



# Hascelik & Coreal Cable



تأسست شركة إيمان في أربيل سنة ١٩٨٢ ، منذ تأسيسها  
باشرت في عمل المقاولات وأنجزت العديد من المشاريع  
المختلفة ( الجسور ، المستشفيات الطرق المدارس ، وأبنية  
مختلفة ) كما تخصصت في استيراد المواد الكهربائية منذ  
سنة ٢٠٠٢ ، فهي وكيل معتمد لعدة شركات تركية عالمية ذات  
ماركات معروفة من ضمنها ( هاس جليك ) لإنتاج الأسلاك  
الألمنيوم والكابلات المجدولة تويست كيبل ، و ( هيس كابلو  
) لإنتاج الكابلات النحاسية للضغط العالي والضغط الواطي ،  
إضافة لشركة ( IES ) لإنتاج أعمدة الكهرباء والإنارة



**Iman Company for general trading of electrical was founded in 1982 in Erbil, since its foundation it started to work in contracting and have achieved many projects (bridges, hospitals, streets, schools and various buildings) after that in 2002 it specialized in importing electric materials.**

**Iman company is agent for Turkish companies (HASCELIK) for aluminum wire and twisted cable, (HES KABLO) for LV cables and MV cables and (IES galvaniz) for electrical poles and lightning poles.**



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**TECHNICAL SPECIFICATION**

**CONDUCTORS FOR OVERHEAD LINES- ROUND WIRE CONCENTRIC LAY STRANDED CONDUCTORS**

1.	Technical Description	Units	Guaranteed Characteristics
<b>1. General Data</b>			
a)	Manufacturer		HASÇELİK KABLO
b)	Conductor type		All Aluminum Conductor
c)	Conductor coding		AAC 70
d)	Applied Standards		EN 50182
e)	SAP Product Number		-
<b>2. Technical Drawing:</b>			
<b>3. Construction Data / Layers of Conductor:</b>			
	Number of wires		
	-Aluminum	pcs.	19
a)	Lay ratio	Number of wires	Lay ratio of layer (min.-max.)
	Center	1	-
	Layer 1	6	10-16
	Layer 2	12	10-14
	Diameter of wires		
	-Nominal diameter of Aluminum wires (D2)	mm	2,1
<b>4. Constructional and dimensional details</b>			
<b>4.1. Aluminum part (AL 1)</b>			
a)	Number of wires	pcs.	19
b)	Nominal diameter of wires	mm	2,1
c)	Nominal section area of aluminum part	mm <sup>2</sup>	65,81
d)	Tensile strength		
	1)Before stranding (min.)	N/mm <sup>2</sup>	180
	2)After stranding (min.)	N/mm <sup>2</sup>	171
e)	Density at 20 °C	kg/dm <sup>3</sup>	2,703
f)	Coefficient of linear expansion	K <sup>-1</sup>	23 x 10 <sup>-6</sup>
g)	Max. resistivity at 20 °C	nΩm	28,264
h)	Temperature coefficient		0,00403
<b>4.2. Conductor</b>			
a)	Nominal Diameter of conductor (D1)	mm	10,5
b)	Nominal section area of conductor	mm <sup>2</sup>	65,809
c)	Aluminum to steel ratio		-
d)	Conductor mass per unit length (approx.)	kg/km	180,87
e)	Direction of lay of the external layer		Z
f)	Conductor rated tensile strength	kN	11,85
g)	Conductor rated tensile strength	kgf	1207,91
h)	Modulus of Elasticity (E-Modulus)	kN/mm <sup>2</sup>	56,0
i)	Thermal Elongation Coefficient	10 <sup>-6</sup> /°C	23,0
j)	Permissible Maximum Working Stress ( %40 RTS)	N/mm <sup>2</sup>	72,0
k)	Everyday Stress (EDS) ( 20% RTS)	N/mm <sup>2</sup>	36,0
l)	Ultimate Exceptional Stress ( %70 RTS)	N/mm <sup>2</sup>	126,0
m)	Minimum Bending Radius Installation (15XD1)	mm	158
n)	Minimum Bending Radius Operation (30XD1)	mm	315
o)	Geometric mean radius	m	0,0040
<b>5. Temperature Range</b>			
a)	Installation	°C	-10 °C ~ +50 °C
b)	Transportation and Operation	°C	-40 °C ~ +80 °C
<b>6. Electrical Technical Data Sheet</b>			
a)	Maximum DC resistance of a conductor at 20 °C	Ω/km	0,4367
b)	Maximum AC resistance of a conductor at 25 °C	Ω/km	0,4473
c)	Maximum AC resistance of a conductor at 75 °C	Ω/km	0,5353
d)	Maximum conductor temperature (Normal operation)	°C	80
e)	Maximum conductor temperature (Short-circuit condition)	°C	200
f)	Current Carrying Capacity*	A	287
*Assumed values for calculation of current carrying capacity:			
1)	Solar Radiation	W/m <sup>2</sup>	900
2)	Wind Velocity	m/s	0,6
3)	Maximum conductor temperature	°C	80
4)	Ambient temperature	°C	30
g)	Short-circuit current** (1 second)	kA	6,6
h)	Short Circuit Current Capacity	kA <sup>2</sup> s	43,8
**Assumed values for calculation of short-circuit current:			
1)	Specific conductivity at 20 °C	1/(Ωm)	35,38
2)	Temperature coefficient	1/K	0,00403
3)	Specific thermal capacity	J/(kg K)	0,91
4)	Conductor temperature of the beginning of a short-circuit	°C	40
5)	Conductor temperature at the end of a short-circuit	°C	200
i)	Total heat capacity of conductor	(J / m °C)	173
j)	Inductive reactance	Ω/km	0,272
k)	Capacitive reactance	MΩ.km	0,232
<b>7. Drum Labeling</b>			
The following information to be attached to the outside of both flanges of each drum;			
a)	Name of Manufacturer		
b)	Year of Manufacture		
c)	Drum Number		
d)	Cable Type		
e)	Length		
f)	Net Weight		
g)	Gross Weight		

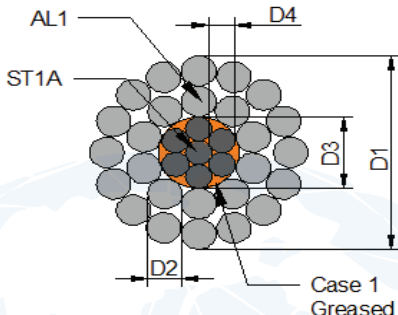
**TECHNICAL SPECIFICATION**

**CONDUCTORS FOR OVERHEAD LINES- ROUND WIRE CONCENTRIC LAY STRANDED CONDUCTORS**

1.	Technical Description	Units	Guaranteed Characteristics
<b>1. General Data</b>			
a)	Manufacturer		HASÇELİK KABLO
b)	Conductor type		All Aluminum Conductor
c)	Conductor coding		AAC 95
d)	Applied Standards		EN 50182
e)	SAP Product Number		-
<b>2. Technical Drawing:</b>			
<b>3. Construction Data / Layers of Conductor:</b>			
	Number of wires		19
	-Aluminum	pcs.	19
a)	Lay ratio	Number of wires	Lay ratio of layer (min.-max.)
	Center	1	-
	Layer 1	6	10-16
	Layer 2	12	10-14
	Diameter of wires		
	-Nominal diameter of Aluminum wires (D2)	mm	2,5
<b>4. Constructional and dimensional details</b>			
<b>4.1. Aluminum part (AL 1)</b>			
a)	Number of wires	pcs.	19
b)	Nominal diameter of wires	mm	2,5
c)	Nominal section area of aluminum part	mm <sup>2</sup>	93,27
d)	Tensile strength		
	1) Before stranding (min.)	N/mm <sup>2</sup>	175
	2) After stranding (min.)	N/mm <sup>2</sup>	166
e)	Density at 20 °C	kg/dm <sup>3</sup>	2,703
f)	Coefficient of linear expansion	K <sup>-1</sup>	23 x 10 <sup>-6</sup>
g)	Max. resistivity at 20 °C	nΩm	28,264
h)	Temperature coefficient		0,00403
<b>4.2. Conductor</b>			
a)	Nominal Diameter of conductor (D1)	mm	12,5
b)	Nominal section area of conductor	mm <sup>2</sup>	93,266
c)	Aluminum to steel ratio		-
d)	Conductor mass per unit length (approx.)	kg/km	256,33
e)	Direction of lay of the external layer		Z
f)	Conductor rated tensile strength	kN	16,32
g)	Conductor rated tensile strength	kgf	1664,34
h)	Modulus of Elasticity (E-Modulus)	kN/mm <sup>2</sup>	56,0
i)	Thermal Elongation Coefficient	10 <sup>-6</sup> /°C	23,0
j)	Permissible Maximum Working Stress ( %40 RTS)	N/mm <sup>2</sup>	70,0
k)	Everyday Stress (EDS) ( 20% RTS)	N/mm <sup>2</sup>	35,0
l)	Ultimate Exceptional Stress ( %70 RTS)	N/mm <sup>2</sup>	122,5
m)	Minimum Bending Radius Installation (15XD1)	mm	188
n)	Minimum Bending Radius Operation (30XD1)	mm	375
o)	Geometric mean radius	m	0,0047
<b>5. Temperature Range</b>			
a)	Installation	°C	-10 °C ~ +50 °C
b)	Transportation and Operation	°C	-40 °C ~ +80 °C
<b>6. Electrical Technical Data Sheet</b>			
a)	Maximum DC resistance of a conductor at 20 °C	Ω/km	0,3081
b)	Maximum AC resistance of a conductor at 25 °C	Ω/km	0,3156
c)	Maximum AC resistance of a conductor at 75 °C	Ω/km	0,3777
d)	Maximum conductor temperature (Normal operation)	°C	80
e)	Maximum conductor temperature (Short-circuit condition)	°C	200
f)	Current Carrying Capacity*	A	359
*Assumed values for calculation of current carrying capacity:			
1)	Solar Radiation	W/m <sup>2</sup>	900
2)	Wind Velocity	m/s	0,6
3)	Maximum conductor temperature	°C	80
4)	Ambient temperature	°C	30
g)	Short-circuit current** (1 second)	kA	9,4
h)	Short Circuit Current Capacity	kA <sup>2</sup> s	87,9
**Assumed values for calculation of short-circuit current:			
1)	Specific conductivity at 20 °C	1/(Ωm)	35,38
2)	Temperature coefficient	1/K	0,00403
3)	Specific thermal capacity	J/(kg K)	0,91
4)	Conductor temperature of the beginning of a short-circuit	°C	40
5)	Conductor temperature at the end of a short-circuit	°C	200
i)	Total heat capacity of conductor	(J / m °C)	245
j)	Inductive reactance	Ω/km	0,261
k)	Capacitive reactance	MΩ.km	0,222
<b>7. Drum Labeling</b>			
The following information to be attached to the outside of both flanges of each drum;			
a)	Name of Manufacturer		
b)	Year of Manufacture		
c)	Drum Number		
d)	Cable Type		
e)	Length		
f)	Net Weight		
g)	Gross Weight		

