

**ELSAN**

**Quality Beyond Standards!**



**ELSAN**



## About Us

Founded in Denizli in 1980, ELSAN A.Ş. initially operated with a production capacity of 40 tons. Today, the company has reached an annual capacity of 50,000 tons.

By understanding customer needs and developing tailored solutions, ELSAN allocates 35% of its sales to exports and holds prestigious quality certifications, including ISO 9001, IATF 16949, UL Certification, REACH and ROHS.

ELSAN demonstrates its commitment to environmental and employee health through certifications such as ISO 14001, TS EN ISO 50001, and ISO 45001, continuing its journey as a brand serving elite clients worldwide.



Export to  
**35+**  
Countries



**284**  
Employees



Revenue  
**\$130**  
Million



## Our Mission

To produce electromagnetic wires with advanced technology machinery, innovative management systems, and a skilled workforce, in a socially and environmentally responsible manner, for organizations that aspire to add value to life through their products



## Our Vision

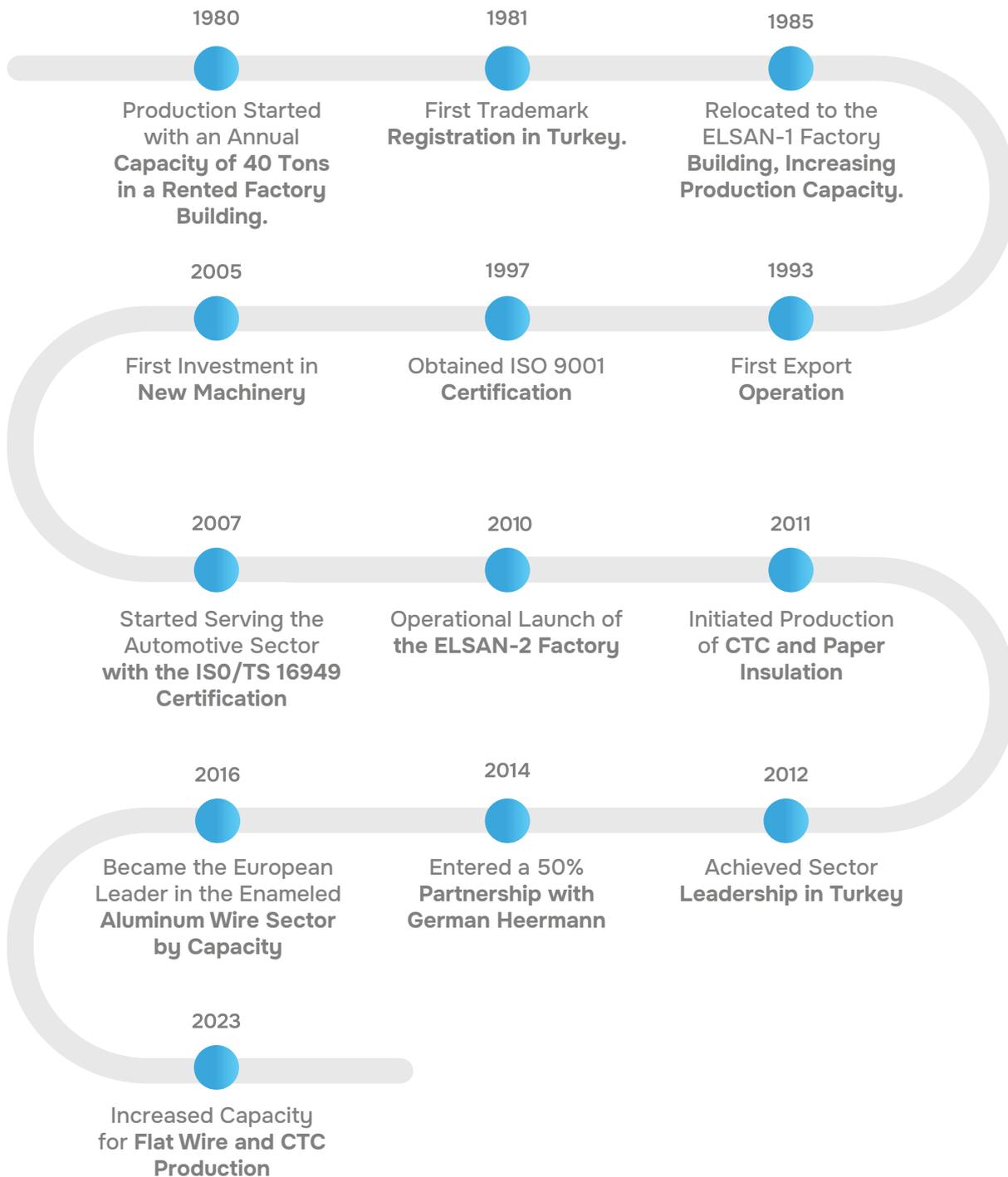
To create happy stakeholders who take pride in our presence that makes every moment of life easier



## Our Values

Sustainability and Social Contribution  
Transparent and Fair Management  
Innovation, Ethics, and Team Spirit  
Reliability and Customer Satisfaction  
Creativity and Initiative  
Employee Satisfaction

# Our Corporate History







# Group Companies

Adm

Gdz

Electricity and Energy Distribution Services in the provinces of Aydın, Denizli, and Muğla

Electricity and Energy Distribution Services in the provinces of İzmir and Manisa

Aydem  
perakende

Gediz  
perakende

Electricity and Energy Supply Services in the provinces of Aydın, Denizli, and Muğla

Electricity and Energy Supply Services in the provinces of İzmir and Manisa

Aydem  
yenilenebilir enerji

## Renewable Energy Sources

Hydroelectric	20 Plants	852mw
Wind	3 Plants	238,5mw
Geothermal	1 Plants	6,9mw
Hybrid	1 Plants	82,15mw

# ELSAN

Conductor Wire Production

Copper: Ranked

1st in Turkey 5th in Europe

Aluminum: Ranked 1st both in Turkey and Europe

parla

Solar Panel and Cell Production

ÇATALAĞZI  
TERMİK SANTRALİ

Total Installed Capacity  
**314.68 MW**

YATAĞAN  
TERMİK ENERJİ

Total Installed Capacity  
**630 MW**



# Production



Quality Beyond Standards



On-Time Delivery



Wide Product Range



## Copper Conductors

	Measurement Range	Ton / Year	
CU	Round	0,03 - 0,10	200
		0,10 - 0,25	700
		0,25 - 1,25	11.000
		1,25 - 6, 00	2.500
	Flat	6-100 mm2	5.000
	Paper Insulated	6-100 mm2	3.000
	CTC	7-63 Tel	5.000

## Aluminum Conductors

	Measurement Range	Ton / Year	
AL	Round	0,30 - 1,00	700
		1,00 - 1,60	750
		1,60 - 5,50	4.000
	Flat	6-100 mm2	1.800
	Paper Insulated	6-100 mm2	1.000

