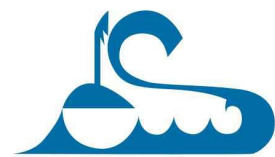


ALUMINIUM FLEXIBLE CABLES

Lightweight Cables
for Heavy Industries
in Extreme Conditions



Sahra Kablo
Wire & Cable

Advantages of TPE-U PUR Sheathing

Flexible

Robust

Durable

Polyurethane has become increasingly important in the cable industry over the past years. This material shows at certain temperatures mechanical and chemical characteristics similar to rubber. The combination of thermoplastic and elastic characteristics has led to the description TPE thermoplastic elastomer.

Mechanical characteristics of PUR

The cables used in heavy conditions are mostly exposed to high mechanical stresses. At this point, outer sheath material plays an essential role to sustain durability, robustness and flexibility of cable in the construction design of a cable.

Cables are often pulled over sharp corners and rough surfaces. This can lead to cuts which are accentuated when the cable is stretched during flexible use. Compressive stress caused by squashing and impacting from tools and machines can also occur.

The most important mechanical characteristics of PUR are:

- High Tensile Strength
- Tear&Abrasion Resistance
- Notch&Impact Resistance
- Flexibility at low temperatures
- High Flexibility
- Long-Lasting comparing to PVC

Chemical Characteristics of PUR

The chemical resistance depends upon many factors such as chemical type, reaction time, temperature, volume, concentration and of course the type of Polyurethane used. In comparison with many other materials, such as rubber or PVC, PUR has a better resistance against chemical reaction.

The outstanding chemical characteristics are

- Resistance against Mineral oils, Grease
- Resistance against Alcohol-free Benzine
- Resistance during storage in water
- Resistance against many Solvents

Exemplary Application fields of PUR Insulated Aluminium Flexible Cables

- Tunneling, Heavy Industries
- Crane Reeling and Festoon Cables
- Conveyor systems and production lines,
- Machine and Plant Construction,
- Iron, steel and chemical industry,
- Wind Turbine Generators
- Heat and Power Plants
- Petrochemical & Mining Industries,
- Aircrafts, Railway Vehicles, Automobiles
- Transformer Stations
- Photovoltaic / Solar Systems
- Fixed&Flexible Installation



Advantages of Aluminium Cables

Electrical Equivalence

Equal Distance	Equal Resistance	Equal Voltage Drop
$L_{Al} = L_{Cu}$	$R_{Al} = R_{Cu}$	$\Delta U_{Al} = \Delta U_{Cu}$

Multiplication factors of Aluminium in 3 conditions while considering 3 assumptions above.

Conditions	Copper	Aluminium
Equal Cross-Section	1	1
*Weight	1	0,33
*Resistance	1	1,6
*Conductivity	1	0,625
*Current Carrying Capacity	1	0,8
Equal Conductivity	1	1
*Cross-Section	1	1,6
*Diameter	1	1,3
*Weight	1	0,49
Equal Thermal Expansion	1	1
*Cross-Section	1	1,4
*Diameter	1	1,17
*Weight	1	0,42

* We can derive from the above table that while multiplying our calculated copper cross-section with 1,6 for equal conductivity, we can eliminate the thermal expansion problem of Aluminium.

Advantages of Aluminium Cables

- Lightweight
- Cost Saving
- More stable prices.
- Less sensitive to market fluctuations.
- Youngest and most abundant metal.
- Easy installation.
- Problem free connection.

Connection of Aluminium Cables

“Today, Aluminum wiring is safe and reliable” Since 1970s, with the development of improved Conductors and Connectors, changes have made installing aluminum wire as simple as installing copper.

