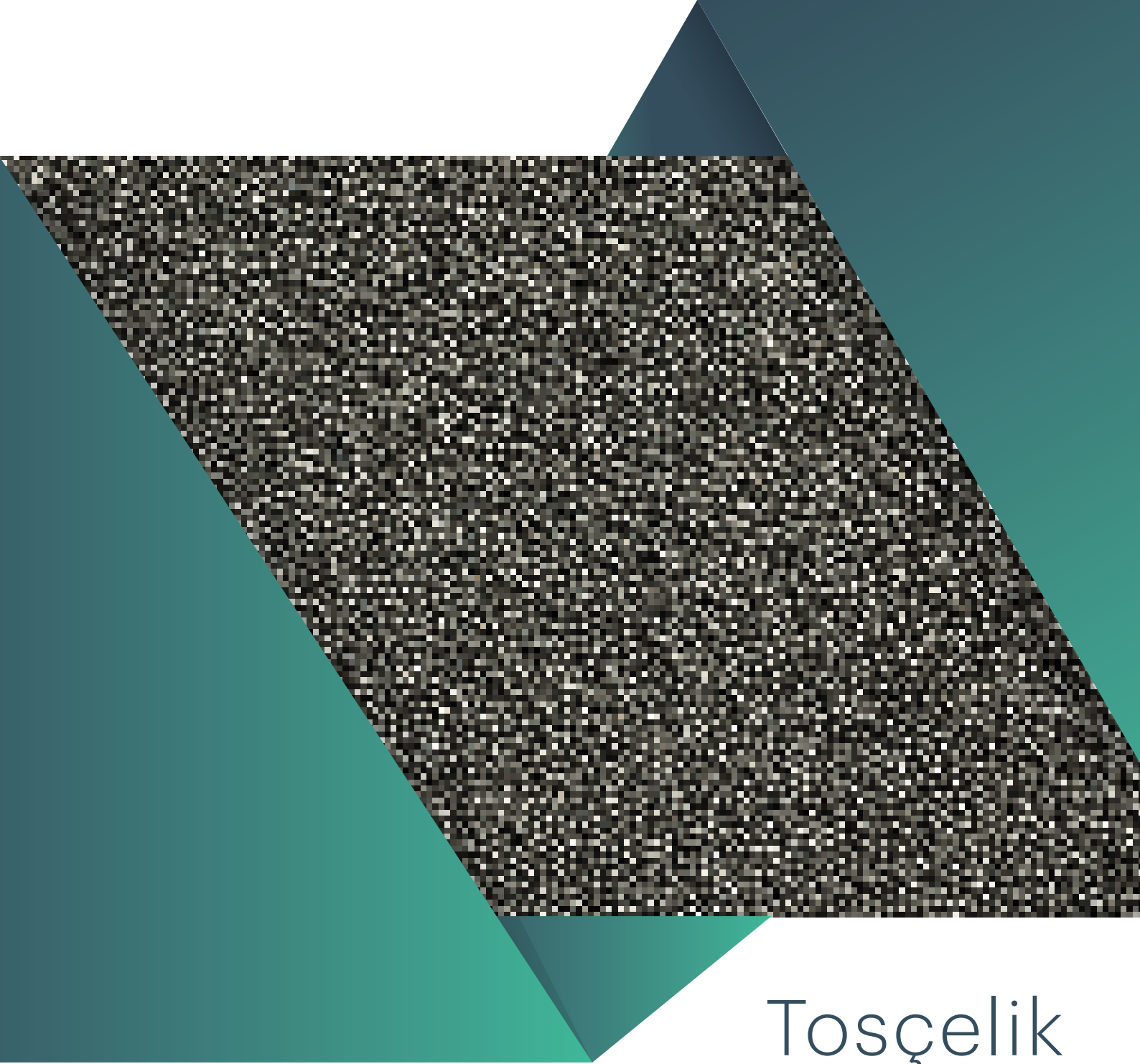




**TOSÇELİK** Granül



Tosçelik  
Granül

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# KOTAR

*Commitment to Excellence*

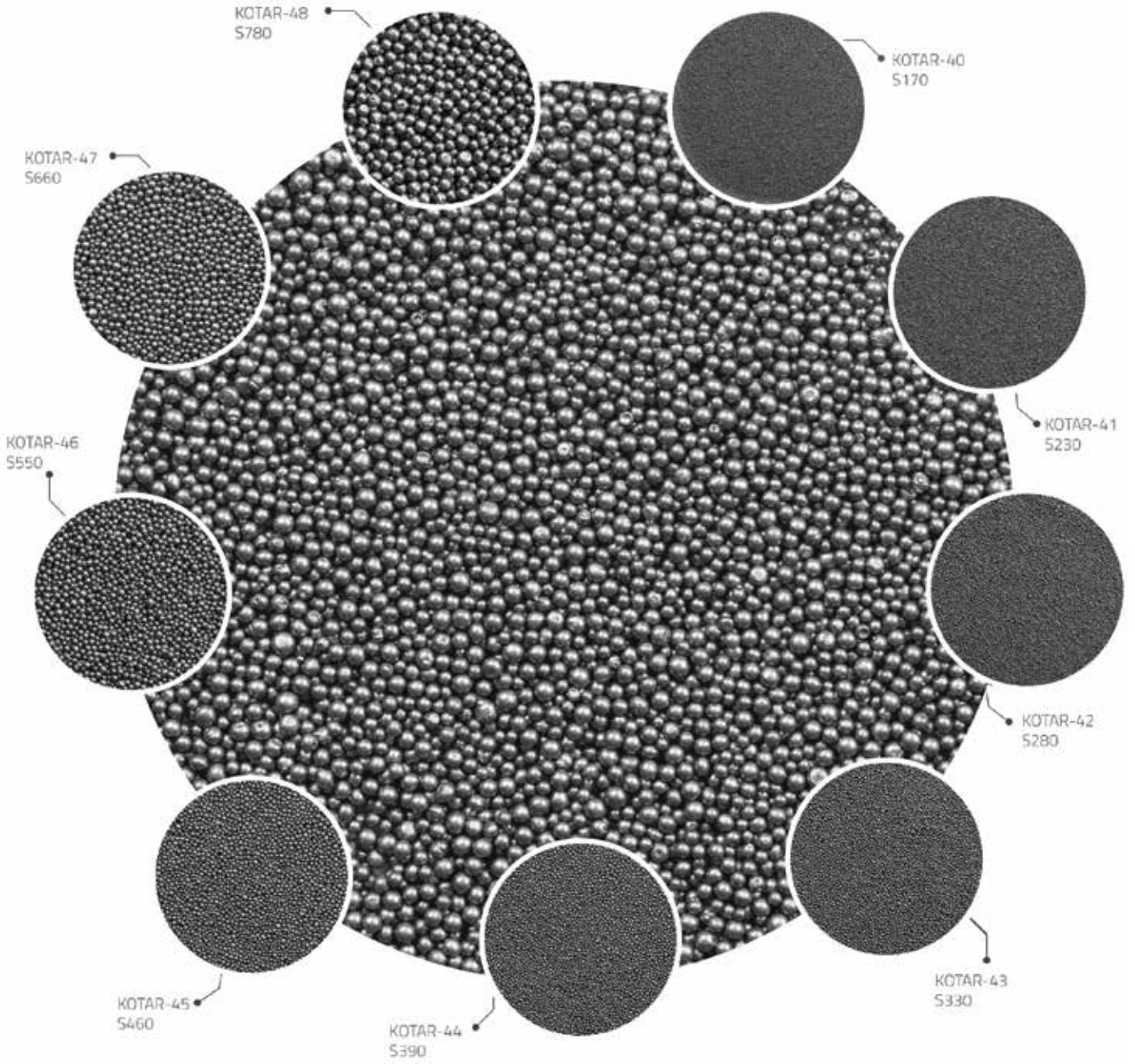


**TOSÇELİK** Granül



## Tosçelik Granül Products



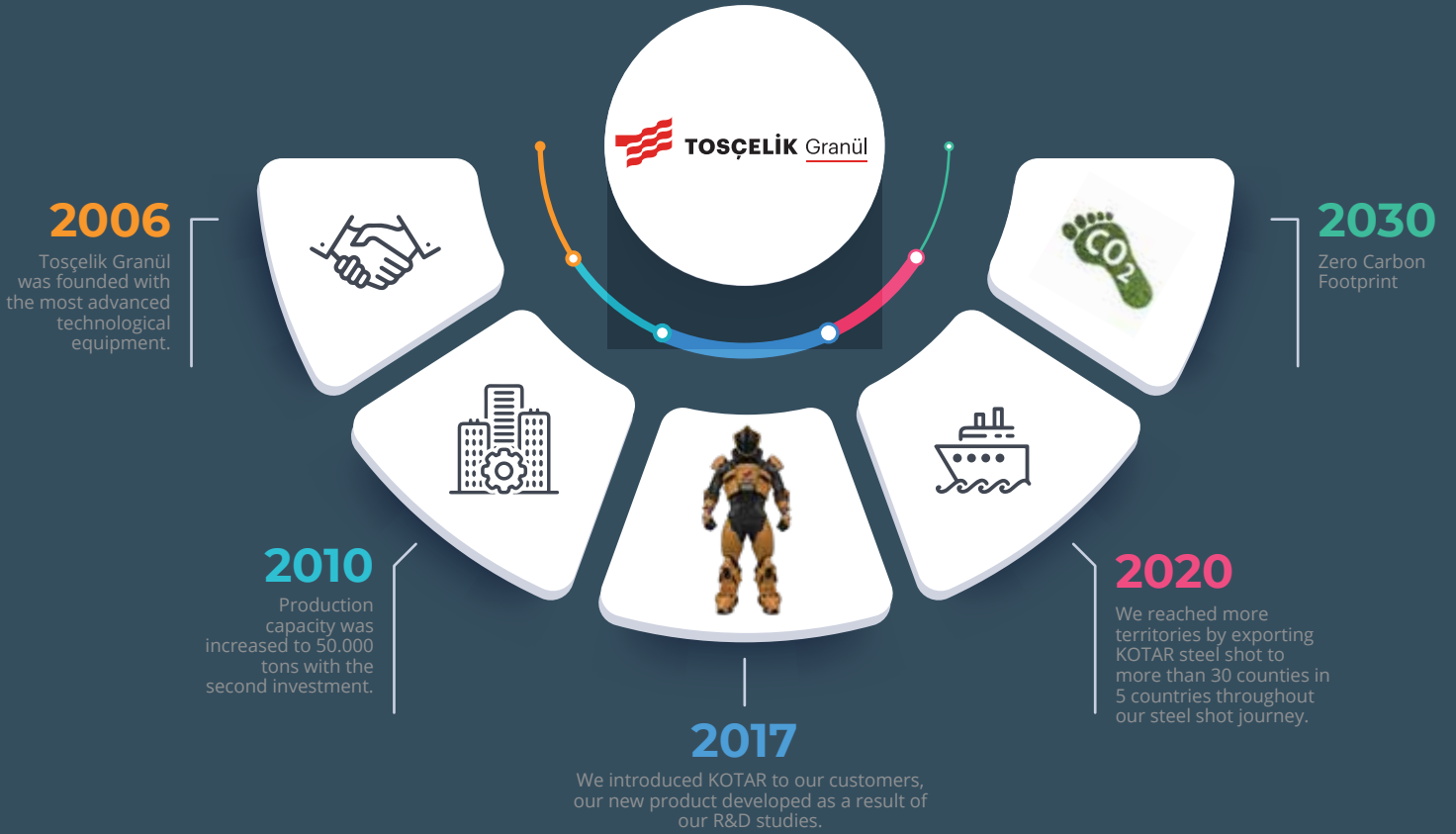


## Tosçelik Granül

We introduced KOTAR, a product resulting from our successful R&D studies, to our customers in 2017. As we witness the successes we have achieved with KOTAR, we are even working harder in order to develop products with higher added value and offer the best to our customers.