# Quality and Management Certifications

## Product Certifications



## Management Certifications



## Continuous Improvement Methods

FMEA - Failure Modes and Effects Analysis

Kaizen - Continuous Improvement

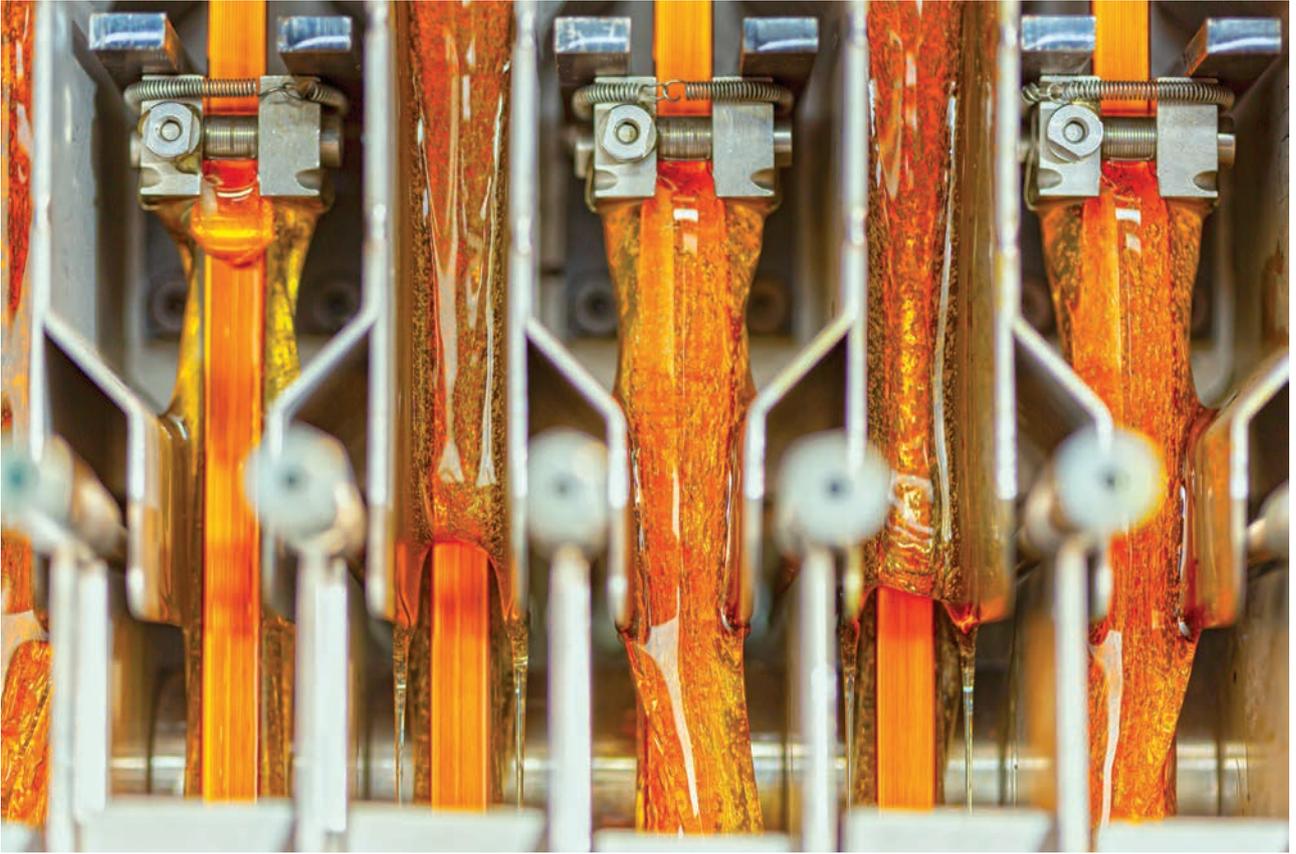
8D - 8-Step Problem Solving

5 Why - Five Whys Technique

FTA - Fault Tree Analysis

LLC - Life Cycle Costing

APQP - Advanced Product Quality Planning



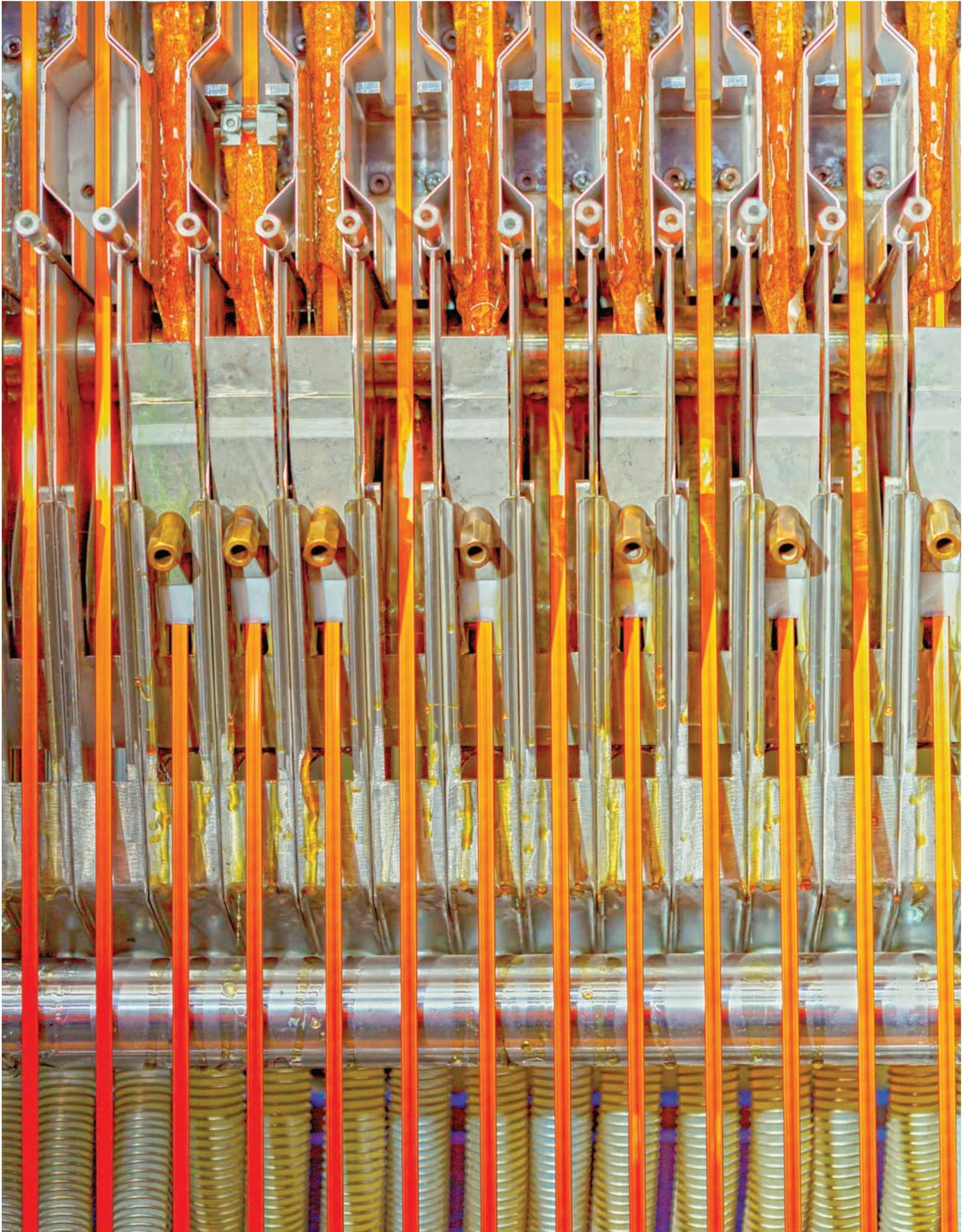
# Enamelled Magnet Wires

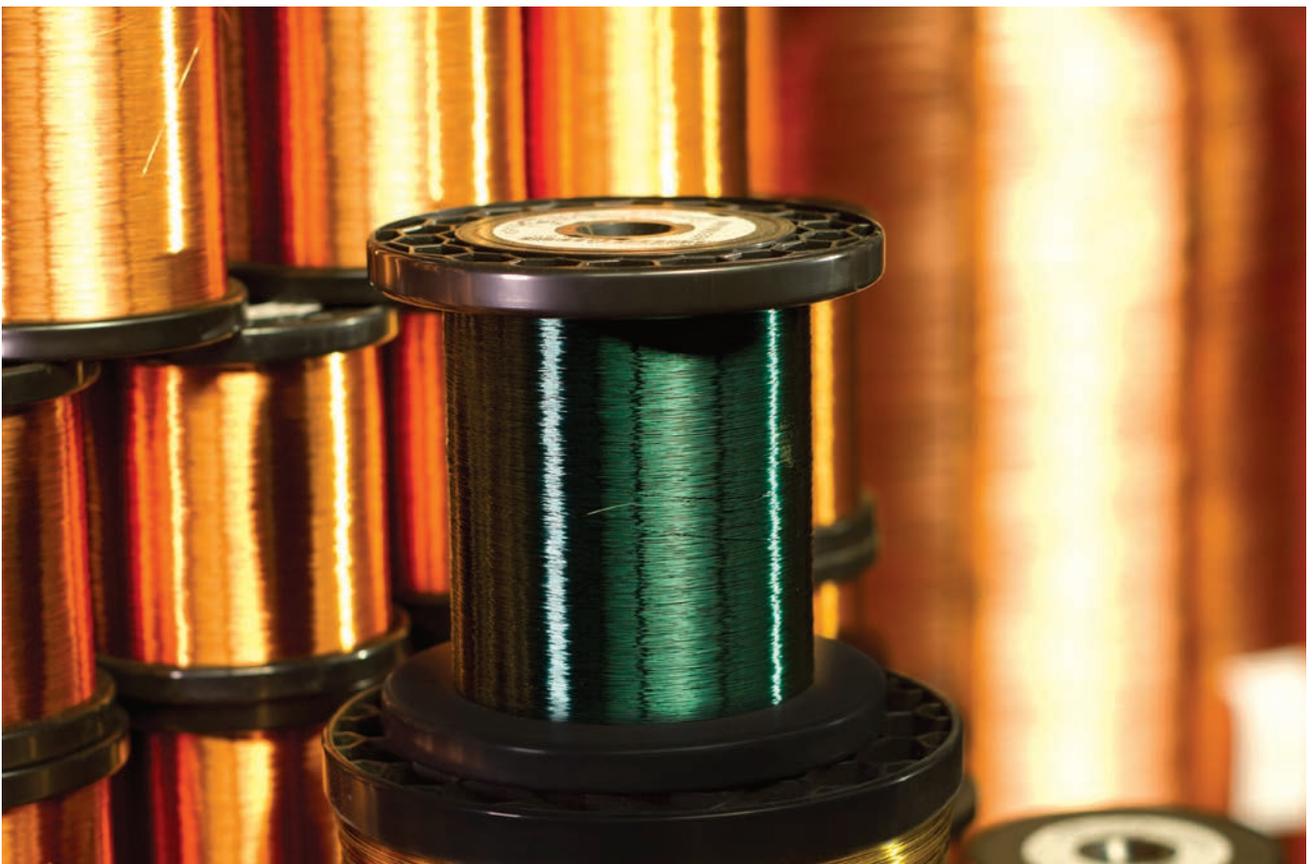
## Standard Aluminium Diameters (Round) / Standart Alüminyum Çaplar (Yuvarlak)

Conductor Tolerance iletken toleransı		Grade 1		Grade 2		Self-Bonding Wires Termoplastik Teller			Aluminium Weight Alüminyum Ağırlık (gr/m)	Conductor iletken
Nominal Diameter Nominal Çap (mm)	Bare Wire Tolerance Çıplak Tel Toleransı (+/-)	Increase Min. Çap Artışı (Min.)	Overall Diameter Emayeli Çap (Max.)	Increase Min. Çap Artışı (Min.)	Overall Diameter Emayeli Çap (Max.)	Min. Increase Bonding Layer Min. Çap Artışı	Max.Overall Diameter Max. Emayeli Çap			
							Grade 1B	Grade 2B		
0,315	0,004	0,019	0,349	0,035	0,367	0,014	0,369	0,387	0,210	AL
0,355	0,004	0,020	0,392	0,038	0,411	0,015	0,413	0,432	0,267	AL
0,400	0,005	0,021	0,439	0,040	0,459	0,016	0,461	0,481	0,339	AL
0,450	0,005	0,022	0,491	0,042	0,513	0,016	0,514	0,536	0,429	AL
0,500	0,005	0,024	0,544	0,045	0,566	0,017	0,568	0,590	0,530	AL
0,550	0,006	0,025	0,596	0,047	0,620	0,017	0,619	0,642	0,641	AL
0,560	0,006	0,025	0,606	0,047	0,630	0,017	0,630	0,654	0,664	AL
0,600	0,006	0,027	0,649	0,050	0,674	0,018	0,674	0,699	0,762	AL
0,630	0,006	0,027	0,679	0,050	0,704				0,841	AL
0,700	0,007	0,028	0,752	0,053	0,779				1,038	AL
0,710	0,007	0,028	0,762	0,053	0,789				1,068	AL