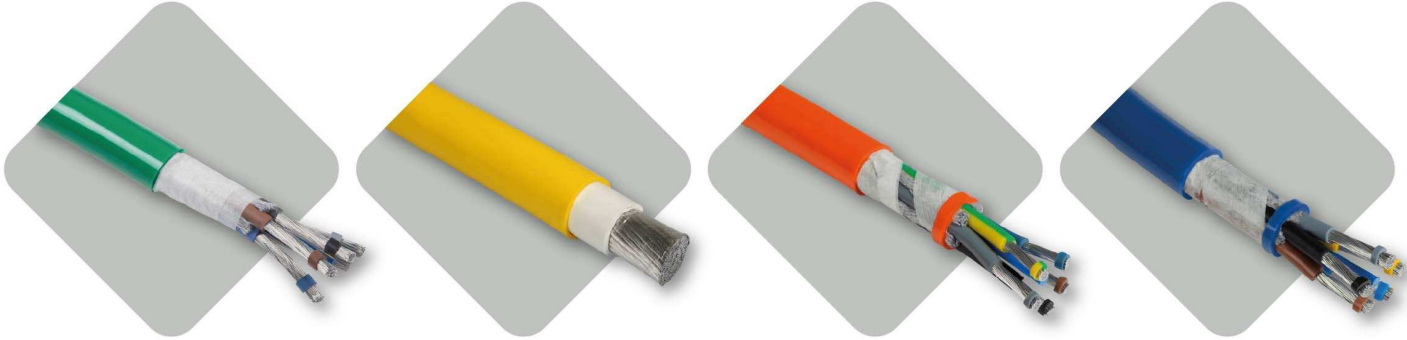
- Operator is the most important "system component" You can take precautions against oxidation but not workmanship.
- The process is not just "insert wire, compress lug". A faulty operation might even cause a fire.
- Poor Workmanship&Imprudent Termination is generally recognized as the primary source of failed connections.
- Oxidation is a very fast a thin layer of Aluminum Oxide (Al_2O_3) and is one of the hardest and brittle materials known and acts as an electrical insulator.
- Corrosion inherent tendency to revert from a processed, metallic state to their natural state, "Ore".
- Compound/Oxide Inhibitor with grinding effect breaks oxide layer and also prevents further oxygen penetrating the contact joints.
- Most satisfied and reliable crimping method must be chosen in order to obtain Maximum Contact Surface.
- After crimping, a heat shrink sleeve should be applied in order to prevent the ingress of moisture or dirt at the junction.

“Follow the guidelines for a reliable connection!!!”

“Without a Qualified Workmanship, it is a Fairy Story!!!”

"Small components have great impacts, even Fire!!! "

H07BQ-AF ■ S07BQ-AF



- Where extreme wear and tear resistance is required
- Where the cable is subjected to hard utilization
- Where lightweight cable is highly requested

TECHNICAL PROPERTIES

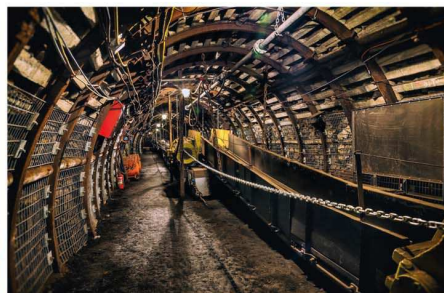
Conductor:	Finely Stranded Aluminium Conductor
Separator:	Optional
Insulation:	EPR EI6
Sheath:	TPU
Operating Temperature:	-40°C...90°C
Conductor Resistance:	ISO 6722-2
Flame Retardancy:	Optional

REFERENCE STANDARDS

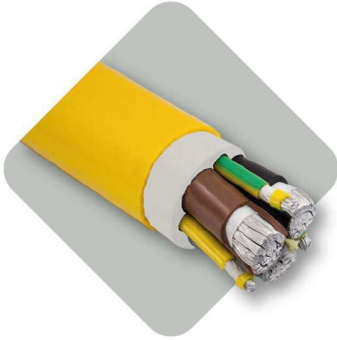
Construction:	EN 50525-2-21, IEC 60245-4
Guide to Use:	EN 50565-1, EN 50565-2
Electrical Tests:	EN 50395
Non-Electrical Tests:	EN 50396, IEC 60245-2
Conductor Resistance:	ISO 6722-2
Conductor Construction:	ISO 6722, Custom Design

APPLICATION AREA

- This termination and connection cable is especially suitable for heavy-duty applications in dry, damp or wet areas, where cables have to endure rubbing and dragging across rough and/or sharp surfaces; for applications like on building sites, in garages, on shipyards, in cold storage ware housing.
- For electrical tools such as drills and hand-held circular saws as well as for portable motors and agricultural machineries, at building sites, docks and in cold-storage appliances in refrigeration plants.



