

kuzeyboru



grp

GLASSFIBER REINFORCED
POLYESTER PIPE AND FITTINGS
PRODUCT GUIDE

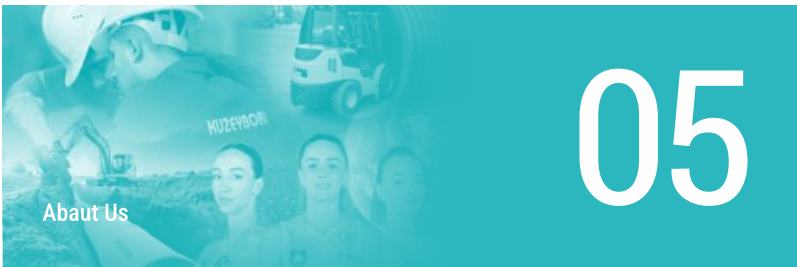
kuzeyboru  GRP

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A collage of images showing Kuzeyboru staff and construction equipment. The text "KUZEYBORU" is visible on a piece of equipment.

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about us



Kuzeyboru was established in 2001 with the vision of a global brand offering innovative solutions for infrastructure and superstructure piping systems. Kuzeyboru is specialized in the production of GRP, HDPE, Corrugated, PPR pipes and fittings with its world-class production facilities and wide product range and offers comprehensive solutions for infrastructure and superstructure projects.

Acting with a sustainable production approach, Kuzeyboru has been a professional solution partner in many infrastructure and superstructure projects in 105 countries in 5 continents since its establishment. It has become one of Turkey's largest manufacturers in GRP, Corrugated Pipe, HDPE and PPR product groups with its modern facilities built on a total area of 200.336,23 m². Having the title of "The First Ministry Certified R&D Center" in the plastic pipe sector, Kuzeyboru aims to develop innovative production techniques, process optimization and create an ecosystem that can respond quickly to the changing needs of the market with this center. The R&D Center is one of the important

building blocks that contribute to Kuzeyboru's sustainable production targets.

Beyond being a professional solution partner, Kuzeyboru also makes a difference with its projects that add value to society. In line with its social responsibility principles, it prioritizes women's employment and equal opportunities and takes important steps in this field. With the "Etkiniz" project, the Company aims to create social benefit by reducing the environmental impact of production, increasing energy efficiency and developing projects for future engineer candidates. In addition, the Company strengthens the place of women in society and contributes to national sports by supporting the women's volleyball team in the Sultans League.



200.336,23 m²
production area



5 continents Export to
105 countries



Among the 100 fastest
growing companies
according to TOBB data



%100 domestic
capital

enviroment and sustainability

Kuzyboru holds the TS EN ISO 14001 Environmental Management System certification, emphasizing its commitment to environmental safety. The company prioritizes health and environmental considerations in the development of its innovative products. Recognizing the environment as a precious treasure, Kuzyboru places significant importance on sustainability, carbon footprint monitoring, and the use of renewable energy. **Kuzyboru effectively and efficiently manages natural resources by employing environmentally friendly technologies. It also raises awareness among its employees and stakeholders to protect biodiversity.**

Sustainability is a strategic priority for Kuzyboru and an integral part of

all its activities. The company meets its energy needs for production from sustainable sources, thanks to its land-based and rooftop solar energy systems.



quality approach and international standards



Quality Approach

To achieve continuous improvement, operational excellence, and sustainable success based on lean production, we adopt an inclusive management approach that ensures leadership at all levels, enhances the implementation of decision-making processes, and strengthens improvements through data analysis. This approach leverages the workforce, processes, and technology in the most effective way.

Accredite Laboratories

Kuzeyboru Testing Laboratory prioritizes impartiality, independence, integrity, confidentiality, reliability, and legal requirements, conducting laboratory work in accordance with national and international standards, with the best economic and technical practices in the shortest time possible.

The laboratory's objective is to exhibit good professional practices with continuously trained expert personnel, using up-to-date testing methods

and technologically advanced devices that comply with current standards to meet customer demands at the highest level and ensure precise test results by using the necessary reference/standard materials. Additionally, it aims to enhance test quality through comparative measurements with national and international laboratories and to minimize complaints by focusing on customer satisfaction.

Personnel work in accordance with policies and procedures conforming to the TS EN ISO/IEC 17025 standard. The laboratory management commits to comply with this standard and to continuous improvement.

International Standards

Kuzeyboru GRP pipes are designed and manufactured to meet the requirements of the most comprehensive international standards listed below.

AWWA C950	Standard for Glass Fiber Pressure Pipes - Clean Water
AWWA M 45	Design Guide for Glass Fiber Pipes
ASTM D 3262	Non-Pressure Glass Fiber Pipes for Wastewater Applications
ASTM D 3754	Standard for Sewer and Industrial Pressure Pipes
ASTM D 3517	Standard for Pressure Pipe for Clean Water
ASTM D 3839	Standard for Installation of Glass Fiber Pipes
ISO 25780	Jacking Pipes for Water Supply, Wastewater, Drainage, and Irrigation Projects
ISO 23856	Water Supply and Wastewater Applications



introduction

The efficient use and effective transportation of water, a vital resource for all life, has become increasingly important due to the diminishing availability of water sources worldwide. Ensuring that transmission lines operate in a manner that minimizes water loss and leakage can only be achieved by using durable and long-lasting pipes.

Kuzeyboru GRP pipes are manufactured with the latest technology to ensure the healthiest and safest conveyance of our most valuable natural resource, water, from one point to another.

The Role of Glass Reinforced Plastic Materials in Our Lives

Composites are among the most widely used materials in the industry due to their high chemical and mechanical resistance. As a composite material, fiberglass reinforced plastic (GRP) is used in the aviation, marine,

infrastructure, superstructure, and land transportation industries, as well as in wind turbines, storage tanks, and tank production. One of the most important industrial applications of GRP composite materials is GRP pipes.

GRP pipes are preferred in applications that require the high corrosion resistance of plastics and the high mechanical strength of metals.

GRP pipes are used in potable water and wastewater systems, irrigation projects, industrial projects, and submarine intake and discharge lines.

1. glass reinforced polyester pipes

Glass Reinforced Polyester (GRP) pipes are durable and flexible composite pipes obtained by adding fiberglass to a thermoset resin matrix. Known for their high fracture resistance and lightweight structure, GRP pipes are preferred in many industries due to their chemical resistance, non-magnetic properties, and permeability to radio signals. GRP pipes can be easily shaped for various applications, making them widely used in the chemical, construction, and energy sectors.

1.1. Why Kuzeyboru GRP Pipes?

In the production of Kuzeyboru GRP pipes, sustainable development principles are prioritized. From the selection of raw materials to the final product, all processes aim for a low carbon footprint, and environmentally friendly production processes have been developed. The GRP pipes produced with technologies developed at the Kuzeyboru R&D center can be customized to meet project needs and meet high-quality standards.

Kuzeyboru GRP pipes are certified with local and international quality certifications and are designed for long-term durability, offering longevity across generations. To minimize environmental impact, green energy sources are utilized in production, advanced technology machines are preferred, and occupational safety is prioritized. This ensures an environmentally friendly and safe production process.

Kuzeyboru GRP pipes, an economically sustainable solution, offer ease of transportation and installation due to their lightweight structure. Their abrasion resistance and smooth inner surface, which retains its properties throughout its lifespan, reduce operational and maintenance costs, making the operational process more efficient.

Kuzeyboru's environmentally friendly, durable, and high-quality GRP pipes provide an economically sustainable and long-lasting solution for your projects.

1.2. Areas Of Use

Drinking water transmission lines and distribution networks

Irrigation projects main transmission and distribution lines

Wastewater pumping lines, sewer networks

- Wastewater treatment plants

- Drinking water treatment plants

- Hydroelectric power plant transmission lines

- Seawater intake and discharge lines, and cooling water lines for power plants

- Stormwater lines

- Seawater desalination plants
- Tank and silo production
- Microtunneling applications
- Jacking applications

1.3. Kuzeyboru GRP Fittings

- Tee pieces
- Elbows
- Reducers
- Flanges
- Manholes
- Saddles
- Special design spools
- WYE pieces

1.4. . Kuzeyboru GRP Pipe Production Ranges

Kuzeyboru manufactures GRP pipes in the required diameters, pressures, and stiffness according to project requirements. The production ranges for Kuzeyboru GRP pipes are given below.

Length (m) : 6m ve 12m. Upon request and considering transportation conditions, Kuzeyboru GRP pipes can be manufactured in the desired lengths.

Diameter (DN) : 300mm - 4.000 mm

Pressure (PN) : 1-32 bar.

Rigidity (SN) : Standard 2.500 - 5.000 - 10.000 N/m².
Upon request, production can be carried out up to 50.000 N/m²

1.5. Advantes of Kuzeyboru GRP Pipes

Lightweight : Kuzeyboru GRP pipes weigh 1/10th of concrete pipes and 1/4th of steel pipes.

Low Transportation Cost : Their lightweight nature and suitability for nested shipment provide economical transportation.

Easy Installation : Offers easier and faster installation compared to other types of pipes.

Couplings : Kuzeyboru possesses both coupling technologies used for joining GRP pipes. Depending on project requirements and demand, reka or integrated gasketed couplings can be preferred.

High Corrosion Resistance : GRP pipes do not corrode, eliminating the need for additional coating or protection.

Superior Hydraulic Properties : Kuzeyboru GRP pipes maintain their hydraulic properties throughout their operational life due to their smooth inner surface.