**TECHNICAL SPECIFICATION**  
**CONDUCTORS FOR OVERHEAD LINES- ROUND WIRE CONCENTRIC LAY STRANDED CONDUCTORS**

Technical Description	Units	Guaranteed Characteristics
<b>1. General Data</b>		
a)Manufacturer		HASÇELİK KABLO
b)Conductor type		Aluminum Conductor Steel Reinforced
c)Conductor coding		ACSR 95/15
d)Applied Standards		EN 50182
e)SAP Product Number		-

2. Technical Drawing:


3. Construction Data / Layers of Conductor:	Units	Guaranteed Characteristics
Number of wires		
a)Steel	pcs.	7
a.1) Lay ratio		Number of wires   Lay ratio of layer (min.-max.)
Center		1   -
Layer 1		6   16-26
b)Aluminum	pcs.	26
b.1) Lay ratio		Number of wires   Lay ratio of layer (min.-max.)
Layer 2		10   10-16
Layer 3		16   10-14
Nominal diameter of wires		
a)Steel wires (D4)	mm	1,67
b)Aluminum wires (D2)	mm	2,15

4. Constructional and dimensional details	Units	Guaranteed Characteristics
<b>4.1 Aluminum part (AL1)</b>		
a)Number of wires	pcs.	26
b)Nominal diameter of wires	mm	2,15
c)Nominal section area of aluminum part	mm <sup>2</sup>	94,39
d)Tensile strength		
1)Before stranding (min.)	N/mm <sup>2</sup>	180
2)After stranding (min.)	N/mm <sup>2</sup>	171
e)Density at 20 C°	kg/dm <sup>3</sup>	2,703
f)Coefficient of linear expansion	K <sup>-1</sup>	23 x 10 <sup>-6</sup>
g)Max. Resistivity at 20 C°	nΩm	28,264
h)Temperature coefficient		0,00403
<b>4.2 Zinc-Coated Steel part (ST 1A)</b>		
a)Number of wires	pcs.	7
b)Nominal diameter of wires	mm	1,67
c)Nominal diameter of steel part (D3)	mm	5,01
d)Nominal section area of steel part	mm <sup>2</sup>	15,33
e)Tensile strength		
1)Tension at 1% elongation (min.)	N/mm <sup>2</sup>	1112
2)Before stranding (min.)	N/mm <sup>2</sup>	1400
3)After stranding (min.)	N/mm <sup>2</sup>	1330
4)elongation in % on breaking	%	2,5
f)Mass of zinc	gr/m <sup>2</sup>	200
g)Density at 20 C°	kg/dm <sup>3</sup>	7,78
h)Coefficient of linear expansion	K <sup>-1</sup>	11,5 x 10 <sup>-6</sup>
i)Max. Resistivity at 20 C°	nΩm	192
<b>4.3 Conductor</b>		
a)Nominal Diameter of conductor (D1)	mm	13,61
b)Nominal section area of conductor	mm <sup>2</sup>	109,73
c)Grease application		Case 1 (Steel core only greased)
d)Aluminum to steel ratio		6,2
e)Conductor mass per unit length (approx.)-without grease	kg/km	380,62
f)Grease mass per unit length (approx.)	kg/km	3,05
g)Direction of lay of the external layer		Z
h)Conductor rated tensile strength	kN	34,93
i)Conductor rated tensile strength	kgf	3561,9
j)Modulus of Elasticity (E-Modulus)	kN/mm <sup>2</sup>	77,1
k)Thermal Elongation Coefficient	10-6/°C	18,7



l) Permissible Maximum Working Stress ( %40 RTS)	N/mm <sup>2</sup>	127,3
m) Everyday Stress (EDS) ( 20% RTS)	N/mm <sup>2</sup>	63,7
n) Ultimate Exceptional Stress ( %70 RTS)	N/mm <sup>2</sup>	222,8
o) Minimum Bending Radius Installation (15XD1)	mm	204
p) Minimum Bending Radius Operation (30XD1)	mm	408
r) Geometric mean radius	m	0,0055

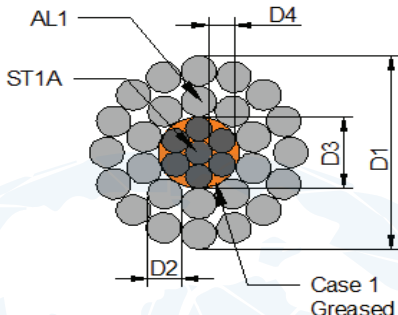
5.	Temperature Range	Units	Guaranteed Characteristics
a)	Installation	C°	-10 C° ~ +50 C°
b)	Transportation and Operation	C°	-40 C° ~ +80 C°

6.	Electrical Technical Data Sheet	Units	Guaranteed Characteristics
a)	Maximum DC resistance of a conductor at 20 C°	Ω/km	0,3060
b)	Maximum AC resistance of a conductor at 25 C°	Ω/km	0,3134
c)	Maximum AC resistance of a conductor at 75 C°	Ω/km	0,3750
d)	Maximum conductor temperature (Normal operation)	C°	80
e)	Maximum conductor temperature (Short-circuit condition)	C°	200
f)	Current Carrying Capacity*	A	369
*Assumed values for calculation of current carrying capacity:			
1)	Solar Radiation	W/m <sup>2</sup>	900
2)	Wind Velocity	m/s	0,6
3)	Maximum conductor temperature	C°	80
4)	Ambient temperature	C°	30
g)	Short-circuit current** (1 second)	kA	10,2
h)	Short circuit current capacity	kA <sup>2</sup> s	104,2
**Assumed values for calculation of short-circuit current:			
1)	Specific conductivity of aluminum at 20 °C	1/(Ωm)	35,38
2)	Specific conductivity of steel at 20 °C	1/(Ωm)	5,208
3)	Temperature coefficient of aluminum	1/K	0,00403
4)	Temperature coefficient of steel	1/K	0,0045
5)	Specific thermal capacity of aluminum	J/(kg K)	0,91
6)	Specific thermal capacity of steel	J/(kg K)	0,48
7)	Conductor temperature of the beginning of a short-circuit	C°	40
8)	Conductor temperature at the end of a short-circuit	C°	200
i)	Total heat capacity of conductor	(J / m C°)	306
j)	Inductive reactance	Ω/km	0,251
k)	Capacitive reactance	MΩ.km	0,217

7.	Drum Labeling
The following information to be attached to the outside of both flanges of each drum;	
a)	Name of Manufacturer
b)	Year of Manufacture
c)	Drum Number
d)	Cable Type
e)	Length
f)	Net Weight
g)	Gross Weight

**TECHNICAL SPECIFICATION**  
**CONDUCTORS FOR OVERHEAD LINES- ROUND WIRE CONCENTRIC LAY STRANDED CONDUCTORS**

Technical Description	Units	Guaranteed Characteristics
<b>1. General Data</b>		
a)Manufacturer		HASÇELİK KABLO
b)Conductor type		Aluminum Conductor Steel Reinforced
c)Conductor coding		ACSR 120/20
d)Applied Standards		EN 50182
e)SAP Product Number		-

2. Technical Drawing:


3. Construction Data / Layers of Conductor:	Units	Guaranteed Characteristics
Number of wires		
a)Steel	pcs.	7
a.1) Lay ratio		Number of wires   Lay ratio of layer (min.-max.)
Center		1   -
Layer 1		6   16-26
b)Aluminum	pcs.	26
b.1) Lay ratio		Number of wires   Lay ratio of layer (min.-max.)
Layer 2		10   10-16
Layer 3		16   10-14
Nominal diameter of wires		
a)Steel wires (D4)	mm	1,90
b)Aluminum wires (D2)	mm	2,44

4. Constructional and dimensional details	Units	Guaranteed Characteristics
<b>4.1 Aluminum part (AL1)</b>		
a)Number of wires	pcs.	26
b)Nominal diameter of wires	mm	2,44
c)Nominal section area of aluminum part	mm <sup>2</sup>	121,57
d)Tensile strength		
1)Before stranding (min.)	N/mm <sup>2</sup>	175
2)After stranding (min.)	N/mm <sup>2</sup>	166
e)Density at 20 C°	kg/dm <sup>3</sup>	2,703
f)Coefficient of linear expansion	K <sup>-1</sup>	23 x 10 <sup>-6</sup>
g)Max. Resistivity at 20 C°	nΩm	28,264
h)Temperature coefficient		0,00403
<b>4.2 Zinc-Coated Steel part (ST 1A)</b>		
a)Number of wires	pcs.	7
b)Nominal diameter of wires	mm	1,90
c)Nominal diameter of steel part (D3)	mm	5,70
d)Nominal section area of steel part	mm <sup>2</sup>	19,85
e)Tensile strength		
1)Tension at 1% elongation (min.)	N/mm <sup>2</sup>	1112
2)Before stranding (min.)	N/mm <sup>2</sup>	1400
3)After stranding (min.)	N/mm <sup>2</sup>	1330
4)elongation in % on breaking	%	2,5
f)Mass of zinc	gr/m <sup>2</sup>	215
g)Density at 20 C°	kg/dm <sup>3</sup>	7,78
h)Coefficient of linear expansion	K <sup>-1</sup>	11,5 x 10 <sup>-6</sup>
i)Max. Resistivity at 20 C°	nΩm	192
<b>4.3 Conductor</b>		
a)Nominal Diameter of conductor (D1)	mm	15,46
b)Nominal section area of conductor	mm <sup>2</sup>	141,42
c)Grease application		Case 1 (Steel core only greased)
d)Aluminum to steel ratio		6,1
e)Conductor mass per unit length (approx.)-without grease	kg/km	490,99
f)Grease mass per unit length (approx.)	kg/km	3,93
g)Direction of lay of the external layer		Z
h)Conductor rated tensile strength	kN	44,50
i)Conductor rated tensile strength	kgf	4537,4
j)Modulus of Elasticity (E-Modulus)	kN/mm <sup>2</sup>	77,2
k)Thermal Elongation Coefficient	10-6/°C	18,7

l) Permissible Maximum Working Stress ( %40 RTS)	N/mm <sup>2</sup>	125,9
m) Everyday Stress (EDS) ( 20% RTS)	N/mm <sup>2</sup>	62,9
n) Ultimate Exceptional Stress ( %70 RTS)	N/mm <sup>2</sup>	220,2
o) Minimum Bending Radius Installation (15XD1)	mm	232
p) Minimum Bending Radius Operation (30XD1)	mm	464
r) Geometric mean radius	m	0,0063

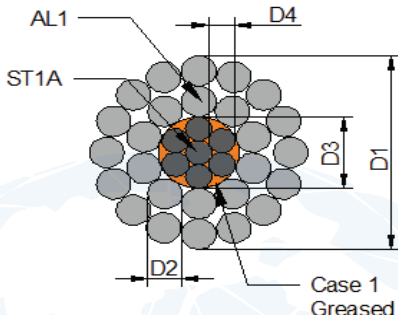
5.	Temperature Range	Units	Guaranteed Characteristics
a)	Installation	C°	-10 C° ~ +50 C°
b)	Transportation and Operation	C°	-40 C° ~ +80 C°

