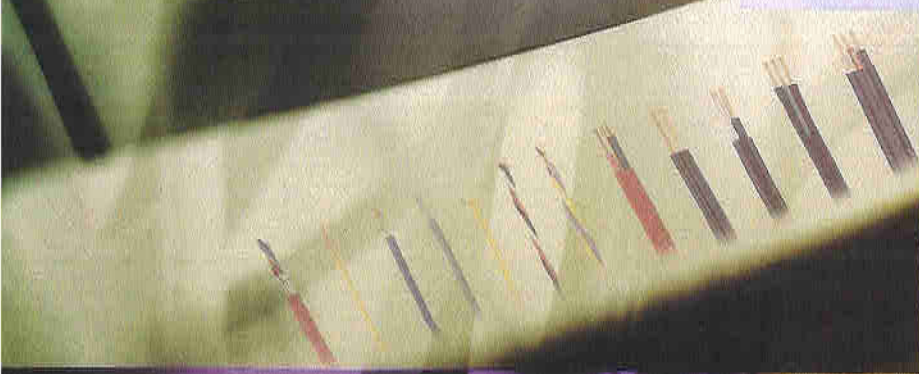


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Nexans

WIRE & CABLE PRODUCT INFORMATION GUIDE
FIL ET CÂBLE GUIDE D'INFORMATION SUR LES PRODUITS














www.nexans.ca

WIRE & CABLE PRODUCT INFORMATION GUIDE

DETAILED PRODUCT INFORMATION IS AVAILABLE ON OUR WEBSITE:
www.nexans.com/products.htm

Nexans manufactures a wide range of cables for residential, commercial, industrial and utility installations. All products are made in ISO 9002 registered plants.

Product leaflets are available for general information about the products contained in each of the following groups.

	ARMOURED CABLES
	COMPONENT & SPECIALTY WIRES
	CONDUIT CABLES & DIRECTLY BURIED CABLES
	CONTROL CABLES
	COPPER & ALUMINUM CONDUCTORS
	HOUSE, FARM & APARTMENT WIRE
	INSULATIONS & JACKETS
	OVERHEAD PRIMARY CONDUCTORS
	OVERHEAD SECONDARY & SERVICE CABLE
	POWER CABLE 5 kV TO 46 kV
	UNDERGROUND SECONDARY & SERVICE CABLE

The descriptions in these leaflets are very brief, and are for general guidance only. For specific installations you should check with a licensed electrician, or the Electrical Inspection Department in your area to confirm the rules and regulations that cover a specific installation. Nexans accepts no liability for injury or damage resulting from incorrect installation and/or use of its products.



www.nexans.com

140 Allstate Parkway, Markham, Ontario, Canada L3R 0Z7
Phone: (905)944-4300 Fax: (905)944-4330

FLAME TEST RATINGS - CSA

FT RATINGS

Flame test ratings indicate how readily fire will spread along wire and cable. The tests are a complex formula of time, distance, diameter, and set-up; but the following gives a general idea of what happens.

FT1	A bunsen burner flame is applied to a vertical sample for five 15 second applications. Burning must cease within 60 seconds of removal of the burner, with no more than 25% of a paper indicator charred. FT1 is applicable for wires such as NMD90 and TW75 which are used in combustible buildings. UL VW1 is similar to CSA FT1.
FT2	A bunsen burner flame is applied to a horizontal sample for five 15 second applications. The charred portion must not exceed 100mm from end to end, and there shall be no flaming particles dropping from the sample. Products such as some S, SJ and HPN cords, as well as SIS wire, are rated FT2.
FT3	This rating has been deleted.
FT4	Cables are strapped to an 8-foot vertical section of ladder tray and burned at 70,000 BTU for 20 minutes. The charred portion shall not exceed 1.5 meters. The FT4 test is used on cables intended for tray or shaft applications. The CSA FT4 test is similar to UL1581 paragraph 1160, but FT4 is more stringent. FT4 cables can be used in non-combustible buildings. Nexans Teck90, RA90 Corflex and ACWU90 are FT4 rated.
FT5	Flame is applied to a horizontal sample, similar to the FT2 fire test but with a much larger burner. The flame must extinguish in less than 4 minutes and the burn length shall not exceed 150mm. The FT5 test is applicable to portable cables used in underground work areas such as mines and tunnels.
FT6	Cable samples on a horizontal tray in a tunnel type of chamber are burned at 300,000 BTU for 20 minutes. Flame spread not to exceed 1.5 meters, with a smoke density during the test of (a) 0.5 peak; and 0.15 maximum average. FT6 is used for cable in return air plenums. The CSA FT6 test is similar to NFPA 262-1985 and UL S102.4. No CSA FT6 rated power cables are presently available in Canada. Some provinces allow FT4 single conductor cables to be used in these locations. Otherwise, cable in conduit is the permitted installation method in return air plenums.
AG14	AG14 refers to the acid gas given off during burning of plastics used in cable. Normal PVC would produce approximately 30%, by weight, of acid gas during combustion. AG14 indicates materials will produce less than 14% acid gas during combustion. Nexans Teck90, RA90 Corflex and ACWU90 all have insulation and jacket materials rated AG14.

ARMoured CABLES

DETAILED PRODUCT INFORMATION IS AVAILABLE ON OUR WEBSITE:
www.nexans.com/products.htm

ARMoured
CABLE FOR
COMMERCIAL,
INDUSTRIAL &
APARTMENT USE
AC90 BX (CSA)



CASH REGISTERS
& COMPUTERS
AC90 ISO-BX
(CSA)



DIRECT BURIAL
CABLE FOR
MULTI-UNIT
RESIDENTIAL,
COMMERCIAL
AND SOME
INDUSTRIAL FEEDERS
ACWU (CSA)



MULTI-UNIT
RESIDENTIAL,
COMMERCIAL &
SOME INDUSTRIAL
FEEDERS
CORFLEX RA90
(CSA)



INDUSTRIAL
INSTRUMENTATION
CONTROL
DATATRANS
(CSA)



AC90 is used in stores, small factories, apartments and similar buildings, where some mechanical protection is required. It has RW90 insulated 600 volt conductors (usually copper) cabled with a bare bonding wire, and enclosed in armour made of interlocked aluminum strip. AC90 must not be buried, nor used in wet locations. It is an inexpensive alternative to wire in conduit.

ISO-BX is the same as AC90 BUT has an additional GREEN conductor, providing an isolated insulated ground, to give extra protection to sensitive equipment. ISO-BX is 600 volt rated.