Water Hammer Resistance : Higher than other types of pipes, tolerating additional pressure increases up to 40% from water hammer effects

Long Service Life : 50 years of service life.

Low Operating Costs : Due to superior hydraulic properties and a smooth inner surface, hydraulic losses are less than other types of pipes. Consequently, a lower capacity pump can be selected, and energy savings can be achieved throughout the operational period.

2. grp pipe production technologies



GRP pipes, which use fiberglass, thermoset resin, and silica sand as main raw materials, are manufactured using three different methods.

1. *Continuous Filament Winding*

2. *Centrifugal Casting*

3. *Filament Winding*

Kuzyboru GRP pipes are manufactured using the latest advanced technology, the **Continuous Filament Winding Method**. The advantages of this technology include.

- While the length of pipes in other production methods is limited to 6m, the Continuous Filament Winding Method allows the production of pipes in desired lengths, such as 12m or 15m, depending on transportation conditions.

- The production speed in the Continuous Filament Winding Method is much higher than other methods. As a result, the production of pipes required for the project can be completed in much shorter timeframes.

- Larger diameter GRP pipes can be produced using the Continuous Filament Winding Method.

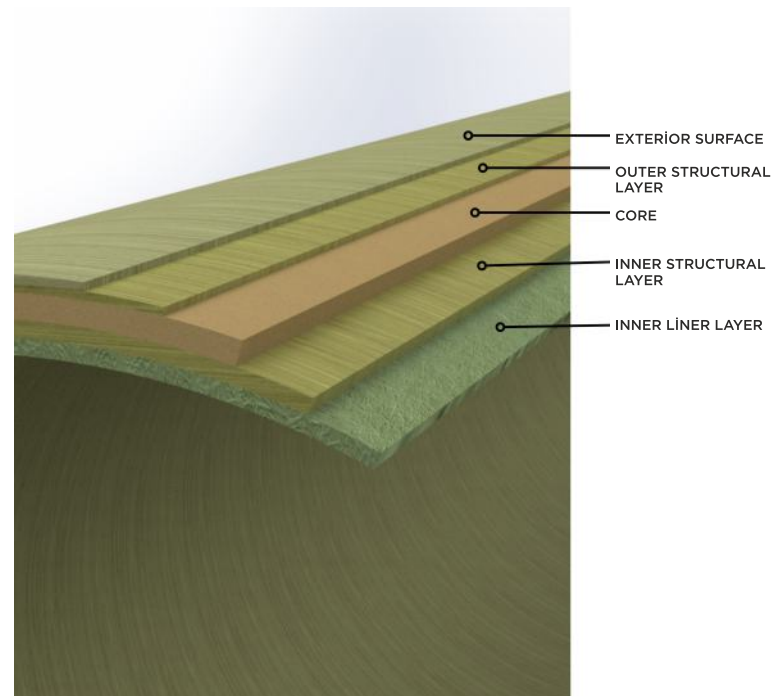
- Optimum solutions can be produced to meet project requirements by using different types of resins and fibers.

2.1. Kuzyboru GRP Pipes Wall Structure

The GRP pipe wall consists of five layers that adhere perfectly to each other, each with different properties and characteristics according to their function.

Exterior Surface, Outer Structural Layer, Core, Inner Structural Layer, Inner Liner Layer

The combination of fiberglass, resin, and silica sand used in the production of GRP pipes creates a structure that is resistant to axial, circumferential, and peak loads. Continuous fibers provide circumferential strength to the pipe, mainly ensuring pressure resistance. Chopped fibers contribute to the axial strength of the pipe, while the sand ensures that the pipe's rigidity reaches the desired level at a minimal cost. The resin acts as a binder for all these materials.



3. kuzeyboru grp pipes

Kuzeyboru GRP pipes are manufactured with advanced Continuous Filament Winding (CFW) machines at the Malatya-Turkey facilities. In the Continuous Filament Winding method, the pipe is produced by winding fiberglass yarns onto an endless mandrel while resin, sand, and chopped fiberglass are poured from above. The materials poured and wound onto the mandrel are compressed using a pressure arm. Kuzeyboru produces GRP pipes in various diameters ranging from 300 mm to 4000 mm.

In a composite material like GRP pipe, the casting location, the amount of raw materials in the composition, and the characteristics of the materials used play a significant role in determining the performance of the pipe.

Resin and continuous fiber are used as the main components in the production of Kuzeyboru GRP pipes. Additionally, chopped fiber and sand are also used in production, depending on the required pipe characteristics.

Kuzeyboru designs superior quality GRP pipes that meet your project requirements, offering the optimum solution for your project.

Beyond producing and delivering GRP pipes and fittings according to your project needs, Kuzeyboru also offers engineering and design support along with on-site supervision services as your professional solution partner.

3.1.Raw Materials

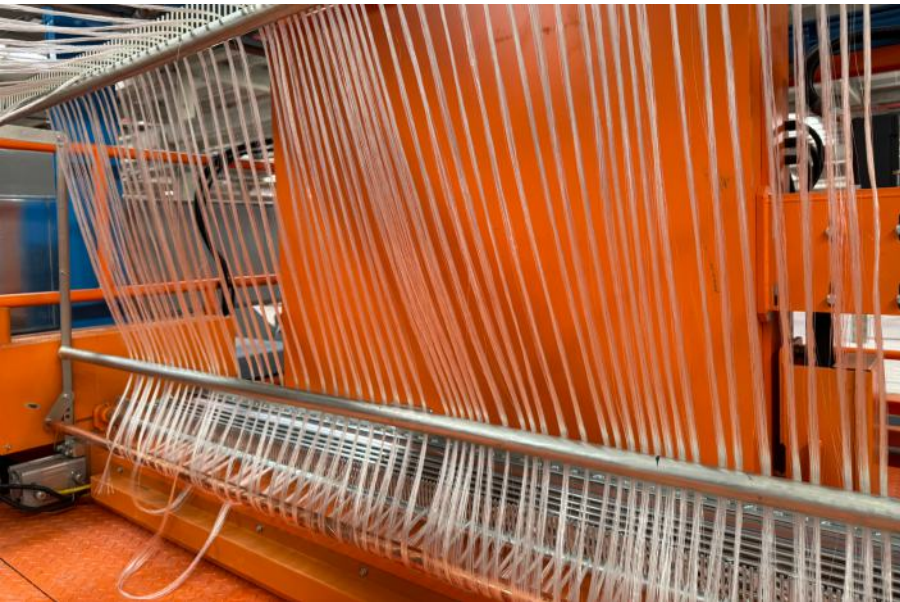
The following raw materials are used in the production of GRP pipes, depending on project conditions and requirements:

3.1.1.Glassfiber

Glass reinforcements are made from two different glass compositions: "C" glass, which exhibits excellent chemical inertness against chemical corrosion, and "E" glass, which has very high mechanical strength.

In the production of fiberglass pipes, fiberglass is used both as continuous fiber and as chopped fiber. Additionally, fiberglass surface veil is also used on the outer surface of the pipe.

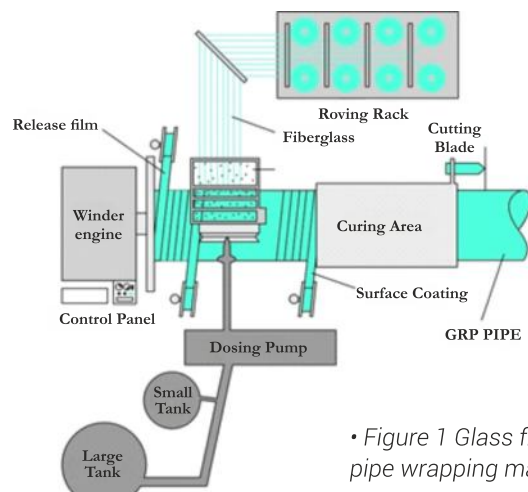




3.1.2. Resin

Depending on the type and temperature of the fluid, and to meet project requirements and ensure the desired performance, Kuzebyoru GRP pipes can be manufactured with four different types of resin.

1. Terephthalic Resin
2. Orthophthalic Resin
3. Isophthalic Resin
4. Vinylester Resin



• Figure 1 Glass fiber pipe wrapping machine

3.1.3. Chemical Additives and Accelerators

Various chemicals such as catalysts, hardeners, and pigments are used in the production of GRP pipes.

3.1.4. Filler Material (Silica Sand)

Silica sand is used along with fiberglass and resin to produce GRP pipes at optimal cost within the desired rigidity class.



3.2 Kuzeýboru GRP Pipe Types

3.2.1. Pressure Pipes

Kuzeýboru offers optimum solutions to clients by producing pressure pipes up to 32 bar using the most advanced technology, the Continuous Filament Winding Method. Kuzeýboru GRP pipes are used in potable water transmission lines, pressurized drainage and wastewater pumping lines, pressurized irrigation lines, and both underground and above-ground applications.

3.2.2. Sewer Pipes

Kuzeýboru also produces specially designed GRP pipes for sewer applications. Kuzeýboru GRP pipes offer the best solutions for sewer projects with their high abrasion resistance against corrosive conditions caused by acids, bases, and aggressive chemicals, and their special inner design that can withstand water jet pressure.



3.2.3. Biaxial Pipes

Kuzeyboru biaxial **GRP** pipes are designed to withstand forces in both directions (circumferential and axial). The use of biaxial pipes eliminates the need for thrust blocks, providing significant advantages, especially in aboveground applications for industrial projects. In pipelines where biaxial pipes are used, joints are made with flanges, hand lay-up, or locking couplings. Axial forces occurring in the pipeline are transferred from one pipe to another through the joints. Kuzeyboru also provides engineering services for projects where biaxial pipes are used.