6.	Electrical Technical Data Sheet	Units	Guaranteed Characteristics
a)	Maximum DC resistance of a conductor at 20 C°	Ω/km	0,2376
b)	Maximum AC resistance of a conductor at 25 C°	Ω/km	0,2433
c)	Maximum AC resistance of a conductor at 75 C°	Ω/km	0,2912
d)	Maximum conductor temperature (Normal operation)	C°	80
e)	Maximum conductor temperature (Short-circuit condition)	C°	200
f)	Current Carrying Capacity*	A	434
*Assumed values for calculation of current carrying capacity:			
1)	Solar Radiation	W/m <sup>2</sup>	900
2)	Wind Velocity	m/s	0,6
3)	Maximum conductor temperature	C°	80
4)	Ambient temperature	C°	30
g)	Short-circuit current** (1 second)	kA	13,2
h)	Short circuit current capacity	kA <sup>2</sup> s	172,9
**Assumed values for calculation of short-circuit current:			
1)	Specific conductivity of aluminum at 20 °C	1/(Ωm)	35,38
2)	Specific conductivity of steel at 20 °C	1/(Ωm)	5,208
3)	Temperature coefficient of aluminum	1/K	0,00403
4)	Temperature coefficient of steel	1/K	0,0045
5)	Specific thermal capacity of aluminum	J/(kg K)	0,91
6)	Specific thermal capacity of steel	J/(kg K)	0,48
7)	Conductor temperature of the beginning of a short-circuit	C°	40
8)	Conductor temperature at the end of a short-circuit	C°	200
i)	Total heat capacity of conductor	(J / m C°)	395
j)	Inductive reactance	Ω/km	0,243
k)	Capacitive reactance	MΩ.km	0,210

7.	Drum Labeling
The following information to be attached to the outside of both flanges of each drum;	
a)	Name of Manufacturer
b)	Year of Manufacture
c)	Drum Number
d)	Cable Type
e)	Length
f)	Net Weight
g)	Gross Weight

**TECHNICAL SPECIFICATION**  
**CONDUCTORS FOR OVERHEAD LINES- ROUND WIRE CONCENTRIC LAY STRANDED CONDUCTORS**

Technical Description	Units	Guaranteed Characteristics
<b>1. General Data</b>		
a)Manufacturer		HASÇELİK KABLO
b)Conductor type		Aluminum Conductor Steel Reinforced
c)Conductor coding		ACSR 210/35
d)Applied Standards		EN 50182
e)SAP Product Number		-

2. Technical Drawing:


3. Construction Data / Layers of Conductor:	Units	Guaranteed Characteristics
Number of wires		
a)Steel	pcs.	7
a.1) Lay ratio		Number of wires   Lay ratio of layer (min.-max.)
Center		1   -
Layer 1		6   16-26
b)Aluminum	pcs.	26
b.1) Lay ratio		Number of wires   Lay ratio of layer (min.-max.)
Layer 2		10   10-16
Layer 3		16   10-14
Nominal diameter of wires		
a)Steel wires (D4)	mm	2,49
b)Aluminum wires (D2)	mm	3,20

4. Constructional and dimensional details	Units	Guaranteed Characteristics
<b>4.1 Aluminum part (AL1)</b>		
a)Number of wires	pcs.	26
b)Nominal diameter of wires	mm	3,20
c)Nominal section area of aluminum part	mm <sup>2</sup>	209,10
d)Tensile strength		
1)Before stranding (min.)	N/mm <sup>2</sup>	165
2)After stranding (min.)	N/mm <sup>2</sup>	157
e)Density at 20 C°	kg/dm <sup>3</sup>	2,703
f)Coefficient of linear expansion	K <sup>-1</sup>	23 x 10 <sup>-6</sup>
g)Max. Resistivity at 20 C°	nΩm	28,264
h)Temperature coefficient		0,00403
<b>4.2 Zinc-Coated Steel part (ST 1A)</b>		
a)Number of wires	pcs.	7
b)Nominal diameter of wires	mm	2,49
c)Nominal diameter of steel part (D3)	mm	7,47
d)Nominal section area of steel part	mm <sup>2</sup>	34,09
e)Tensile strength		
1)Tension at 1% elongation (min.)	N/mm <sup>2</sup>	1083
2)Before stranding (min.)	N/mm <sup>2</sup>	1350
3)After stranding (min.)	N/mm <sup>2</sup>	1283
4)elongation in % on breaking	%	2,5
f)Mass of zinc	gr/m <sup>2</sup>	230
g)Density at 20 C°	kg/dm <sup>3</sup>	7,78
h)Coefficient of linear expansion	K <sup>-1</sup>	11,5 x 10 <sup>-6</sup>
i)Max. Resistivity at 20 C°	nΩm	192
<b>4.3 Conductor</b>		
a)Nominal Diameter of conductor (D1)	mm	20,27
b)Nominal section area of conductor	mm <sup>2</sup>	243,19
c)Grease application		Case 1 (Steel core only greased)
d)Aluminum to steel ratio		6,1
e)Conductor mass per unit length (approx.)-without grease	kg/km	844,11
f)Grease mass per unit length (approx.)	kg/km	6,76
g)Direction of lay of the external layer		Z
h)Conductor rated tensile strength	kN	73,36
i)Conductor rated tensile strength	kgf	7480,8
j)Modulus of Elasticity (E-Modulus)	kN/mm <sup>2</sup>	77,2
k)Thermal Elongation Coefficient	10-6/°C	18,7

l) Permissible Maximum Working Stress ( %40 RTS)	N/mm <sup>2</sup>	120,7
m) Everyday Stress (EDS) ( 20% RTS)	N/mm <sup>2</sup>	60,3
n) Ultimate Exceptional Stress ( %70 RTS)	N/mm <sup>2</sup>	211,2
o) Minimum Bending Radius Installation (15XD1)	mm	304
p) Minimum Bending Radius Operation (30XD1)	mm	608
r) Geometric mean radius	m	0,0082

5. Temperature Range	Units	Guaranteed Characteristics
a) Installation	C°	-10 C° ~ +50 C°
b) Transportation and Operation	C°	-40 C° ~ +80 C°

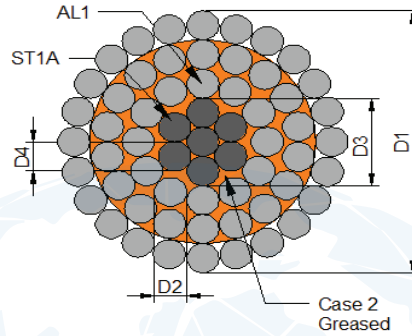
6. Electrical Technical Data Sheet	Units	Guaranteed Characteristics
a) Maximum DC resistance of a conductor at 20 C°	Ω/km	0,1381
b) Maximum AC resistance of a conductor at 25 C°	Ω/km	0,1415
c) Maximum AC resistance of a conductor at 75 C°	Ω/km	0,1693
d) Maximum conductor temperature (Normal operation)	C°	80
e) Maximum conductor temperature (Short-circuit condition)	C°	200
f) Current Carrying Capacity*	A	616
*Assumed values for calculation of current carrying capacity:		
1) Solar Radiation	W/m <sup>2</sup>	900
2) Wind Velocity	m/s	0,6
3) Maximum conductor temperature	C°	80
4) Ambient temperature	C°	30
g) Short-circuit current** (1 second)	kA	22,6
h) Short circuit current capacity	kA <sup>2</sup> s	511,5
**Assumed values for calculation of short-circuit current:		
1) Specific conductivity of aluminum at 20 °C	1/(Ωm)	35,38
2) Specific conductivity of steel at 20 °C	1/(Ωm)	5,208
3) Temperature coefficient of aluminum	1/K	0,00403
4) Temperature coefficient of steel	1/K	0,0045
5) Specific thermal capacity of aluminum	J/(kg K)	0,91
6) Specific thermal capacity of steel	J/(kg K)	0,48
7) Conductor temperature of the beginning of a short-circuit	C°	40
8) Conductor temperature at the end of a short-circuit	C°	200
i) Total heat capacity of conductor	(J / m C°)	678
j) Inductive reactance	Ω/km	0,226
k) Capacitive reactance	MΩ.km	0,194

7. Drum Labeling
The following information to be attached to the outside of both flanges of each drum;
a) Name of Manufacturer
b) Year of Manufacture
c) Drum Number
d) Cable Type
e) Length
f) Net Weight
g) Gross Weight

**TECHNICAL SPECIFICATION**  
**CONDUCTORS FOR OVERHEAD LINES- ROUND WIRE CONCENTRIC LAY STRANDED CONDUCTORS**

Technical Description	Units	Guaranteed Characteristics
<b>1. General Data</b>		
a)Manufacturer		HASÇELİK KABLO
b)Conductor type		Aluminum Conductor Steel Reinforced
c)Conductor coding		ACSR 490/65
d)Applied Standards		EN 50182
e)SAP Product Number		-

**2. Technical Drawing:**



Construction Data / Layers of Conductor:	Units	Guaranteed Characteristics
Number of wires		
a)Steel	pcs.	7
a.1) Lay ratio		Number of wires
Center		1
Layer 1		6
b)Aluminum	pcs.	54
b.1) Lay ratio		Number of wires
Layer 2		12
Layer 3		18
Layer 4		24
Nominal diameter of wires		
a)Steel wires (D4)	mm	3,40
b)Aluminum wires (D2)	mm	3,40

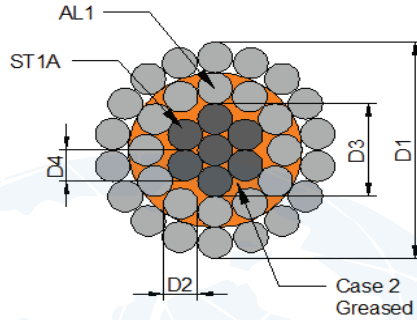
Constructional and dimensional details	Units	Guaranteed Characteristics
<b>4.1 Aluminum part (AL1)</b>		
a)Number of wires	pcs.	54
b)Nominal diameter of wires	mm	3,40
c)Nominal section area of aluminum part	mm <sup>2</sup>	490,28
d)Tensile strength		
1)Before stranding (min.)	N/mm <sup>2</sup>	165
2)After stranding (min.)	N/mm <sup>2</sup>	157
e)Density at 20 C°	kg/dm <sup>3</sup>	2,703
f)Coefficient of linear expansion	K <sup>-1</sup>	23 x 10 <sup>-6</sup>
g)Max. Resistivity at 20 C°	nΩm	28,264
h)Temperature coefficient		0,00403
<b>4.2 Zinc-Coated Steel part (ST 1A)</b>		
a)Number of wires	pcs.	7
b)Nominal diameter of wires	mm	3,40
c)Nominal diameter of steel part (D3)	mm	10,20
d)Nominal section area of steel part	mm <sup>2</sup>	63,55
e)Tensile strength		
1)Tension at 1% elongation (min.)	N/mm <sup>2</sup>	1045
2)Before stranding (min.)	N/mm <sup>2</sup>	1300
3)After stranding (min.)	N/mm <sup>2</sup>	1235
4)elongation in % on breaking	%	3,5
f)Mass of zinc	gr/m <sup>2</sup>	245
g)Density at 20 C°	kg/dm <sup>3</sup>	7,78
h)Coefficient of linear expansion	K <sup>-1</sup>	11,5 x 10 <sup>-6</sup>
i)Max. Resistivity at 20 C°	nΩm	192
<b>4.3 Conductor</b>		
a)Nominal Diameter of conductor (D1)	mm	30,6
b)Nominal section area of conductor	mm <sup>2</sup>	553,83
c)Grease application		Case 2 (All the conductor is greased except the outer layer)
d)Aluminum to steel ratio		7,7
e)Conductor mass per unit length (approx.)-without grease	kg/km	1852,86
f)Grease mass per unit length (approx.)	kg/km	75,83
g)Direction of lay of the external layer		Z
h)Conductor rated tensile strength	kN	150,81
i)Conductor rated tensile strength	kgf	15377,9
j)Modulus of Elasticity (E-Modulus)	kN/mm <sup>2</sup>	73,3
k)Thermal Elongation Coefficient	10-6/°C	19,3