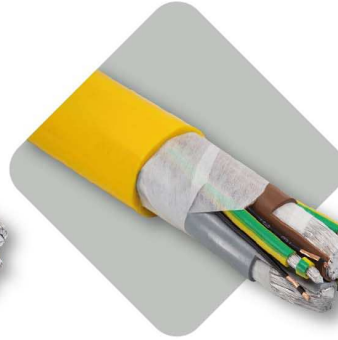
**Mining & Shore
Power Supply Cables**



**Braid Reinforced
Crane Cables**



**Drag Chain &
Reeling Cables**



**Flat Festoon
Cables**



TECHNICAL PROPERTIES

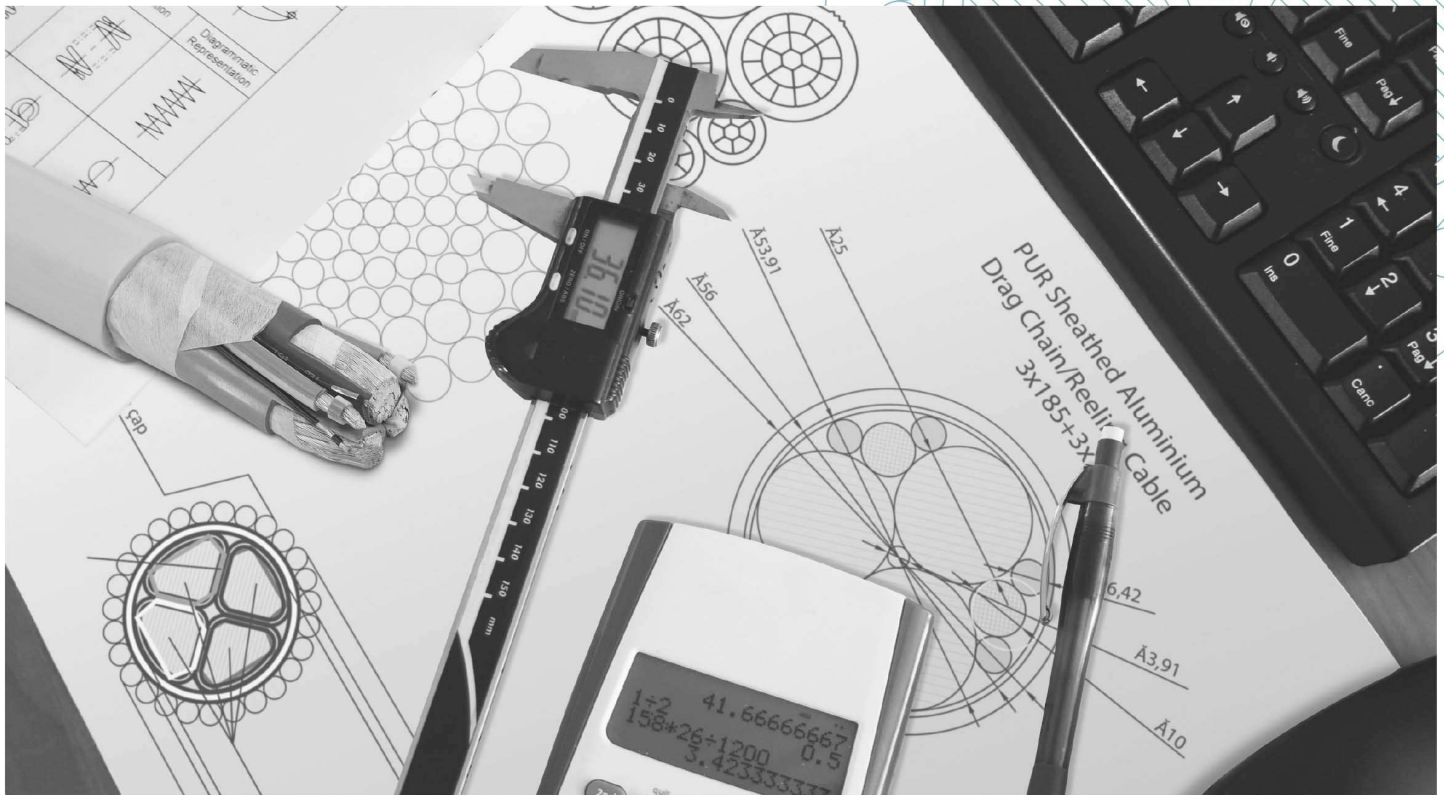
Conductor:	Finely Stranded Annealed Aluminium Conductor
Separator:	Optional
Insulation:	Thermoplastic/Thermoset Insulation @90°C/105°C
Stress Relieving_Op1:	Yarn Members Providing High Tensile Strength
Stress Relieving_Op2:	Stranded Strain-Relief Cotton Ropes
Reinforcement_Op1:	Central Aramid Fibers for Pulling Cable
Reinforcement_Op1:	Braiding of Aramid Threads between Sheaths
Outer Sheath:	PVC/TPU/Elastomeric/Depending Cable Construction
Operating Temperature:	-40°C...+90°C
Nominal Voltage@20°C:	600/1000 V
Conductor Construction:	ISO 6722-2 or EN 60228 or Custom Design
Conductor Resistance:	ISO 6722-2 or EN 60228 or Agreements
Cable Construction:	Depending on Cable Type/Datasheets
Cable Tests:	Depending on Cable Type/Datasheets