3.2.4. Jacking Pipes

Kuzeyboru jacking pipes are used for the renewal and construction of underground pipelines through trenchless methods. The high axial pressure resistance of jacking pipes offers significant advantages for microtunneling and pipe jacking applications compared to other pipe materials. The technical specifications and wall thicknesses of the pipes used for these applications vary. Accordingly, they are manufactured in special lengths up to a nominal rigidity of $1,000,000 \text{ N/m}^2$.



3.2.5.GRP Pipe Dimensions

PRESSURE CLASS		PN1			PN6			PN10		
STIFFNESS CLASS		SN2500 N/m²	SN5000 N/m²	SN10000 N/m²	SN2500 N/m²	SN5000 N/m²	SN10000 N/m²	SN2500 N/m²	SN5000 N/m²	SN10000 N/m²
DN	OD	W	W	W	W	W	W	W	W	W
(mm)	(inç)	(mm)	(kg/m)	(kg/m)	(kg/m)	(kg/m)	(kg/m)	(kg/m)	(kg/m)	(kg/m)
300	12"	323,8	7,28	9,01	11,34	7,28	9,01	11,34	7,28	9,01
350	14"	375,7	9,78	12,28	15,47	9,78	12,28	15,47	9,77	12,28
400	16"	426,6	12,42	15,71	19,43	12,42	15,71	19,44	12,22	15,71
450	18"	477,6	15,74	19,8	24,3	15,74	19,8	24,3	15,22	19,72
500	20"	529,5	19,51	24,16	29,71	19,51	24,16	29,71	18,55	24,14
600	24"	616,5	27,79	34,18	42,19	27,79	34,18	42,19	26,22	34,18
700	28"	718,9	37,24	45,96	56,87	37,25	45,95	56,87	35,22	45,96
800	32"	820,9	48,09	59,49	73,79	48,09	59,49	73,79	45,57	59,49
900	36"	922,9	60,35	74,8	92,94	60,36	74,81	92,98	57,28	74,81
1000	40"	1024,9	74	91,91	114,32	74,01	91,92	114,34	70,34	91,92
1100	44"	1126,9	89,06	110,73	138,01	89,07	110,76	137,97	84,77	110,74
1200	48"	1228,9	105,55	131,39	163,9	105,56	131,39	163,91	100,58	131,42
1300	52"	1330,9	123,45	153,85	192,01	123,46	153,86	192,02	117,76	153,84
1400	56"	1432,9	142,84	178,1	222,45	142,85	178,08	222,46	136,33	178,08
1500	60"	1534,9	163,53	204,12	255,14	163,52	204,14	255,16	156,29	204,14
1600	64"	1636,9	185,68	232	290,15	185,72	232,02	290,17	177,64	232,01
1700	68"	1738,9	209,3	261,66	327,04	209,36	261,68	327,45	200,39	261,68
1800	72"	1840,9	234,37	293,17	366,96	234,36	293,19	367	224,54	293,19
1900	76"	1942,9	260,9	326,6	408,86	260,92	326,62	408,89	250,1	326,62
2000	80"	2044,9	288,79	361,6	453	288,81	361,62	453,11	277,06	361,62
2100	84"	2146,9	318,12	398,55	499,44	318,15	398,57	499,6	305,44	398,57
2200	88"	2248,9	348,94	437,42	548,5	348,96	437,44	548,26	335,24	437,44
2300	92"	2350,9	381,26	477,91	599,46	381,28	477,96	599,48	366,45	447,96
2400	96"	2452,9	415,15	520,4	653,14	415,17	520,42	653,16	399,09	520,42
2500	100"	2554,9	450,16	564,66	708,6	450,19	564,69	708,62	433,16	564,64
2600	104"	2656,9	486,82	610,82	766,61	486,84	610,86	766,64	468,65	610,88
2700	108"	2758,9	524,82	658,79	827,04	524,83	658,9	827,07	505,57	658,85
2800	112"	2860,9	564,64	708,87	889,88	564,67	708,67	889,91	543,93	708,63
2900	116"	2962,9	605,43	760,39	954,85	605,5	760,42	954,73	583,73	760,42
3000	120"	3064,9	647,87	813,78	1022,16	648,01	813,81	1022,19	624,96	813,81
3100	124"	3166,9	691,91	869,3	1092,17	691,92	869,3	1092,17	667,64	869,29
3200	128"	3268,9	737,39	926,54	1164,23	737,29	926,54	1164,23	711,76	926,54
3300	132"	3370,9	784,27	985,52	1238,67	784,21	985,52	1238,66	757,33	985,52
3400	136"	3472,9	832,58	1046,4	1316,06	833,02	1046,4	1316,08	804,34	1046,4
3500	140"	3574,9	882,44	1109,49	1394,68	882,5	1109,49	1394,68	852,81	1109,49
3600	144"	3676,9	933,91	1174,05	1476,4	933,91	1174,05	1476,59	902,73	1174,05
3700	148"	3778,9	986,46	1241,24	1549,88	986,46	1241,24	1549,88	954,11	1241,24
3800	152"	3880,9	1041,19	1309,01		1041,19	1309,01		1006,95	1309,01
3900	156"	3982,9	1096,63	1379,37		1096,62	1379,37		1061,24	1379,37
4000	160"	4084,9	1153,86	1451,65		1153,86	1451,66		1117	1451,66

4. grp couplings

Kuzyboru is among the few manufacturers offering both options by producing two types of couplings that provide excellent sealing for the joining of GRP pipes. Kuzyboru GRP pipes and fittings can be shipped with either REKA Type or Zeroleak Couplings attached to one end.



• Reka Type

Zeroleak Couplings

SERIES	Nominal Diameter (DN)	Coupling Width	ZEROLEAK Coupling Outer Diameter (±3 mm)					
	DN (mm)	W (mm)	PN 6	PN 10	PN 16	PN 20	PN 25	PN 32
B2 SERIES	300	250	365	370	375	380	385	390
	350	250	415	420	425	430	435	440
	400	250	465	470	475	480	485	490
	450	250	515	520	525	530	535	540
	500	250	570	575	580	585	590	595
B1 SERIES	600	278	648	653	658	663	668	673
	700	278	755	760	765	770	775	780
	800	278	865	870	875	880	885	890
	900	278	960	965	970	975	980	985
	1000	278	1075	1080	1085	1090	1095	1100
	1100	278	1165	1170	1175	1180	1185	1190
	1200	278	1280	1285	1290	1295	1300	1305
	1300	278	1370	1375	1380	1385	1390	1395
	1400	278	1485	1490	1495	1500	1505	1510
	1500	278	1580	1585	1590	1595	1600	1605
	1600	278	1695	1700	1705	1710	1715	1720
	1700	298	1785	1790	1795	1800	1805	1815
	1800	298	1900	1905	1910	1915	1925	
	1900	298	1990	1995	2000	2015	2030	
	2000	298	2105	2110	2115	2125	2155	
	2100	298	2195	2200	2205	2220	2250	
	2200	298	2310	2315	2320	2330	2360	
	2300	298	2400	2405	2410	2420	2450	
	2400	298	2515	2520	2525	2535	2540	
	2500	314	2600	2605	2610			
	2600	314	2715	2720	2725			
	2700	314	2810	2815	2820			
	2800	314	2920	2925	2930			
	2900	314	3015	3020	3025			
	3000	314	3130	3135	3140			
	3100	334	3225	3230	3235			
	3200	334	3335	3340	3345			
	3300	334	3430					
	3400	334	3545					
	3500	334	3640					
	3600	334	3750					
	3700	334	3845					
	3800	334	3960					
	3900	334	4055					
	4000	334	4165					

Wall Coupling

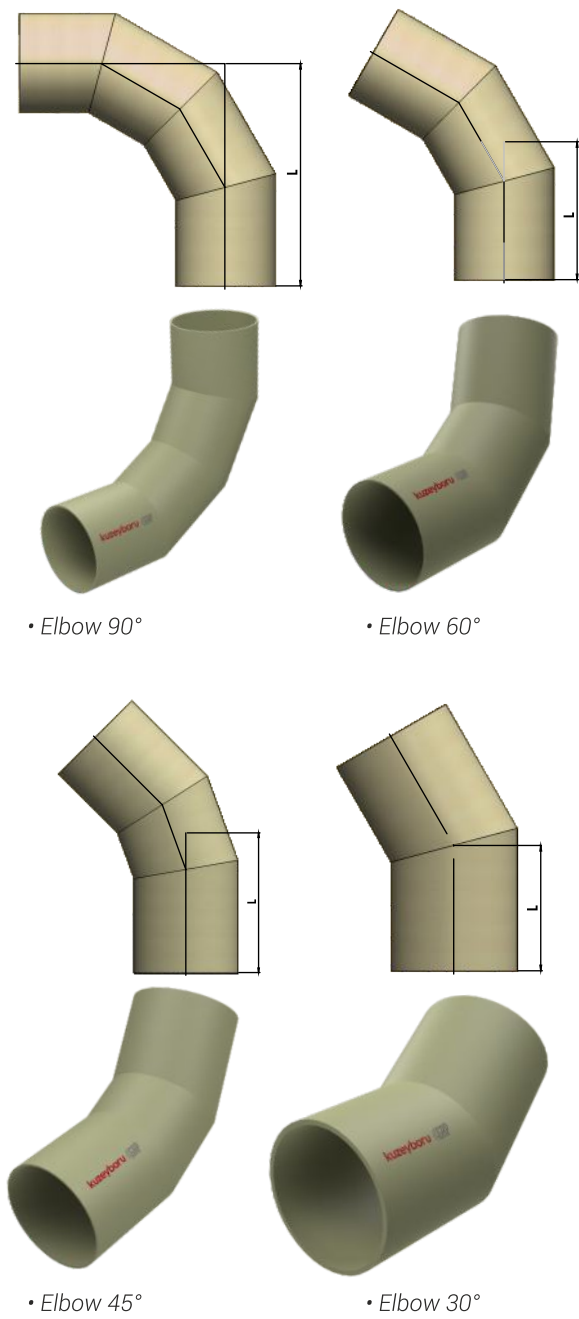
Wall couplings are used at the connection points of GRP pipe lines with concrete structures. To ensure tight adhesion between the GRP concrete coupling and the concrete structure, the GRP concrete couplings are coated with sand or gravel. Upon request, concrete couplings can be produced up to 3 meters in length.