	l) Permissible Maximum Working Stress ( %40 RTS)	N/mm <sup>2</sup>	108,9
	m) Everyday Stress (EDS) ( 20% RTS)	N/mm <sup>2</sup>	54,5
	n) Ultimate Exceptional Stress ( %70 RTS)	N/mm <sup>2</sup>	190,6
	o) Minimum Bending Radius Installation (15XD1)	mm	459
	p) Minimum Bending Radius Operation (30XD1)	mm	918
	r) Geometric mean radius	m	0,0124
<b>5. Temperature Range</b>			
	a) Installation	C°	-10 C° ~ +50 C°
	b) Transportation and Operation	C°	-40 C° ~ +80 C°
<b>6. Electrical Technical Data Sheet</b>			
	a) Maximum DC resistance of a conductor at 20 C°	Ω/km	0,0590
	b) Maximum AC resistance of a conductor at 25 C°	Ω/km	0,0604
	c) Maximum AC resistance of a conductor at 75 C°	Ω/km	0,0723
	d) Maximum conductor temperature (Normal operation)	C°	80
	e) Maximum conductor temperature (Short-circuit condition)	C°	200
	f) Current Carrying Capacity*	A	1066
	*Assumed values for calculation of current carrying capacity:		
	1) Solar Radiation	W/m <sup>2</sup>	900
	2) Wind Velocity	m/s	0,6
	3) Maximum conductor temperature	C°	80
	4) Ambient temperature	C°	30
	g) Short-circuit current** (1 second)	kA	52,3
	h) Short circuit current capacity	kA <sup>2</sup> s	2731,1
	**Assumed values for calculation of short-circuit current:		
	1) Specific conductivity of aluminum at 20 °C	1/(Ωm)	35,38
	2) Specific conductivity of steel at 20 °C	1/(Ωm)	5,208
	3) Temperature coefficient of aluminum	1/K	0,00403
	4) Temperature coefficient of steel	1/K	0,0045
	5) Specific thermal capacity of aluminum	J/(kg K)	0,91
	6) Specific thermal capacity of steel	J/(kg K)	0,48
	7) Conductor temperature of the beginning of a short-circuit	C°	40
	8) Conductor temperature at the end of a short-circuit	C°	200
	i) Total heat capacity of conductor	(J / m C°)	1531
	j) Inductive reactance	Ω/km	0,200
	k) Capacitive reactance	MΩ.km	0,170
<b>7. Drum Labeling</b>			
	The following information to be attached to the outside of both flanges of each drum;		
	a) Name of Manufacturer		
	b) Year of Manufacture		
	c) Drum Number		
	d) Cable Type		
	e) Length		
	f) Net Weight		
	g) Gross Weight		

**TECHNICAL SPECIFICATION**  
**CONDUCTORS FOR OVERHEAD LINES- ROUND WIRE CONCENTRIC LAY STRANDED CONDUCTORS**

	Technical Description	Units	Guaranteed Characteristics
<b>1.</b>	<b>General Data</b>		
	a)Manufacturer		HASÇELİK KABLO
	b)Conductor type		Aluminum Conductor Steel Reinforced
	c)Conductor coding		ACSR LARK
	d)Applied Standards		EN 50182
	e)SAP Product Number		-

**2. Technical Drawing:**



	Construction Data / Layers of Conductor:	Units	Guaranteed Characteristics
	Number of wires		
	a)Steel	pcs.	7
	a.1) Lay ratio		Number of wires
	Center		1
	Layer 1		6
	b)Aluminum	pcs.	30
	b.1) Lay ratio		Number of wires
	Layer 2		12
	Layer 3		18
	Nominal diameter of wires		
	a)Steel wires (D4)	mm	2,92
	b)Aluminum wires (D2)	mm	2,92

**4. Constructional and dimensional details**

	Constructional and dimensional details	Units	Guaranteed Characteristics
<b>4.1</b>	<b>Aluminum part (AL1)</b>		
	a)Number of wires	pcs.	30
	b)Nominal diameter of wires	mm	2,92
	c)Nominal section area of aluminum part	mm <sup>2</sup>	200,90
	d)Tensile strength		
	1)Before stranding (min.)	N/mm <sup>2</sup>	170
	2)After stranding (min.)	N/mm <sup>2</sup>	162
	e)Density at 20 C°	kg/dm <sup>3</sup>	2,703
	f)Coefficient of linear expansion	K <sup>-1</sup>	23 x 10 <sup>-6</sup>
	g)Max. Resistivity at 20 C°	nΩm	28,264
	h)Temperature coefficient		0,00403
<b>4.2</b>	<b>Zinc-Coated Steel part (ST 1A)</b>		
	a)Number of wires	pcs.	7
	b)Nominal diameter of wires	mm	2,92
	c)Nominal diameter of steel part (D3)	mm	8,76
	d)Nominal section area of steel part	mm <sup>2</sup>	46,88
	e)Tensile strength		
	1)Tension at 1% elongation (min.)	N/mm <sup>2</sup>	1083
	2)Before stranding (min.)	N/mm <sup>2</sup>	1350
	3)After stranding (min.)	N/mm <sup>2</sup>	1283
	4)elongation in % on breaking	%	3
	f)Mass of zinc	gr/m <sup>2</sup>	230
	g)Density at 20 C°	kg/dm <sup>3</sup>	7,78
	h)Coefficient of linear expansion	K <sup>-1</sup>	11,5 x 10 <sup>-6</sup>
	i)Max. Resistivity at 20 C°	nΩm	192
<b>4.3</b>	<b>Conductor</b>		
	a)Nominal Diameter of conductor (D1)	mm	20,44
	b)Nominal section area of conductor	mm <sup>2</sup>	247,77
	c)Grease application		Case 2 (All the conductor is greased except the outer layer)
	d)Aluminum to steel ratio		4,3
	e)Conductor mass per unit length (approx.)-without grease	kg/km	921,90
	f)Grease mass per unit length (approx.)	kg/km	27,97
	g)Direction of lay of the external layer		Z
	h)Conductor rated tensile strength	kN	87,59
	i)Conductor rated tensile strength	kgf	8931,9
	j)Modulus of Elasticity (E-Modulus)	kN/mm <sup>2</sup>	84,6
	k)Thermal Elongation Coefficient	10-6/°C	17,7



	l) Permissible Maximum Working Stress ( %40 RTS)	N/mm <sup>2</sup>	141,4
	m) Everyday Stress (EDS) ( 20% RTS)	N/mm <sup>2</sup>	70,7
	n) Ultimate Exceptional Stress ( %70 RTS)	N/mm <sup>2</sup>	247,5
	o) Minimum Bending Radius Installation (15XD1)	mm	307
	p) Minimum Bending Radius Operation (30XD1)	mm	613
	r) Geometric mean radius	m	0,0082
<b>5. Temperature Range</b>			
	a) Installation	C°	-10 C° ~ +50 C°
	b) Transportation and Operation	C°	-40 C° ~ +80 C°
<b>6. Electrical Technical Data Sheet</b>			
	a) Maximum DC resistance of a conductor at 20 C°	Ω/km	0,1439
	b) Maximum AC resistance of a conductor at 25 C°	Ω/km	0,1473
	c) Maximum AC resistance of a conductor at 75 C°	Ω/km	0,1763
	d) Maximum conductor temperature (Normal operation)	C°	80
	e) Maximum conductor temperature (Short-circuit condition)	C°	200
	f) Current Carrying Capacity*	A	605
	*Assumed values for calculation of current carrying capacity:		
	1) Solar Radiation	W/m <sup>2</sup>	900
	2) Wind Velocity	m/s	0,6
	3) Maximum conductor temperature	C°	80
	4) Ambient temperature	C°	30
	g) Short-circuit current** (1 second)	kA	22,4
	h) Short circuit current capacity	kA <sup>2</sup> s	501,3
	**Assumed values for calculation of short-circuit current:		
	1) Specific conductivity of aluminum at 20 °C	1/(Ωm)	35,38
	2) Specific conductivity of steel at 20 °C	1/(Ωm)	5,208
	3) Temperature coefficient of aluminum	1/K	0,00403
	4) Temperature coefficient of steel	1/K	0,0045
	5) Specific thermal capacity of aluminum	J/(kg K)	0,91
	6) Specific thermal capacity of steel	J/(kg K)	0,48
	7) Conductor temperature of the beginning of a short-circuit	C°	40
	8) Conductor temperature at the end of a short-circuit	C°	200
	i) Total heat capacity of conductor	(J / m C°)	705
	j) Inductive reactance	Ω/km	0,226
	k) Capacitive reactance	MΩ.km	0,194
<b>7. Drum Labeling</b>			
	The following information to be attached to the outside of both flanges of each drum;		
	a) Name of Manufacturer		
	b) Year of Manufacture		
	c) Drum Number		
	d) Cable Type		
	e) Length		
	f) Net Weight		
	g) Gross Weight		