ACWU is the same as AC90 but has a PVC plastic jacket over the armour. This permits its use for direct earth burial and in wet locations. Conductors are usually aluminum alloy, but may also be copper. In single conductor cables there is a concentric copper bonding wire over the insulation, which is sized in accordance with the electrical code. When marked "HL" ACWU can be used in hazardous locations. It is a cheaper and less robust cable than Teck. ACWU is 600 volt rated. Nexans ACWU is rated FT4, HL and AG14.

CORFLEX (CSA type RA90) is similar to ACWU - but **DIFFERENT**. There is no bonding wire because Corflex has an aluminum sheath that is a 'tube' (not a wrapped strip like ACWU) that can be used as an equipment bond. It is water and gas tight, can be bent by hand, and holds the shape made. Approved for use in hazardous locations it has excellent fire, water and crush resistance. It can be installed on hangers, as it holds its shape better than interlocked armour cables. Corflex is excellent for use in high rise apartments, hospitals, schools, shopping centres and factories. Corflex is 600 volt rated. Available in single conductors of both copper and aluminum alloy, Nexans Corflex is rated FT4, HL and AG14.

DATATRANS is a cable made of pairs or triads (bundles of 2 or 3 conductors) shielded, cabled with an overall shield and jacket, then encased in aluminum interlocked armour and a gray PVC jacket. It is common in both 300 volt and 600 volt ratings, and is approved for direct burial. Its handling characteristics are similar to Teck, and it is commonly used in industrial applications to carry signals from process monitoring and data acquisition equipment. Non-armoured construction can also be manufactured.

ARMoured CABLES

DETAILED PRODUCT INFORMATION IS AVAILABLE ON OUR WEBSITE:
www.nexans.com/products.htm

VARIABLE
FREQUENCY
DRIVES
DriveRx
(CSA)



DriveRx was developed in response to requirements identified in studies by leading drive manufacturers. DriveRx helps to reduce serious problems which may occur in variable frequency drive applications. These problems might otherwise result in costly downtime. It is stocked in 3 conductor 12 gauge to 500 MCM. DriveRx is rated 1000 volt and uses the same specially designed connectors as RA90 Corflex. VFD cable is a readily available and economical way to avoid expensive system component failure and production interruptions due to the special characteristics resulting from the use of high frequencies in VFDs. Also known as Variable Speed Drive cable, DriveRx is rated FT4, HL and AG14.

FIRE ALARM,
SIGNAL, SECURITY,
TWO-WAY
EMERGENCY
COMMUNICATION
SYSTEMS
SECUREX
(CSA)



SECUREX is mostly 18 gauge solid copper conductors, PVC plastic insulated and colour coded. The conductors are cabled then covered with a red PVC jacket. Shielded unarmoured Securex is also available. Rated 300 volts, Securex is used in houses to connect the central furnace and the thermostat. The armoured version has an aluminum interlocked armour over the jacket. FT4 rated, unarmoured Securex in metal conduit and armoured Securex can be used as fire alarm cable. Securex must NOT be used as a power supply wire to lights or outlets. Securex is readily available up to 30 conductors. Some provincial inspection authorities allow its use in return air plenums.

MAJOR INDUSTRIAL
INSTALLATIONS
TECK90
(CSA)



TECK is the most widely used, abuse resistant, easy to install and readily available cable for industrial use. It has been the backbone of power systems in paper mills, petrochemical installations, mines and industrial plants for almost 50 years. Usually made of copper conductors with RW90 insulation, Teck is rated 600 volts in 14-10 gauge and 1000 volts in sizes 8 gauge and larger. We also stock 1000 volt 2C#12, 3C#12 and 3C#10. Teck is also available in shielded and non shielded medium voltage constructions. Conductors in 14-10 gauge are compressed strand; #8 and larger are compact. There is a PVC jacket between the conductors and the interlocked aluminum armour so that if the cable is crushed the edge of the armour will not cut the insulation. Covered by an outer PVC jacket Teck has excellent fire, water and cold-bend characteristics. It may be direct buried and used in wet locations. "HL" marked material may be used in hazardous locations. Nexans Teck90 is rated FT4, HL and AG14.

MINE &
ELEVATOR
SHAFTS
VERTEK
(CSA)



VERTEK is non-stock, specially modified Teck for vertical installations, such as mineshafts, elevator shafts and cableways. It is designed to ensure that the core does not slip out of the armour when running vertically for long distances. It usually has galvanized steel interlocked armour. Vertek voltage ratings range from 600 volts to 15 kV.

COMPONENT & SPECIALTY WIRES

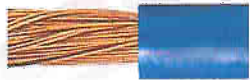
DETAILED PRODUCT INFORMATION IS AVAILABLE ON OUR WEBSITE:
www.nexans.com/products.htm

AIRPORT RUNWAY
LIGHTING CABLE
**AIRPORT SERIES
LIGHTING CABLE 'ASLC'**
(CSA)



AIRPORT SERIES LIGHTING CABLE is designed for burial beside runways, to power the lights that guide aircraft to safe landings. It has a thick covering of cross-linked polyethylene, and is rated 5,000 volts unshielded. Normally it is #8 gauge and is the standard cable for this function in all Canadian airports. Nexans cable is CSA and DOT approved.

AUTOMOTIVE, BATTERY
OR BOOSTER CABLE
BATTERY CABLE
(SAE)



BATTERY CABLE is used for car and truck batteries, and also as battery jumper cable. It has a very flexible stranded copper conductor, covered with heat, cold and oil resistant CPE insulation. Made to SAE J1127 specification, battery cable is not suitable for use in buildings.

**BLASTING
WIRE**



BLASTING WIRE is used to electrically detonate explosives in mining operations. It has one or two PVC insulated copper conductors. Two conductor constructions have the conductors laid parallel like lamp cord and HPN. Blasting wire has no voltage rating and there is no CSA or UL standard for this product.

INDUSTRIAL
EQUIPMENT CONTROL
**CONTROL
CABLES -
INDUSTRIAL**
(CSA)



INDUSTRIAL CONTROL CABLE controls equipment in industrial applications. Generally it has stranded copper conductors in sizes #14-10 gauge, but larger sizes are also manufactured. Control cable has 300 volt or 600 volt PVC or XLPE insulation and an overall PVC jacket. An overall shield under the jacket is also available.

INTERNAL
AUTOMOTIVE
WIRING **GPT** (SAE)



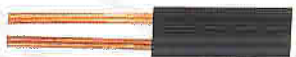
GPT made to SAE J1128 standard is general purpose automotive wiring, insulated with high performance PVC compound.

KETTLE, TOASTER and
HEATER CORD
HPN 90° and 105°
(CSA)



HPN is made of stranded copper conductors laid parallel. HPN is insulated with CPE, a special compound which enables it to withstand heat and grease. It is not designed to be wet, and care should be taken to avoid this. Standard 300 volt HPN is 90° but 105° HPN can be special ordered.