SERIES	Nominal Diameter (DN)	Coupling Width	REKA Coupling Outer Diameter (mm) (±3 mm)					
	DN (mm)	W (mm)	PN 6	PN 10	PN 16	PN 20	PN 25	PN 32
B2 SERIES	300	270	359	360	361	362	363	
	350	270	411	412	413	414	416	
	400	270	462	463	464	465	467	
	450	270	513	514	515	517	518	
	500	270	548	550	551	553	555	
B1 SERIES	600	300	655	660	663	665	667	
	700	300	760	764	767	769	772	
	800	300	863	867	870	873	876	
	900	300	965	970	974	977	979	
	1000	300	1067	1073	1077	1080	1084	
	1100	300	1170	1176	1180	1184	1188	
	1200	300	1272	1279	1284	1288	1292	
	1300	300	1375	1383	1388	1392	1396	
	1400	300	1478	1486	1491	1496	1500	
	1500	300	1580	1589	1595			
	1600	300	1683	1692	1698			
	1700	300	1785	1795	1802			
	1800	300	1888	1898	1905			
	1900	300	1990	2002	2009			
	2000	300	2093	2105	2112			
	2100	300	2195	2208	2216			
	2200	300	2298	2311	2319			
	2300	300	2400	2414	2423			
	2400	300	2503	2517	2526			
	2500	330	2607	2620				
	2600	330	2711	2723				
	2700	330	2815	2826				
	2800	330	2919	2929				
	2900	370	3040	3050				
	3000	370	3144	3148				
	3100	370	3246	3251				
	3200	370	3349	3353				
	3300	370	3451	3456				
	3400	370	3554	3559				
	3500	370	3656	3662				
	3600	370	3759	3765				
	3700	370	3861	3868				
	3800	370	3964	3971				
	3900	370	4066	4074				
	4000	370	4169	4177				

5. kuzeyboru grp fittings

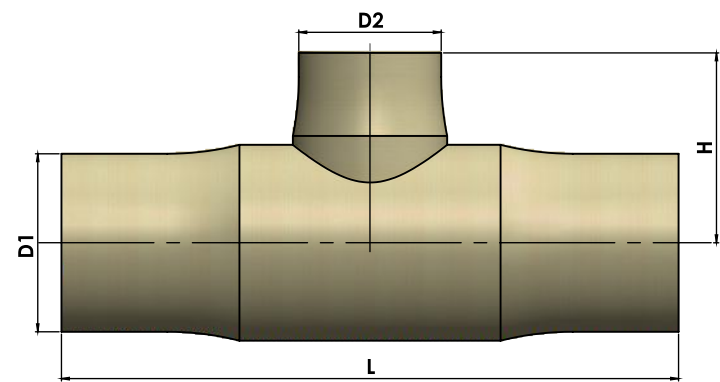
Fittings such as tees, elbows, reducers, and flanges used in GRP pipelines are also produced by Kuzeyboru. Details and dimensions of these fittings are provided in the accompanying tables.

5.1. Elbows



Kuzeyboru Standard Elbow Dimensions PN6/PN10							
Miter No	1				2		3
Angle Degrees	11,25°	15°	22,5°	30°	45°	60°	90°
DN (mm)	L				L		L
300	300	300	325	350	425	475	675
350	300	300	325	350	450	525	725
400	350	350	375	400	500	575	825
450	350	350	400	425	550	650	975
500	350	350	400	425	550	650	975
600	350	350	450	475	625	725	1100
700	425	425	450	500	675	800	1225
800	425	425	475	550	725	875	1375
900	425	425	500	575	750	900	1425
1000	450	450	525	600	775	950	1475
1100	500	500	550	625	825	1025	1575
1200	500	500	550	625	850	1050	1625
1300	525	525	575	675	900	1100	1675
1400	525	525	600	700	925	1125	1725
1500	575	575	675	750	1050	1275	1925
1600	625	625	700	825	1125	1325	2025
1700	700	700	800	875	1225	1425	2225
1800	700	700	800	875	1225	1425	2225
1900	725	725	825	925	1325	1525	2425
2000	725	725	825	925	1325	1525	2425
2100	800	800	900	975	1425	1625	2625
2200	800	800	900	975	1425	1625	2625
2300	825	825	925	1025	1525	1725	2825
2400	825	825	925	1025	1525	1725	2825
2500	1025	1025	1125	1225	1725	1925	3025
2600	1025	1025	1125	1225	1725	1925	3025
2700	1125	1125	1225	1325	1825	2025	3225
2800	1125	1125	1225	1325	1825	2025	3225
2900	1225	1225	1325	1425	1925	2125	3425
3000	1225	1225	1325	1425	1925	2125	3425
3100	1325	1325	1425	1525	2025	2225	3625
3200	1325	1325	1425	1625	2025	2225	3625
3300	1425	1425	1525	1725	2125	2325	3825
3400	1425	1425	1525	1725	2125	2325	3825
3500	1525	1525	1625	1825	2225	2425	4025
3600	1525	1525	1625	1825	2225	2425	4025
3700	1625	1625	1725	1925	2325	2525	4225
3800	1625	1625	1725	1925	2325	2525	4225
3900	1725	1725	1825	2025	2425	2625	4425
4000	1725	1725	1825	2025	2425	2625	4425

5.2. Tee Pieces (Equal & Unequal)



• Equal Tee

• Unequal Tee

Kuzeyboru T Piece Dimensions PN6/PN10			
D1 (mm)	D2 (mm)	L (mm)	H (mm)
300	100	750	400
	150	850	400
	200	950	410
	250	950	410
	300	1050	430
350	150	850	420
	200	950	440
	250	950	440
	300	1050	450
	350	1250	480
400	200	950	460
	250	950	460
	300	1050	480
	350	1250	510
	400	1350	540
450	200	950	490
	300	1050	500
	350	1250	530
	400	1350	570
	450	1450	600
500	200	950	520
	300	1050	530
	400	1350	600
	450	1450	630
	500	1550	640
600	200	950	570
	300	1050	580
	400	1350	650
	450	1450	680
	600	1750	720
700	200	950	620
	350	1350	670
	450	1550	730
	500	1650	750
	700	1950	800
800	200	950	670
	350	1350	740
	450	1650	800
	600	1850	840
	800	2150	900

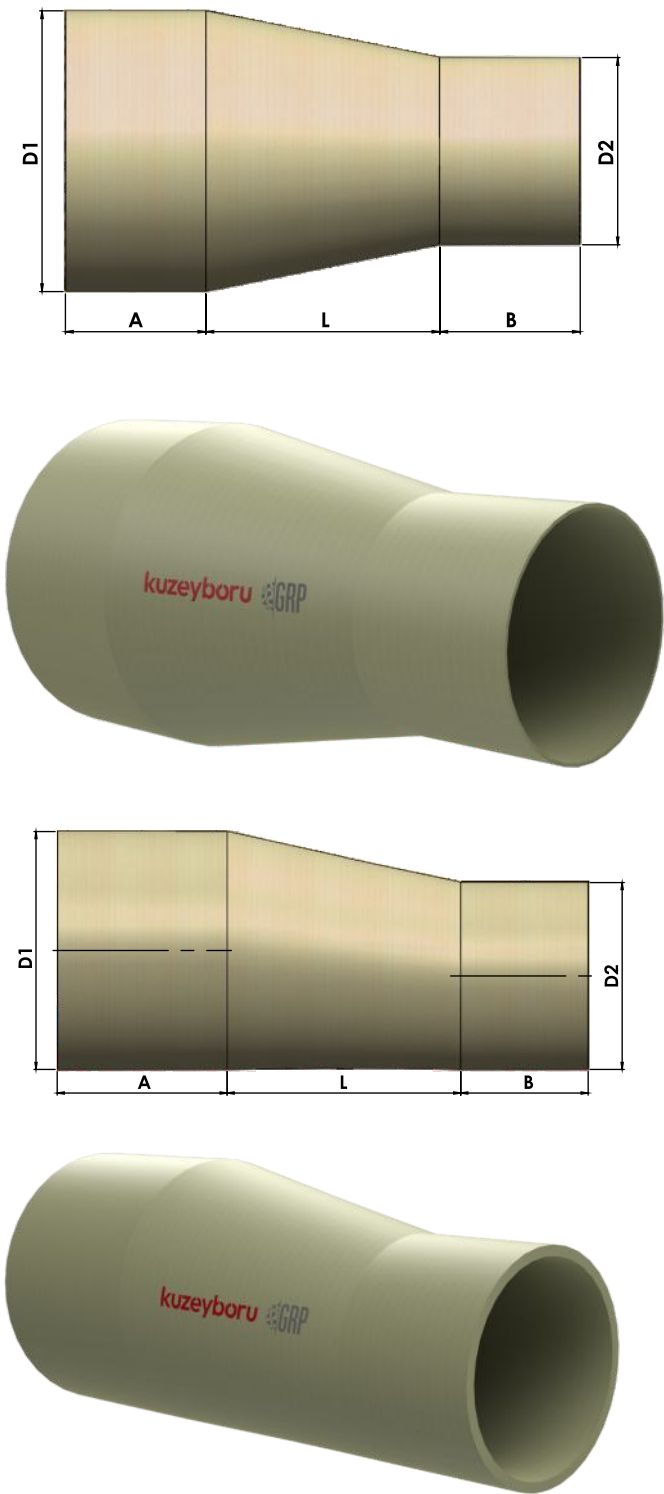
Kuzeyboru T Piece Dimensions PN6/PN10			
D1 (mm)	D2 (mm)	L (mm)	H (mm)
900	200	1050	730
	350	1450	800
	500	1750	880
	700	2050	930
	900	2250	980
1000	200	1050	790
	350	1450	870
	500	1850	950
	700	2050	1000
	1000	2450	1070
1100	200	1050	840
	400	1650	970
	600	2050	1040
	800	2250	1090
	1100	2650	1160
1200	200	1050	900
	400	1750	1040
	600	2050	1100
	900	2450	1180
	1200	2850	1260
1300	200	1050	950
	400	1750	1100
	700	2250	1200
	1000	2650	1270
	1300	2950	1340
1400	200	1150	1020
	400	1750	1150
	700	2250	1250
	1000	2650	1320
	1400	3150	1430
1500	200	1150	1080
	450	1950	1250
	800	2450	1340
	1100	2750	1420
	1500	3350	1520
1600	200	1150	1130
	450	1950	1310
	800	2450	1410
	1200	2950	1510
	1600	3450	1600