**TECHNICAL SPECIFICATION  
CONDUCTORS FOR OVERHEAD LINES- ROUND WIRE CONCENTRIC LAY STRANDED CONDUCTORS**

Technical Description	Units	Guaranteed Characteristics	
<b>1. General Data</b>			
a)Manufacturer		HASÇELİK KABLO	
b)Conductor type		Aluminum Conductor Steel Reinforced	
c)Conductor coding		ACSR TEAL	
d)Applied Standards		EN 50182	
e)SAP Product Number		-	
<b>2. Technical Drawing:</b>			
<b>3. Construction Data / Layers of Conductor:</b>	<b>Units</b>	<b>Guaranteed Characteristics</b>	
Number of wires			
a)Steel	pcs.	19	
a.1) Lay ratio		Number of wires	Lay ratio of layer (min.-max.)
Center		1	-
Layer 1		6	16-26
Layer 2		12	14-22
b)Aluminum	pcs.	30	
b.1) Lay ratio		Number of wires	Lay ratio of layer (min.-max.)
Layer 3		12	10-16
Layer 4		18	10-14
Nominal diameter of wires			
a)Steel wires (D4)	mm	2,16	
b)Aluminum wires (D2)	mm	3,61	
<b>4. Constructional and dimensional details</b>	<b>Units</b>	<b>Guaranteed Characteristics</b>	
<b>4.1 Aluminum part (AL1)</b>			
a)Number of wires	pcs.	30	
b)Nominal diameter of wires	mm	3,61	
c)Nominal section area of aluminum part	mm <sup>2</sup>	307,06	
d)Tensile strength			
1)Before stranding (min.)	N/mm <sup>2</sup>	160	
2)After stranding (min.)	N/mm <sup>2</sup>	152	
e)Density at 20 C°	kg/dm <sup>3</sup>	2,703	
f)Coefficient of linear expansion	K <sup>-1</sup>	23 x 10 <sup>-6</sup>	
g)Max. Resistivity at 20 C°	nΩm	28,264	
h)Temperature coefficient		0,00403	
<b>4.2 Zinc-Coated Steel part (ST 1A)</b>			
a)Number of wires	pcs.	19	
b)Nominal diameter of wires	mm	2,16	
c)Nominal diameter of steel part (D3)	mm	10,80	
d)Nominal section area of steel part	mm <sup>2</sup>	69,62	
e)Tensile strength			
1)Tension at 1% elongation (min.)	N/mm <sup>2</sup>	1112	
2)Before stranding (min.)	N/mm <sup>2</sup>	1400	
3)After stranding (min.)	N/mm <sup>2</sup>	1330	
4)elongation in % on breaking	%	2,5	
f)Mass of zinc	gr/m <sup>2</sup>	215	
g)Density at 20 C°	kg/dm <sup>3</sup>	7,78	
h)Coefficient of linear expansion	K <sup>-1</sup>	11,5 x 10 <sup>-6</sup>	
i)Max. Resistivity at 20 C°	nΩm	192	
<b>4.3 Conductor</b>			
a)Nominal Diameter of conductor (D1)	mm	25,24	
b)Nominal section area of conductor	mm <sup>2</sup>	376,68	
c)Grease application		Case 2 (All the conductor is greased except the outer layer)	
d)Aluminum to steel ratio		4,4	
e)Conductor mass per unit length (approx.)	kg/km	1395,90	

f)Grease mass per unit length (approx.)	kg/km	43,9
g)Direction of lay of the external layer		Z
h)Conductor rated tensile strength	kN	130,59
i)Conductor rated tensile strength	kgf	13316,3
j)Modulus of Elasticity (E-Modulus)	kN/mm <sup>2</sup>	83,9
k)Thermal Elongation Coefficient	10 <sup>-6</sup> /°C	17,8
l)Permissible Maximum Working Stress ( %40 RTS)	N/mm <sup>2</sup>	138,7
m)Everyday Stress (EDS) ( 20% RTS)	N/mm <sup>2</sup>	69,3
n)Ultimate Exceptional Stress ( %70 RTS)	N/mm <sup>2</sup>	242,7
o)Minimum Bending Radius Installation (15XD1)	mm	379
p)Minimum Bending Radius Operation (30XD1)	mm	757
r)Geometric mean radius	m	0,0101

5. Temperature Range	Units	Guaranteed Characteristics
a)Installation	C°	-10 C° ~ +50 C°
b)Transportation and Operation	C°	-40 C°~ +80 C°

6. Electrical Technical Data Sheet	Units	Guaranteed Characteristics
a)Maximum DC resistance of a conductor at 20 C°	Ω/km	0,0942
b)Maximum AC resistance of a conductor at 25 C°	Ω/km	0,0965
c)Maximum AC resistance of a conductor at 75 C°	Ω/km	0,1155
d)Maximum conductor temperature (Normal operation)	C°	80
e)Maximum conductor temperature (Short-circuit condition)	C°	200
f)Current Carrying Capacity*	A	796
*Assumed values for calculation of current carrying capacity:		
1)Solar Radiation	W/m <sup>2</sup>	900
2)Wind Velocity	m/s	0,6
3)Maximum conductor temperature	C°	80
4)Ambient temperature	C°	30
g)Short-circuit current** (1 second)	kA	34,1
h)Short circuit current capacity	kA <sup>2</sup> s	1164,6
**Assumed values for calculation of short-circuit current:		
1)Specific conductivity of aluminum at 20 °C	1/(Ωm)	35,38
2)Specific conductivity of steel at 20 °C	1/(Ωm)	5,208
3)Temperature coefficient of aluminum	1/K	0,00403
4)Temperature coefficient of steel	1/K	0,0045
5)Specific thermal capacity of aluminum	J/(kg K)	0,91
6)Specific thermal capacity of steel	J/(kg K)	0,48
7)Conductor temperature of the beginning of a short-circuit	C°	40
8)Conductor temperature at the end of a short-circuit	C°	200
i)Total heat capacity of conductor	(J / m C°)	1071
j)Inductive reactance	Ω/km	0,213
k)Capacitive reactance	MΩ.km	0,181

7. Drum Labeling
The following information to be attached to the outside of both flanges of each drum;
a)Name of Manufacturer
b) Year of Manufacture
c) Drum Number
d) Cable Type
e) Length
f) Net Weight
g) Gross Weight

**Overhead distribution cable of rated voltage 0,6/1 kV**

	Technical Description	Units	Guaranteed Characteristics
<b>1.</b>	<b>General Data</b>		
	a)Manufacturer		HASÇELİK KABLO
	b)Type of cable		TWISTED CABLE
	c)Applied Standards		HD 626 S1
	d)Number of cores and Cross-sectional area	mm <sup>2</sup>	3X95+50+16
	e)Rated Voltage U0/U(Um)	kV	0,6/1(1,2)
	f)SAP Product Number		-
<b>2.</b>	<b>Construction Data / Layers of Cable:</b>		
	-Aluminum Conductor		
	-High Density Polyethylene Insulation		
<b>3.</b>	<b>Constructional and dimensional details</b>	<b>Units</b>	<b>Guaranteed Characteristics</b>
<b>3.1.1</b>	<b>Conductor (Three Phases)</b>		
	a)Material of Conductor		Aluminum-Class 2
	b)Nominal section area of conductor	mm <sup>2</sup>	95
	c)Conductor Shape		Circular stranded compacted
	d)Number of Wires	pcs.	15 (min.)
	e)Conductor Diameter	mm	11-12
	f)Direction of lay		Right hand (Z)
<b>3.1.2</b>	<b>Conductor (One Neutral)</b>		
	a)Material of Conductor		Aluminum Alloy-Class 2
	b)Nominal section area of conductor	mm <sup>2</sup>	50
	c)Conductor Shape		Circular stranded compacted
	d)Number of Wires	pcs.	6 (min.)
	e)Conductor Diameter	mm	7,7-8,6
	f)Direction of lay		Right hand (Z)
<b>3.1.3</b>	<b>Conductor (Public Street Lighting)</b>		
	a)Material of Conductor		Aluminum-Class 1
	b)Nominal section area of conductor	mm <sup>2</sup>	16
	c)Conductor Shape		Solid
	d)Number of Wires	pcs.	1
	e)Conductor Diameter	mm	4,35-4,45
	f)Direction of lay		-
<b>3.2</b>	<b>Insulation</b>		
<b>3.2.1</b>	<b>Three Phases</b>		
	a)Type of Insulation		HDPE
	b)Nominal thickness of insulation	mm	1,6
	c)Colour of HDPE Insulation		Black
	d)Marking		
	1)Identification (Two ridges-Three ridges-Four ridges)		Ridge(s) along the cable
	2)On the insulation a marking is applied as follows;		
	Two ridges		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKEY 2R" (by inkjet)
	Three ridges		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKEY 3S" (by inkjet)
	Four ridges		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKEY 4T" (by inkjet)
	3)Continuity of marks;		
	Max. distance between the start of the mark and the beginning of the next mark: 1 meter		
<b>3.2.2</b>	<b>One Neutral</b>		
	a)Type of Insulation		HDPE
	b)Nominal thickness of insulation	mm	1,4
	c)Colour of HDPE Insulation		Black
	d)Marking		
	1)Identification (One ridge)		Ridge(s) along the cable
	2)On the insulation a marking is applied as follows;		
	"Meter Marking" (by inkjet)		
	3)Continuity of marks;		
	Distance between the start of one mark and the beginning of the next identical mark: 1 meter		
<b>3.2.3</b>	<b>Public Street Lighting</b>		
	a)Type of Insulation		HDPE
	b)Nominal thickness of insulation	mm	1,2
	c)Colour of HDPE Insulation		Black
	d)Marking		
	1)Identification		
	2)On the insulation a marking is applied as follows;		
	"Cross-sectional area" (by inkjet)		
	3)Continuity of marks;		
	Distance between the start of one mark and the beginning of the next identical mark: 1 meter		
<b>3.3</b>	<b>Complete Cable</b>		
	a)Direction of lay of outer strands		Right hand (Z)
	b)Outer Diameter of Cable (approx.)	mm	37
	c)Cable Unit Weight (approx.)	kg/km	1175
<b>4</b>	<b>Electrical Technical Data Sheet</b>	<b>Units</b>	<b>Guaranteed Characteristics</b>
	a)Max. DC resistance of phases at 20 C°	Ω/km	0,320
	b)Max. DC resistance of neutral at 20 C°	Ω/km	0,720
	c)Max. DC resistance of public Street Lightings at 20 C°	Ω/km	1,91
	d)Maximum conductor temperature (Normal operation)	C°	90
	e)Maximum conductor temperature (Short-circuit 5 seconds maximum duration)	C°	250
	f)Maximum Short-Circuit Current for 1 second	kA	8,9
	g)Current Carrying Capacity*		
	*In Air (Ambient Temperature 30 °C, Load Factor 1.0, Flat)		
	1)Phase conductor	(A)	258
	2)Public Street Lightings conductor	(A)	81
	h) Test Voltage (AC)	kV	4
<b>5</b>	<b>Drum Labeling</b>		
	The following information to be attached to the outside of both flanges of each drum;		
	a)Name of Manufacturer		
	b) Year of Manufacture		
	c) Drum Number		
	d) Cable Type		
	e) Length		
	f) Net Weight		
	g) Gross Weight		