We feel the pride of exporting KOTAR steel shot to more than 30 countries in 5 continents as of 2023 aiming to achieve further growth and improvement each coming year.

As Tosçelik Granül, we set the goal of **'Zero Carbon Footprint'** in line with the vision of **'Green Steel'** and we restructured not only our production processes but also the chemical content of our product with the awareness of this responsibility.





**TOSÇELİK** Granül

# Corporate Values

## About Us

Tosçelik Granül plant was established in 2006 in line with the mission of meeting global steel shot demand taking the advantage of most advanced technological equipment in order to produce a high quality steel shot using top quality scraps.

Capacity of our plant was increased to 50.000 tons with our second investment made in 2010. We are the biggest steel shot producer in Turkey and one of the top two global low carbon steel shot producers in the world.

We took the road with the belief that low carbon steel shot is not appraised as it should be within the global steel shot market. We also consider that the advantages of low carbon steel shot in comparison with the high carbon product are not sufficiently recognized and exploited by users.

We introduced KOTAR, a product developed as a result of our successful R&D studies, to our customers in 2017. As we witness the successes we have achieved with KOTAR, we work harder to develop products with higher added value and offer the best service to our customers.

We feel the pride of exporting KOTAR steel shot to more than 30 countries in 5 continents as of 2023 aiming to achieve further growth and improvement each coming year.

## Vision

Securing our global position in the steel shot market within the top tier thanks to our quality and technical support and becoming a distinguished brand.

## Mission

- Becoming a brand that engages in quality and environmental-oriented production from raw material to finished product in steel shot production, enhances the added value of its products through R&D studies and reaching all regions in the world where steel shot is used.
- Improving the quality of technical service provided with its customers through new technologies and initiatives and working in customer-oriented manner.
- Being regarded as a transparent, reliable and ever-growing brand by steel shot users.