POLE & BRACKET
STREET LIGHT WIRE
MID RIP



MID RIP, like SLV, runs from the base of hollow streetlight poles to the bracket and on to the lamp holder. Made like a very large lamp cord, Mid Rip is flat with a groove between the conductors, which can be ripped apart to allow terminating. There is no CSA or UL standard for this 600 volt PVC insulated product.

SUBMERSIBLE
PUMP CABLE
(CSA)



PUMP CABLE is used to power electric pumps submerged in wells, ponds or similar places. Copper conductors are individually insulated with colour coded PVC (designated type TWU), then cabled together in various size and colour combinations. It is readily available in sizes #14 - #6. Pump cable is rated 600 volts, FT1.

RAILWAY SIGNAL CABLE



RAILWAY SIGNAL CABLE has single or multiple copper conductors, polyethylene (PE) insulation and a PE jacket and is used in railway signaling applications. This 600 volt cable is made to CPR Specification 100. There is no CSA or UL standard for this product.

SWITCHBOARD WIRE SIS (CSA)



SIS is similar to TEW but has cross-linked polyethylene insulation rated plus 90°C to minus 40°C. Unlike its predecessor 'TBS' switchboard wire, it has no overall braid covering, making it cleaner to use. SIS is FT2 rated and 600 volts.

OUTDOOR EXTENSION CORD SJTW (CSA)



SJTW is for use outdoors on trimmers, lawn mowers, barbecues, and similar devices. It is rated 300 volts, and has a cold temperature and water-resistant yellow PVC jacket. Other jacket colours are available on special order. SJTW is FT1 rated.

STREETLIGHT WIRE SLV



SLV has two solid copper conductors, 600 volt PVC insulated, laid parallel and encased in a black, low temperature PVC jacket. It is designed to run from the base of hollow streetlight poles to the bracket and on to the lamp holder. There is no CSA or UL standard for this product.

INTERNAL AUTOMOTIVE WIRING SXL (SAE)



SXL made to the SAE J1128 standard is cross-linked polyethylene insulated giving it excellent resistance to high and low temperatures, oil, abrasion and aging. High temperature wire could go in engine compartments.

INTERNAL WIRING OF EQUIPMENT TEW and TEWN (CSA)



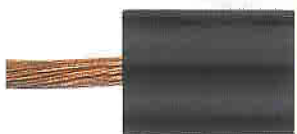
TEW is used inside electrical equipment to connect the various components, and in many other applications such as lighting fixtures. TEW with a nylon coating (TEWN) is used in lighting ballasts. TEW is made of copper, with 105°C 600 volt PVC insulation. Solid or stranded copper conductor TEW is available from stock in a wide range of colours. It is NOT approved for use as distribution wire in conduit.

ENERGY CONTROL SYSTEM WIRE TFN (UL)



TFN is used with sophisticated energy-saving installations where the lighting and ventilation systems in a building are controlled and co-ordinated by a central computer. This 600 volt wire is 2 or 3 conductors, in various colour combinations and gauges depending on the system (most commonly #16). Each wire is PVC insulated with a thin 'skin' of nylon over the PVC to add mechanical strength.

TRANSFORMER DROP



TRANSFORMER DROP is stranded copper, with a thick covering of track resistant black polyethylene. It connects the transformer to the primary supply line. If made with medium hard copper it can be formed to special shapes, (such as a right angle offset), if required. Transformer drop wire has no voltage rating. There is no CSA or UL standard for this product.

CONDUIT CABLES

DETAILED PRODUCT INFORMATION IS AVAILABLE ON OUR WEBSITE:
www.nexans.com/products.htm

RW90
600 Volts (CSA)



RW90 is insulated with cross-linked polyethylene (XLPE), over copper or aluminum conductors. It is mechanically and electrically very strong. Flame retardant jackets are available on special order. The XLPE insulation has very good cold weather characteristics, and excellent water resistance. It can be used in wet locations and underground ducts. RW90 is poor on ultraviolet (sunlight) resistance unless made with special additives and printed 'OUTDOOR' on the outside of the insulation. Our stock black RW90 #6 and larger is 'OUTDOOR'.

T90/TWN75
600 Volts (CSA)



T90/TWN75 is copper conductor insulated with a thin layer of PVC plastic covered with a 'skin' of nylon (like nail varnish). It is very useful when a lot of conductors must be put into a small conduit. Solid and stranded conductors are available in many different colours. It is rated 90°C in dry locations, but only 75°C if wet. It must not be exposed to ultraviolet rays (sunlight) as it will crack. It is not as robust as RW90, and must be handled with care at low temperatures.

TW75
600 Volts (CSA)



TW75 is a single copper wire covered with PVC plastic, commonly used for service entrances connecting the utility power supply conductors to the house or other building. It must be carefully handled at low temperatures but withstands both rain and ultraviolet rays from the sun. The most common service entrance sizes are stock. TW75 has mostly been replaced by T90/TWN75, with protection where exposed to sunlight.

**UNDERGROUND
DUCTS (CSA)**



RW90, TWN75 and TW75 may be installed in underground ducts, but must NOT be directly buried. When using conduit or duct these must be cleaned of any loose stones or sharp edges; and plenty of pulling compound should be used during installation in the ducts.

DIRECTLY BURIED CABLES

DETAILED PRODUCT INFORMATION IS AVAILABLE ON OUR WEBSITE:
www.nexans.com/products.htm

ARMOURED TYPES (CSA)



Most **ARMOURED CABLES** can be directly buried. These include: Teck90, ACWU90, RA90 Corflex, Armoured Datatrans and DriveRx VFD cable. More details about these cables can be found in the "Armoured Cable" leaflet.

NMWU 300 Volts (CSA)



NMWU has copper conductors with thick PVC insulation; assembled with a bare copper bond wire; and encased in a thick PVC plastic jacket. Excellent for buried runs to lawn lights, sheds, garages, etc. and also for use to (and in) barns and animal pens.

RWU90-40 600 Volts (CSA)



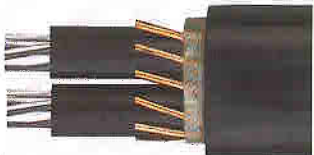
RWU90 is RW90 with thicker cross-linked polyethylene (XLPE) insulation for direct burial in earth or in duct and is rated 1000 volts. It is tough and has excellent water resistance.

TWU-40 600 Volts (CSA)



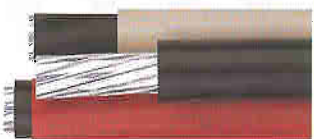
TWU-40 is similar to TW75 but has a thicker wall of PVC plastic insulation. It may be installed (with care) down to minus 40°C. It has a high temperature limit of +60°C. It is designed to be directly buried in the ground, but may be put in duct if desired.

