10    | 0.030   | 0.025-0.040 | 20-50 |

### ORTA KARBONLU SOĞUK KAFA ŞİŞİRME ÇELİKLERİ

#### MEDIUM CARBON COLD HEADING STEELS

| EN 10263-4 | %C        | %Si max   | %Mn       | %P max | %S max | %Cu max | %Cr max   | %Ni max | %Mo max | %Al         | ppm B |
|------------|-----------|-----------|-----------|--------|--------|---------|-----------|---------|---------|-------------|-------|
| 17 MnB 4   | 0.15-0.19 | 0.20      | 0.90-1.00 | 0.015  | 0.015  | 0.10    | 0.10      | 0.10    | 0.050   | 0.025-0.040 | 20-50 |
| 20 MnB 4   | 0.20-0.23 | 0.20      | 0.90-1.20 | 0.015  | 0.015  | 0.10    | 0.10      | 0.10    | 0.050   | 0.025-0.040 | 20-50 |
| 20 MnB 4   | 0.20-0.23 | 0.20      | 0.95-1.20 | 0.015  | 0.015  | 0.10    | 0.15-0.20 | 0.10    | 0.050   | 0.025-0.040 | 20-50 |
| 23 MnB 4   | 0.21-0.25 | 0.20      | 1.00-1.20 | 0.015  | 0.015  | 0.10    | 0.15-0.20 | 0.10    | 0.050   | 0.025-0.040 | 20-50 |
| 27 MnB 4   | 0.25-0.29 | 0.15-0.30 | 1.00-1.20 | 0.015  | 0.015  | 0.10    | 0.20-0.25 | 0.10    | 0.050   | 0.025-0.040 | 20-50 |
| 30 MnB 4   | 0.27-0.32 | 0.20      | 0.90-1.10 | 0.015  | 0.015  | 0.10    | 0.20-0.25 | 0.10    | 0.050   | 0.025-0.040 | 20-50 |
| 41 Cr 4    | 0.39-0.43 | 0.30      | 0.60-0.80 | 0.020  | 0.020  | 0.10    | 0.90-1.10 | 0.10    | 0.030   | 0.025-0.040 | -     |

Düşük ve orta karbonlu soğuk kafa şişirme çelikleri, bağlantı elemanları sektörünün ihtiyaçları doğrultusunda geniş kalite seçenekleri ile sunulmaktadır. Kalite kontrol aşamasında ezme testlerine tabi tutulan filmaşinlerimiz, otomotiv ve benzeri kalite beklentisi yüksek sektörlerde kullanılmak üzere müşterilerimize sevk edilmektedir.

Low and medium carbon cold heading steels are offered with a wide range of steel quality options in line with the needs of the fastener industry. Our wire rods, which are subjected to 1/3 upset testing during the quality control stage, are shipped to our customers for use in the automotive and similar sectors with high-quality expectations.

#### Kullanım Alanları / Applications

- Vidalar / Screws
- Cıvatalar / Bolts
- Somunlar / Nuts
- Perçinler / Rivets
- Zincir / Chain



# ELEKTROT VE KAYNAK TELİ ÜRETİMİNE YÖNELİK FİLMAŞIN

## WIRE ROD FOR WELDING WIRE AND ELECTRODE MANUFACTURING

### ELEKTROT ÜRETİMİNE YÖNELİK FİLMAŞIN

#### WIRE ROD FOR ELECTRODE PRODUCTION

| EN 756 | EN ISO 14171 | %C        | %Si       | %Mn       | %P max | %S max | %Cu max | %Cr max | %Ni max | %Mo       | %Al max |
|--------|--------------|-----------|-----------|-----------|--------|--------|---------|---------|---------|-----------|---------|
| S1     | S1           | 0.06-0.09 | 0.07 max  | 0.40-0.60 | 0.020  | 0.020  | 0.15    | 0.10    | 0.10    | 0.030 max | 0.020   |
| S2     | S2           | 0.07-0.10 | 0.04-0.10 | 1.05-1.20 | 0.025  | 0.025  | 0.10    | 0.15    | 0.15    | 0.030 max | 0.015   |
| S2Si   | S2Si         | 0.07-0.12 | 0.20-0.30 | 1.05-1.25 | 0.025  | 0.025  | 0.15    | 0.15    | 0.15    | 0.030 max | 0.015   |
| S2Mo   | S2Mo         | 0.08-0.11 | 0.13-0.20 | 1.00-1.20 | 0.015  | 0.015  | 0.10    | 0.12    | 0.12    | 0.50-0.65 | 0.015   |