Kuzeyboru T Piece Dimensions PN6/PN10			
D1 (mm)	D2 (mm)	L (mm)	H (mm)
1700	200	1150	1190
	450	1950	1360
	900	2550	1480
	1300	3050	1570
	1700	3650	1690
1800	200	1150	1250
	450	2050	1430
	900	2650	1540
	1300	3150	1640
	1800	3750	1780
1900	200	1250	1300
	500	2150	1500
	1000	2750	1620
	1400	3250	1730
	1900	3950	1860
2000	200	1250	1360
	500	2150	1570
	1000	2850	1690
	1500	3450	1800
	2000	4050	1940
2100	200	1250	1420
	500	2150	1620
	1100	2950	1770
	1600	3550	1890
	2100	4250	2030
2200	200	1250	1470
	500	2250	1680
	1100	2950	1830
	1600	3650	1950
	2200	4350	2120
2300	200	1250	1530
	600	2350	1760
	1200	3150	1920
	1700	3750	2030
	2300	4550	2200
2400	200	1250	1580
	600	2450	1820
	1200	3150	1980
	1800	3950	2130
	2400	4650	2280
2500	200	1350	1660
	600	2450	1880
	1300	3350	2040
	1900	4050	2200
	2500	4850	2360

Kuzeyboru T Piece Dimensions PN6/PN10			
D1 (mm)	D2 (mm)	L (mm)	H (mm)
2600	200	1350	1720
	600	2550	1950
	1300	3350	2110
	1900	4150	2260
	2600	5050	2450
2700	200	1350	1770
	700	2650	2010
	1400	3550	2190
	2000	4250	2340
	2700	5150	2530
2800	200	1450	1830
	700	2650	2080
	1400	3550	2260
	2100	4450	2430
	2800	5350	2610
2900	200	1450	1880
	700	2650	2130
	1500	3650	2320
	2200	4550	2520
	2900	5450	2690
3000	200	1450	1940
	700	2750	2200
	1500	3750	2390
	2200	4650	2580
	3000	5650	2770
3100	200	1450	2000
	800	2850	2280
	1600	3850	2470
	2300	4750	2650
	3100	5750	2860
3200	200	1450	2050
	800	2950	2350
	1600	3950	2540
	2400	4950	2750
	3200	5950	2950
3300	200	1550	2110
	800	2950	2400
	1700	4050	2610
	2500	5050	2820
	3300	6150	3040
3400	200	1550	2170
	800	2950	2460
	1700	4050	2680
	2500	5050	2880
	3400	6350	3160

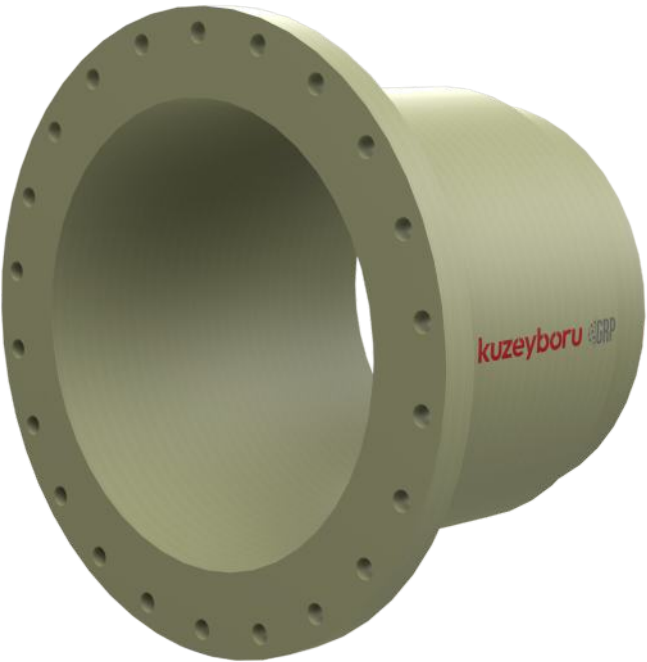
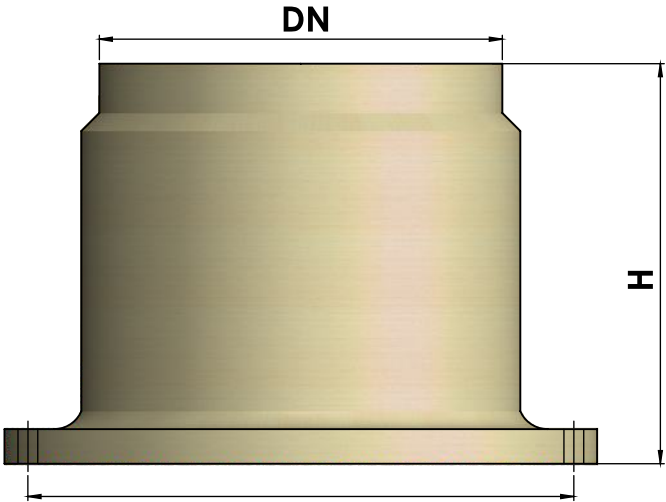
Kuzeyboru T Piece Dimensions PN6/PN10			
D1 (mm)	D2 (mm)	L (mm)	H (mm)
3500	200	1550	2220
	800	2950	2510
	1700	4050	2730
	2500	5050	2930
	3500	6550	3260
3600	200	1550	2280
	800	3050	2580
	1700	4150	2790
	2500	5150	3000
	3600	6650	3330
3700	200	1550	2330
	800	3050	2630
	1700	4150	2840
	2500	5150	3050
	3700	6850	3420
3800	200	1550	2390
	800	3050	2700
	1700	4150	2910
	2500	5150	3120
	3800	7050	3510
3900	200	1650	2450
	800	3050	2750
	1700	4150	2960
	2500	5150	3170
	3900	7150	3590
4000	200	1650	2500
	800	3150	2810
	1700	4250	3030
	2500	5250	3230
	4000	7350	3680