Environmentally-friendly



Global company



Sustainability



Innovative



Experienced Staff



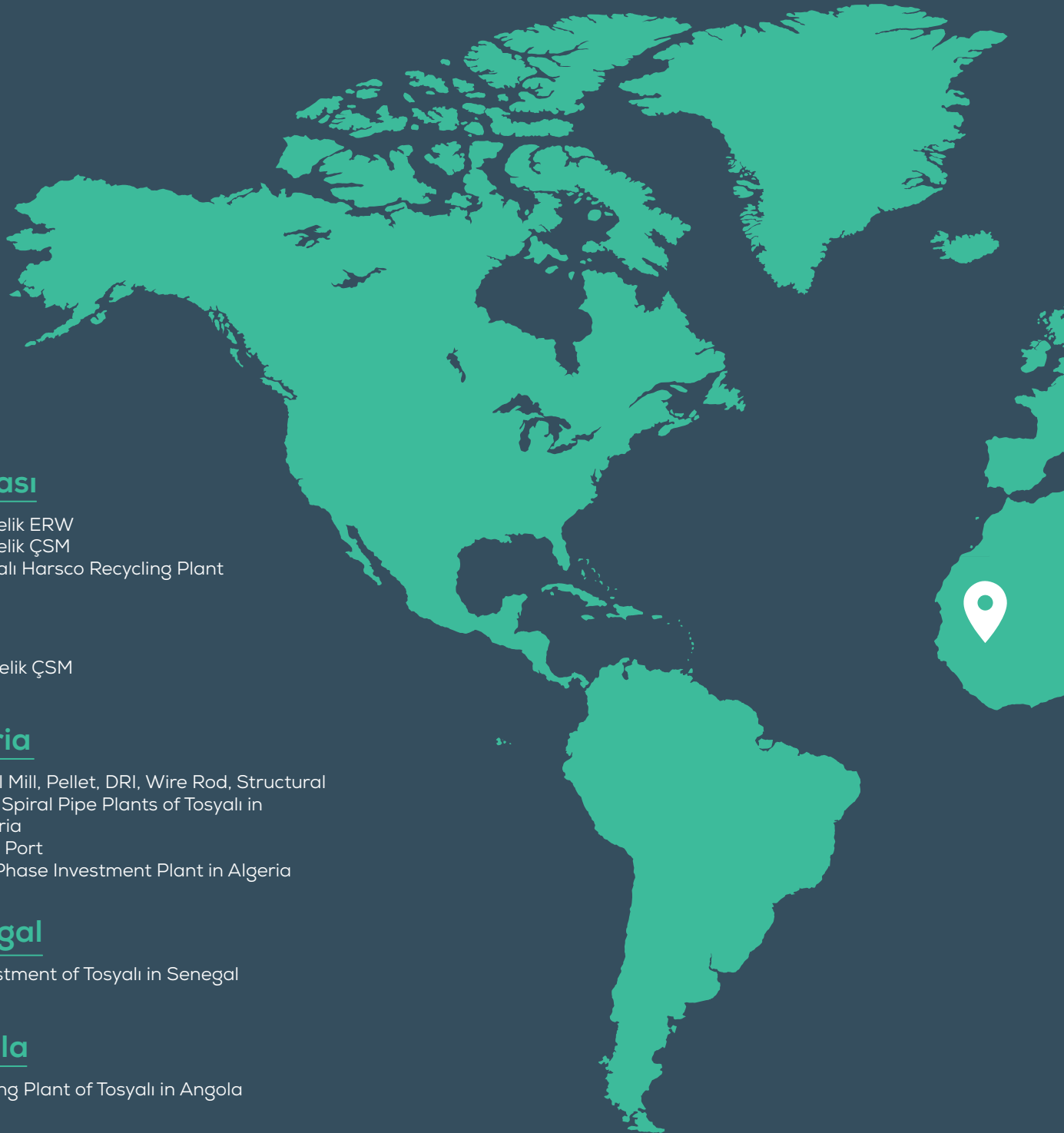
Productivity-Oriented



Industry Leading

PRODUCTION SITES OF TOSYALI

# LEADING THE WORLD



## Dilovası

- Tosçelik ERW
- Tosçelik ÇSM
- Tosyalı Harsco Recycling Plant

## İzmir

- Tosçelik ÇSM

## Algeria

- Steel Mill, Pellet, DRI, Wire Rod, Structural Iron, Spiral Pipe Plants of Tosyalı in Algeria
- BPM Port
- 4th Phase Investment Plant in Algeria

## Senegal

- Investment of Tosyalı in Senegal

## Angola

- Mining Plant of Tosyalı in Angola



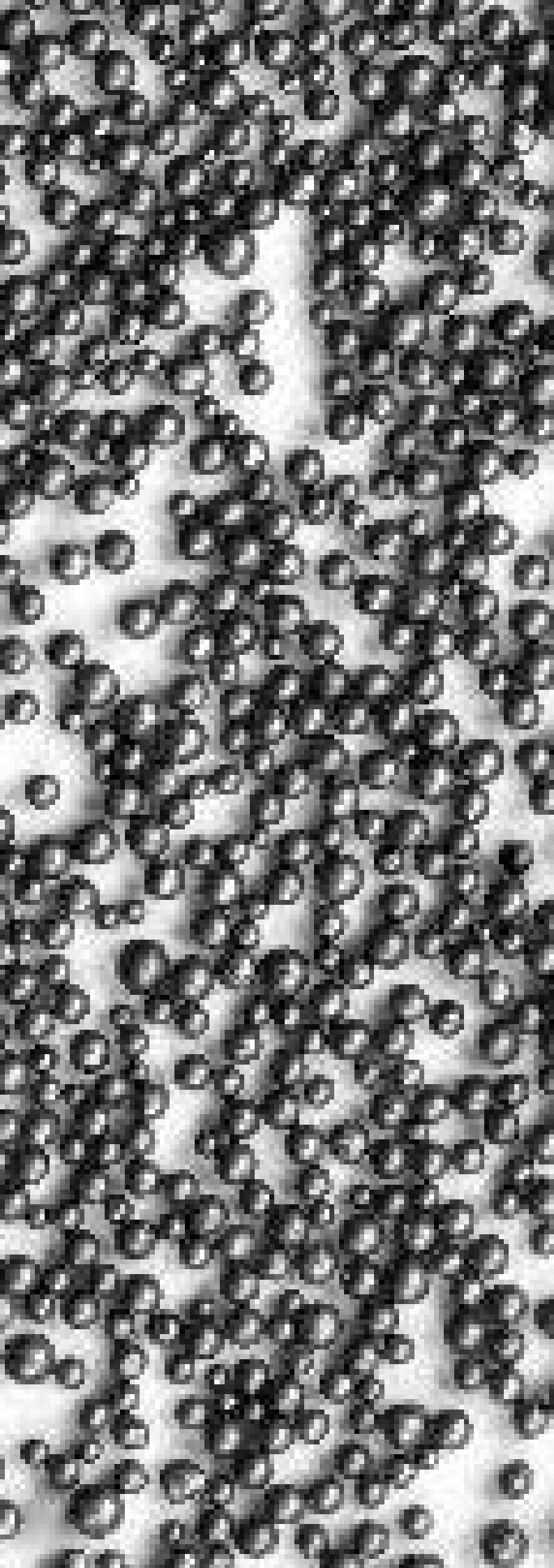
## İskenderun

- Iron Steel, Steel Mill, Rolling Mill and Wire Rod Production Plants of Tosyalı (3)
- Iron Steel Rolling Profile Plant of Tosyalı
- Tosçelik Granül Production Plant
- Galvanizing Plant of Tosyalı
- Natural Gas Pipe Plant of Tosyalı
- İskenderun Port of Tosyalı
- Tosçelik ÇSM

## Osmaniye

- Steel Mill and Rolling Mill Plants of Tosçelik
- Galvanizing Plant of Tosçelik
- ERW Plant of Tosçelik
- Export by Consignment Plant of Tosçelik
- Tosçelik ÇSM
- Spiral Pipe Plants of Tosçelik (2)
- Wire Rod Production Plant of Tosyalı
- Cold Rolling Steel Mill Plant of Tosyalı Toyo
- Recycling Plant of Tosyalı Harsco





INDUSTRY

INDUSTRY

QUALITY

QUALITY

INVESTMENT

INVESTMENT

PRODUCT DIVERSITY

PRODUCT DIVERSITY

PRODUCTION

PRODUCTION

KOTAR

KOTAR

LOW CARBON

LOW CARBON

HIGH PERFORMANCE

HIGH PERFORMANCE

LONG LIFETIME

LONG LIFETIME

SUSTAINABILITY

SUSTAINABILITY

STEEL

STEEL

ECO-FRIENDLY

ECO-FRIENDLY

GREEN STEEL

GREEN STEEL

ZERO CARBON

ZERO CARBON

# The Contents

- ☞ KOTAR
- ☞ Size Distribution of KOTAR Shot
- ☞ Production
- ☞ Technical Specifications

10  
12  
14  
16



## KOTAR, BEYOND THE TALENT...

Meaning “Talent” and “Wise” and being equivalent to the mythological Greek God Hephaestus, KOTAR is a smith, engineer, architect and inventor God who supplies weapons to the Gods besides constructing and furnishing the palaces.