USEB90 600 Volts (CSA)



USEB90 is preferred to USE1 in some provinces. Instead of twisting the aluminum conductors together, they are laid parallel then surrounded by a copper concentric neutral and an overall PVC jacket. Contact your local electrical inspection authority before deciding whether to use USE1 or USEB.

USEI75/ USEI90 600 Volts (CSA)



USEI is normally made with aluminum conductors. USEI75 is insulated with polyethylene, and USEI90 is insulated with cross-linked polyethylene. Each insulated conductor is individually covered with a PVC jacket, and then cabled together. USEI is principally used for underground power supply to houses, trailer parks, etc. It is economical, and readily available from stock in many sizes.

CONTROL CABLE



The Product

Nexans Wire & Cable Control Cables are single and multi-conductor cables available in both 300V and 600V. These cables are all manufactured using the latest in production technology and computer aided manufacturing systems. There are a variety of features that can be chosen to further enhance the superior quality inherent in these cables. These features include flame retardancy, low acid gas emission and zero halogen content.

The Application

Nexans Wire & Cable Control Cables can be suitable for direct earth burial, for installation in ducts or conduit as well as open air conditions both inside and outside (subject to UV radiation) depending on the design parameters chosen. Nexans Wire & Cable Control Cables are suitable for continuous operation at 75°C and can be designed for wet or dry environments in addition to being sunlight resistant.

The Approvals

Nexans Wire & Cable are designed, manufactured and tested in accordance with the following specifications:

ASTM B3: Soft or Annealed Copper Wire

ASTM B8: Concentric Lay Stranded

Conductors, Hard, Medium-Hard or Soft

ASTM D 1248: Polyethylene Plastics

Molding and Extrusion Materials

ICEA S-73-532. Standard for Control Cables

AIRPORT RUNWAY LIGHTING CABLE AIRPORT SERIES LIGHTING CABLE 'ASLC' (CSA)



AIRPORT SERIES LIGHTING CABLE is designed for burial beside runways, to power the lights that guide aircraft to safe landings. It has a thick covering of cross-linked polyethylene, and is rated 5,000 volts unshielded. Normally it is #8 gauge and is the standard cable for this function in all Canadian airports. Nexans cable is CSA and DOT approved.

CONTROL CABLES

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POLE & BRACKET
STREET LIGHT WIRE
MID RIP



MID RIP, like SLV, runs from the base of hollow streetlight poles to the bracket and on to the lamp holder. Made like a very large lamp cord, Mid Rip is flat with a groove between the conductors, which can be ripped apart to allow terminating. There is no CSA or UL standard for this 600 volt PVC insulated product.

**RAILWAY
SIGNAL
CABLE**



RAILWAY SIGNAL CABLE has single or multiple copper conductors, polyethylene (PE) insulation and a PE jacket and is used in railway signaling applications. This 600 volt cable is made to CPR Specification 100. There is no CSA or UL standard for this product.

**TRANSFORMER
DROP**



TRANSFORMER DROP is stranded copper, with a thick covering of track resistant black polyethylene. It connects the transformer to the primary supply line. If made with medium hard copper it can be formed to special shapes, (such as a right angle offset), if required. Transformer drop wire has no voltage rating. There is no CSA or UL standard for this product.

COPPER CONDUCTORS

DETAILED PRODUCT INFORMATION IS AVAILABLE ON OUR WEBSITE:
www.nexans.com/products.htm

COPPER

All **COPPER** conductors supplied by Nexans have a purity guaranteed not less than 99.8%. Virtually all are drawn from copper rod made at the Nexans factory in Montreal East, from copper supplied by Noranda's adjacent copper refinery. Common sizes of soft bare conductors are readily available from stock.

COPPER - TINNED

Copper conductors may be **TINNED** to resist corrosion or to make soldering easier.

STRAND - COMPACT

In **COMPACT** conductors each layer of wires in the conductor is compacted so that all the wires are segment shaped leaving no air spaces visible between the wires. This reduces the conductor diameter approximately 9% to 10%. Compact conductors are standard in large size Teck and most medium voltage power cable.

STRAND - COMPRESSED

COMPRESSED has the outer layer of wires in a stranded conductor smoothed, thereby reducing the diameter approximately 3%. Compressed conductor is used in all building wire.

STRAND - FLEXIBLE and ROPE

Used in small flexible conductors, **BUNCHED** strand is a group of very fine wires twisted together in a common direction: not concentrically. **ROPE** strands are assemblies of bunch-stranded members that are used in very flexible cables, such as welding cable. These strands are expensive, and used only where essential.

STRAND - ROUND

Conductors can be stranded in several different ways. The original was **ROUND** strand, in which a single solid center wire has other solid wires wrapped around it in layers.

TEMPER

Copper is most commonly supplied in soft (drawn) **TEMPER**. It is easy to pull into conduits, and to terminate. Medium hard and hard are seldom used, except where strength is needed such as going from pole-to-pole along streets, or as power supply conductors for streetcars or overhead cranes.



ALUMINUM CONDUCTORS

DETAILED PRODUCT INFORMATION IS AVAILABLE ON OUR WEBSITE:
www.nexans.com/products.htm

ALLOYS

The **ALLOY** used for many years has been EC grade (or alloy 1350). In recent years the need to improve aluminum's handling characteristics led to the introduction of the 8000 series of alloys (known as ACM). Alloy 8030 ACM is now standard in all Nexans aluminum conductor building wire products. Aluminum has approximately 61% of the conductivity of copper, therefore a larger sized conductor must be used to carry the same current as copper. Many conductors for use overhead and directly buried are stocked. Aluminum RA90 Corflex, RWU90, RW90 and ACWU90 building wire are readily available.

STRANDING

Aluminum **STRANDING** is the same as for copper, except that it is not suitable for very fine flexible conductors, since the individual fine aluminum wires composing the strand are susceptible to breakage during manufacture and use.

TEMPER

Since all Nexans aluminum building wire conductors are made of ACM (alloy 8030) they must be heat treated before they are insulated. This heat treatment makes them a dead soft or zero **TEMPER**. Half hard, 3/4 hard and full hard tempers of alloy 1350 conductors are used in some cable constructions for overhead applications.

UNIQUE INSTALLATION REQUIREMENTS

The use of aluminum conductors is NOT as simple as copper. Aluminum (and its alloys) quickly form an oxide 'coat' and this can lead to faulty 'hot' connections. There are some **UNIQUE INSTALLATION REQUIREMENTS** for aluminum. The conductor must be wire brushed to remove the oxide, then immediately covered in a suitable inhibitor (such as Penetrox). Lugs and terminals must be designed for use with aluminum to ensure good conductivity, and evenly spread pressure to avoid cold flow. Before using aluminum conductors it is wise to obtain specific advice on proper installation methods. Aluminum can save some money on the initial cable purchase, but requires more care in installation and if improperly installed can cause serious problems. ACM aluminum alloys help to eliminate some of these problems with aluminum conductors but **TIME, KNOWLEDGE and CARE** are **ESSENTIAL**.



