

LAPP

“Cables connect the present and the future”

Oskar Lapp



LAPP GLOBAL

▼ LAPP is based on trust and tradition - because we believe these are things that last ▼

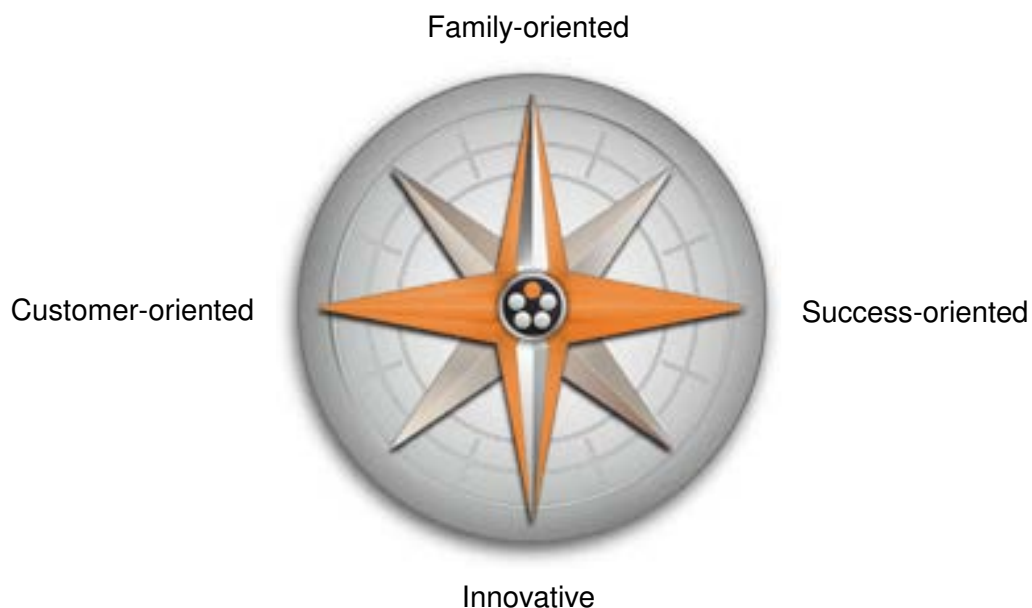
Total trust in 100 percent family ownership



As a one hundred percent family owned company, we know that everything we have achieved so far has only been possible with the support and collaboration of our customers and employees.

Thanks to this support, along with our strong roots and values, we can look ahead with confidence as we continue the LAPP story.

Our values are deeply rooted



Customer-oriented

Cooperation based on trust ensures our customers' success.

Success-oriented

Independence and profitable growth are important to us.

Family-oriented

Warmth and closeness enable us to have a long-term focus.

Innovative

We develop forward-looking solutions for our customers.

A feel for figures



LAPP INDIA

Double digit annual growth story in a very challenging and high potential market

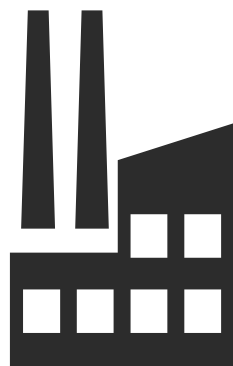
Key facts



INR 600+ Crores



9,000+ Customers



- 2** Factories
- 1** Innovation & Engineering centre
- 5** Warehouses
- 3** Service points
- 4** Regional sales offices



8 Strong brands



200 channel partners



E-shop



300+ Employees



- Machine Tools
- Textile
- Automotive
- Food & Beverage
- Automation
- Industrial data Communication
- Solar & Wind
- Oil & Gas
- Chemicals
- Cement
- Steel
- Mining
- Building
- Infrastructure
- Transport

Geographical Presence

BHOPAL



High Volume / Low Mix Plant

Production 2018: 150,000 km
Inauguration: 2012
Land Area: 30 acres

Production Portfolio:
Single Core Wires: up to 300mm²
Multi Core Cables : unbraided, copper or steel braided

Certifications:



JIGANI



Low Volume / High Mix Plant

Production 2018: 20,000 km
Inauguration: 1998
Land Area: 10 acres

Production Portfolio:
Single Core Wires: up to 400 mm²
Multi Core Cables : unbraided, copper or steel braided
Special Cables: instrumentation
Armoured Cables: LV Power