APPLICATION AREA

- Flexible low voltage reeling cable for power supply, suitable for application under moderate and high mechanical stresses.
- This special flexible heavy duty power cables have been developed for use on moving installations where there are torsional and tensile stresses, ambient conditions are harsh or there is danger of abrasion and crushing in the applications of mobile installations on all types of harbour cranes, container cranes, shipunloaders, mobile harbour cranes, deck cranes, stacker & reclaimers, trippers, mining & tunneling equipment and mobile generator sets.
- For use in hoists, transporting machines and conveyors, in power chains, as drum and drag cables and as hawsers. Wherever cables are reeled, unreeled, guided by roller trains or similar in heavy industries or construction sites.



Custom Design Cables



Main Design Criteria for Flexible Cable Production to Prevent Failures or Downtimes

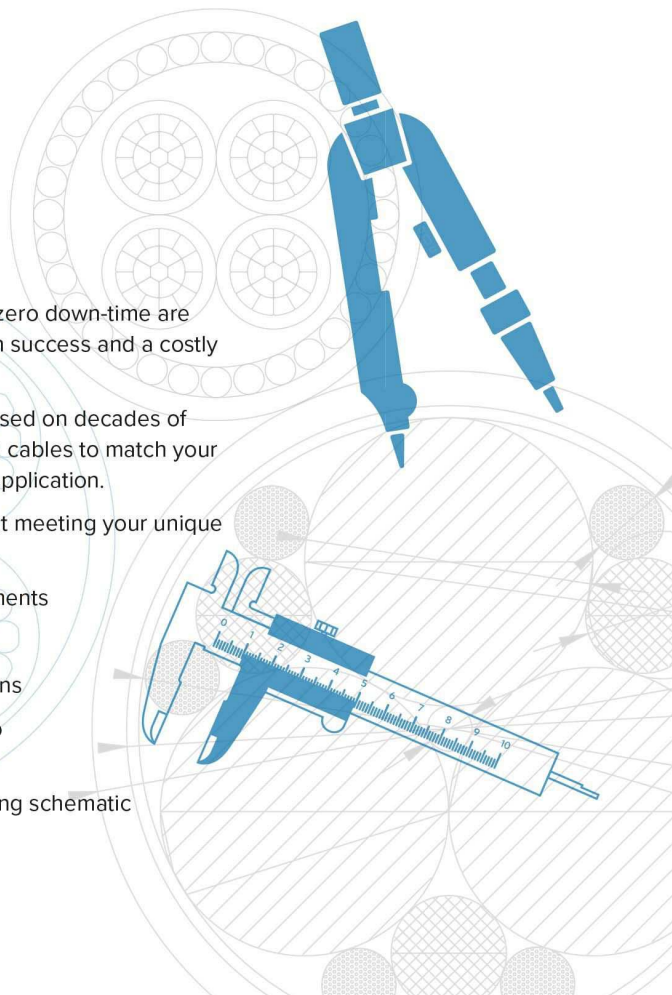
- Standards & Specifications
- Motion Types
- Installation Conditions
- Limitation Realities of Aluminium

In all environments, especially extreme conditions, high reliability and zero down-time are imperative and even the smallest factor can be the difference between success and a costly failure.