### KAYNAK TELİ ÜRETİMİNE YÖNELİK FİLMAŞIN

#### WIRE ROD FOR WELDING WIRE PRODUCTION

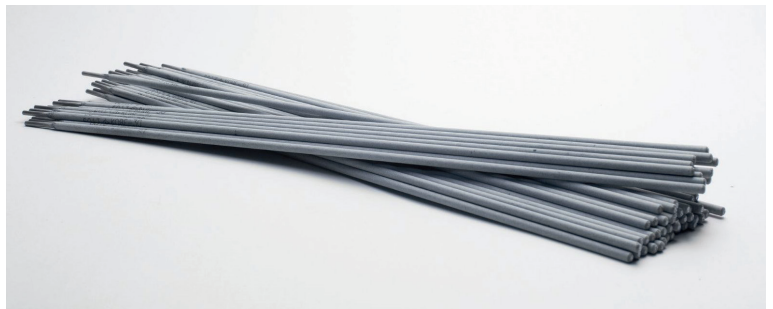
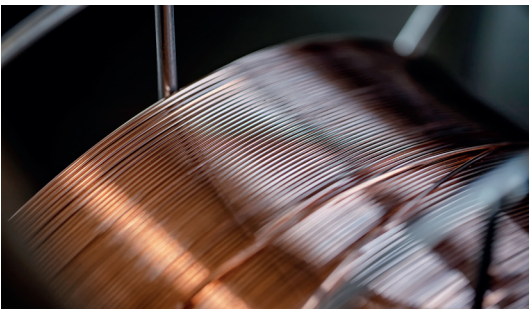
| DIN 8559-1 | EN 440 | %C        | %Si       | %Mn       | %P max | %S max | %Cu max | %Cr max | %Ni max | %Mo       | %Al max |
|------------|--------|-----------|-----------|-----------|--------|--------|---------|---------|---------|-----------|---------|
| SG1        | G2Si1  | 0.06-0.09 | 0.50-0.70 | 1.00-1.30 | 0.020  | 0.020  | 0.07    | 0.10    | 0.10    | 0.030 max | 0.015   |
| SG2        | G3Si1  | 0.06-0.08 | 0.80-0.90 | 1.40-1.50 | 0.020  | 0.020  | 0.08    | 0.10    | 0.10    | 0.030 max | 0.020   |
| SG3        | G4Si1  | 0.06-0.08 | 0.80-1.00 | 1.60-1.70 | 0.020  | 0.020  | 0.08    | 0.10    | 0.10    | 0.030 max | 0.020   |

**Elektrot ve Kaynak Teli üretimine yönelik filmaşın ürünlerimiz, gerek uluslararası standartlar dahilinde gerekse müşterilerimizin kendi istedikleri doğrultusunda modifiye edilmiş kimyasal ve mekanik değerler göz önüne alınarak üretilmektedir.**

Our wire rod products for the production of Welding Wire and Electrodes are manufactured in accordance with international standards and as per modified chemical and mechanical requirements of our customers.