State-of-the-art laboratory

- 3200 Sq ft area located in Bangalore factory
- Certified under ISO and IEC17025
- Over 240 measuring & test equipments
- Performs internal & customer specific inspections
- External testing services to customers with NABL accreditation



Laboratory can Perform test under



IS (Indian Standard)



BS (British Standard)



IEC



VDE

LAPP PRODUCTS & SOLUTIONS

LAPP

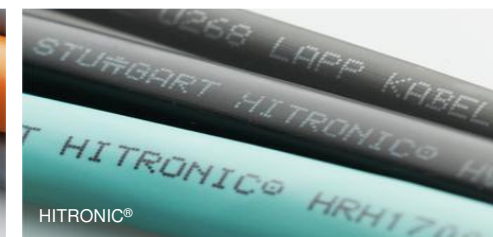
LAPP Brand

From standard to custom-made products

8 strong brands, which are international industry standards



ÖLFLEX®



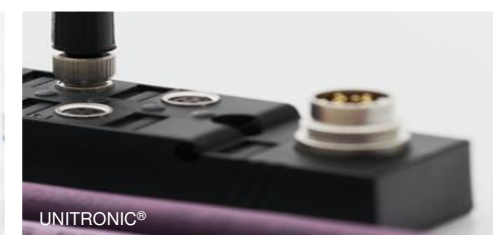
HITRONIC®



ETHERLINE®



SKINTOP®



UNITRONIC®



SILVYN®

More than **40,000 standard products** for practically every international requirement



EPIC®



FLEXIMARK®

Tailored solutions for customer-specific applications



CUSTOMIZED PRODUCTS

ÖLFLEX® – The world's first branded cable



ÖLFLEX® has become synonymous with power and control cables. Our flexible and oil-resistant cables satisfy the highest demands and can withstand even the very toughest conditions.

Applications

- Industrial machinery, machine tools, plant and equipment engineering
- Measurement, control, heating and air conditioning systems
- Wind power and photovoltaic systems
- Public buildings, airports and stations.
- Medical technology, chemical industry, composting plants and sewage works
- Food and beverage industry
- Construction machinery, vehicles and agricultural equipment
- Stage technology
- Mobile electrical equipment (electric tools, power tools, domestic appliances).

UNITRONIC® – Efficient cabling for data transmission



Our high-quality UNITRONIC® data network cables and field bus components provide a forward-looking solution for all applications in industrial machinery and plant engineering. From transmission of simple control signals to field bus signals in complex network structures - we offer a dependable cabling and connection solution for almost every situation.

Applications

- Industrial machinery and plant engineering
- Sensors and actuating elements
- Appliances
- Measurement and control technology
- Automated production processes and industrial robots
- Bus systems
- Computing and communication systems