0,750	0,008	0,030	0,805	0,056	0,834				1,192	AL
0,800	0,008	0,030	0,855	0,056	0,884				1,356	AL
0,850	0,009	0,032	0,909	0,060	0,939				1,530	AL
0,900	0,009	0,032	0,959	0,060	0,989				1,716	AL
0,950	0,010	0,034	1,012	0,063	1,044				1,912	AL
1,000	0,010	0,034	1,062	0,063	1,094				2,118	AL
1,060	0,011	0,034	1,124	0,065	1,157				2,380	AL
1,100	0,011	0,034	1,164	0,065	1,197				2,563	AL
1,120	0,011	0,034	1,184	0,065	1,217				2,657	AL
1,180	0,012	0,035	1,246	0,067	1,279				2,949	AL
1,250	0,013	0,035	1,316	0,067	1,349				3,309	AL
1,320	0,013	0,036	1,388	0,069	1,422				3,691	AL
1,400	0,014	0,036	1,468	0,069	1,502				4,152	AL
1,500	0,015	0,038	1,570	0,071	1,606				4,767	AL
1,600	0,016	0,038	1,670	0,071	1,706				5,421	AL
1,700	0,017	0,039	1,772	0,073	1,809				6,121	AL
1,800	0,018	0,039	1,872	0,073	1,909				6,864	AL
1,900	0,019	0,040	1,974	0,075	2,012				7,645	AL
2,000	0,020	0,040	2,074	0,075	2,112				8,473	AL
2,120	0,021	0,041	2,196	0,077	2,235				9,521	AL
2,240	0,022	0,041	2,316	0,077	2,355				10,627	AL
2,360	0,024	0,042	2,438	0,079	2,478				11,797	AL
2,500	0,025	0,042	2,578	0,079	2,618				13,239	AL
2,650	0,027	0,043	2,730	0,081	2,772				14,876	AL
2,800	0,028	0,043	2,880	0,081	2,922				16,606	AL
3,000	0,030	0,045	3,083	0,084	3,126				19,064	AL
3,150	0,032	0,045	3,233	0,084	3,276				21,018	AL
3,350	0,034	0,046	3,435	0,086	3,479				23,773	AL
3,550	0,036	0,046	3,635	0,086	3,679				26,694	AL
3,750	0,038	0,047	3,838	0,089	3,883				29,788	AL
4,000	0,040	0,047	4,088	0,089	4,133				33,891	AL
4,250	0,045	0,049	4,341	0,092	4,387				38,241	AL
4,500	0,045	0,049	4,591	0,092	4,637				42,872	AL
4,750	0,045	0,049	4,843	0,092	4,887				47,768	AL
5,000	0,050	0,050	5,093	0,094	5,141				52,928	AL