5.3. Reducers



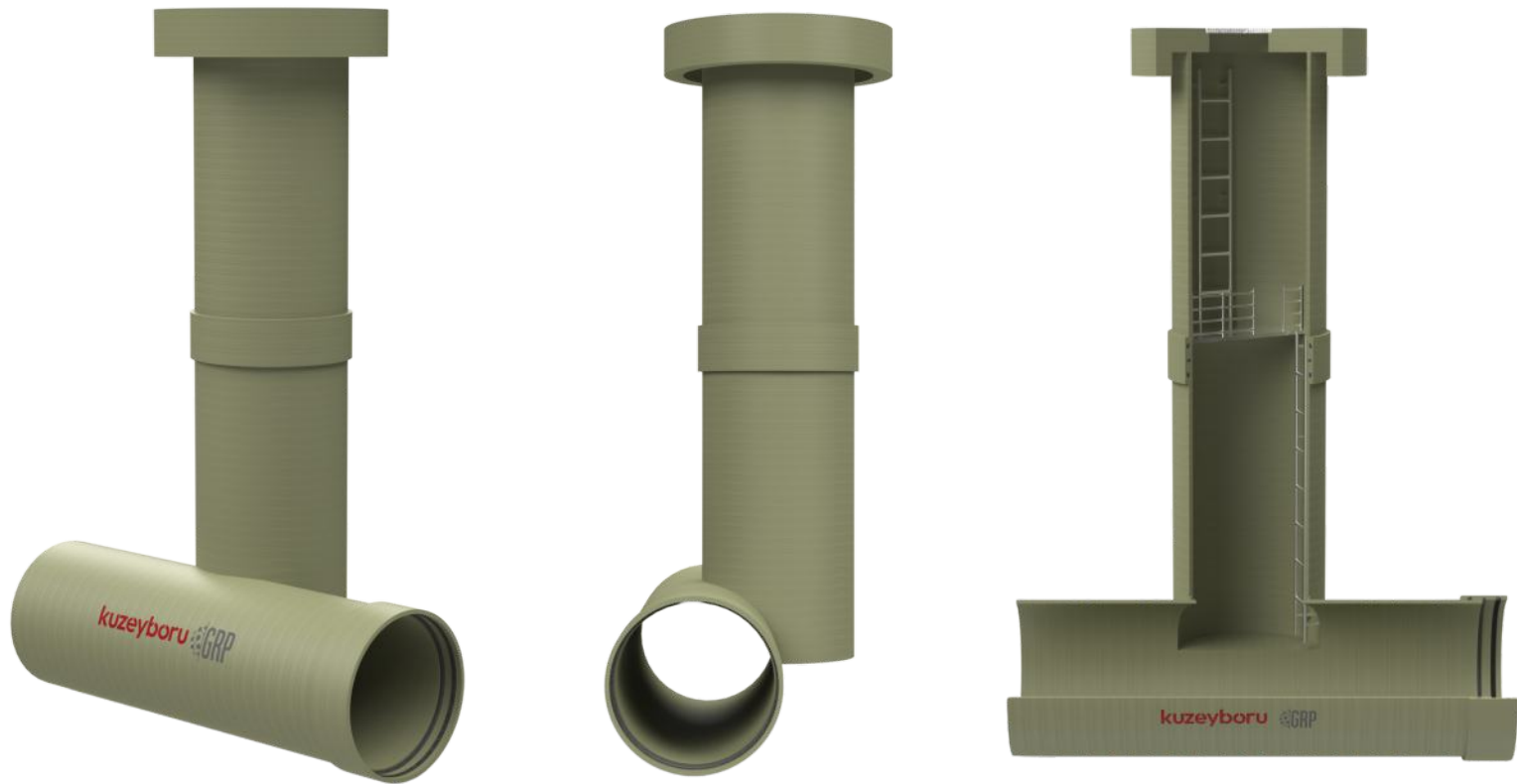
Kuzeyboru GRP Reducer Dimensions PN6/PN10				
DL (mm)	D2 (mm)	A=B (mm)	L (mm)	Total Height (mm)
300	200	400	250	1050
300	250	400	125	925
350	250	400	250	1050
350	300	400	125	925
400	300	400	250	1050
400	350	400	125	925
500	350	400	375	1175
500	400	400	250	1050
600	400	400	500	1300
600	500	400	250	1050
700	500	400	500	1300
700	600	400	250	1050
800	600	400	500	1300
800	700	400	250	1050
900	700	400	500	1300
900	800	400	250	1050
1000	800	400	500	1300
1000	900	400	250	1050
1200	900	500	750	1750
1200	1000	500	500	1500
1400	1000	500	1000	2000
1400	1200	500	500	1500
1600	1200	600	1000	2200
1600	1400	600	500	1700
1800	1400	600	1000	2200
1800	1600	600	500	1700
2000	1600	600	1000	2200
2000	1800	600	500	1700
2200	2000	600	500	1700
2200	2100	600	250	1450
2400	2200	600	500	1700
2400	2300	600	250	1450
2600	2400	750	500	2000
2600	2500	750	250	1750
2800	2600	750	500	2000
2800	2700	750	250	1750
3000	2800	750	500	2000
3000	2900	750	250	1750
3200	3000	900	500	2300
3200	3100	900	250	2050
3400	3200	900	500	2300
3400	3300	900	250	2050
3600	3400	1050	500	2600
3600	3500	1050	250	2350
3800	3600	1050	500	2600
3800	3700	1050	250	2350
4000	3800	1100	500	2700
4000	3900	1100	250	2450

5.4. Flanges



Kuzeyboru GRP Flange Dimensions PN1/PN16			
DN (mm)	H (mm)	DN (mm)	H (mm)
300	700	2100	1100
350	700	2200	1100
400	700	2300	1200
450	700	2400	1200
500	700	2500	1300
600	800	2600	1300
700	800	2700	1400
800	800	2800	1400
900	800	2900	1500
1000	800	3000	1500
1100	900	3100	1600
1200	900	3200	1600
1300	900	3300	1800
1400	900	3400	1800
1500	900	3500	2000
1600	1000	3600	2000
1700	1000	3700	2000
1800	1000	3800	2000
1900	1000	3900	2000
2000	1000	4000	2000

6. grp manhole



GRP manholes are made from durable composite materials consisting of fiberglass-reinforced thermoset resin and silica sand. This composite structure provides the manholes with high durability, corrosion resistance, and a long service life. GRP manholes, which can be used in both underground and aboveground applications, are designed to meet various industrial needs.

6.1.GRP Manhole Applications

Kuzeyboru GRP manholes are widely used in water and wastewater infrastructure projects, industrial facilities, piping systems of chemical production plants, circulation lines of power plants, and transmission lines of hydroelectric power plants. These manholes, preferred in many areas such as stormwater and drainage systems, sewer lines, and underwater pipe applications, provide reliable solutions across a broad range of applications.

6.2.Advantage of Kuzeyboru GRP Manholes

GRP manholes stand out for their long lifespan and durable structure. With a minimum service life of 50 years, these manholes operate smoothly across a wide pH range and provide excellent resistance to corrosion. Their lightweight design offers significant advantages in transport and installation; they do not require special equipment during assembly and can be quickly installed. Compared to steel, cast iron, and concrete manholes, GRP manholes are much lighter, making them easy to transport and practical to install.

Kuzeyboru **GRP** manholes provide low hydraulic losses with their smooth inner surface structure, ensuring efficient transmission of water and wastewater with minimal friction. Their fully integrated elastomeric gasket connection system ensures leak-tightness, creating safe and robust connections.

7. design characteristics

7.1.Hydraulic Roughness

Pipe roughness is a key parameter for hydraulic calculations and analyses. The values to be used for KuzeYboru GRP pipes are as follows:

Table 2 Hydraulic roughness

Manning (n)	0,009
Hazen-Williams (c)	150
Colebrook-White (k)	0,029

Due to the smooth inner surface of the pipe, hydraulic losses are lower compared to other types of pipes such as steel pipes. This superior feature of GRP pipes reduces the investment costs for equipment like pumps and the amount of energy consumed during operation. The excellent hydraulic properties of GRP pipes also have a positive environmental impact by reducing energy consumption during operation.

7.2.Flow Velocity

The recommended maximum flow rate for GRP pipes is 3.0 m/s. If the water is clean and does not contain abrasive substances, flow rates can go up to 5.0 m/s. For higher flow rates, KuzeYboru can design special products depending on the fluid.

7.3.UV Resistance

The primary source of ultraviolet rays is sunlight. Long-term performance tests and research have shown that sunlight does not cause any weakening in GRP pipes, only potential color changes on the outer surface. KuzeYboru GRP pipes are manufactured to withstand UV rays. However, if requested, the outer surfaces of the pipes can be coated with gelcoat or special designs by KuzeYboru can be applied.

7.4.Poisson Coefficient

The Poisson's ratio is directly related to the structure of the pipe.

KuzeYboru GRP pipes have a Poisson's ratio of 0.22 – 0.29 for circumferential loads in the axial direction. The effect of axial load in the circumferential direction, or the Poisson's ratio, is slightly lower than this and can be considered negligible.

7.5.Thermal Coefficient

The thermal coefficient for axial elongation and contraction for KuzeYboru GRP pipes is $24-30 \times 10^{-6} \text{ mm/mm/}^{\circ}\text{C}$

7.6.Abrasion Resistance

Abrasion resistance is related to the effects of sand and similar materials within the fluid on the inner surface of the pipe. Although there is not yet a standardized procedure or classification method for this issue, the average abrasion loss for GRP pipes has been determined to be 0.34 mm over 100,000 cycles according to the Darmstadt Test Method. If necessary, KuzeYboru designs special GRP pipes with high resistance to abrasion.

7.7.Operating Temperature

The abrasion resistance is related to the effects of materials such as sand present in the fluid on the inner surface of the pipe. Although there is no standardized procedure or classification method established for this issue, the average abrasion loss of GRP pipes has been determined to be 0.34 mm over 100,000 cycles according to the Darmstadt Test Method. If required, KuzeYboru designs special GRP pipes with high resistance to abrasion.

Table 3 Resin types according to operation temperature

OPERATION TEMPERATURE	PRESSURE DERATING RATIO PN (1-% Değerlendirme Oranı)	RESIN TYPE
Temp ≤ 35°C	PN Class	Terephthalic, Orthophthalic, Isophthalic
36°C < Temp ≤ 50°C	The nominal pipe pressure should be reanalyzed and evaluated according to operating conditions.	Terephthalic, Orthophthalic, Isophthalic
36 °C < Temp ≤ 40 °C 41 °C < Temp ≤ 45 °C 46 °C < Temp ≤ 50 °C	Pressure Derating Ratio : 30 % Pressure Derating Ratio: 40 % Pressure Derating Ratio : 50 %	he type of resin to be used should be determined according to project conditions.
50 °C < Temp	Pressure Derating Ratio : 50 %	Vinyl ester resin should be used either only in the liner layer or in all layers of the pipe, depending on the project conditions.

7.8.Negative Pressure (Vacuum)

If there is negative pressure in the pipeline, pipes with high stiffness values should be preferred. For buried pipelines with a negative pressure of -0.5 bar, it is recommended to use SN5000 pipes and ensure a minimum burial depth of 1 meter.

7.9.Water Hammer Pressure

In pipelines, sudden opening or closing of valves, or sudden stopping or starting of pumps, can cause sudden pressure surges known as water hammer. GRP pipes are less affected by water hammer compared to steel or similar pipes. Kuzeyboru GRP pipes can withstand water hammer up to 40% of their nominal pressure.