#### Kullanım Alanları / Applications

- **Gazaltı Kaynak Telleri / MIG-TIG Welding Wire**
- **Tozaltı Kaynak Telleri / Submerged Arc Welding Wire**
- **Elektrot Çubuğu / Electrodes**



# SU VERİLMİŞ VE TEMPERLENMİŞ YAYLAR İÇİN FİLMAŞIN

## SPRING GRADE WIRE ROD (QUENCHED AND TEMPERED)

### SU VERİLMİŞ VE TEMPERLENMİŞ YAYLAR İÇİN FİLMAŞIN

#### SPRING GRADE WIRE ROD (QUENCHED AND TEMPERED)

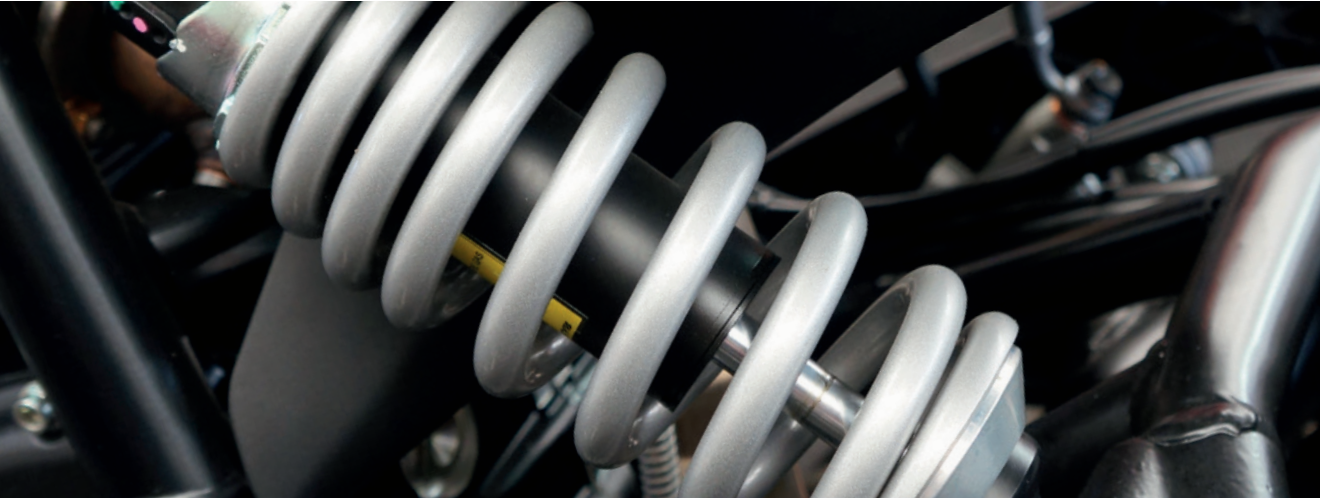
| EN 10089  | %C        | %Si       | %Mn       | %P max | %S max | %Cu max | %Cr max   | %Ni max | %Mo         | %Al max |
|-----------|-----------|-----------|-----------|--------|--------|---------|-----------|---------|-------------|---------|
| 38Si7     | 0.37-0.40 | 1.55-1.75 | 0.55-0.75 | 0.020  | 0.020  | 0.15    | 0.20-0.25 | 0.20    | 0.050 max   | 0.020   |
| 51 CrV4   | 0.50-0.55 | 0.15-0.35 | 0.80-1.10 | 0.030  | 0.030  | 0.15    | 0.90-1.20 | 0.20    | 0.050 max   | 0.020   |
| 52 CrMoV4 | 0.50-0.55 | 0.15-0.35 | 0.75-1.00 | 0.030  | 0.030  | 0.15    | 0.90-1.20 | 0.20    | 0.150-0.250 | 0.020   |
| 55 Cr3    | 0.53-0.57 | 0.25-0.50 | 0.80-1.00 | 0.030  | 0.030  | 0.15    | 0.75-0.95 | 0.20    | 0.050 max   | 0.020   |