HOUSE, FARM & APARTMENT WIRE

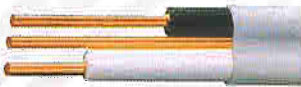
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BELLS & BUZZERS
ANNUNCIATOR
or **BELL WIRE**
(CSA)



ANNUNCIATOR and **BELL WIRE** are two common names for an inexpensive and widely used wire, comprising 2 or 3 insulated conductors twisted together, with NO overall covering. It may only be used on systems of 30 volts or less. The covering is thin, and not very good in cold weather so it must be handled carefully during installation. It is used on bells or buzzers which are powered through a step-down transformer. It must NEVER be used on full house power of 110 volts.

LIGHT & OUTLET
CIRCUITS
NMD90 (White)
CANADEX
300 Volt
(CSA)



NMD90 is common house wire. It is designed for use indoors, in dry locations, and away from the weather. It must NOT be buried or used in wet locations. The slight dampness found in some basements will not hurt it. A bare copper bonding (ground) wire is always included to permit safe operation of attached equipment. The plastic covering is not designed for installation at low temperatures, and it is good practice to warm the spools before unrolling the wire in winter. NMD90 always contains a white NEUTRAL wire, except for NMD (Red) HEATEX.

ELECTRIC HEAT
CIRCUITS
NMD90 (Red)
HEATEX
300 Volt
(CSA)



NMD90 (Red) HEATEX is a variant of NMD90 CANADEX, with NO WHITE WIRE in the 2 conductor cable. This cable is designed for use on 230-volt systems where there is no NEUTRAL, therefore the cable has a black and a red conductor in addition to the bare bonding wire. To make identification easier it is usually supplied with a RED overall jacket. It should NOT be used on 110-volt systems as there is no neutral, and it is dangerous to use either the red or the black as a neutral. Large sizes are available for use with electric furnaces.

BURIED CIRCUITS
BARNs, SHEDS &
LAWN LIGHTS
NMWU SUPERVEX
300 Volt
(CSA)



Although **NMWU** is similar in appearance to NMD, it is in fact quite different. This wire has very thick PVC insulation on the individual conductors, and is then covered with a thick PVC jacket making it suitable for direct burial. It is a very good cable to use for supplying a garage, garden shed or lawn lights. The #2 gauge and larger is suitable for 100 amps. NMWU can be used in wet locations, and in barns and other animal enclosures where not exposed to mechanical injury.

SUBMERSIBLE
PUMP CABLE
(CSA)



PUMP CABLE is used to power electric pumps submerged in wells, ponds or similar places. Copper conductors are individually insulated with colour coded PVC (designated type TWU), then cabled together in various size and colour combinations. It is readily available in sizes #14 - #6. Pump cable is rated 600 volt, FT1.

HOUSE, FARM & APARTMENT WIRE

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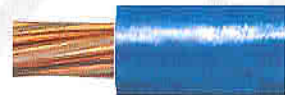
SERVICE
ENTRANCE OR
SUPPLY WIRE



RW90
600 Volt
(CSA)

RW90, made with either copper or aluminum alloy conductor, is another wire type used for service entrances. The cross-linked polyethylene (XLPE) insulation has very good cold weather characteristics, and excellent water resistance. HOWEVER, it is poor on ultraviolet (sunlight) resistance unless made with special additives and printed 'OUTDOOR' on the outside of the insulation. Our stock black RW90 #6 and larger is 'OUTDOOR'. If it is not marked 'OUTDOOR' it can only be used away from sunlight, or may be used outdoors if covered with tape or other sunlight protection acceptable to the local electrical inspector. Extra care is required to terminate aluminum RW90.

BURIED CIRCUITS



RWU90
1000 Volt
(CSA)

RWU is a version of RW90 that can be direct buried in earth. This solid or stranded copper conductor, insulated with extra thick cross-link insulation is 1000 volt rated. A stock item, RWU can be used to bury circuits to or between buildings or outdoor lights. As with TWU, mechanical protection is usually required.

THERMOSTAT &
FIRE ALARM,
SIGNAL, SECURITY,
TWO-WAY EMERGENCY
COMMUNICATION SYSTEMS



SECUREX FAS/LVT
300 Volt
(CSA)

SECUREX is mostly 18 gauge solid copper conductors, PVC plastic insulated and colour coded. The conductors are cabled then covered with a red PVC jacket. Shielded unarmoured Securex is also available. Rated 300 volts, Securex is used in houses to connect the central furnace and the thermostat. The armoured version has an aluminum interlocked armour over the jacket. FT4 rated, unarmoured Securex in metal conduit and armoured Securex can be used as fire alarm cable. Securex must NOT be used as a power supply wire to lights or outlets. Securex is readily available up to 30 conductors. Some provincial inspection authorities allow its use in return air plenums.

SERVICE ENTRANCE
OR SUPPLY WIRE



TW75 600 Volt
(CSA)

TW75 is a single copper wire covered with PVC plastic, commonly used for service entrances connecting the utility power supply conductors to the house or other building. It must be carefully handled at low temperatures. It withstands both rain and ultraviolet rays from the sun.

BURIED
CIRCUITS
TWU-40
600 Volt
(CSA)



TWU-40 is a solid or stranded copper conductor, insulated with very thick PVC plastic insulation, good for direct burial in the earth. TWU-40 has very good low temperature characteristics. Inexpensive and readily available from stock, it may be used for direct buried circuits running to or between buildings or to outdoor lights. Mechanical protection will usually be required to keep stones and frost heaving from damaging it.

INSULATIONS

DETAILED PRODUCT INFORMATION IS AVAILABLE ON OUR WEBSITE:
www.nexans.com/products.htm

EPR/EPDM

ETHYLENE PROPYLENE
RUBBER/ETHYLENE
PROPYLENE DIENE
MONOMER

EPR/EPDM are synthetic rubbers used on cables in low and medium voltages. These rubbers are soft and pliable material, good on trailing cable used in mines and similar applications. It is not as tough mechanically as XLPE. Some manufacturers offer it as an alternative to XLPE, but Nexans is committed to XLPE which has a long and reliable history.

PE

POLYETHYLENE

PE is widely used as an insulation on cables to be installed outdoors, exposed to the weather. Polyethylene has naturally excellent electrical, mechanical and cold weather capability, and with appropriate additives it can readily withstand ultraviolet rays from the sun. Polyethylene burns easily, but this can be altered by using additives where necessary.