ETHERLINE® – For secure industrial networking

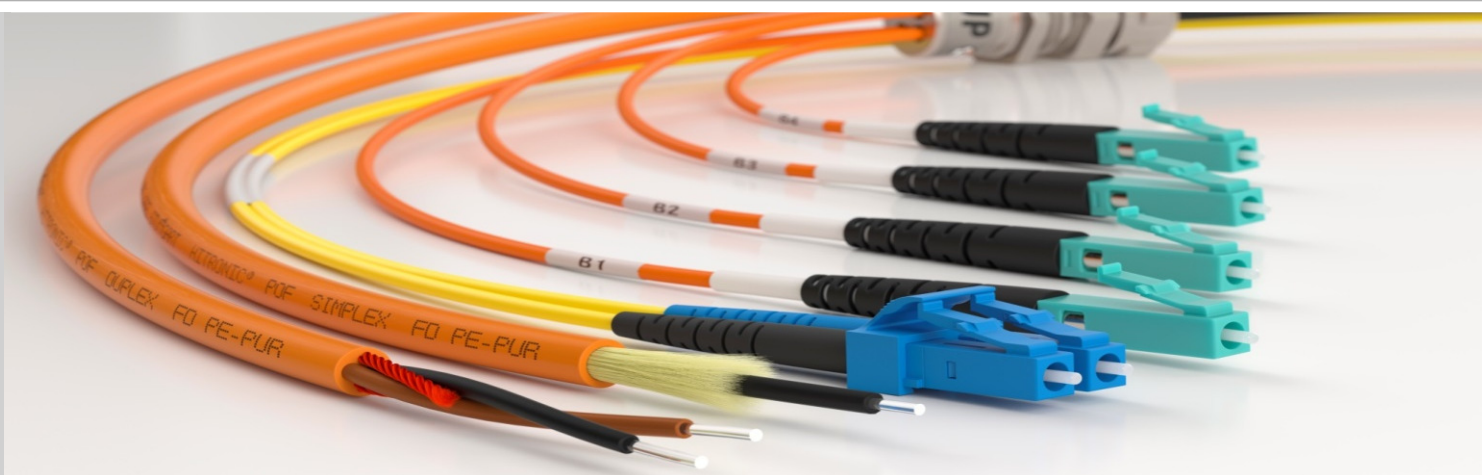


Our ETHERLINE® branded products open up a secure, fast and reliable path to the future of Ethernet applications. The systems are made up of durable and robust cables and connection components for passive network technology, and deliver an effective solution for almost any application, particularly in an industrial environment.

Applications

- Industry and building networks
- Industrial machinery and plant engineering
- Automation technology
- Control engineering

HITRONIC® – Unbeatable speed and security



HITRONIC® fibre optic cables make transmitting large data volumes easy: fault free, bug proof and at almost light speed. Even electromagnetic radiation does not interfere with the transmission. The HITRONIC® range includes the ideal solution for indoor or outdoor use, for demanding conditions, and even for use in power chains.

Applications

- Telecommunications and network technology
- Industrial cabling and automation level
- Industrial machinery and plant engineering
- Data transmission under harsh conditions (mining and tunnel construction, oil and gas platforms, wind power plants)

EPIC® – Robust yet flexible



EPIC® industrial connectors can be found everywhere in industrial machinery and plant engineering, for measuring, control and drives. EPIC® is a flexible system of housings, inserts and contacts: all extremely robust, absolutely safe and simplicity itself to assemble.

Applications

- Electronics and telecommunications.
- Measurement, testing and control technology
- Industrial machinery and appliances
- Drive technology and industrial automation
- Photovoltaic plants

SKINTOP® – Securely connected in seconds



Simply feed in the cable and twist. That's it. Our SKINTOP® cable glands provide secure connections in no time. The universal systems are simple but effective. They secure and center the cable, hermetically seal it and guarantee optimum strain relief.

Applications

- Industrial machinery and plant engineering
- Drive systems
- Measurement and control technology
- Renewable energies
- Wherever cables need to be fastened securely and quickly

SILVYN® – For hard wearing all-round protection



The universal range of SILVYN® protection and guidance systems protect cables effectively against dust, moisture, mechanical, thermal and chemical influences. The versatile SILVYN® CHAIN, range of energy supply chains also protect and guide cables in dynamic applications.

Applications

- Industrial machinery and plant engineering
- Automotive industry
- Machine tool manufacture
- Renewable energies
- Wherever cables require additional protection or guidance

FLEXIMARK® – For a rapid overview



The requirement: Permanent marking. The solution: FLEXIMARK®. These sophisticated systems mean that a clear overview inside a control cabinet is no longer just a pipe dream. From simple labels for manual marking through to electronic markings, the FLEXIMARK® range is guaranteed to be permanent.

Applications

- Control cabinet manufacturing
- Automation technology
- Industrial machinery and plant engineering
- Renewable energies
- Wherever cables are used

ÖLFLEX® CONNECT – Systems Solutions made by LAPP



ÖLFLEX® CONNECT CHAIN

Our system engineers know our components right down to the smallest detail, but also have an in-depth understanding of your application.