**Overhead distribution cable of rated voltage 0,6/1 kV**

Technical Description		Units	Guaranteed Characteristics
<b>1. General Data</b>			
a)Manufacturer			HASÇELİK KABLO
b)Type of cable			XLPE TWISTED CABLE
c)Applied Standards			NFC 33 209
d)Number of cores and Cross-sectional area	mm <sup>2</sup>		3X95+50+16
e)Rated Voltage U0/U(Um)	kV		0,6/1(1,2)
f)SAP Product Number			-
<b>2. Construction Data / Layers of Cable:</b>			
-Aluminum Conductor			
-Black cross linked polyethylene Insulation			
<b>3. Constructional and dimensional details</b>			
<b>3.1.1 Conductor (Three Phases)</b>			
a)Material of Conductor			Aluminum-Class 2
b)Nominal section area of conductor	mm <sup>2</sup>		95
c)Conductor Shape			Circular stranded compacted
d)Number of Wires	pcs.		15 (min.)
e)Conductor Diameter	mm		11-12
f)Direction of lay			Right hand (Z)
<b>3.1.2 Conductor (One Neutral)</b>			
a)Material of Conductor			Aluminum Alloy-Class 2
b)Nominal section area of conductor	mm <sup>2</sup>		50
c)Conductor Shape			Circular stranded compacted
d)Number of Wires	pcs.		6 (min.)
e)Conductor Diameter	mm		7,9-8,4
f)Direction of lay			Right hand (Z)
<b>3.1.3 Conductor (Public Street Lighting)</b>			
a)Material of Conductor			Aluminum-Class 1
b)Nominal section area of conductor	mm <sup>2</sup>		16
c)Conductor Shape			Solid
d)Number of Wires	pcs.		1
e)Conductor Diameter	mm		4,35-4,45
f)Direction of lay			-
<b>3.2 Insulation</b>			
<b>3.2.1 Three Phases</b>			
a)Type of Insulation			XLPE
b)Nominal thickness of insulation	mm		1,8
c)Colour of XLPE Insulation			BLACK with RED strip, BLACK with BLUE strip, BLACK with WHITE strip
d)Marking			
1)Identification			
2)On the insulation a marking is applied as follows;			
BLACK with RED strip			"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKIYE 2R" (by inkjet)
BLACK with WHITE strip			"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKIYE 3S" (by inkjet)
BLACK with BLUE strip			"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKIYE 4T" (by inkjet)
3)Continuity of marks;			
Max. distance between the start of the mark and the beginning of the next mark: 1 meter			
<b>3.2.2 One Neutral</b>			
a)Type of Insulation			XLPE
b)Nominal thickness of insulation	mm		1,6
c)Colour of XLPE Insulation			Black
d)Marking			
1)Identification			
2)On the insulation a marking is applied as follows;			
"Meter Marking" (by inkjet)			
3)Continuity of marks;			
Distance between the start of one mark and the beginning of the next identical mark: 1 meter			
<b>3.2.3 Public Street Lighting</b>			
a)Type of Insulation			XLPE
b)Nominal thickness of insulation	mm		1,2
c)Colour of XLPE Insulation			Black
d)Marking			
1)Identification			
2)On the insulation a marking is applied as follows;			
"Cross-sectional area" (by inkjet)			
3)Continuity of marks;			
Distance between the start of one mark and the beginning of the next identical mark: 1 meter			
<b>3.3 Complete Cable</b>			
a)Direction of lay of outer strands			Right hand (Z)
b)Outer Diameter of Cable (approx.)	mm		37
c)Cable Unit Weight (approx.)	kg/km		1220
<b>4 Electrical Technical Data Sheet</b>		<b>Units</b>	<b>Guaranteed Characteristics</b>
a)Max. DC resistance of phases at 20 C°		Ω/km	0,320
b)Max. DC resistance of neutral at 20 C°		Ω/km	0,720
c)Max. DC resistance of public Street Lightings at 20 C°		Ω/km	1,91
d)Maximum conductor temperature (Normal operation)		C°	90
e)Maximum conductor temperature (Short-circuit 5 seconds maximum duration)		C°	250
f)Maximum Short-Circuit Current for 1 second		kA	8,9
g)Current Carrying Capacity*			
*In Air (Ambient Temperature 30 °C, Load Factor 1.0, Flat)			
1)Phase conductor		(A)	258
2)Public Street Lightings conductor		(A)	81
h) Test Voltage (AC)		kV	4
<b>5 Drum Labeling</b>			
The following information to be attached to the outside of both flanges of each drum;			
a)Name of Manufacturer			
b) Year of Manufacture			
c) Drum Number			
d) Cable Type			
e) Length			
f) Net Weight			
g) Gross Weight			

### Overhead distribution cable of rated voltage 0,6/1 kV

	Technical Description	Units	Guaranteed Characteristics
<b>1. General Data</b>			
a) Manufacturer			HASÇELİK KABLO
b) Type of cable			TWISTED CABLE
c) Applied Standards			HD 626 S1
d) Number of cores and Cross-sectional area	mm <sup>2</sup>		3X95+70+16
e) Rated Voltage U0/U(Um)	kV		0,6/1(1,2)
f) SAP Product Number			-
<b>2. Construction Data / Layers of Cable:</b>			
	-Aluminum Conductor		
	-High Density Polyethylene Insulation		
<b>3. Constructional and dimensional details</b>			
<b>3.1.1 Conductor (Three Phases)</b>			
a) Material of Conductor			Aluminum-Class 2
b) Nominal section area of conductor	mm <sup>2</sup>		95
c) Conductor Shape			Circular stranded compacted
d) Number of Wires	pcs.		15 (min.)
e) Conductor Diameter	mm		11-12
f) Direction of lay			Right hand (Z)
<b>3.1.2 Conductor (One Neutral)</b>			
a) Material of Conductor			Aluminum Alloy-Class 2
b) Nominal section area of conductor	mm <sup>2</sup>		70
c) Conductor Shape			Circular stranded compacted
d) Number of Wires	pcs.		12 (min.)
e) Conductor Diameter	mm		9,3-10,2
f) Direction of lay			Right hand (Z)
<b>3.1.3 Conductor (Public Street Lighting)</b>			
a) Material of Conductor			Aluminum-Class 1
b) Nominal section area of conductor	mm <sup>2</sup>		16
c) Conductor Shape			Solid
d) Number of Wires	pcs.		1
e) Conductor Diameter	mm		4,35-4,45
f) Direction of lay			-
<b>3.2 Insulation</b>			
<b>3.2.1 Three Phases</b>			
a) Type of Insulation			HDPE
b) Nominal thickness of insulation	mm		1,6
c) Colour of HDPE Insulation			Black
d) Marking			
1) Identification (Two ridges-Three ridges-Four ridges)			Ridge(s) along the cable
2) On the insulation a marking is applied as follows;			
Two ridges			"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKEY 2R" (by inkjet)
Three ridges			"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKEY 3S" (by inkjet)
Four ridges			"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKEY 4T" (by inkjet)
3) Continuity of marks;			
Max. distance between the start of the mark and the beginning of the next mark: 1 meter			
<b>3.2.2 One Neutral</b>			
a) Type of Insulation			HDPE
b) Nominal thickness of insulation	mm		1,4
c) Colour of HDPE Insulation			Black
d) Marking			
1) Identification (One ridge)			Ridge(s) along the cable
2) On the insulation a marking is applied as follows;			
"Meter Marking" (by inkjet)			
3) Continuity of marks;			
Distance between the start of one mark and the beginning of the next identical mark: 1 meter			
<b>3.2.3 Public Street Lighting</b>			
a) Type of Insulation			HDPE
b) Nominal thickness of insulation	mm		1,2
c) Colour of HDPE Insulation			Black
d) Marking			
1) Identification			
2) On the insulation a marking is applied as follows;			
"Cross-sectional area" (by inkjet)			
3) Continuity of marks;			
Distance between the start of one mark and the beginning of the next identical mark: 1 meter			
<b>3.3 Complete Cable</b>			
a) Direction of lay of outer strands			Right hand (Z)
b) Outer Diameter of Cable (approx.)	mm		43,5
c) Cable Unit Weight (approx.)	kg/km		1265
<b>4 Electrical Technical Data Sheet</b>			
a) Max. DC resistance of phases at 20 C°	Ω/km		0,320
b) Max. DC resistance of neutral at 20 C°	Ω/km		0,493
c) Max. DC resistance of public Street Lightings at 20 C°	Ω/km		1,91
d) Maximum conductor temperature (Normal operation)	C°		90
e) Maximum conductor temperature (Short-circuit 5 seconds maximum duration)	C°		250
f) Maximum Short-Circuit Current for 1 second	kA		8,9
g) Current Carrying Capacity*			
*In Air (Ambient Temperature 30 °C, Load Factor 1.0, Flat)			
1) Phase conductor	(A)		258
2) Public Street Lightings conductor	(A)		81
h) Test Voltage (AC)	kV		4
<b>5 Drum Labeling</b>			
The following information to be attached to the outside of both flanges of each drum;			
a) Name of Manufacturer			
b) Year of Manufacture			
c) Drum Number			
d) Cable Type			
e) Length			
f) Net Weight			
g) Gross Weight			

**Overhead distribution cable of rated voltage 0,6/1 kV**

Technical Description	Units	Guaranteed Characteristics
<b>1. General Data</b>		
a)Manufacturer		HASÇELİK KABLO
b)Type of cable		XLPE TWISTED CABLE
c)Applied Standards		NFC 33 209
d)Number of cores and Cross-sectional area	mm <sup>2</sup>	3X95+70+16
e)Rated Voltage U0/U(Um)	kV	0,6/1(1,2)
f)SAP Product Number		-
<b>2. Construction Data / Layers of Cable:</b>		
-Aluminum Conductor		
-Black cross linked polyethylene Insulation		
<b>3. Constructional and dimensional details</b>		
<b>3.1.1 Conductor (Three Phases)</b>		
a)Material of Conductor		Aluminum-Class 2
b)Nominal section area of conductor	mm <sup>2</sup>	95
c)Conductor Shape		Circular stranded compacted
d)Number of Wires	pcs.	15 (min.)
e)Conductor Diameter	mm	11-12
f)Direction of lay		Right hand (Z)
<b>3.1.2 Conductor (One Neutral)</b>		
a)Material of Conductor		Aluminum Alloy-Class 2
b)Nominal section area of conductor	mm <sup>2</sup>	70
c)Conductor Shape		Circular stranded compacted
d)Number of Wires	pcs.	12 (min.)
e)Conductor Diameter	mm	10-10,2
f)Direction of lay		Right hand (Z)
<b>3.1.3 Conductor (Public Street Lighting)</b>		
a)Material of Conductor		Aluminum-Class 1
b)Nominal section area of conductor	mm <sup>2</sup>	16
c)Conductor Shape		Solid
d)Number of Wires	pcs.	1
e)Conductor Diameter	mm	4,35-4,45
f)Direction of lay		-
<b>3.2 Insulation</b>		
<b>3.2.1 Three Phases</b>		
a)Type of Insulation		XLPE
b)Nominal thickness of insulation	mm	1,8
c)Colour of XLPE Insulation		BLACK with RED strip, BLACK with BLUE strip, BLACK with WHITE strip
d)Marking		
1)Identification		
2)On the insulation a marking is applied as follows;		
BLACK with RED strip		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKIYE 2R" (by inkjet)
BLACK with WHITE strip		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKIYE 3S" (by inkjet)
BLACK with BLUE strip		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKIYE 4T" (by inkjet)
3)Continuity of marks;		
Max. distance between the start of the mark and the beginning of the next mark: 1 meter		
<b>3.2.2 One Neutral</b>		
a)Type of Insulation		XLPE
b)Nominal thickness of insulation	mm	1,5
c)Colour of XLPE Insulation		Black
d)Marking		
1)Identification		
2)On the insulation a marking is applied as follows;		
"Meter Marking" (by inkjet)		
3)Continuity of marks;		
Distance between the start of one mark and the beginning of the next identical mark: 1 meter		
<b>3.2.3 Public Street Lighting</b>		
a)Type of Insulation		XLPE
b)Nominal thickness of insulation	mm	1,2
c)Colour of XLPE Insulation		Black
d)Marking		
1)Identification		
2)On the insulation a marking is applied as follows;		
"Cross-sectional area" (by inkjet)		
3)Continuity of marks;		
Distance between the start of one mark and the beginning of the next identical mark: 1 meter		
<b>3.3 Complete Cable</b>		
a)Direction of lay of outer strands		Right hand (Z)
b)Outer Diameter of Cable (approx.)	mm	38,5
c)Cable Unit Weight (approx.)	kg/km	1255
<b>4. Electrical Technical Data Sheet</b>		
a)Max. DC resistance of phases at 20 C°	Ω/km	0,320
b)Max. DC resistance of neutral at 20 C°	Ω/km	0,493
c)Max. DC resistance of public Street Lightings at 20 C°	Ω/km	1,91
d)Maximum conductor temperature (Normal operation)	C°	90
e)Maximum conductor temperature (Short-circuit 5 seconds maximum duration)	C°	250
f)Maximum Short-Circuit Current for 1 second	kA	8,9
g)Current Carrying Capacity*		
*In Air (Ambient Temperature 30 °C, Load Factor 1.0, Flat)		
1)Phase conductor	(A)	258
2)Public Street Lightings conductor	(A)	81
h) Test Voltage (AC)	kV	4
<b>5. Drum Labeling</b>		
The following information to be attached to the outside of both flanges of each drum;		
a)Name of Manufacturer		
b)Year of Manufacture		
c) Drum Number		
d) Cable Type		
e) Length		
f) Net Weight		
g) Gross Weight		