## Standard Copper Diameters (Round) / Standart Bakır Çaplar (Yuvarlak)

Conductor Tolerance iletken toleransı		Grade 1		Grade 2		Self-Bonding Wires Termoplastik Teller			Copper Weight Bakır Ağırlık (gr/m)	Conductor iletken
Nominal Diameter Nominal Çap (mm)	Bare Wire Tolerance Çıplak Tel Toleransı (+/-)	Increase Min. Çap Artışı (Min.)	Overall Diameter Emayeli Çap (Max.)	Increase Min. Çap Artışı (Min.)	Overall Diameter Emayeli Çap (Max.)	Min. Increase Bonding Layer Min. Çap Artışı	Max.Overall Diameter Max. Emayeli Çap			
							Grade 1B	Grade 2B		
0,040	0,002	0,004	0,049	0,008	0,054	0,003	0,055	0,060	0,012	Cu
0,050	0,002	0,005	0,060	0,010	0,066	0,003	0,068	0,074	0,017	Cu
0,060	0,003	0,010	0,072	0,011	0,079	0,006	0,081	0,088	0,025	Cu
0,071	0,003	0,010	0,084	0,012	0,091	0,006	0,094	0,101	0,035	Cu
0,080	0,003	0,010	0,094	0,014	0,101	0,007	0,105	0,112	0,045	Cu
0,100	0,003	0,010	0,117	0,016	0,125	0,007	0,129	0,137	0,070	Cu
0,112	0,003	0,010	0,130	0,017	0,139	0,008	0,143	0,152	0,087	Cu
0,140	0,003	0,011	0,160	0,021	0,171	0,010	0,175	0,186	0,137	Cu
0,180	0,003	0,013	0,204	0,025	0,217	0,010	0,220	0,233	0,226	Cu
0,200	0,003	0,014	0,226	0,027	0,239	0,011	0,243	0,256	0,279	Cu
0,250	0,004	0,017	0,281	0,032	0,297	0,013	0,300	0,316	0,437	Cu
0,280	0,004	0,018	0,310	0,033	0,329	0,013	0,331	0,348	0,548	Cu
0,300	0,004	0,019	0,334	0,035	0,352	0,014	0,354	0,372	0,629	Cu
0,315	0,004	0,019	0,349	0,035	0,367	0,014	0,369	0,387	0,694	Cu
0,355	0,004	0,020	0,392	0,038	0,411	0,015	0,413	0,432	0,881	Cu
0,400	0,005	0,021	0,439	0,040	0,459	0,016	0,461	0,481	1,118	Cu
0,450	0,005	0,022	0,491	0,042	0,513	0,016	0,514	0,536	1,415	Cu
0,500	0,005	0,024	0,544	0,045	0,566	0,017	0,568	0,590	1,748	Cu
0,560	0,006	0,025	0,606	0,047	0,630	0,017	0,630	0,654	2,192	Cu
0,600	0,006	0,027	0,649	0,050	0,674	0,018	0,674	0,699	2,516	Cu
0,630	0,006	0,027	0,679	0,050	0,704				2,774	Cu
0,700	0,007	0,028	0,752	0,053	0,779				3,425	Cu
0,710	0,007	0,028	0,762	0,053	0,789				3,524	Cu
0,750	0,008	0,030	0,805	0,056	0,834				3,932	Cu
0,800	0,008	0,030	0,855	0,056	0,884				4,474	Cu
0,850	0,009	0,032	0,909	0,060	0,939				5,050	Cu
0,900	0,009	0,032	0,959	0,060	0,989				5,662	Cu
0,950	0,010	0,034	1,012	0,063	1,044				6,309	Cu
1,000	0,010	0,034	1,062	0,063	1,094				6,990	Cu
1,060	0,011	0,034	1,124	0,065	1,157				7,854	Cu
1,120	0,011	0,034	1,184	0,065	1,217				8,768	Cu
1,180	0,012	0,035	1,246	0,067	1,279				9,733	Cu
1,250	0,013	0,035	1,316	0,067	1,349				10,920	Cu
1,320	0,013	0,036	1,38B	0,069	1,422				12,180	Cu
1,400	0,014	0,036	1,468	0,069	1,502				13,700	Cu
1,500	0,015	0,038	1,570	0,071	1,606				15,730	Cu
1,600	0,016	0,038	1,670	0,071	1,706				17,890	Cu
1,700	0,017	0,039	1,772	0,073	1,809				20,200	Cu
1,800	0,018	0,039	1,872	0,073	1,909				22,650	Cu
1,900	0,019	0,040	1,974	0,075	2,012				25,230	Cu
2,000	0,020	0,040	2,074	0,075	2,112				27,960	Cu
2,120	0,021	0,041	2,196	0,077	2,235				31,420	Cu
2,360	0,024	0,042	2,438	0,079	2,478				38,930	Cu
2,500	0,025	0,042	2,578	0,079	2,618				43,690	Cu
2,650	0,027	0,043	2,730	0,081	2,772				49,090	Cu
2,800	0,028	0,043	2,880	0,081	2,922				54,800	Cu
3,000	0,030	0,045	3,083	0,084	3,126				62,910	Cu
3,150	0,032	0,045	3,233	0,084	3,276				69,360	Cu
3,350	0,034	0,046	3,435	0,086	3,479				78,450	Cu
3,550	0,036	0,046	3,635	0,086	3,679				88,090	Cu
4,000	0,040	0,047	4,088	0,089	4,133				111,840	Cu
4,500	0,045	0,049	4,591	0,092	4,637				141,477	Cu
5,000	0,050	0,050	5,093	0,094	5,141				174,663	Cu