### About the Product

*KOTAR came into life as a result of many R&D studies based on the years of experience. One of the most critical parameters for shotblasting operations is hardness. It is known that the hardness value is a highly important factor in the adjustment of shotblasting times. With this awareness, we have initially built our fund of knowledge and R&D studies upon our capability to increase the hardness value as much as possible without sacrificing the quality of our existing low carbon steel shot product.*

*We developed our KOTAR product which can function without breakage, maintaining its spherical shape during the cleaning operation in this journey that we started with the goal to manufacture “a product that is lasting very long as a low carbon steel shot and hard as a high carbon steel shot”. Starting the cleaning operation with the hardness values of 43 – 44 HRC, our product reaches the hardness values of 49 – 50 HRC in a short period of time with the contribution of its chemical contents and maintains this hardness value until it becomes inactive.*

*Produced at the hardness of a high carbon steel shot, KOTAR products perform the same job in a much shorter time than its competitors without breakage inside the machine thanks to the high energy transmitted on to the contact surfaces. During shotblasting operation, low carbon shot particles get smaller by being peeled in thin layers like an onion throughout 80% of its service life due to the abrasion.*

*Shotblasting machine and spare part wear substantially reduces because of its breakage free operation and low rate of pulverization. KOTAR products clean more parts in a shorter period of time with less shot in comparison with other high carbon steel products which leads to a great efficiency. It proved its contributions to longer shotblasting machine and spare parts lifetimes through practical trials performed initially at our test centre and later in various cleaning operations performed by our customers.*



# LOW CARBON



Second priority in our R&D studies, on the other hand, was to improve the cleaning efficiency through an operation mix that is stable for a long period of time. Keeping the homogeneity of the operation mix with the contribution of regular product insertions in shotblasting machine maximizes the effective cleaning performance.

Especially in foundries, casting parts with different geometrical shapes are generally cleaned by only one size of steel shot in a single machine. Using only one shot size makes it difficult to clean each detail of these casting parts with a different geometry at the same quality level. In order to remove this disadvantage, KOTAR products are developed using new sieve distribution always in compliance with SAE standards.

Our KOTAR products initially provide the operation mix that is needed in shotblasting machines and maintain its sieve distribution throughout the shotblasting process. In this way, coverage of a larger area on the workpiece is achieved with more shot particles in terms of unit time and unit volume. Thus, more effective and efficient cleaning is achieved on the parts with different geometries.

Our KOTAR products are tested in our shotblasting machine available at our factory under real operating conditions and they are also compared against other steel abrasives at the market through performance tests.

### Areas of usage

Being a Tosçelik Granül brand, KOTAR steel shot delivers an excellent performance in rust, sand and burr removal processes, surface preparation and stress relief operations thanks to its long service life and high level of hardness. It is ideal for use at foundries, steel plants, rolling mills and in machine production, steel industry, automobile, ship, airplane and structural steel industries..

# HIGH PERFORMANCE

## Size Distribution of KOTAR Shot



Designed with a wider sieve range in comparison with the products with standard sieve distribution, KOTAR ensures a more effective coverage on the surface of parts to be cleaned.

Parts with different geometries are generally cleaned using only one shot size in a single shotblasting machine particularly in foundries.

We developed our KOTAR products with new sieve distribution in compliance with the SAE standards for the purpose of improving cleaning efficiency by keeping the operation mix stable for a long period of time.

SAE Sieve No	Sieve Size		KOTAR48 S780	KOTAR47 S660	KOTAR46 S550	KOTAR45 S460	KOTAR44 S390	KOTAR43 S330	KOTAR42 S280	KOTAR41 S230	KOTAR40 S170	KOTAR39 S110	KOTAR38 S70
	mm	inch											
6	3,35	0,132	-	-	-	-	-	-	-	-	-	-	-
7	2,8	0,111	All pass	-	-	-	-	-	-	-	-	-	-
8	2,36	0,094	-	All pass	-	-	-	-	-	-	-	-	-
10	2,00	0,079	85% min	-	All pass	All pass	-	-	-	-	-	-	-
12	1,70	0,066	97% min	85% min	-	5% max	All pass	-	-	-	-	-	-
14	1,40	0,056	-	97% min	85% min	-	5% max	All pass	-	-	-	-	-
16	1,18	0,047	-	-	97% min	85% min	-	5% max	All pass	-	-	-	-
18	1,00	0,039	-	-	-	96% min	85% min	-	5% max	All pass	-	-	-
20	0,85	0,033	-	-	-	-	96% min	85% min	-	10% max	All pass	-	-
25	0,71	0,028	-	-	-	-	-	96% min	85% min	-	10% max	-	-
30	0,60	0,023	-	-	-	-	-	-	96% min	85% min	-	All pass	-
35	0,50	0,0197	-	-	-	-	-	-	-	97% min	-	10% max	-
40	0,42	0,017	-	-	-	-	-	-	-	-	85% min	-	All pass
45	0,35	0,014	-	-	-	-	-	-	-	-	97% min	-	10% max
50	0,30	0,012	-	-	-	-	-	-	-	-	-	80% min	-
80	0,18	0,007	-	-	-	-	-	-	-	-	-	90% min	80% min
120	0,12	0,005	-	-	-	-	-	-	-	-	-	-	90% min
200	0,075	0,003	-	-	-	-	-	-	-	-	-	-	-