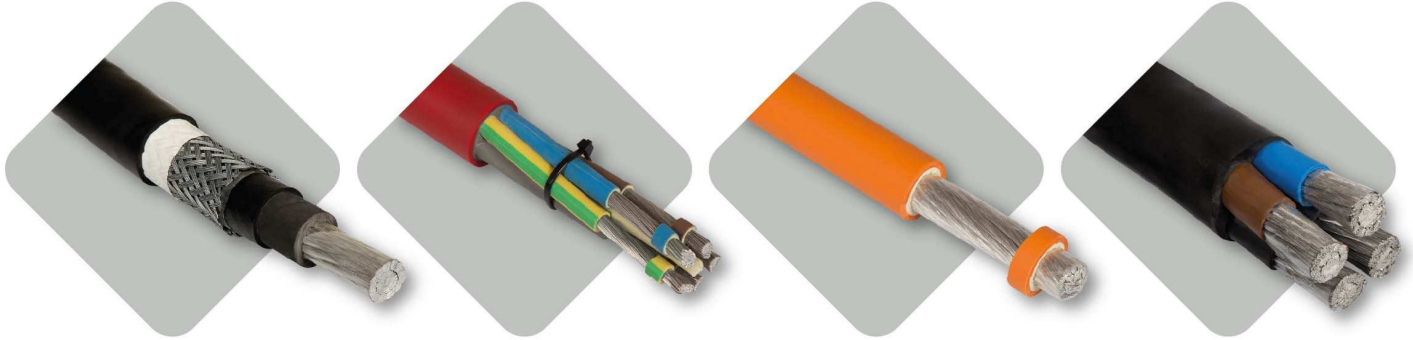
Sahra Kablo, having an extensive range of manufacturing capability based on decades of experience, specializes in the design and production of custom design cables to match your exact specifications in case of if a standard cable won't work for your application.

Manufacturing the perfect custom cable for your application is all about meeting your unique requirements and specifications.

- Custom Design Cables can be tailored to your specific requirements
- No two Customers' requirements are ever the same
- Custom Design Cables can be built to all manner of specifications
- We are applying our quality approach to cable manufacturing to produce a robust cable for the best possible cost
- We surely provide documentation of all the components including schematic drawings and data sheets provided to illustrate construction



H07RN-AF ■ H07BN4-AF



- Aluminium Welding Cable
- Aluminium Wind Turbine Cable
- Aluminium Railway Cables

TECHNICAL PROPERTIES

Conductor:	Finely Stranded Annealed Aluminium Conductor
Separator:	Optional
Insulation:	EPR EI4 / EI7
Inner Sheath:	Elastomeric Inner Sheath
Reinforcement_Op1:	Galvanized Steel Wire Braiding
Reinforcement_Op2:	Braiding of Aramid Threads between Sheaths
Outer Sheath:	EM2 / EM7 Rubber
Operating Temperature:	-25°C...+60°C
Nominal Voltage@20°C:	450/750 V
Conductor Construction:	ISO 6722-2 or EN 60228 or Custom Design
Conductor Resistance:	ISO 6722-2 or EN 60228 or Custom Design
Cable Construction:	EN 50525-2-21, IEC 60245-4
Cable Tests:	EN 50395, EN 50396

APPLICATION AREA

- Flexible low voltage reeling cable for power supply, suitable for application under moderate and high mechanical stresses.
- This special flexible heavy duty power cables have been developed for use on moving installations where there are torsional and tensile stresses, ambient conditions are harsh or there is danger of abrasion and crushing in the applications of mobile installations on all types of harbour cranes, container cranes, shipunloaders, mobile harbour cranes, deck cranes, stacker & reclaimers, trippers, mining & tunneling equipment and mobile generator sets.
- Rubber sheathed cables with particularly tear resistant outer sheaths, have been developed for various equipment used in open-cast mining in rocky areas and where there is prolonged exposure to sunlight like heavy industries or construction sites.





CUSTOM DESIGNED ALUMINIUM CABLES

WHILE YOU ARE REVIEWING THIS CATALOG,
WE PROBABLY COULD HAVE MANUFACTURED
ANOTHER TYPE OF ALUMINIUM CABLE



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