## Copper Flat Wire Cross-Section Table (mm<sup>2</sup>)

Width / Genişlik (mm)	Thickness / Kalınlık (mm)																
	1	1,12	1,25	1,40	1,60	1,80	2,00	2,24	2,50	2,80	3,15	3,55	4,00	4,50	5,00	5,60	6,00
2,00																	
2,24																	
2,50																	
2,80							6,00										
3,15							6,30	6,72									
3,55						6,39	7,10	7,95	8,88								
4,00			5,00	5,60	6,40	7,20	8,00	8,96	11,25	11,20							
4,50			5,63	6,30	7,20	8,10	9,00	10,08	12,50	12,60	14,17						
5,00			6,25	7,00	8,00	9,00	10,00	11,20	14,00	14,00	15,75	17,75	20,00				
5,60		6,27	7,00	7,84	8,96	10,08	11,20	12,54	14,00	15,68	17,64	19,88	22,40	25,20			
6,30		7,06	7,88	8,82	10,08	11,34	12,60	14,11	15,75	17,64	19,85	22,37	25,20	28,35	31,50		
7,10			8,88	9,94	11,36	12,78	14,20	15,90	17,75	19,88	22,37	25,21	28,40	31,95	35,50	39,76	
8,00				11,20	12,80	14,40	16,00	17,92	20,00	22,40	25,20	28,40	32,00	36,00	40,00	44,80	
9,00					14,40	16,20	18,00	20,16	22,50	25,20	28,35	31,95	36,00	40,50	45,00	50,40	
10,00						18,00	20,00	22,40	25,00	28,00	31,50	35,50	40,00	45,00	50,00	56,00	
11,20							22,40	25,09	28,00	31,36	35,28	39,76	44,80	50,40	56,00	62,72	
12,50								28,00	31,25	35,00	39,38	44,38	50,00	56,25	62,50	70,00	
14,00									35,00	39,20	44,10	49,70	56,00	63,00	70,00	78,40	
16,00										44,80	50,40	56,80	64,00	72,00	80,00		
18,00											56,70	63,90	72,00	81,00			
20,00													80,00				

Width / Genişlik mm	Tolerance mm
≥2,00-3,10	±0,03
≥3,15-6,30	±0,05
≥6,30-12,50	±0,07
≥12,50	±0,10

Thickness / Kalınlık mm	Corner Radius/ Köşe Yarı Çap Tolerance mm
≥ 1,00-3,10	0,50 +25%
≥1,60-2,24	0,65 +25%
≥2,24-3,55	0,80 +25%
≥3,55-5,60	1,00 +25%

## Aluminium Flat Wire Cross-Section Table (mm<sup>2</sup>)

Width / Genişlik (mm)	Thickness / Kalınlık (mm)												
	2,00	2,24	2,50	2,80	3,15	3,55	4,00	4,50	5,00	5,60	6,00	7,20	8,00
2,24													
2,50													
2,80													
3,00													
3,15													
3,55													
4,00													
4,50													
5,00				14,00	15,75	17,75	20,00						
5,60			14,00	15,68	17,64	19,88	22,40						
6,30			15,75	17,64	19,85	22,37	25,20	28,35					
7,10			17,75	19,88	22,37	25,21	28,40	31,95	35,50				
8,00			20,00	22,40	25,20	28,40	32,00	36,00	40,00	44,80	48,00		
9,00			22,50	25,20	28,35	31,95	36,00	40,50	45,00	50,40	54,00		
10,00			25,00	28,00	31,50	35,50	40,00	45,00	50,00	56,00	60,00		
11,20			28,00	31,36	35,28	39,76	44,80	50,40	56,00	62,72	67,20	80,64	
12,50			31,25	35,00	39,38	44,38	50,00	56,25	62,50	70,00	75,00	90,00	
14,00			35,00	39,20	44,10	49,70	56,00	63,00	70,00	78,40	84,00	100,80	
16,00				44,80	50,40	56,80	64,00	72,00	80,00	89,60			
18,00					56,70	63,90	72,00	81,00					
20,00													

Width / Genişlik mm	Tolerance mm
≥2,00-3,10	±0,03
≥3,15-6,30	±0,05
≥6,30-12,50	±0,07
≥12,50	±0,10

Thickness / Kalınlık mm	Corner Radius/ Köşe Yarı Çap Tolerance mm
≥ 1,00-3,10	0,50 +25%
≥1,60-2,24	0,65 +25%
≥2,24-3,55	0,80 +25%
≥3,55-5,60	1,00 +25%

## High Mechanical and Thermal Resistance Flat Wires / Yüksek Isı ve Mekanik Dayanım Özellikli Yassı Teller

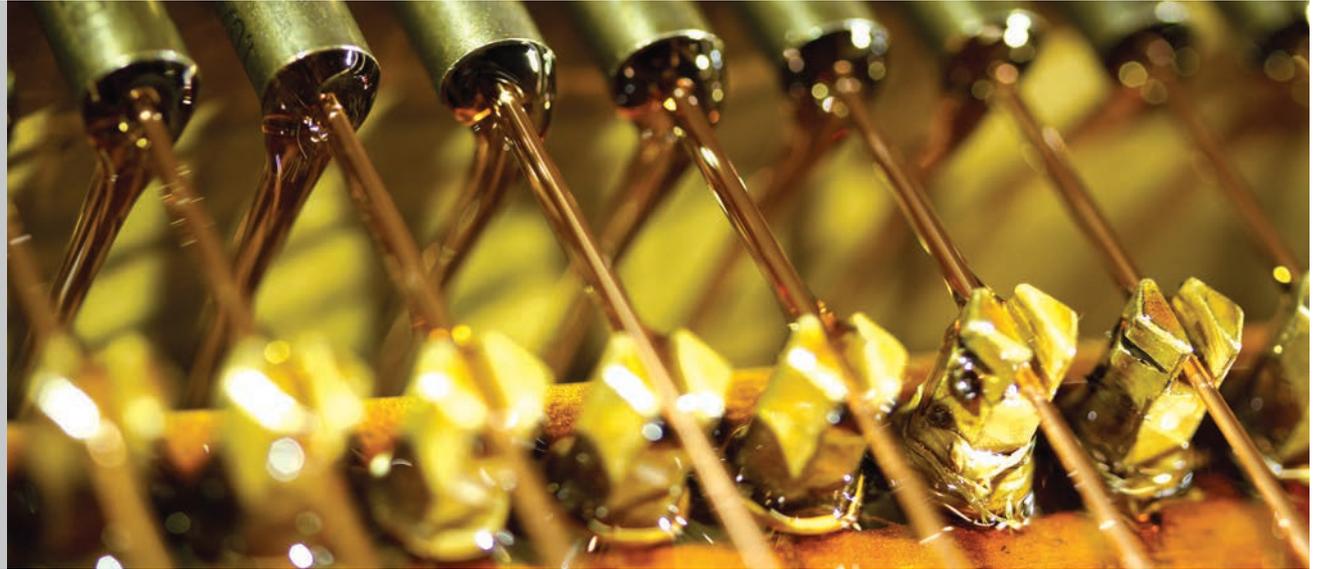
	Name of Product /Ürün Adı	CUF 120	CUF 155	CUF 180 H	CUF 200 HC	CUF 220 C
Standards / Standartlar	TSE	TS EN-60317-18	TS EN-60317-16	TS EN-60317-28	TS EN-60317-29	TS EN-60317-58
	NEMA	MW 18	-	-	MW 36 C	MW 84 C
	IEC	60317 - 18	60317 - 16	60317 - 28	60317 - 29	60317 - 58
Enamel Type/ Emaye Tipi	Base Coat / Alt kaplama	Polyvinylacetal	Polyester	Theic Modified Polyesteremide	Theic Modified Polyesteremide	Polyamide - Imide
	Over Coat / Üst Kaplama	-	-	-	Polyamide - Imide	-
Range of Prod. Ürün Aralığı	Section/Kesit (mm <sup>2</sup> )	5 - 100	5 - 100	5 - 100	5 - 100	5 - 100
	Section/Kesit (AWG)	000-10	000-10	000-10	000-10	000-10
Mechanical Specifications/ Mekanik Özellikler IEC 60851-3	% Elongation /%Uzama	> 32	> 32	> 32	> 32	> 32
	Flexibility (width ≤10mm)/Esneklik	No crack for 2xwidth	No crack for 4xwidth	No crack for 4xwidth	No crack for 4xwidth	No crack for 4xwidth
	Flexibility (width >10mm) / Esneklik	No crack for 3xwidth	No crack for 5xwidth	No crack for 5xwidth	No crack for 5xwidth	No crack for 5xwidth
	Flexibility (thickness)/Esneklik	No crack for 2xthickness	No crack for 4xthickness	No crack for 4xthickness	No crack for 4xthickness	No crack for 4xthickness
	Adherence/Yapışma	Loss of Adhesion max 1xWidth	Loss of Adhesion max 1xWidth	Loss of Adhesion max 1xWidth	Loss of Adhesion max 1xWidth	Loss of Adhesion max 1xWidth
	Pencil Hardness/Kalem Sertliği	5 H	3 H	3 H	4 H	4 H
Electrical Specifications/ Elektriksel Özellikler IEC 60851-5	Breakdown Voltage for Gr.1 at room T./ Gr.1 Oda Sıcaklığında Voltaj dayanımı	> 1500 V	> 1500 V	> 1500 V	> 1500 V	> 1500 V
	Breakdown Voltage for Gr.2 at room T./ Gr.2 Oda Sıcaklığında Voltaj dayanımı	> 2500 V	> 2500 V	> 2500 V	> 2500 V	> 2500 V
Thermal Specifications/ Isısal Özellikler IEC 60851-6	Heat Shock/Isı şoku (C°)	≥ 155	≥ 175	≥ 200	≥ 220	≥ 240
	Thermal Index/Sıcaklık İndeksi (C°)	120	155	180	200	220
	Cut-Through Temp./Yumuşama sıcaklığı(C°)	≥ 230	≥ 230	≥ 350	≥ 350	≥ 400