## Size Distribution of KOTAR Shot

Sieve (mm)	S660 First sample from Firm A	S660 second sample from Firm A	KOTAR 47 (S660)
2,80	0,00	0,00	0,00
2,36	0,00	0,00	0,00
2,00	35,96	89,74	57,45
1,70	60,49	9,80	36,67
1,40	3,50	0,34	5,62
1,18	0,05	0,07	0,26
1,00	0,00	0,05	0,00
0,85	0,00	0,00	0,00
0,71	0,00	0,00	0,00
0,60	0,00	0,60	0,60
0,50	0,00	0,00	0,00
0,42	0,00	0,00	0,00

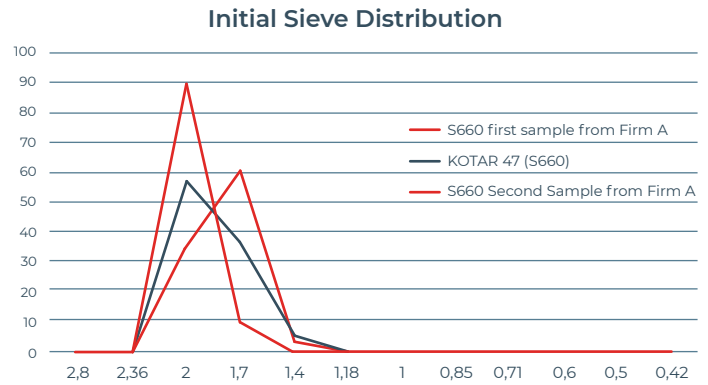


Figure – A : The graphics shown in the figure represent KOTAR 47 (S660) and S-660 samples produced by Firm A on different dates.

With KOTAR, we made the sieve distribution more homogenous which generally concentrated on a single sieve size still within the limits set by SAE standards (Figure – A).

In general, steel shot which is produced within the scope of SAE J444 and has the same product code can vary in itself. Final product can be packaged based on a smaller sieve or bigger sieve in different times (Figure – A). However, our KOTAR branded steel shot is produced with the broader sieve distribution still within the limits of international standards are packaged so that the product content will be homogenous.

High number of bigger shot particles in the product distribution can damage the details such as brand and writings placed on the parts during the shotblasting process whereas high number of small shot particles affect the shotblasting time and surface quality negatively. Proven after many tests and trials, having a homogenous distribution instead of concentration on a single sieve size brings the advantage of shotblasting the parts with mixed geometries at desired level, eliminates the necessity for a second shotblasting and makes the brand, writings or other indications more visible.

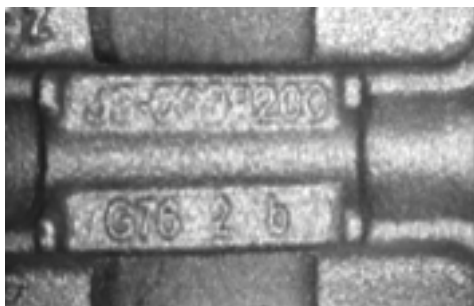
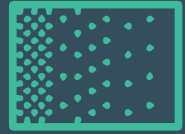


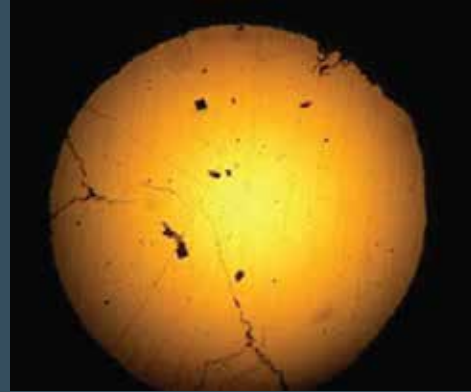
Figure A : Casting piece shotblasted with standard S-660 product



Figure B : Casting part shotblasted with our KOTAR 47 product



**Figure 1:** Low Carbon Steel Shot



**Figure 2:** High Carbon Steel Shot

These images are taken under a microscope.