**Overhead distribution cable of rated voltage 0,6/1 kV**

	Technical Description	Units	Guaranteed Characteristics
<b>1.</b>	<b>General Data</b>		
	a)Manufacturer		HASÇELİK KABLO
	b)Type of cable		TWISTED CABLE
	c)Applied Standards		HD 626 S1
	d)Number of cores and Cross-sectional area	mm <sup>2</sup>	3X120+70+16
	e)Rated Voltage U0/U(Um)	kV	0,6/1(1,2)
	f)SAP Product Number		-
<b>2.</b>	<b>Construction Data / Layers of Cable:</b>		
	-Aluminum Conductor		
	-High Density Polyethylene Insulation		
<b>3.</b>	<b>Constructional and dimensional details</b>	<b>Units</b>	<b>Guaranteed Characteristics</b>
<b>3.1.1</b>	<b>Conductor (Three Phases)</b>		
	a)Material of Conductor		Aluminum-Class 2
	b)Nominal section area of conductor	mm <sup>2</sup>	120
	c)Conductor Shape		Circular stranded compacted
	d)Number of Wires	pcs.	15 (min.)
	e)Conductor Diameter	mm	12,3-13,5
	f)Direction of lay		Right hand (Z)
<b>3.1.2</b>	<b>Conductor (One Neutral)</b>		
	a)Material of Conductor		Aluminum Alloy-Class 2
	b)Nominal section area of conductor	mm <sup>2</sup>	70
	c)Conductor Shape		Circular stranded compacted
	d)Number of Wires	pcs.	12 (min.)
	e)Conductor Diameter	mm	9,3-10,2
	f)Direction of lay		Right hand (Z)
<b>3.1.3</b>	<b>Conductor (Public Street Lighting)</b>		
	a)Material of Conductor		Aluminum-Class 1
	b)Nominal section area of conductor	mm <sup>2</sup>	16
	c)Conductor Shape		Solid
	d)Number of Wires	pcs.	1
	e)Conductor Diameter	mm	4,35-4,45
	f)Direction of lay		-
<b>3.2</b>	<b>Insulation</b>		
<b>3.2.1</b>	<b>Three Phases</b>		
	a)Type of Insulation		HDPE
	b)Nominal thickness of insulation	mm	1,6
	c)Colour of HDPE Insulation		Black
	d)Marking		
	1)Identification (Two ridges-Three ridges-Four ridges)		Ridge(s) along the cable
	2)On the insulation a marking is applied as follows;		
	Two ridges		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKEY 2R" (by inkjet)
	Three ridges		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKEY 3S" (by inkjet)
	Four ridges		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKEY 4T" (by inkjet)
	3)Continuity of marks;		
	Max. distance between the start of the mark and the beginning of the next mark: 1 meter		
<b>3.2.2</b>	<b>One Neutral</b>		
	a)Type of Insulation		HDPE
	b)Nominal thickness of insulation	mm	1,4
	c)Colour of HDPE Insulation		Black
	d)Marking		
	1)Identification (One ridge)		Ridge(s) along the cable
	2)On the insulation a marking is applied as follows;		
	"Meter Marking" (by inkjet)		
	3)Continuity of marks;		
	Distance between the start of one mark and the beginning of the next identical mark: 1 meter		
<b>3.2.3</b>	<b>Public Street Lighting</b>		
	a)Type of Insulation		HDPE
	b)Nominal thickness of insulation	mm	1,2
	c)Colour of HDPE Insulation		Black
	d)Marking		
	1)Identification		
	2)On the insulation a marking is applied as follows;		
	"Cross-sectional area" (by inkjet)		
	3)Continuity of marks;		
	Distance between the start of one mark and the beginning of the next identical mark: 1 meter		
<b>3.3</b>	<b>Complete Cable</b>		
	a)Direction of lay of outer strands		Right hand (Z)
	b)Outer Diameter of Cable (approx.)	mm	45,5
	c)Cable Unit Weight (approx.)	kg/km	1500
<b>4</b>	<b>Electrical Technical Data Sheet</b>	<b>Units</b>	<b>Guaranteed Characteristics</b>
	a)Max. DC resistance of phases at 20 C°	Ω/km	0,253
	b)Max. DC resistance of neutral at 20 C°	Ω/km	0,493
	c)Max. DC resistance of public Street Lightings at 20 C°	Ω/km	1,91
	d)Maximum conductor temperature (Normal operation)	C°	90
	e)Maximum conductor temperature (Short-circuit 5 seconds maximum duration)	C°	250
	f)Maximum Short-Circuit Current for 1 second	kA	11,3
	g)Current Carrying Capacity*		
	*In Air (Ambient Temperature 30 °C, Load Factor 1.0, Flat)		
	1)Phase conductor	(A)	280
	2)Public Street Lightings conductor	(A)	81
	h) Test Voltage (AC)	kV	4
<b>5</b>	<b>Drum Labeling</b>		
	The following information to be attached to the outside of both flanges of each drum;		
	a)Name of Manufacturer		
	b) Year of Manufacture		
	c) Drum Number		
	d) Cable Type		
	e) Length		
	f) Net Weight		
	g) Gross Weight		



**Overhead distribution cable of rated voltage 0,6/1 kV**

	Technical Description	Units	Guaranteed Characteristics
<b>1.</b>	<b>General Data</b>		
	a)Manufacturer		HASÇELİK KABLO
	b)Type of cable		XLPE TWISTED CABLE
	c)Applied Standards		NFC 33 209
	d)Number of cores and Cross-sectional area	mm <sup>2</sup>	3X120+70+16
	e)Rated Voltage U0/U(Um)	kV	0,6/1(1,2)
	f)SAP Product Number		-
<b>2.</b>	<b>Construction Data / Layers of Cable:</b>		
	-Aluminum Conductor		
	-Black cross linked polyethylene Insulation		
<b>3.</b>	<b>Constructional and dimensional details</b>	<b>Units</b>	<b>Guaranteed Characteristics</b>
<b>3.1.1</b>	<b>Conductor (Three Phases)</b>		
	a)Material of Conductor		Aluminum-Class 2
	b)Nominal section area of conductor	mm <sup>2</sup>	120
	c)Conductor Shape		Circular stranded compacted
	d)Number of Wires	pcs.	15 (min.)
	e)Conductor Diameter	mm	12-13,1
	f)Direction of lay		Right hand (Z)
<b>3.1.2</b>	<b>Conductor (One Neutral)</b>		
	a)Material of Conductor		Aluminum Alloy-Class 2
	b)Nominal section area of conductor	mm <sup>2</sup>	70
	c)Conductor Shape		Circular stranded compacted
	d)Number of Wires	pcs.	12 (min.)
	e)Conductor Diameter	mm	10-10,2
	f)Direction of lay		Right hand (Z)
<b>3.1.3</b>	<b>Conductor (Public Street Lighting)</b>		
	a)Material of Conductor		Aluminum-Class 1
	b)Nominal section area of conductor	mm <sup>2</sup>	16
	c)Conductor Shape		Solid
	d)Number of Wires	pcs.	1
	e)Conductor Diameter	mm	4,35-4,45
	f)Direction of lay		-
<b>3.2</b>	<b>Insulation</b>		
<b>3.2.1</b>	<b>Three Phases</b>		
	a)Type of Insulation		XLPE
	b)Nominal thickness of insulation	mm	1,8
	c)Colour of XLPE Insulation		BLACK with RED strip, BLACK with BLUE strip, BLACK with WHITE strip
	d)Marking		
	1)Identification		
	2)On the insulation a marking is applied as follows;		
	BLACK with RED strip		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKIYE 2R" (by inkjet)
	BLACK with WHITE strip		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKIYE 3S" (by inkjet)
	BLACK with BLUE strip		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKIYE 4T" (by inkjet)
	3)Continuity of marks;		
	Max. distance between the start of the mark and the beginning of the next mark: 1 meter		
<b>3.2.2</b>	<b>One Neutral</b>		
	a)Type of Insulation		XLPE
	b)Nominal thickness of insulation	mm	1,5
	c)Colour of XLPE Insulation		Black
	d)Marking		
	1)Identification		
	2)On the insulation a marking is applied as follows;		
	"Meter Marking" (by inkjet)		
	3)Continuity of marks;		
	Distance between the start of one mark and the beginning of the next identical mark: 1 meter		
<b>3.2.3</b>	<b>Public Street Lighting</b>		
	a)Type of Insulation		XLPE
	b)Nominal thickness of insulation	mm	1,2
	c)Colour of XLPE Insulation		Black
	d)Marking		
	1)Identification		
	2)On the insulation a marking is applied as follows;		
	"Cross-sectional area" (by inkjet)		
	3)Continuity of marks;		
	Distance between the start of one mark and the beginning of the next identical mark: 1 meter		
<b>3.3</b>	<b>Complete Cable</b>		
	a)Direction of lay of outer strands		Right hand (Z)
	b)Outer Diameter of Cable (approx.)	mm	41
	c)Cable Unit Weight (approx.)	kg/km	1490
<b>4</b>	<b>Electrical Technical Data Sheet</b>	<b>Units</b>	<b>Guaranteed Characteristics</b>
	a)Max. DC resistance of phases at 20 C°	Ω/km	0,253
	b)Max. DC resistance of neutral at 20 C°	Ω/km	0,493
	c)Max. DC resistance of public Street Lightings at 20 C°	Ω/km	1,91
	d)Maximum conductor temperature (Normal operation)	C°	90
	e)Maximum conductor temperature (Short-circuit 5 seconds maximum duration)	C°	250
	f)Maximum Short-Circuit Current for 1 second	kA	11,3
	g)Current Carrying Capacity*		
	*In Air (Ambient Temperature 30 °C, Load Factor 1.0, Flat)		
	1)Phase conductor	(A)	280
	2)Public Street Lightings conductor	(A)	81
	h) Test Voltage (AC)	kV	4
<b>5</b>	<b>Drum Labeling</b>		
	The following information to be attached to the outside of both flanges of each drum;		
	a)Name of Manufacturer		
	b) Year of Manufacture		
	c) Drum Number		
	d) Cable Type		
	e) Length		
	f) Net Weight		
	g) Gross Weight		