PVC

POLYVINYLCHLORIDE

PVC is a general purpose compound. It has reasonably good electrical, moisture resistance, flame retardant and cold temperature characteristics. It is only used on lower voltage wires, such as TW and NMWU cables. PVC can be modified to enhance various characteristics, but this usually results in degrading another feature, e.g. enhancing it for cold weather will degrade its high temperature and fire resistant characteristics.

XLPE

CROSS-LINKED
POLYETHYLENE

XLPE is very widely used on wire and cable for direct burial; pulled into conduits and on conductors in armoured power cables. It is also used on medium and high voltage cables. XLPE has excellent electrical and mechanical strength, it resists moisture and has good cold weather characteristics. It must have additives included to withstand ultraviolet rays if exposed to sunlight. XLPE insulation provides a first rate, reliable cable whether buried, pulled into conduit, laid submarine, or used as part of a bigger cable.

JACKETS

DETAILED PRODUCT INFORMATION IS AVAILABLE ON OUR WEBSITE:
www.nexans.com/products.htm

CPE
CHLORINATED
POLYETHYLENE

CPE has characteristics which are good for use on low voltage flexible cables (such as HPN cord) at lower cost than neoprene or hypalon. CPE is cold, oil and heat resistant, as well as flame retardant. In the case of HPN cord CPE acts as insulation and jacket combined.

HYPALON

HYPALON is a successor to Neoprene. It is flame retardant and is excellent where heat and oil are normally present such as on diesel-electric locomotives. Hypalon still has a role to play on specialized products, but has a limited market, as it has been displaced by CPE in many products.

NEOPRENE

NEOPRENE is a flame-retardant synthetic rubber. For many years it was a common jacketing material. Now largely superseded by other materials such as hypalon and CPE, Nexans no longer uses it.

NYLON

NYLON is applied as a thin film (like nail varnish) over insulations such as the PVC on T90. This allows the use of thinner insulation walls, and provides a slippery outer surface. This reduces insulation diameter and allows users to put more T90/TWN75 wires into a given conduit size, knowing that the tough nylon jacket will help avoid damage during installation. Nylon has poor UV resistance, and should not be exposed to sunlight. It is resistant to many common chemicals such as oils but it should NOT be used where acids are present.

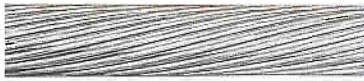
PE
POLYETHYLENE

PE provides an excellent, tough, water-resistant jacket. Polyethylene is highly recommended for cables that will be buried, put in underground ducts, or laid in water. Polyethylene does not have good flame resistance, and is not recommended in buildings. It is resistant to many common chemicals, such as acids, alkalis and some oils.

PVC
POLYVINYLCHLORIDE

PVC used as a jacket is often modified to enhance physical characteristics such as low temperature flexibility and flame retardancy at the expense of electrical. It is tough, sunlight resistant, and can be compounded to meet the FT4 fire rating. It is resistant to many common chemicals such as acids, alkalis and most oils.

ACSR



ACSR

Aluminum conductor, steel reinforced (ACSR) has long been the backbone of overhead transmission and distribution systems. It is common in all sizes from 6 AWG through 2000 kcmil, and can be even larger. It is made in a variety of constructions, depending on the conditions of use, but all constructions are characterized by the use of hard-drawn, aluminum alloy 1350 wires stranded over a galvanized steel wire core. Including a larger steel core can strengthen the conductor, thereby reducing the number of poles or towers required.

ACSR-II



ACSR-II is manufactured by twisting together two standard ACSR conductors with a very long and carefully controlled length of lay. This configuration helps reduce wind-induced conductor motion such as aeolian vibration and conductor galloping. The use of ACSR-II conductor can result in a lower installed cost system by reducing conductor fatigue damage, eliminating the need for vibration controlling accessories, reduced structure costs through higher installation tensions, and increased load capacity.

SELF-DAMPING CONDUCTOR

These conductors have layers of trapezoidal aluminum alloy 1350 or 6101 wires stranded over a galvanized steel wire core. A small gap is maintained between layers. As a result, the conductor dissipates the energy of wind-induced conductor motion. This conductor design has been used to good effect in the past, but Nexans Energy believes that the ACSR-II construction provides a more effective and economical way of controlling conductor motion.

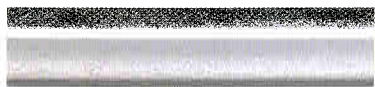
ACAR

Aluminum conductor alloy reinforced (ACAR) is used where higher conductivity is required than is provided by ACSR. The construction consists of hard-drawn, aluminum alloy 1350 wires stranded over an aluminum alloy 6101 core. In addition to the higher conductivity, it helps reduce corrosion in situations where the steel core might otherwise be affected. The initial purchase price is slightly higher than conventional ACSR.

ASC

Aluminum stranded conductor (ASC) consists only of hard-drawn, aluminum alloy 1350 wires stranded together. They are commonly used to exit power stations, and as sub-feeders in places where there are heavy loads, and short spans of 30-35 metres. They provide good conductivity, are easy to handle, and are readily available. They do not have the same tensile strength as ACSR or ACAR.

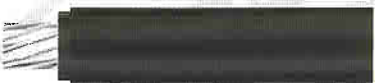
TIE WIRE



TIE WIRE

Tie wire is used to attach overhead conductors to insulators. It is usually either 4 or 2 AWG soft solid aluminum wire. Softness is essential so that line crews can quickly and easily bend it into position around conductors and insulators.

FIELD LASHED CABLE



FIELD LASHED POWER CABLE

Where space is restricted (e.g. along alleys, on poles carrying multiple circuits, or through heavily treed areas where rocky ground precludes burial) the use of XLPE-insulated, shielded and jacketed power cable can be a good choice. First a steel messenger is strung between poles, and then the cable is lashed to this with field spinning equipment. On short runs, the use of ultraviolet (UV) resistant tie-wraps (or equivalent) to attach the cable to the messenger may be satisfactory. Often cable already available in stores can be used for these installations, thereby reducing the need for purchasing special cable and special terminating materials.

TREE CABLE



SPACER CABLE AND TREE WIRE

Spacer cable and tree wire are used for primary and secondary overhead distribution where limited space is available for rights-of-way. They are installed as an uninsulated conductor; however, the covering is effective in preventing direct shorts and instantaneous flashovers should tree limbs or other objects contact the conductors in such close proximity.

Tree wire is used for spans where trees crowd the right-of-way, such as in wooded residential areas, when a minimum of interference with the environment is desired. The covering minimizes power outages due to conductor contact with tree limbs, reducing the need for frequent or severe trimming.