#### Low Carbon Steel Shot

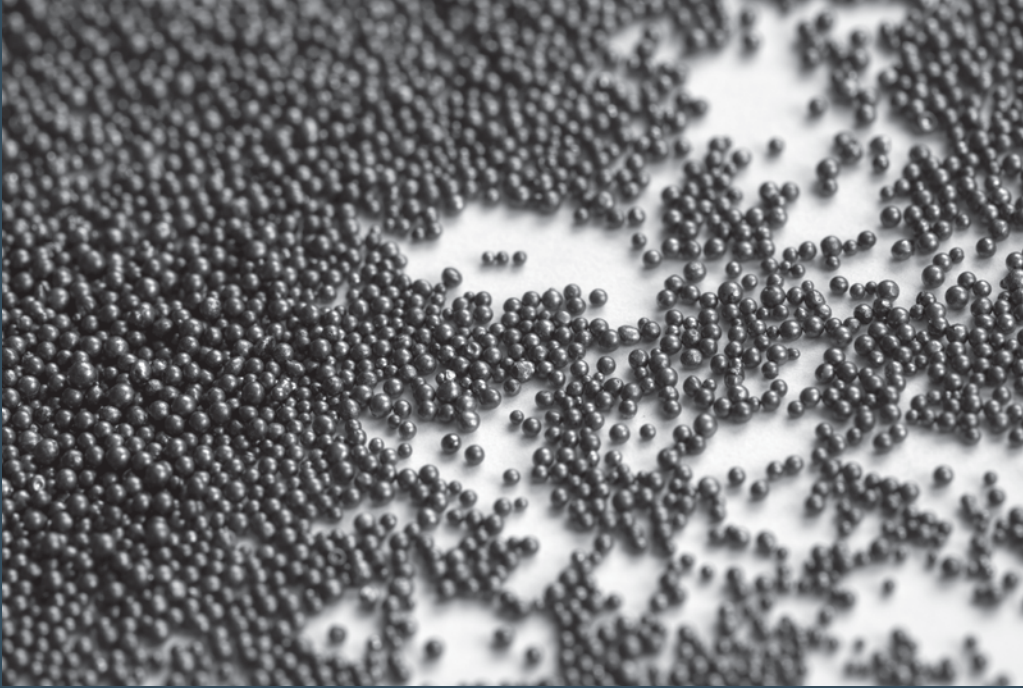
- It is only made of low carbon, low phosphorus and specially selected scraps containing a low rate of sulphur.
- Due to the absence of a second heat treatment, perfect particles are obtained which have a bainitic structure, free from cracks and resistant to impact and abrasion.
- Shot does not break up into small pieces during the shotblasting process. They always get smaller, maintaining their spherical shape.

#### High Carbon Steel Shot

- All kinds of scrap are used in their production. They have a hard, fragile and martensitic structure after casting.
- Compulsory second heat treatment after casting leads to cracks on the shot surface.
- Due to the cracks that occur during production, particles break up in the form of hard and angular pieces in a short period of time during shotblasting. For this reason, high carbon shot damages the parts of the shotblasting machine much more causing high maintenance and replacement costs.

Low carbon steel shot is consumed (about 20%) less than high carbon shot thanks to its longer lifetime. Meaning **"less shot >> more outputs >> consumption of less natural resources"**, low carbon steel shot also represents less energy consumption, less labour force use and low level of wastes.





### Low Carbon – High Performance

The fact that the initial hardness of KOTAR products (43-44 HRC) is high and that this value can reach the level of 50 HRC during the operation ensures an obvious improvement in the cleaning performance. Standard shot might be insufficient in complete cleaning of the angular parts with variable geometries; however, we achieve the desired surface quality in the shortest period of time on the surfaces to be cleaned thanks to our KOTAR products which are developed with the sieve distribution that ensures the best coverage on the surface.

KOTAR products offer the mix that is needed in the machine at the very beginning and maintains its distribution throughout the process. The most important advantage of this for our customers is that it will ensure a stable quality of all part surfaces.

TOSÇELİK GRANÜL makes use of the scraps with optimum alloys that are obtained from its group companies in the production of KOTAR steel shot. This guarantees the sustainability of low carbon steel shot quality which is largely dependent on scraps.

Low carbon steel shot has a high impact absorption capacity and the impact energy is evenly distributed on the shot.

Unlike high carbon shot, low carbon steel shot has a longer lifetime since it does not contain micro cracks.

Technical Specifications

Low Carbon Steel Shot

Chemical Composition  
(Molten Metal)

Carbon : %0.10 - 0.15  
 Manganese : %1.20 - 1.50  
 Silica : %0.10 - 0.25  
 Sulphur : max %0.035  
 Phosphorus : max %0.035

Hardness

The hardness of KOTAR low carbon steel shot is 43-44 HRC. It starts the cleaning operation with the hardness values of 43-44 HRC and reaches the hardness values of 49-50 HRC in the machine in a short period of time.

Density

The density should be minimum 7.0 g/cm<sup>3</sup> according to industrial standards. Density of KOTAR steel shot is minimum 7.3 g/cm<sup>3</sup>

Microstructure

Low carbon steel shot of TOSÇELİK has bainitic microstructure which ensures the combination of high hardness, long lifetime and resistance

General View

Steel shot should be as spherical as possible. Extended, adherent, caudal and porous particles which are considered to be defective as well as broken parts and unwanted items such as slag should be at the minimum level.

Areas of Usage

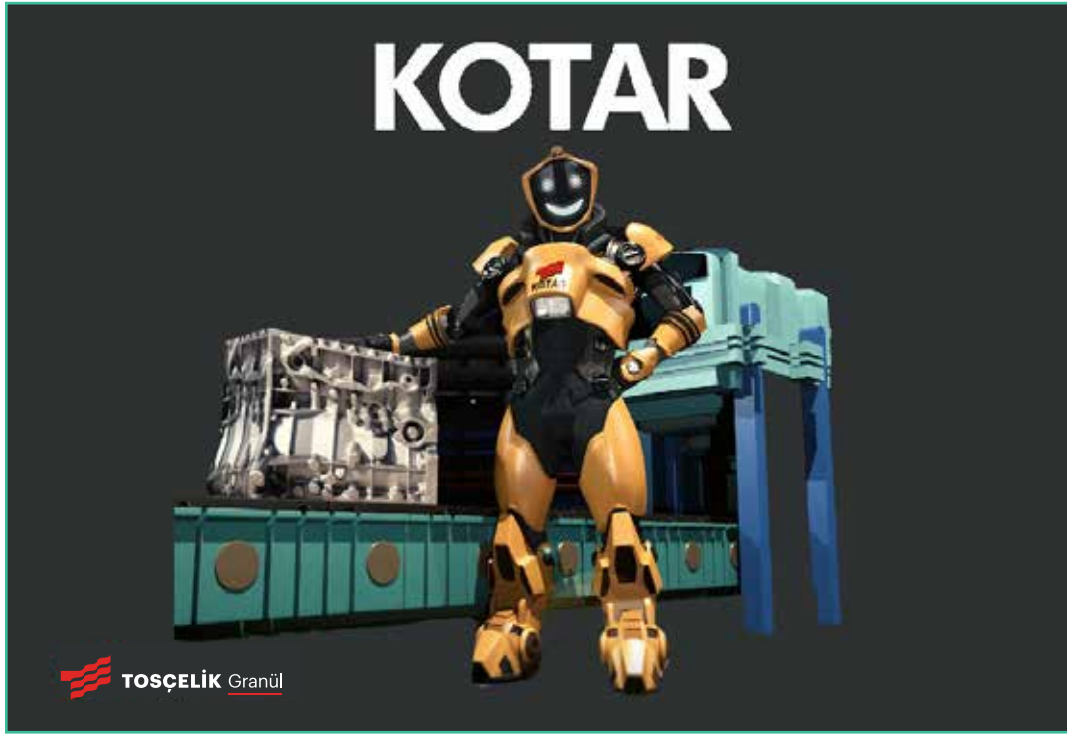
Used by foundries, steel mills, forging mills, rolling mills and machine producers that provide services with automobile, airplane, ships, structural iron and many other industries.