8. quality control and performance tests

8.1.Quality

During the production of high-quality Kuzeyboru GRP pipes, tests and measurements are meticulously conducted according to relevant standards at every stage, from the arrival of raw materials at the factory to the shipment of the produced GRP pipes.

Table 4 GRP pipe inspection tests

GRP PIPE LABORATORY TESTS	STANDARD
Barcol Hardness Test	TS EN 59
Long Term Ring Bending Test	TS ISO 10466
Circumferencial Tensile Test	(Method B, Method D) TS ISO 8521 (Method B, Method D)
Stiffness Test	TS EN 1228 (Method B) ASTM D2412 TS ISO 7685 (Method B)
Axial Tensile Test	TS ISO 8513 (Method A)
Dimensional Controls (Length,OD, Wall thickness)	TS EN ISO 3126
Hydrostatic Pressure Test	ISO 7511 (Method A)

8.1.1.Raw Material Acceptance Tests

For the raw materials provided by approved suppliers with certificates demonstrating their compliance with quality standards, Kuzeyboru performs initial raw material entry control tests on resin, fiber, and sand in accredited Kuzeyboru laboratories within the framework of quality standards. Materials that meet the acceptance criteria are used in production.

- Glassfiber Tests
- Resin Control Tests
- Filler Silica Sand Tests

8.1.2. Tests Performed on All Produced Pipes

During the production process of Kuzeyboru GRP pipes, the following tests are conducted to check the conformity of the produced pipes to the criteria.

Visual Controls	: The pipes and fittings shall be free from defects s uch as notches, holes, cracks, pits, foreign materials, air bubbles, and resin-deficient areas that could affect their strength and operational capability.
Barcol Hardness	: The surface hardness of the produced pipe is measured using a Barcol Hardness Impressor.
Pipe Wall Thickness Control	: The wall thicknesses of the pipes are measured to check their conformity.
Pipe Length Control	: The lengths of all produced pipes are measured and checked.
Diameter Control	: All pipes undergo diameter checks to ensure compliance with standards.
Hydrostatic Pressure Test	: The manufactured pipes are tested using a hydrostatic test device.

8.1.3. Tests Performed on Produced Pipes Using Sampling Method

The produced pipes are subjected to the following tests using a sampling system in accordance with the requirements of standards and specifications.

- Stiffness test
- Structural Deterioration Control Under High Deflection
- Circumferential Tensile Test
- Axial Tensile Test
- Composite Test

8.1.4. Qualification Tests

In addition to raw material acceptance, product, and performance tests, the following tests are also conducted to determine if the produced pipes meet the required standards and to monitor their long-term performance.

Tests lasting over 10,000 hours aim to create design data and ensure predictable performance. In other words, according to ISO 10928 standards, the necessary physical parameters for the targeted nominal design life of 50 years are determined during this process. Typically, at least eighteen samples are prepared in the study, allowing for the collection of different data points throughout the testing period. A graph is created using the least squares method in logarithmic regression analysis. The performance values that meet the 50 year service life of the GRP pipe should be presented in accordance with the tables in international standards.

Strain Corrosion Test

- Hydrostatic Design Basis (HDB)
- Long Term Ring Bending Test
- Long Term Ring Stiffness Test
- Abrasion resistance Test
- Joint Tests
-





CHEMICAL RESISTANCE TABLE		
MATERIAL NAME	POLYESTER RESIN	VINYLESTER
Acetic Acid < 20%		X
Adipic Acid		X
Alum (Aluminum Potassium Sulfate)	X	
Aluminum Chloride, Aqueous	X	
Ammonia, Aqueous < 20%		X
Ammonium Chloride, Aqueous (40°C)	X	X
Ammonium Nitrate, Aqueous (40°C)	X	
Ammonium Phosphate-Monobasic, Aqueous	X	
Ammonium Sulfate, Aqueous	X	
Aniline Hydrochloride		X
Barium Carbonate		X
Barium Chloride		X
Barium Sulfate		X
Beet Sugar Liquor		X
Benzene Sulfonic Acid (10%) *		X
Benzoic Acid *		X
Black Liquor (Paper)		X
Borax (40°C)	X	
Boric Acid		X
Bromine, Aqueous (5%) *		X
Butyric Acid < 25% (40°C)*		X
Calcium Bisulfide *	X	
Calcium Carbonate	X	
Calcium Chlorate, Aqueous (40°C)	X	
Calcium Chloride (Saturated) (40°C)	X	
Calcium Hydroxide, 100%		X
Calcium Hypochlorite *		X
Calcium Nitrate (40°C)	X	
Calcium Sulfate NL AOC	X	
Cane Sugar Liquor		X
Carbon Dioxide, Aqueous	X	

Casein	X	
Caustic Potash (KOH) (40°C)		X
Chlorine, Dry Gas *		X
chlorine, water *		X
chlorine, wet gas *		X
citric acid, aqueous		X
copper acetate, aqueous (40°C)	X	
copper nitrate, aqueous (40°C)	X	
copper sulfate, aqueous (40°C)	X	
crude oil (sour) (30°C) *	X	
crude oil (sweet) (30°C) *	X	
crude oil, salt water (25°C) *		X
cyclohexane (40°C) *		X
cyclohexanol (30°C) *		X
fuel oil (25°C) *	X	
gasoline, ethyl *		X
glycerine		X
green liquor, paper		X
hexane *		X
hydrochloric acid, up to 15%	X	
kerosene *		X
lactic acid, 10% (30°C)	X	
lead acetate, aqueous (25°C)	X	
lead nitrate, aqueous (25°C)	X	
linseed oil *	X	
lithium bromide, aqueous (40°C) *	X	
lithium chloride, aqueous (40°C) *	X	
magnesium bicarbonate, aqueous (30°C) *	X	
magnesium carbonate (40°C) *	X	X
magnesium sulfate	X	
magnesium chloride, aqueous (25°C) *	X	
manganese chloride, aqueous (40°C) *	X	
manganese sulfate, aqueous (40°C) *	X	
mineral oil *	X	
n-heptane (25°C) *	X	

naphthalene (30°C) *	X	
naptha *		X
oleic acid (40°C)	X	
oxalic acid, aqueous		X
paraffin (30°C) *	X	
perchloric acid (25°C)		X
petroleum, refined & sour *		X
phosphoric acid		X
potassium nitrate, aqueous (40°C)	X	
potassium sulfate (40°C)	X	
propylene glycol (30°C)	X	
sea water (40°C)	X	
sewage (50°C)	X	
silicone oil (40°C)	X	
silver nitrate, aqueous (40°C)	X	
sodium hydroxide 10%		X
sodium mono-phosphate		X
sodium nitrate, aqueous (40°C)	X	
sodium nitrite, aqueous (40°C)*	X	
sodium silicate		X
sodium sulfide		X
sodium tetraborate		X
stannous chloride, aqueous (40°C)	X	
stearic acid, aqueous (40°C)*	X	
sulfuric acid, < 25% (25°C)*	X	
tannic acid, aqueous (35°C)	X	
tartaric acid (30°C)	X	
triethylamine (40°C) *		X
turpentine *		X
urea, aqueous (30°C) *	X	
vinegar (25°C)	X	
water, distilled (40°C)	X	
water, sea (40°C)	X	
water, tap (40°C)	X	
zinc chloride, aqueous (40°C)	X	

Reçine türü seçimi hakkında daha fazla bilgi için lütfen KUZAYBORU ile temasa geçiniz.

Certification and Documents



CERTIFICATE OF CONFORMITY
UYGUNLUK SERTİFİKASI

TÜV AUSTRIA

Certificate No / Sertifikası No : 24-IS-0757-TAT-25-COC-0441

Applicant
Beyrüz Sahbi

Manufacturer
(Üretici)
Kusay Boro Anonim Şirketi
Kırsak OSB Mah. Mehmetçik Bulvarı No: 2 Merkez, Aksaray, Türkiye

Product
(Ürün)
"Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Sewer and Industrial Pressure (GRP) Pipe

Brand Name/Trade Mark
Ticaret Markası

Type/Model(s)
Tipe/Model(ler)
KUZUYBORU

Standards / Certification Basis
Standartlar / Yürürlük Temeli
ASTM D3362-25
Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Sewer Pipe

This Certificate of Conformity is issued on a voluntary basis according to ASTM D3362-25 standard. It confirms that the sample and its technical file submitted for conformity assessment in accordance with the internal factory production control system assessment.

Ref. Inspection Report No.
Ref. Denetim Raporu No. : 24-IS-0757-TAT-25-01-0001 (Annex No. 8.4)

First Issued Date
İlk Verilme Tarihi : 04.10.2024

Next Surveillance Date
Bir Sonraki Denetim Tarihi : 03.10.2026

Expiry Date
Geçerlilik Tarihi : 03.10.2027

This Certificate has been granted to the applicant based on the results of testing performed by the applicant/manufacturer or an accepted laboratory and the consequent review of the test report by TÜV Austria TGA. Reasons to the referenced certification basis or any change of the design, materials, components or processing, manufacturing address may require the repetition of all or some of the qualification tests in order for the test report and therefore the associated certificate to remain valid.