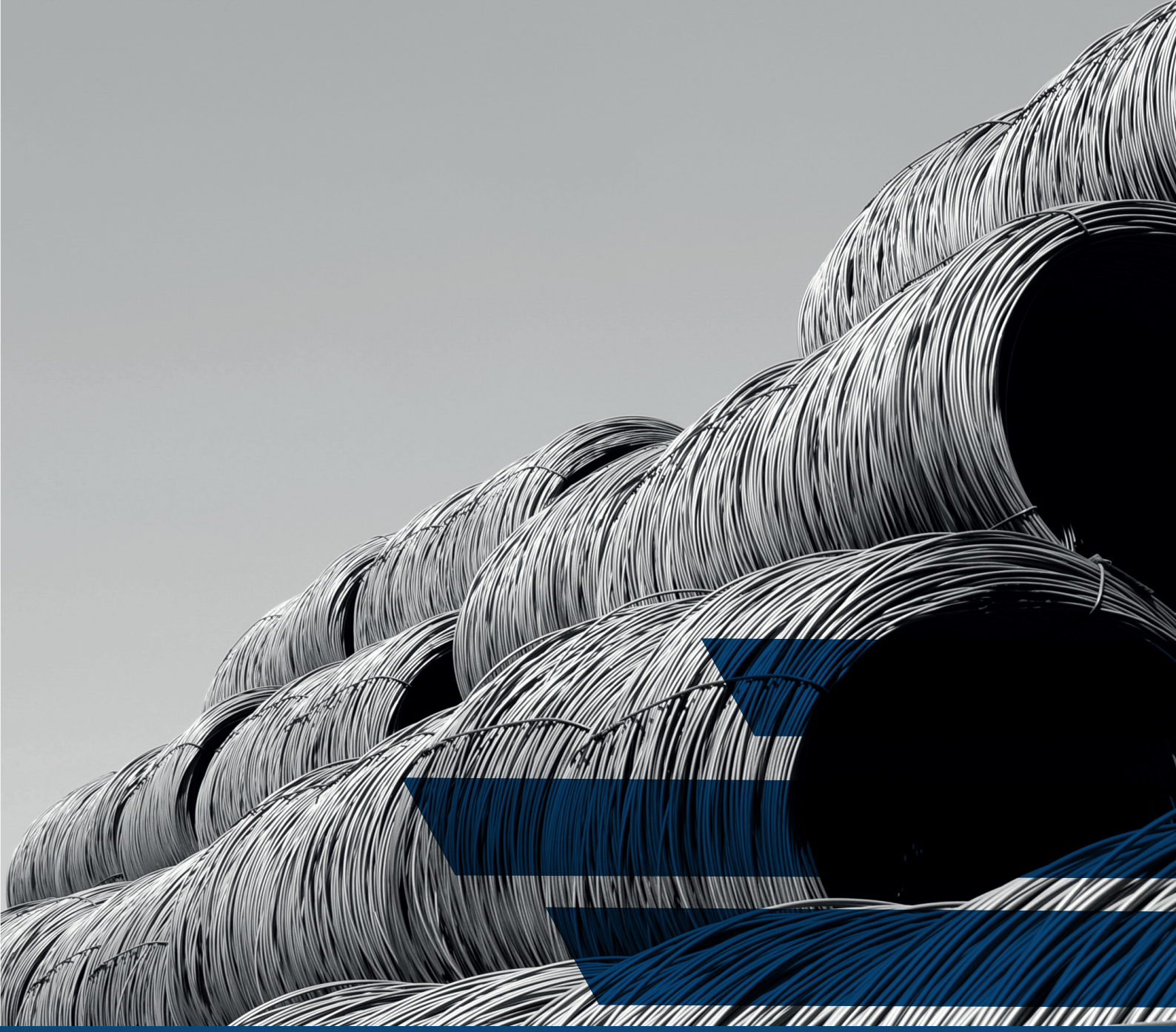
**Su verilmiş ve temperlenmiş yay üretiminde kullanılan filmaşınlar yorulma dayanımları ile ön plana çıkmaktadır. Güvenlik açısından kritik parçaların imalatında kullanılan ürünlerimiz bu kapsamda detaylı kalite kontrol süreçlerine tabi tutulmaktadır.**

Wire rods utilized in the production of quenched and tempered springs stand out due to their fatigue strength. Our products, which are used in the manufacturing of safety-critical parts, are consequently subjected to detailed quality control processes within this scope.

#### Kullanım Alanları / Applications

- Süspansiyon Yayı / Suspension Spring
- Viraj Denge Çubuğu / Anti-Roll Bar
- Demiryolu Rayları için Yaylı Kıskaç / Rail Clamps





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