Spacer cable is installed with other spacer cables on a supporting messenger through a series of spacers. The resulting close-proximity configuration minimizes the amount of space and hardware required for line installation; it is particularly useful in congested areas.

NS-1

300Volts
(CSA)



TYPE NS-1 NEUTRAL SUPPORTED CABLE (300 VOLT)

This is the most widely used overhead secondary distribution cable. It consists of one or more insulated conductors and a bare neutral conductor. They are intended for use either as a service drop cable between a power pole and the service entrance, or as a secondary distribution cable between poles.

The aluminum alloy 1350 phase conductors are insulated with black linear low-density polyethylene (LLDPE). Phase identification may be provided either by surface marking or extruded ridges. One or more insulated phase conductors are twisted around the bare ACSR or aluminum alloy 6101 neutral conductor.

DUPLEX is often used to connect streetlights. A very wide range of sizes and conductor varieties is available.

TRIPLEX commonly supplies residences at 115/230 V single phase and runs from the street to the house. It may also be used for supplying power to overhead outdoor lighting.

QUADRUPLEX is used where three phase wires are needed such as for 120/208 V high intensity lighting at stadiums.

NSF-2

600Volts
(CSA)



TYPE NSF-2 NEUTRAL SUPPORTED CABLE (600 VOLT)

The Type NSF-2 cable is similar to Type NS-1 but is rated for 600 V applications. Each phase conductor has a colour-coded, flame retardant PVC jacket over the black LLDPE insulation. Type NSF-2 is approved for use over buildings, while Type NS-1 is not.

TRANSFORMER DROP WIRE



TRANSFORMER DROP WIRE

Transformer drop wire consists of a stranded soft bare copper conductor covered with black linear low-density polyethylene (LLDPE). It is used to connect the transformer to the primary supply line.

LINE WIRE



LINE WIRE

Line wire is intended for use in overhead distribution circuits operating at primary or secondary voltages. The covering provides circuit protection against momentary contact with other conductors or trees. Because the covering carries no voltage rating, the conductors must be installed on insulators adequate for the intended service voltage. The user should consider the dielectric compatibility of the covering, insulator and conductor/insulator tie.

Typically medium-density polyethylene (MDPE) insulation is applied over an aluminum alloy 1350, ACSR or medium hard-drawn copper phase conductor.

FIELD SPUN SECONDARY CABLE



FIELD SPUN SECONDARY CABLE

Similar to line wire, this cable has a heavier covering of medium density polyethylene (MDPE) and 600 V rating. It is supplied as single conductors which are pulled together during installation. It is lashed to a field-installed messenger using a spinning machine, or in short runs, with suitable clips or straps. It occupies less space on the pole than line wire, and if brought down by storm or accident, offers greater protection to passersby.

STREETLIGHT WIRE SLV



SLV

This cable consists of two solid copper conductors, PVC-insulated, laid parallel with a black, low temperature PVC jacket. It is designed to run from the base of hollow street light poles to the bracket and from there to the lamp holder. It is NOT a CSA approved type.

MID-RIP POLE AND BRACKET WIRE



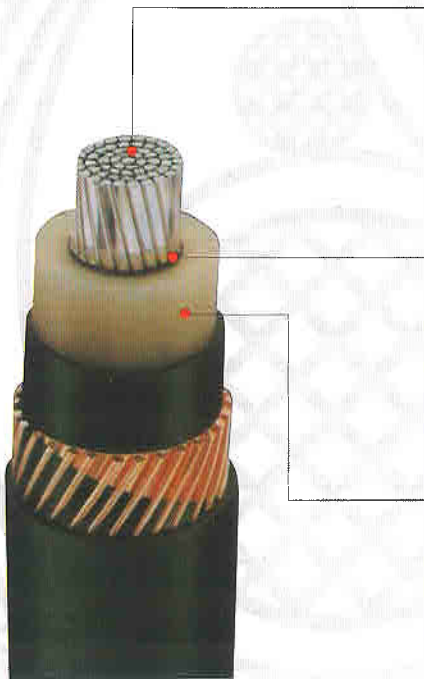
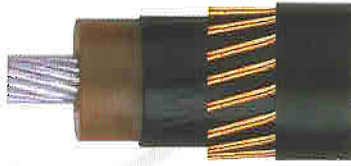
MID-RIP POLE AND BRACKET WIRE

Used for the same purpose as SLV, it is made like a very large lamp cord (i.e. flat with a groove between the conductors). This construction allows the conductors to be separated to allow for terminating. It is NOT a CSA approved type.

POWER CABLE 5 kV TO 46 kV

DETAILED PRODUCT INFORMATION IS AVAILABLE ON OUR WEBSITE:
www.nexans.com/products.htm

MEDIUM VOLTAGE POWER CABLE (5-46 kV)



BASIC CONSTRUCTION

Conductors may be either aluminum or copper. They are usually stranded, but sizes 2/0 AWG and smaller are often supplied as solid. A thin layer of semiconducting crosslinked polyolefin (XLPO) is extruded over the conductor, followed by the tree-retardant crosslinked polyethylene (TR-XLPE) insulation and then a strippable semiconducting crosslinked polyolefin (XLPO) insulation shield. All three layers are extruded through a single true triple crosshead on a dry cure catenary continuous vulcanization (CCV) line.

Depending on the cable's application, it may have metallic shielding, armour or sheath and an overall jacket. Such cables can be directly buried, pulled into underground ducts, submerged under water or hung from an overhead messenger wire. They are robust, easy to install and readily available in most conductor sizes and voltages from 5 to 46 kV.

CONDUCTOR

Conductors are made from either aluminum alloy 1350 or soft bare copper, and can be solid, compressed stranded or compact stranded. Stranded conductors can be manufactured with Strandblock™, which prevents the ingress of water into the conductor and retards the development and propagation of electrochemical (water) trees in the insulation.

CONDUCTOR SHIELD

Premature cable failure can also be initiated by microscopic irregularities at the interface between the conductor shield layer and the insulation. The use of an optional supersmooth conductor shield compound provides a smooth, uniform interface between these layers. This reduction of interface irregularities and protrusions helps reduce the risk of cable failure.

EXTRA CLEAN TR-XLPE INSULATING COMPOUND

All primary distribution cables are manufactured with a tree-retardant crosslinked polyethylene (TR-XLPE) compound containing an additive to retard the development and propagation of water trees.

Water trees in the insulation can also be triggered by the presence of contaminants in the insulation. All power cables supplied by Nexans Energy are manufactured with extra-clean compound that has been packaged, shipped and unloaded under "clean room" conditions. It is then conveyed to the extruder by a sealed vacuum system. In this way the compound is never exposed to possible air-borne contaminants.