## Solderable Round Wires / Lehimlenebilir Yuvarlak Teller

NAME OF PRODUCTION ÜRÜN ADI		CUR 155 S	CUR 180 S	CUR 180 SH	CUR 155 SN	CUR 180 SN
Standards Standartlar	TSE	TS EN 60317-20	TS EN 60317-51	TS EN 60317-23	TS EN 60317-21	-
	NEMA	MW79 C	MW82 C	MW77 C	MW80 C	MW83 C
	IEC	60317-20	60317-51	60317-23	60317 - 21	-
Enamel Type Emaye Tipi	Base coat Alt Kaplama	Polyurethane	Polyurethane	Polyesterimide	Polyurethane	Polyurethane
	Over coat Üst Kaplama	-	-	-	Polyamide	Polyamide
Range of Production / Üretim Aralığı		0,04-2,00 mm 12-47 AWG	0,04-2,00 mm 12-47 AWG	0,04-2,50 mm 10-47 AWG	0,04-1,70 mm 13-47 AWG	0,15-2,00 mm 12-35 AWG
Thermal Index / Isı Sınıfı (°C)		155	180	180	155	180
Heat Shock / Isı şoku (°C)		≥ 200	≥ 200	≥ 175	≥ 200	≥ 200
Cut - Through / Isı Yumuşama Sıcaklığı (°C)		≥ 230	≥ 285	≥ 300	≥ 230	≥ 260
Solderability/ Lehim Alma Sıcaklığı (°C)		375 -1Sec	375 -1Sec	470-7Sec	375 -1Sec	375 -1Sec



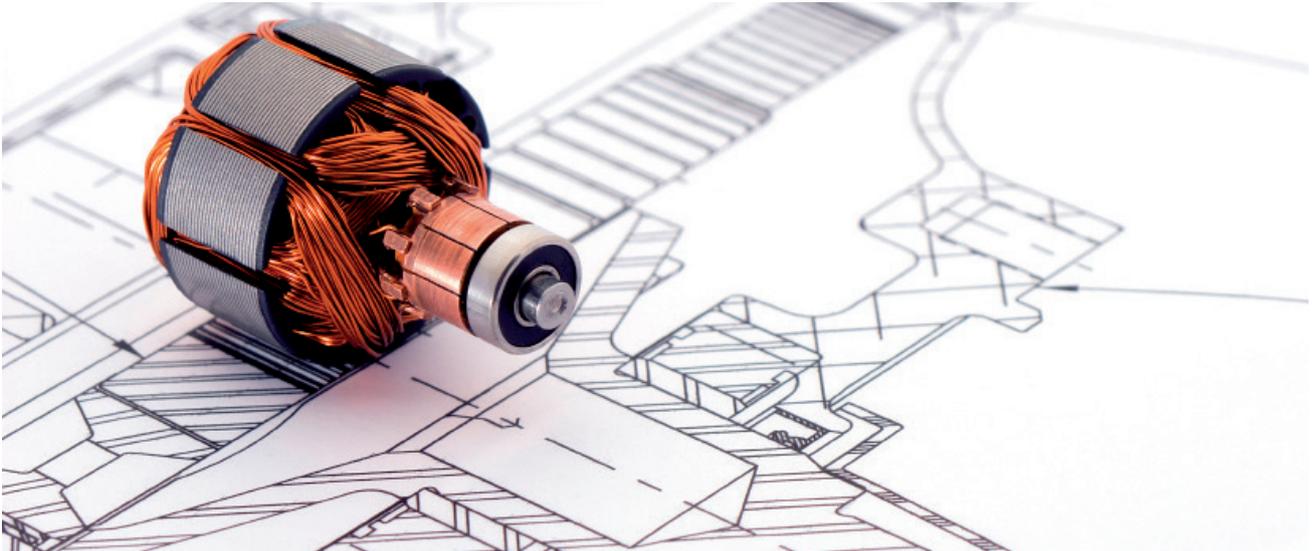
## Self Bonding Round Wires / Termoplastik YuvarlakTeller

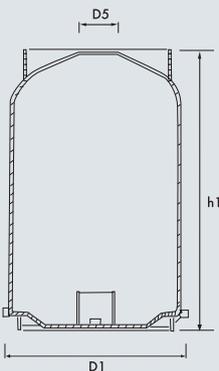
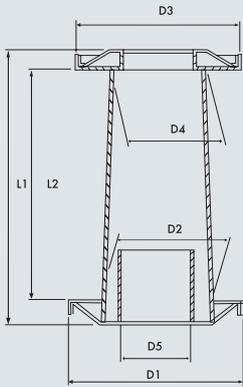
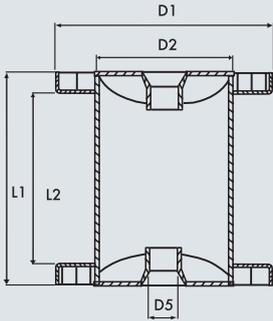
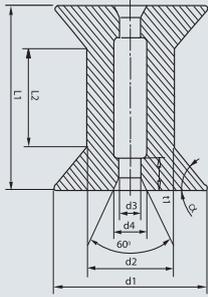
NAME OF PRODUCTION ÜRÜN ADI		CUR 130 SB	CUR 155 SB	CUR 180 HB	CUR 200 HB	CUR 180 HSB
Standards Standartlar	TSE	TS EN 60317 - 2	TS EN 60317 - 35	TS EN 60317 - 37	TS EN 60317 - 38	TS EN 60317 - 36
	NEMA	MW130 C	MW131 C	MW132 C	MW102 C	-
	IEC	60317 - 2	60317 - 35	60317 - 37	60317 - 38	60317 - 36
Enamel Type Emaye Tipi	Base coat Alt Kaplama	Polyurethane	Polyurethane	THEIC Polyesterimide	THEIC Polyesterimide + Polyamide Imide	Polyesterimide
	Over coat Üst Kaplama	Bonding Layer	Bonding Layer	Bonding Layer	Bonding Layer	Bonding Layer
Range of Production/ Üretim Aralığı		0,15-0,60 mm 22-35 AWG	0,15-0,60 mm 22-35 AWG	0,15-0,60 mm 22-35 AWG	0,15-0,60 mm 22-35 AWG	0,15-0,60 mm 22-35 AWG
Thermal Index / Isı Sınıfı (°C)		130	155	180	210	180
Heat Shock / Isı Şoku (°C)		≥155	≥175	≥220	≥240	≥200
Cut - Through / Isı Yumuşama Sıcaklığı (°C)		≥170	≥240	≥340	≥360	≥300
Solderability / Lehim Alma Sıcaklığı (°C)		375 -1Sec	375 -1Sec	-	-	470 -7Sec
Scrape Resistance / Sürtünmeye Dayanım		Good	Good	Good	Very Good	Good
Bonding Temperature Yapışma Sıcaklığı (°C)		120	140	170	170	170
Re-Softening Temperature Yeniden Yumuşama Sıcaklığı (°C)		100 - 120	100 - 120	150 - 180	155 - 200	155 - 180