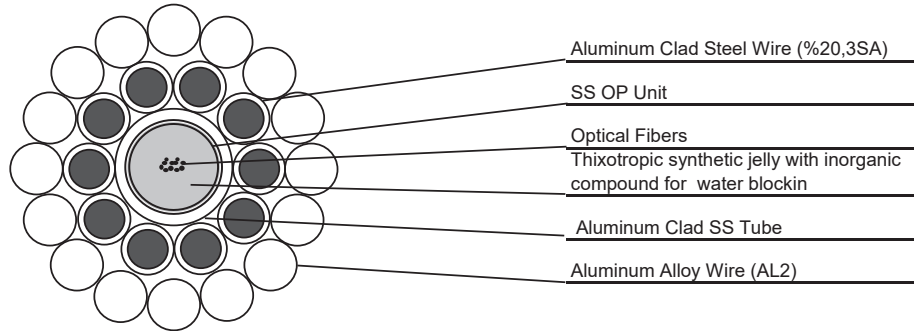
**Overhead distribution cable of rated voltage 0,6/1 kV**

	Technical Description	Units	Guaranteed Characteristics
<b>1.</b>	<b>General Data</b>		
	a)Manufacturer		HASÇELİK KABLO
	b)Type of cable		TWISTED CABLE
	c)Applied Standards		HD 626 S1
	d)Number of cores and Cross-sectional area	mm <sup>2</sup>	3x120+95+16
	e)Rated Voltage U0/U(Um)	kV	0,6/1(1,2)
	f)SAP Product Number		-
<b>2.</b>	<b>Construction Data / Layers of Cable:</b>		
	-Aluminum Conductor		
	-High Density Polyethylene Insulation		
<b>3.</b>	<b>Constructional and dimensional details</b>	<b>Units</b>	<b>Guaranteed Characteristics</b>
<b>3.1.1</b>	<b>Conductor (Three Phases)</b>		
	a)Material of Conductor		Aluminum-Class 2
	b)Nominal section area of conductor	mm <sup>2</sup>	120
	c)Conductor Shape		Circular stranded compacted
	d)Number of Wires	pcs.	15 (min.)
	e)Conductor Diameter	mm	12,3-13,5
	f)Direction of lay		Right hand (Z)
<b>3.1.2</b>	<b>Conductor (One Neutral)</b>		
	a)Material of Conductor		Aluminum Alloy-Class 2
	b)Nominal section area of conductor	mm <sup>2</sup>	95
	c)Conductor Shape		Circular stranded compacted
	d)Number of Wires	pcs.	15 (min.)
	e)Conductor Diameter	mm	11-12
	f)Direction of lay		Right hand (Z)
<b>3.1.3</b>	<b>Conductor (Public Street Lighting)</b>		
	a)Material of Conductor		Aluminum-Class 1
	b)Nominal section area of conductor	mm <sup>2</sup>	16
	c)Conductor Shape		Solid
	d)Number of Wires	pcs.	1
	e)Conductor Diameter	mm	4,35-4,45
	f)Direction of lay		-
<b>3.2</b>	<b>Insulation</b>		
<b>3.2.1</b>	<b>Three Phases</b>		
	a)Type of Insulation		HDPE
	b)Nominal thickness of insulation	mm	1,6
	c)Colour of HDPE Insulation		Black
	d)Marking		
	1)Identification (Two ridges-Three ridges-Four ridges)		Ridge(s) along the cable
	2)On the insulation a marking is applied as follows;		
	Two ridges		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKEY 2R" (by inkjet)
	Three ridges		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKEY 3S" (by inkjet)
	Four ridges		"Manufacturer, Cable Type, Number of cores and Cross-sectional area, Standard, Rated Voltage, Year of manufacturing, MADE IN TURKEY 4T" (by inkjet)
	3)Continuity of marks;		
	Max. distance between the start of the mark and the beginning of the next mark: 1 meter		
<b>3.2.2</b>	<b>One Neutral</b>		
	a)Type of Insulation		HDPE
	b)Nominal thickness of insulation	mm	1,6
	c)Colour of HDPE Insulation		Black
	d)Marking		
	1)Identification (One ridge)		Ridge(s) along the cable
	2)On the insulation a marking is applied as follows;		
	"Meter Marking" (by inkjet)		
	3)Continuity of marks;		
	Distance between the start of one mark and the beginning of the next identical mark: 1 meter		
<b>3.2.3</b>	<b>Public Street Lighting</b>		
	a)Type of Insulation		HDPE
	b)Nominal thickness of insulation	mm	1,2
	c)Colour of HDPE Insulation		Black
	d)Marking		
	1)Identification		
	2)On the insulation a marking is applied as follows;		
	"Cross-sectional area" (by inkjet)		
	3)Continuity of marks;		
	Distance between the start of one mark and the beginning of the next identical mark: 1 meter		
<b>3.3</b>	<b>Complete Cable</b>		
	a)Direction of lay of outer strands		Right hand (Z)
	b)Outer Diameter of Cable (approx.)	mm	45,8
	c)Cable Unit Weight (approx.)	kg/km	1595
<b>4</b>	<b>Electrical Technical Data Sheet</b>	<b>Units</b>	<b>Guaranteed Characteristics</b>
	a)Max. DC resistance of phases at 20 C°	Ω/km	0,253
	b)Max. DC resistance of neutral at 20 C°	Ω/km	0,363
	c)Max. DC resistance of public Street Lightings at 20 C°	Ω/km	1,91
	d)Maximum conductor temperature (Normal operation)	C°	90
	e)Maximum conductor temperature (Short-circuit 5 seconds maximum duration)	C°	250
	f)Maximum Short-Circuit Current for 1 second	kA	11,3
	g)Current Carrying Capacity*		
	*In Air (Ambient Temperature 30 °C, Load Factor 1.0, Flat)		
	1)Phase conductor	(A)	280
	2)Public Street Lightings conductor	(A)	81
	h) Test Voltage (AC)	kV	4
<b>5</b>	<b>Drum Labeling</b>		
	The following information to be attached to the outside of both flanges of each drum;		
	a)Name of Manufacturer		
	b) Year of Manufacture		
	c) Drum Number		
	d) Cable Type		
	e) Length		
	f) Net Weight		
	g) Gross Weight		

<b>Serial No:</b>	HC2019-12-009 Rev1
<b>Bid No:</b>	

**Cable Type:** OPGW - 36B4- ( AA/ACS 16/49 -183,9 )

**Cross Section:**



**ITU-T 36 G655.C**

Structure:	Material	No	Material	No	Material Dia.	
	Fiber	G.655 C	36			
SS-Tube		1			Outer Dia	3,50 mm
Al-Tube	Al	1	Inner-Dia	3,50	Outer Dia	5,80 mm
Layer1	20.3% AS wire	10	AA Wire	0	Diameter	2,52 mm
Layer2	20.3% AS wire	0	AA wire	16	Diameter	2,52 mm

<b>Technical Data:</b>	According to IEC60794-4-10, IEEE-1138 standards	
	Stranding direction of outer layer is right hand (Z-stranding)	
	Stranded:Core and layer1 greased	YES
	Cable Diameter	15,9 mm
	Cable Weight (Approx.)(without grease)	622 kg/km
	Cable Weight (Approx.)	630 kg/km
	Supporting Cross Section	146,5 mm <sup>2</sup>
	Section of ACS Wire	49,9 mm <sup>2</sup>
	Section of AL Part	96,6 mm <sup>2</sup>
	Rated Tensile Strength (RTS)	84,8 kN
	Modulus of Elasticity (E-Modulus)	97,0 kN/mm <sup>2</sup>
	Thermal Elongation Coefficient	17,3 10 <sup>-6</sup> /°C
	Permissible Maximum Installation Stress-MIT	21 kN    145 N/mm <sup>2</sup>
	Permissible Maximum Working Stress-MAT (40% RTS)	34 kN    232 N/mm <sup>2</sup>
	Everyday Stress (EDS) (20% RTS)	17 kN    116 N/mm <sup>2</sup>
	Ultimate Exceptional Stress (72% RTS)	61 kN    417 N/mm <sup>2</sup>
	Max DC Resistance (at 20 °C)	0,282 Ω /km
	Short Time Current (1s 40°C~200°C)	13,6 kA
	Short Circuit Current Capacity I <sup>2</sup> t (40°C~200°C)	183,9 kA <sup>2</sup> s
	Minimum Bending Radius Installation	317 mm
Minimum Bending Radius Operation	238 mm	
Ratio of RTS to weight	13,9 km	
<b>Temperature Range:</b>	Installation	-10°C ~ +50 °C
	Transportation and Operation	-30°C ~ +80 °C
<b>Remarks:</b>	All Sizes and Values are Nominal Values Diameter tolerance: ± 1% ; Weight tolerance : ± 2%	
17.12.2019	HC2019-12-009 Rev1	IRAQ - OPGW 36 G.655C
		OPGW    MK

	<b>OPGW Cable Specifications</b>	<b>Serial No:</b> HC2019-12-009 Rev1
		<b>Page</b> 2/5

**Fiber Specification:**

The optical fiber brand is Fujikura from Japanese origin. The optical fiber shall be made of high pure silica and germanium doped silica. UV curable acrylate material is applied over fiber cladding as optical fiber primary protective coating. The detail data of optical fiber performance are shown in the following table:

**G.655C Fiber in Cable**

Category	Description		Typical Value
<b>Optical Specifications</b>	Attenuation	1550nm	≤ 0.22 dB/km (Max.)
		1625nm	≤ 0.24 dB/km
	Point Discontinuity	1550nm	≤ 0.05 dB
	Attenuation vs wavelength	1525~1575nm	≤ 0.05 dB/km
		1625nm	≤ 0.05 dB/km
	Dispersion Slope		≤ 0.092 ps/nm <sup>2</sup> .km
	Dispersion coefficient	1530~1550nm	2 ~ 6 ps/nm.km
		1565~1625nm	4.5 ~ 11.2 ps/nm.km
	Polarization Mode Dispersion (PMD)	Max. Individual Value	≤ 0.2 ps/√km
		Link Design Value	≤ 0.08 ps/√km
	Mode Field Diameter	1550nm	9.6± 0.5μm
Cut-off Wavelength λ <sub>cc</sub>		≤ 1480nm	
Macro-bend loss	1550nm (60mm)	≤ 0.05dB/km	
	1625nm (60mm)	≤ 0.05dB/km	
<b>Dimensional Specifications</b>	Cladding Diameter		125 ± 0.7μm
	Core/cladding concentricity error		≤ 0.6μm
	Cladding Non-circularity		≤ 1.0%
	Coating Diameter		245 ± 10μm (uncolored fiber)
	Coating/cladding concentricity error		< 12μm
<b>Mechanical Specifications</b>	Proof stress		≥ 0.69Gpa



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