Insulation level comes from ICEA standards and relates to the fault clearing time for the system on which the cable is used. 100% (Grounded) level is used where a system fault is cleared within 1 minute. 133% (Ungrounded) level is used where a system fault is cleared within 1 hour. (133% is often specified when extra protection against surges, lightning, or water treeing is desired.

CONCENTRIC NEUTRAL CABLE (5-46 kV)



SHIELDED POWER CABLE (5-46 kV)



CORU-SHIELD™ (5-46 kV)



CABLE IN CONDUIT



METALLIC SHIELDING

Concentric Neutral

The concentric neutral wires may be either bare or tinned copper. For single-phase systems, the conductance of the neutral is equivalent to that of the phase conductor. For three-phase systems, it is typically 1/3 but can be made with 1/6, 1/12, etc. neutrals. The concentric wires serve to carry the neutral return current as well as the ground fault current.

Helical Tape

For electrostatic shielding of the underlying cable core, one or more copper tapes are applied helically over the extruded insulation shield. It may not always have sufficient fault current capability for protective relaying purposes.

CORU-SHIELD™

Another option consists of a longitudinally applied corrugated copper tape (with a small overlap) along the axis of the cable. This offers greater short circuit capability than helically applied tapes and reduced shield loss when compared to the concentric neutral construction. The sealed overlap of the shield provides increased resistance to radial moisture ingress.

JACKET

The jacket provides mechanical protection during installation and inhibits corrosion of the concentric neutral wires or metallic shield. The standard jacket on concentric neutral cables is an extruded-to-fill (encapsulating) linear low-density polyethylene (LLDPE). It prevents longitudinal ingress of water between the concentric neutral wires if the jacket is damaged. On request medium-density polyethylene (MDPE) or semiconducting polyethylene can also be used.

The jacket can also be of the overlaying (sleeved) type using any of the above materials as well as PVC. If fire is a concern (as in a building), a PVC jacket should be used. It is not quite as tough as polyethylene, but has superior flame retardance.

Where required for identification of power cables in shared underground systems, three extruded red stripes can be provided on the cable jacket.

Cable in Conduit

Cable in Conduit is an extruded high-density or medium density polyethylene duct over primary cable. The conduit provides additional mechanical protection for the cable, reduces installation time, and allows for quick access and ease of cable replacement. Specifically used for primary cables, cable in conduit is also available for secondary cable.

**USEI75/
USC75**
600 Volts
(CSA)
(CEA)



LLDPE-PVC

TYPE USEI75 UNDERGROUND SERVICE ENTRANCE CABLE

This is the most widely used cable for underground secondary distribution and service entrance applications at 600 volts or less. They may be either directly buried or installed in ducts. Type USEI75 is principally used for underground power supply to houses and trailer parks. It is economical and readily available from stock in many sizes.

The aluminum alloy 1350 phase conductors are insulated with black polyethylene (LLDPE). Each phase conductor has a colour-coded, flame retardant PVC jacket applied over the insulation prior to being cabled together.

USEI90
600 Volts
(CSA)



XLPE-PVC

TYPE USEI90 UNDERGROUND SERVICE ENTRANCE CABLE

This is the most widely used cable for underground secondary distribution and service entrance applications at 600 volts or less. They may be either directly buried or installed in ducts. Type USEI90 is principally used for underground power supply to houses and trailer parks. It is economical and readily available from stock in many sizes.

The aluminum alloy 1350 phase conductors are insulated with black crosslinked polyethylene (XLPE). Each phase conductor has a colour-coded, flame retardant PVC jacket applied over the insulation prior to being cabled together.

USEB90
600 Volts
(CSA)



TYPE USEB90 UNDERGROUND SERVICE ENTRANCE CABLE

Used for the same purposes as USEI-90, however, there are differences in the cable construction. The conductors and insulation are the same (i.e. aluminum conductors with XLPE), but instead of a jacket on each conductor, the conductors are cabled together and a copper concentric neutral is applied. The entire assembly is then covered with an overall PVC jacket. This provides a robust cable, which is better able to withstand frost heaving, rodents' teeth, and minor dig-ins.

**CATHODIC
PROTECTION
CABLE**



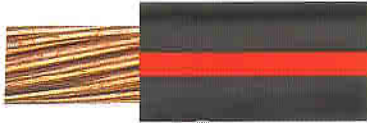
CATHODIC PROTECTION CABLE

Buried alongside pipelines, storage tanks, and other structures, this cable supplies DC power to cathodic protection systems. Made of stranded copper conductor, insulated with medium density polyethylene, they are made in various sizes and colours as required.

UNDERGROUND SECONDARY & SERVICE CABLE

DETAILED PRODUCT INFORMATION IS AVAILABLE ON OUR WEBSITE:
www.nexans.com/products.htm

TRACER WIRE



TRACER WIRE

Tracer wires are small polyethylene or PVC-covered copper wires (usually 14 or 16 AWG) which are buried beside pipelines or utilities to make them easier to locate in the future. Location is by the use of various electronic techniques.

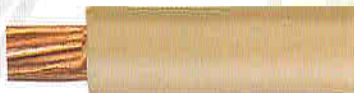
TYPE RWU90 1000 Volts



TYPE RWU90 (1000 VOLT)

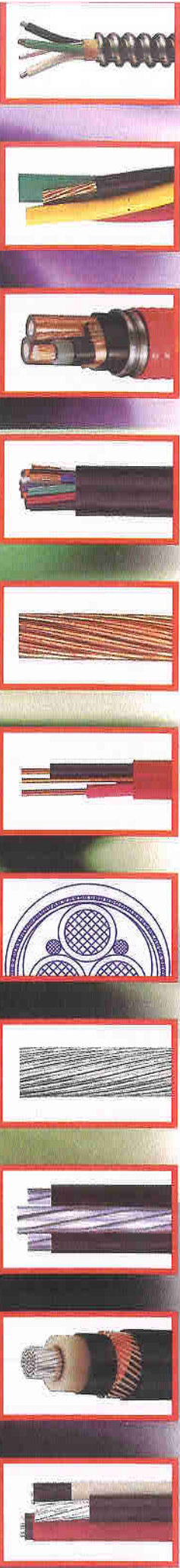
Type RWU90 cable is made with either copper or aluminum conductors insulated with a thick covering of crosslinked polyethylene (XLPE). It has excellent water resistance, can be handled in cold temperatures, and is mechanically and electrically strong. It can be directly buried in the earth or pulled into ducts.

TWU-40 600 Volts



TWU-40 (600 VOLT)

Type TWU-40 cable is made with copper conductors having a thick PVC plastic insulation. It is designed for direct burial and can provide good service at an economical price in conditions that are not too severe.



 Nexans

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