Location / Yür
ANKARA

Date / Tarih
13.10.2025

Approved for and behalf of
TÜV AUSTRIA TÜRKİYE
Eğilim Yöneticisi / Müdürü
T. GÜRKAN GÜRKAN

Accepted for and behalf of
Kusay Boro Anonim Şirketi
Eğilim Yöneticisi / Müdürü
B. SAHBI

CERTIFICATE OF CONFORMITY
UYGUNLUK SERTİFİKASI

TÜV AUSTRIA

Certificate No / Sertifikası No : 24-IS-0757-TAT-25-COC-0442

Applicant
Beyrüz Sahbi

Manufacturer
(Üretici)
Kusay Boro Anonim Şirketi
Kırsak OSB Mah. Mehmetçik Bulvarı No: 2 Merkez, Aksaray, Türkiye

Product
(Ürün)
"Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pressure (GRP) Pipe

Brand Name/Trade Mark
Ticaret Markası

Type/Model(s)
Tipe/Model(ler)
KUZUYBORU

Standards / Certification Basis
Standartlar / Yürürlük Temeli
ASTM D3362-25
Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pressure Pipe

This Certificate of Conformity is issued on a voluntary basis according to ASTM D3362-25 standard. It confirms that the sample and its technical file submitted for conformity assessment in accordance with the internal factory production control system assessment.

Ref. Inspection Report No.
Ref. Denetim Raporu No. : 24-IS-0757-TAT-25-01-0001 (Annex No. 8.5)

First Issued Date
İlk Verilme Tarihi : 04.10.2024

Next Surveillance Date
Bir Sonraki Denetim Tarihi : 03.10.2026

Expiry Date
Geçerlilik Tarihi : 03.10.2027

This Certificate has been granted to the applicant based on the results of testing performed by the applicant/manufacturer or an accepted laboratory and the consequent review of the test report by TÜV Austria TGA. Reasons to the referenced certification basis or any change of the design, materials, components or processing, manufacturing address may require the repetition of all or some of the qualification tests in order for the test report and therefore the associated certificate to remain valid.

Location / Yür
ANKARA

Date / Tarih
13.10.2025

Approved for and behalf of
TÜV AUSTRIA TÜRKİYE
Eğilim Yöneticisi / Müdürü
T. GÜRKAN GÜRKAN

Accepted for and behalf of
Kusay Boro Anonim Şirketi
Eğilim Yöneticisi / Müdürü
B. SAHBI

CERTIFICATE OF CONFORMITY
UYGUNLUK SERTİFİKASI

TÜV AUSTRIA

Certificate No / Sertifikası No : 24-IS-0757-TAT-25-COC-0443

Applicant
Beyrüz Sahbi

Manufacturer
(Üretici)
Kusay Boro Anonim Şirketi
Kırsak OSB Mah. Mehmetçik Bulvarı No: 2 Merkez, Aksaray, Türkiye

Product
(Ürün)
"Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Sewer and Industrial Pressure (GRP) Pipe

Brand Name/Trade Mark
Ticaret Markası

Type/Model(s)
Tipe/Model(ler)
KUZUYBORU

Standards / Certification Basis
Standartlar / Yürürlük Temeli
ASTM D3362-25
Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pressure Pipe

This Certificate of Conformity is issued on a voluntary basis according to ASTM D3362-25 standard. It confirms that the sample and its technical file submitted for conformity assessment in accordance with the internal factory production control system assessment.

Ref. Inspection Report No.
Ref. Denetim Raporu No. : 24-IS-0757-TAT-25-01-0001 (Annex No. 8.6)

First Issued Date
İlk Verilme Tarihi : 04.10.2024

Next Surveillance Date
Bir Sonraki Denetim Tarihi : 03.10.2026

Expiry Date
Geçerlilik Tarihi : 03.10.2027

This Certificate has been granted to the applicant based on the results of testing performed by the applicant/manufacturer or an accepted laboratory and the consequent review of the test report by TÜV Austria TGA. Reasons to the referenced certification basis or any change of the design, materials, components or processing, manufacturing address may require the repetition of all or some of the qualification tests in order for the test report and therefore the associated certificate to remain valid.

Location / Yür
ANKARA

Date / Tarih
13.10.2025

Approved for and behalf of
TÜV AUSTRIA TÜRKİYE
Eğilim Yöneticisi / Müdürü
T. GÜRKAN GÜRKAN

Accepted for and behalf of
Kusay Boro Anonim Şirketi
Eğilim Yöneticisi / Müdürü
B. SAHBI

CERTIFICATE OF CONFORMITY
UYGUNLUK SERTİFİKASI

TÜV AUSTRIA

Certificate No / Sertifikası No : 24-IS-0757-TAT-25-COC-0444

Applicant
Beyrüz Sahbi

Manufacturer
(Üretici)
Kusay Boro Anonim Şirketi
Kırsak OSB Mah. Mehmetçik Bulvarı No: 2 Merkez, Aksaray, Türkiye

Product
(Ürün)
"Fiberglass Pressure (GRP) Pipe

Brand Name/Trade Mark
Ticaret Markası

Type/Model(s)
Tipe/Model(ler)
KUZUYBORU

Standards / Certification Basis
Standartlar / Yürürlük Temeli
ASTM D3362-25
Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pressure Pipe

This Certificate of Conformity is issued on a voluntary basis according to ASTM D3362-25 standard. It confirms that the sample and its technical file submitted for conformity assessment in accordance with the internal factory production control system assessment.

Ref. Inspection Report No.
Ref. Denetim Raporu No. : 24-IS-0757-TAT-25-01-0001 (Annex No. 8.7)

First Issued Date
İlk Verilme Tarihi : 04.10.2024

Next Surveillance Date
Bir Sonraki Denetim Tarihi : 03.10.2026

Expiry Date
Geçerlilik Tarihi : 03.10.2027

This Certificate has been granted to the applicant based on the results of testing performed by the applicant/manufacturer or an accepted laboratory and the consequent review of the test report by TÜV Austria TGA. Reasons to the referenced certification basis or any change of the design, materials, components or processing, manufacturing address may require the repetition of all or some of the qualification tests in order for the test report and therefore the associated certificate to remain valid.

Location / Yür
ANKARA

Date / Tarih
13.10.2025

Approved for and behalf of
TÜV AUSTRIA TÜRKİYE
Eğilim Yöneticisi / Müdürü
T. GÜRKAN GÜRKAN

Accepted for and behalf of
Kusay Boro Anonim Şirketi
Eğilim Yöneticisi / Müdürü
B. SAHBI

CERTIFICATE OF CONFORMITY
UYGUNLUK SERTİFİKASI

TÜV AUSTRIA

Certificate No / Sertifikası No : 24-IS-0757-TAT-25-COC-0445

Applicant
Beyrüz Sahbi

Manufacturer
(Üretici)
Kusay Boro Anonim Şirketi
Kırsak OSB Mah. Mehmetçik Bulvarı No: 2 Merkez, Aksaray, Türkiye

Product
(Ürün)
"Glass-Reinforced Thermosetting Plastic (GRP) Pipes

Brand Name/Trade Mark
Ticaret Markası

Type/Model(s)
Tipe/Model(ler)
KUZUYBORU

Standards / Certification Basis
Standartlar / Yürürlük Temeli
ISO 25780-2011
Standard Specification for "Glass-Reinforced Thermosetting Plastic (GRP) Pipes

This Certificate of Conformity is issued on a voluntary basis according to ISO 25780-2011 standard. It confirms that the sample and its technical file submitted for conformity assessment in accordance with the internal factory production control system assessment.

Ref. Inspection Report No.
Ref. Denetim Raporu No. : 24-IS-0757-TAT-25-01-0001 (Annex No. 8.2)

First Issued Date
İlk Verilme Tarihi : 04.10.2024

Next Surveillance Date
Bir Sonraki Denetim Tarihi : 03.10.2026

Expiry Date
Geçerlilik Tarihi : 03.10.2027

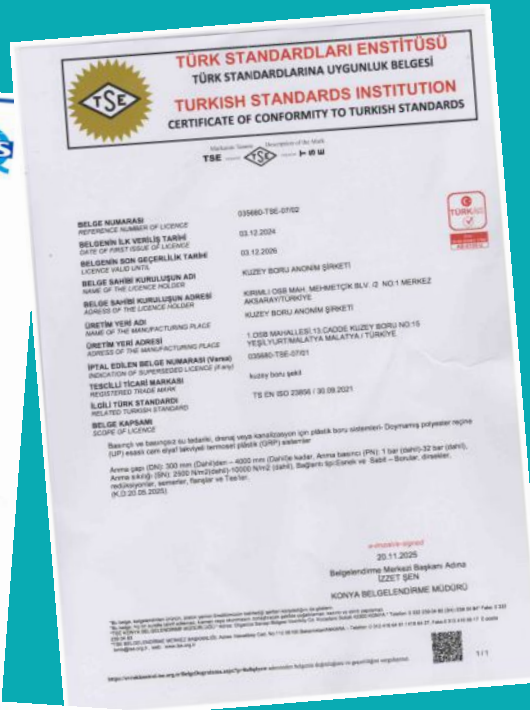
This Certificate has been granted to the applicant based on the results of testing performed by the applicant/manufacturer or an accepted laboratory and the consequent review of the test report by TÜV Austria TGA. Reasons to the referenced certification basis or any change of the design, materials, components or processing, manufacturing address may require the repetition of all or some of the qualification tests in order for the test report and therefore the associated certificate to remain valid.

Location / Yür
ANKARA

Date / Tarih
13.10.2025

Approved for and behalf of
TÜV AUSTRIA TÜRKİYE
Eğilim Yöneticisi / Müdürü
T. GÜRKAN GÜRKAN

Accepted for and behalf of
Kusay Boro Anonim Şirketi
Eğilim Yöneticisi / Müdürü
B. SAHBI





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to women's sports
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