## High Mechanical And Thermal Resistance Round Wires / Yüksek Isı Ve Mekanik Özellikli Yuvarlak Teller

NAME OF PRODUCTION ÜRÜN ADI			CUR 180 H	CUR 200 H	CUR 200 HC	CUR 220 C	CUR 180 HN
Standards Standartlar	Cu	TSE	TS EN 60317-8	TS EN 60317-8	TS EN 60317-13	TS EN 60317-57	TS EN 60317-22
		NEMA	MW30 C	MW74 C	MW35 C/MW73 C	MW81 C	MW76 C
		IEC	60317-8	60317-8	60317-13	60317-57	60317-22
	Al	TSE	TS EN 60317-15		TS EN 60317-25	-	-
		NEMA	MW30 A	MW74 A	MW35 A/MW73 A	-	-
		IEC	60317-15		60317-25	-	-
Enamel Type Emaye Tipi	Base coat Alt Kaplama	Theic Modified Polyesterimide	Theic Modified Polyesterimide	Theic Modified Polyesterimide	Polyamide-Imide	THEIC Polyesterimide	
	Over coat Üst Kaplama	-	-	Polyamide-Imide	-	Polyamide	
Range of Production Üretim Aralığı (mm)	Cu	0.036 - 5.50 mm		3 - 47 AWG			
	Al	0.30 - 4.50 mm		5 - 28 AWG			
Thermal Index / Isı Sınıfı (°C)		180	200	210	220	180	
Heat Shock / Isı Şoku (°C)		≥ 200	≥ 220	≥ 240	≥ 240	≥ 200	
Cut - Through / Isı Yumuşama Sıcaklığı(°C)		≥ 320	≥ 360	≥ 360	≥ 400	≥ 285	
Solderability / Lehim Alma Sıcaklığı (°C/s)		-	-	-	-	-	





### Biconical Plastic Spools/Bikonik Plastik Makara

IEC 60264-5-1

	Range of Diameter mm	Cu Wire Weight app. Kg	d1	d2	d3	d4	a	L1	L2
HKV 160	0,04-0,250	6	160	90	22	34	- - 45°	160	85
HKV 200	0,04-0,250	11	200	112	22	34	- - 45°	200	106
HKV 250	0,04-0,250	25	250	140	22	34	- - 45°	250	133

### Cylindrical Plastic Spools / Silindirik Plastik Makaralar

IEC 60264-2-1

	Range of Diameter mm	Cu Wire Weight app. Kg	d1	d2	d5	L1	L2
K 160	0,050-0,500	6.3	160	100	- - 13	160	128
K 200	0,050-1,000	14	200	125	- - 13	200	160
K 250	0,050-4,000	22	250	160	- - 13	200	160
K 355 + (Flat)	0,200-5,500	48	355	224	- - 26	200	160
DWF 500 + (Flat)	0,500-5,500	103	500	315	- - 26	250	180
VM 710 + (Flat)	2,000-5,500	170	710	500	- - 51	250	180
VM 750 + (Flat)	2,000-5,500	400	750	400	- - 56	380	310

### Conical Plastic Spools / Konik Plastik Makaralar

IEC 60264-3

	Range of Diameter mm	Cu Wire Weight app. Kg	d1	d2	d3	d4	L1 max.	L2
250/400	0,100-4,000	45	250	125	190	112	400	265
315/500	0,150-4,000	90	315	200	300	180	500	425
400/630	0,200-4,000	190	400	250	375	224	630	530
500/800	0,500-4,000	400	500	315	475	280	800	670

### Containers For Conical and Biconical Spools/Konik ve Bikonik Makaralar için Konteynırlar

IEC 60264-3-5

	d1 max.	h1 max.	d2	d3	h2 min.
VB 250/400	315	500	236	215	40
VB 315/500	400	630	355	338	63
VB 400/630	500	800	450	428	80
VB 500/800	580	1000	545	503	100
VB 250	350	295	283	270	50
VB 250/250	305	350	283	270	50

# Paper Tape Wrapped Wires



Round Wire Dimensions Yuvarlak Tel Ölçüleri		
	Min. (Min.)	Max. (Maks.)
Diameter / Çap	3,5 mm	9,5 mm
Cross Section / Kesit Alanı	10 mm <sup>2</sup>	70 mm <sup>2</sup>

Round Wire Dimensions Yuvarlak Tel Ölçüleri		
	Min. (Min.)	Max. (Maks.)
Diameter / Çap	3,5 mm	12,5 mm
Cross Section / Kesit Alanı	10 mm <sup>2</sup>	125 mm <sup>2</sup>

Rectangular Wire Dimensions Yassı Tel Ölçüleri		
Aluminium / Alüminyum	Min. (Min.)	Max. (Maks.)
Width / Genişlik	5 mm	18 mm
Thickness / Kalınlık	1,5 mm	8 mm
Cross section / Kesit Alan	6 mm <sup>2</sup>	80 mm <sup>2</sup>
Width / Thickness (Genişlik / Kalınlık)	1,25 - 10	

Rectangular Wire Dimensions Yassı Tel Ölçüleri		
Copper / Bakır	Min. (Min.)	Max. (Maks.)
Width / Genişlik	4 mm	20 mm
Thickness / Kalınlık	1,3 mm	9 mm
Cross section / Kesit Alan	6 mm <sup>2</sup>	150 mm <sup>2</sup>
Width / Thickness (Genişlik / Kalınlık)	1,25 - 10	

Insulation Type İzolasyon Tipi	Thermal Class Isı Sınıfı	Standard Standart	Applications Uygulamalar
Kraft / Kraft	105 °C	IEC 60317-27	Oil-Filled Transformers Yağlı Tip Transformatörler
Nomex	220 °C	IEC 60317-52 & 53	Dry-Type & Oil Filled Transformers Kuru ve Yağlı Tip Transformatörler
Polyester Film	155 °C	Acc. Customer Spec. Müşteri Şartnamesine Göre	Special Transformers (Gas Transformers) Özel Tip Transformatörler (Gaz Transformatörleri)
Kapton (Polyimide paper) Kapton (Poliimid Kağıt)	240 °C	IEC 60317-43 & 44	Traction Motors Cer Motorları
Mica / Mika	155 °C	Acc. Customer Spec. Müşteri Şartnamesine Göre	High Voltage Motors - Generators Yüksek Gerilim Motorları - Jeneratörler
Dennison	120 °C	IEC 60317-27	Oil-Filled Transformers