Package

KOTAR steel shot is packaged in 25 kg polyethylene bags, placed on pallets so that there will be 1 ton of product on each pallet, covered with a cardboard box and shrunk. 100% recycled, environmentally-friendly materials are used in our packages. Packaging options include also bigbag and metal drum.







## THE DIFFERENCE LEADING TO EXCELLENCE

**TOSÇELİK GRANÜL** has brought a new dimension to the surface cleaning and abrasive materials industry in terms of environment and quality thanks to its **LOW CARBON STEEL SHOT**.

Selection of the right raw material is one of the most critical factors in the production of high quality **LOW CARBON STEEL SHOT** and this is the reason of the difference offered by **TOSÇELİK GRANÜL**.

**LOW CARBON STEEL SHOT** has a longer lifetime because of its bainitic microstructure, is more effective and cleans fast in comparison with its high carbon equivalences.

**TOSÇELİK GRANÜL** has an energy saving and environmentally-friendly plant thanks to its production technology.

Low carbon steel shot >> longer lifetime >> more cleaning job with less shot >> less consumption of natural resources...



## APPRECIATION OF THE FUTURE...

Priority of KOTAR, a Tosçelik Granül brand, is to minimize carbon footprint in the nature with its sustainable characteristic.

In today's world where the energy need has substantially increased, greenhouse gas emission that has increased with the use of fossil resources has irreversible negative impacts on the climate.

As Tosçelik Granül, we set the goal of 'Zero Carbon Footprint' and besides our production processes, we restructured the chemical contents of our product with the awareness of this responsibility.

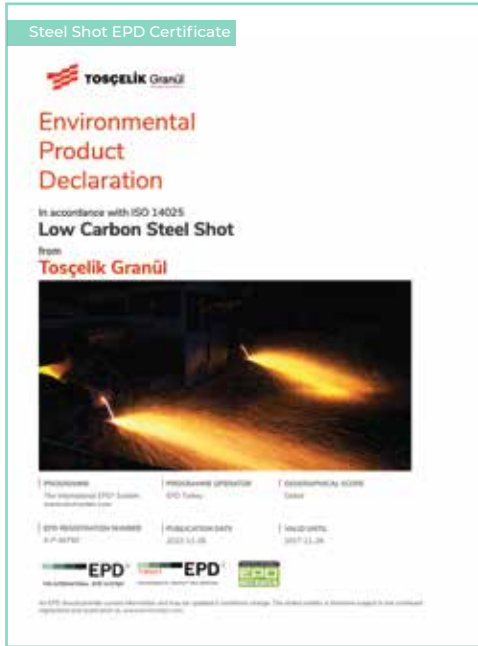
We produce steel shot which is our finished product with special scraps that are regarded as a waste by many production plants with the use of the least energy as far as possible.

We allow users to perform the highest number of works with less steel shot based on the goal to minimize our carbon footprint at the time of usage.



# KOTAR

*Commitment to Excellence*







# TOSÇELİK Granül

## Istanbul Sales Office

Barbaros Mahallesi Sütçü yolu Cad.  
Tosyalı Plaza No:72  
Ataşehir/İstanbul/Türkiye

## Production Plant

Sarıseki Org. San. Böl.  
Noksel Girişi Cad.  
Sarıseki/İskenderun/Hatay/Türkiye



0090 (216) 544 36 00  
0090 (326) 656 34 34



[www.toscelikgranul.com.tr](http://www.toscelikgranul.com.tr)







**2006**

Tosçelik Granül, en ileri teknolojik ekipmanlar ile kuruldu.



**2030**

Sıfır Karbon Ayak İzi



**2010**

Yapılan ikinci yatırım ile kapasitesi 50.000 tona çıkarıldı.



**2020**

Bilye yolculuğumuzda 5 kıtada 30'un üzerinde ülkeye ihracat gerçekleştirerek daha da geniş bir ağa yayıldık.



**2017**

Ar&Ge çalışmalarımız sonucu geliştirdiğimiz ürünümüz KOTAR 'ı müşterilerimiz ile tanıştırdık.





**2006**

Tosçelik Granül was founded with the most advanced technological equipment.



**2030**

Zero Carbon Footprint



**2010**

Production capacity was increased to 50.000 tons with the second investment.



**2020**

We reached more territories by exporting KOTAR steel shot to more than 30 countries in 5 countries throughout our steel shot journey.



**2017**

We introduced KOTAR to our customers, our new product developed as a result of our R&D studies.