# CTC Continuously Transposed Conductors

## Mechanical Properties of Single Conductor (BS 1432) Tek İletkenin Mekanik Özellikleri (BS 1432)

Rp (% 0,2)		Rp (% 0,1)	
Designation Tanım	Value (MPa) Değer (MPa)	Designation Tanım	Value (MPa) Değer (MPa)
Annealed Tavlı	60 - 100	CPR 1	140 - 200
CPR A	90 - 100	CPR 2	170 - 220
CPR B	120 - 150	CPR 3	220 - 260

## Enamelled Rectangular Wires / Emayeli Yassı Teller

Designation / Tanım	Enamel Type / Emaye Tipi	Grade / Sınıf	Dimension Increase (mm) Ölçü Artışı (mm)
ALF120-CUF120	PVF Resins	1	0,11 ± 0,02
		2	0,15 ± 0,03
ALF200HC-CUF- 200HC	PEI + PAI	1	0,12 ± 0,02
		2	0,15 ± 0,03
ALF120B-CUF120B	PVF + Epoxy	1	0,17 ± 0,03
		2	0,19 ± 0,03

## CTC Dimensions / CTC Ölçüleri

Enamelled Rectangular Wires Emayeli Yassı Teller		Transposed Conductor Transpoze İletken	
Min. Width (h) Min. Genişlik (h)	3,2 mm	Number of Strands Tel Sayısı	7 to 63
Max. Width (h) Maks. Genişlik (h)	12,50 mm	Min. Radial Dimension (B) Min. Radyal Ölçü (B)	5,2 mm
Min. Thickness (b) Min. Kalınlık (b)	1,2 mm	Max. Radial Dimension (B) Maks. Radyal Ölçü (B)	80 mm
Max. Thickness (b) Maks. Kalınlık (b)	3,00 mm	Min. Axial Dimension (H) Min. Aksiyal Ölçü (H)	5,6 mm
Preferred Ratio h/b Tercih Edilen Oran h/b	Min 3, Max 8	Max. Axial Dimension (H) Maks. Aksiyal Ölçü (H)	24 mm

Note: Min. and max. width/thickness can not be used in combination. Max. wire cross section may not exceed 30 mm<sup>2</sup>.

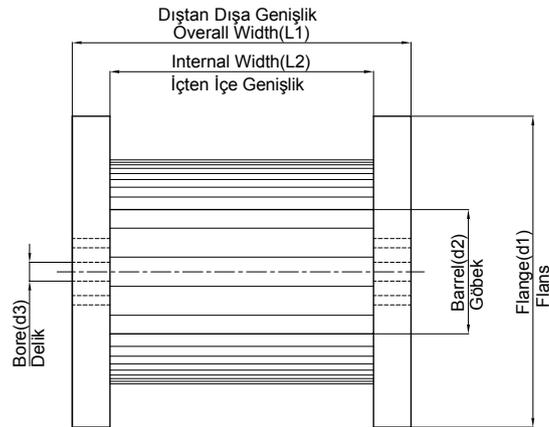
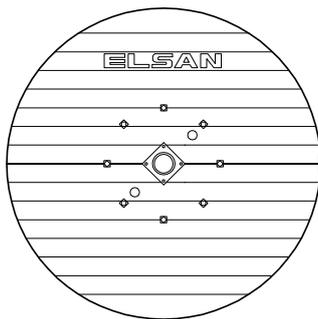
TNot: Min. ve Maks. genişlik/kalınlık kombine edilemez. Maks. kesit alanı 30mm<sup>2</sup>'yi aşmamalıdır.

## CTC Paper Insulation / CTC Kağıt İzolasyonu

Type of Paper Kağıt Tipi	Applications Uygulamalar	Main Properties Ana Özellikler
Kraft Paper Kraft Kağıdı	General purposes Genel Amaçlı	High Purity 5A2 1M3 Yüksek Safılık
Calendered Kraft Kalenderlenmiş Kraft Kağıdı	General purposes Genel Amaçlı	High density and dielectric strength Yüksek Yoğunluk ve Elektriksel Dayanım
Calendered Crepe Paper Kalenderlenmiş Krep Kağıdı	Inner and Outermost Layers İç ve En Dış Katmanlar	High Mechanical Characteristic Mekanik Karakteristik
Upgraded Paper Termal Olarak Yükseltilmiş Kağıt	Inner and Outermost Layers İç ve En Dış Katmanlar	High Thermal Properties Özellikler
Aramid Paper Aramid Kağıt	Thermal Class 220 °C 220 °C Termal Sınıf	Excellent Physical, Thermal and Electrical Toughness Mükemmel Fiziksel, Termal ve Elektriksel Dayanıklılık
Polyester Film	Gas Transformers Gaz Transformatörleri	Flexible, Strong and Excellent Resistance to Moisture Esnek, Sağlam ve Neme Karşı Mükemmel Direnç

## Standard Spools For CTC / CTC İçin Standart Makaralar

Type Tip	Max. Weight Cu (Kg) Maks. Ağırlık Cu (Kg)	Dimensions (mm) / Ölçüler (mm)				
		Flange Flanş	Barrel Göbek	Bore Delik	Overall Width Dıştan Dışa Genişlik	Internal Width İçten İçe Genişlik
A5	600	1000	800	82	630	530
P1000/S	1100	2000	800	82	610	490
P1000/X	1500	1200	570	82	610	490
P1000/M	1250	1200	700	82	610	490
P1000/L	1600	1200	800	82	710	590
P1600/S	1850	1600	900	82	610	450
P1600/M	3600	1600	700	82	710	550
P1600/L	2800	1600	900	82	710	550
P1000/XM	1400	1200	610	82	610	490
P1000/XS	1270	1200	670	82	610	490
P1600/XL	4000	1600	1000	82	900	740





## ELSAN

Genel Müdürlük ve Fabrika II / Head Office and Copper Plant  
ELSAN ELEKTRİK GEREÇLERİ SAN. VE TİC. A.Ş.  
Bozburun Mah. 7002 Sok. No:14 20085 Merkezefendi / DENİZLİ / TURKEY

T: +90 258 371 44 66  
F: +90 258 371 02 56

Fabrika I / Aluminium Plant  
Bozburun Mah. 7040 Sok. No:60 20085 Merkezefendi / DENİZLİ / TURKEY

T: +90 258 371 44 66  
F: +90 258 371 02 56

İkitelli Organize Sanayi Bölgesi Esenler Sanayi Sitesi  
Ortaklar İş Merkezi A-6 Blok No:31-32 Başakşehir / İSTANBUL

T: +90 212 549 87 81  
F: +90 212 549 87 83

Heermann Fabrika (Partner Şirket) / Heermann Plant (Partner Company)  
Barmerfeld 14, 58119 HAGEN / GERMANY

T: +49 (0) 23349288-0  
F: +49 (0) 23349288-11

info@elsan-tr.com / www.elsan-tr.com

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[elsan-tr.com](http://elsan-tr.com)