1. Analysis of requirements
2. CAD design of the drag chain system (incl. cable layout)
3. Coordination
4. Delivery & Installation

Selection of accessories and services:

- Chains in nylon or steel design
- Highly flexible power, control and signal cables, incl. accessoires
- Hydraulic and pneumatic hoses
- Protective cable conduits with glands
- Towing arms or other functional units
- Testing incl. comprehensive test report
- Individual installation guidelines

Customized Products

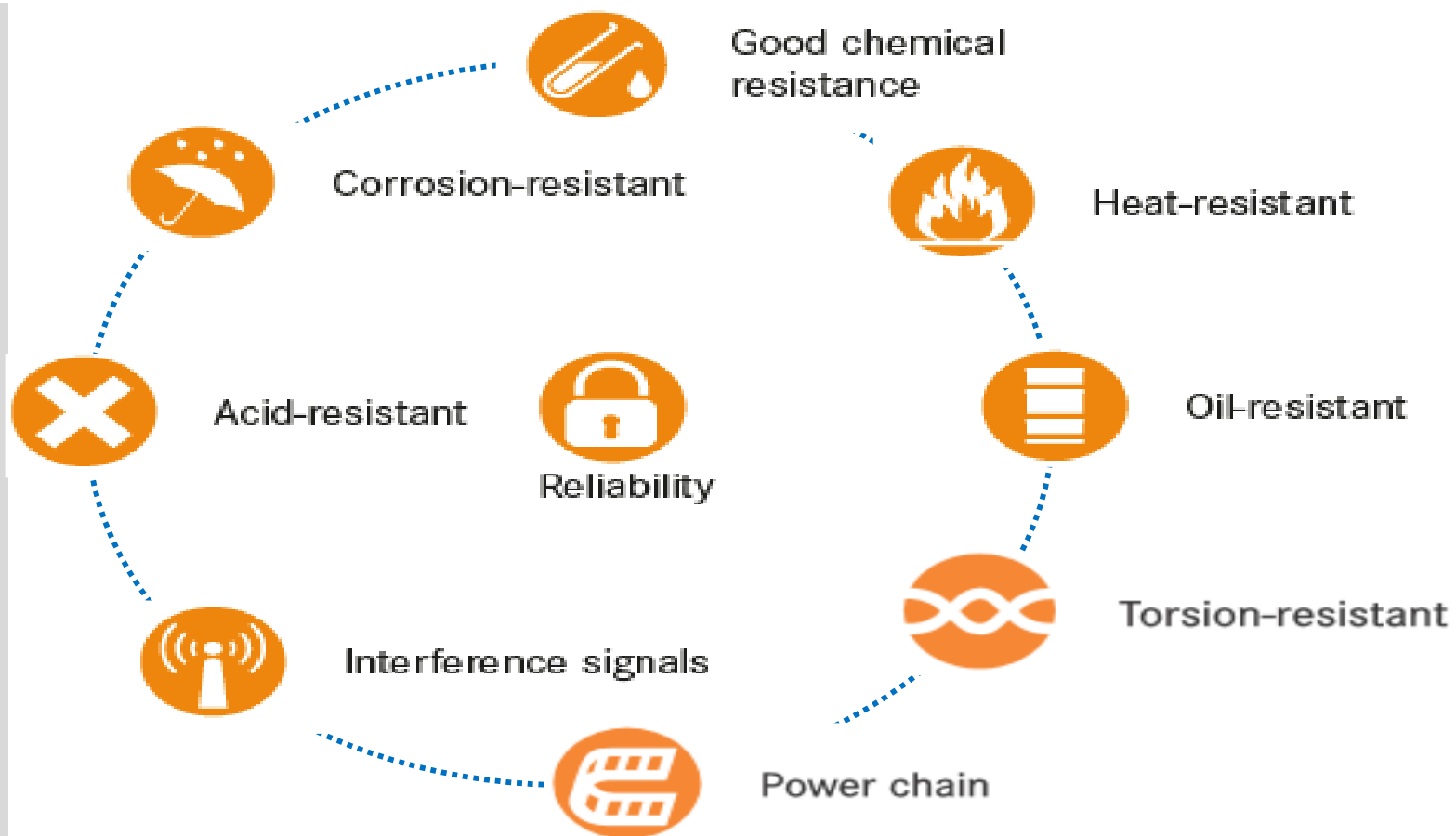
Closer to the customer, closer to the trends



- Wide range of cross sections and cabling techniques
 - Optimize for high bending cycles or narrow bending radii
 - Cables for use in aggressive media, water or oils
 - Wide range of shielding technologies- film, braiding or sheath
-

ESSENTIALS CHARACTERISTICS OF CABLES

Essential Characteristics of Cables



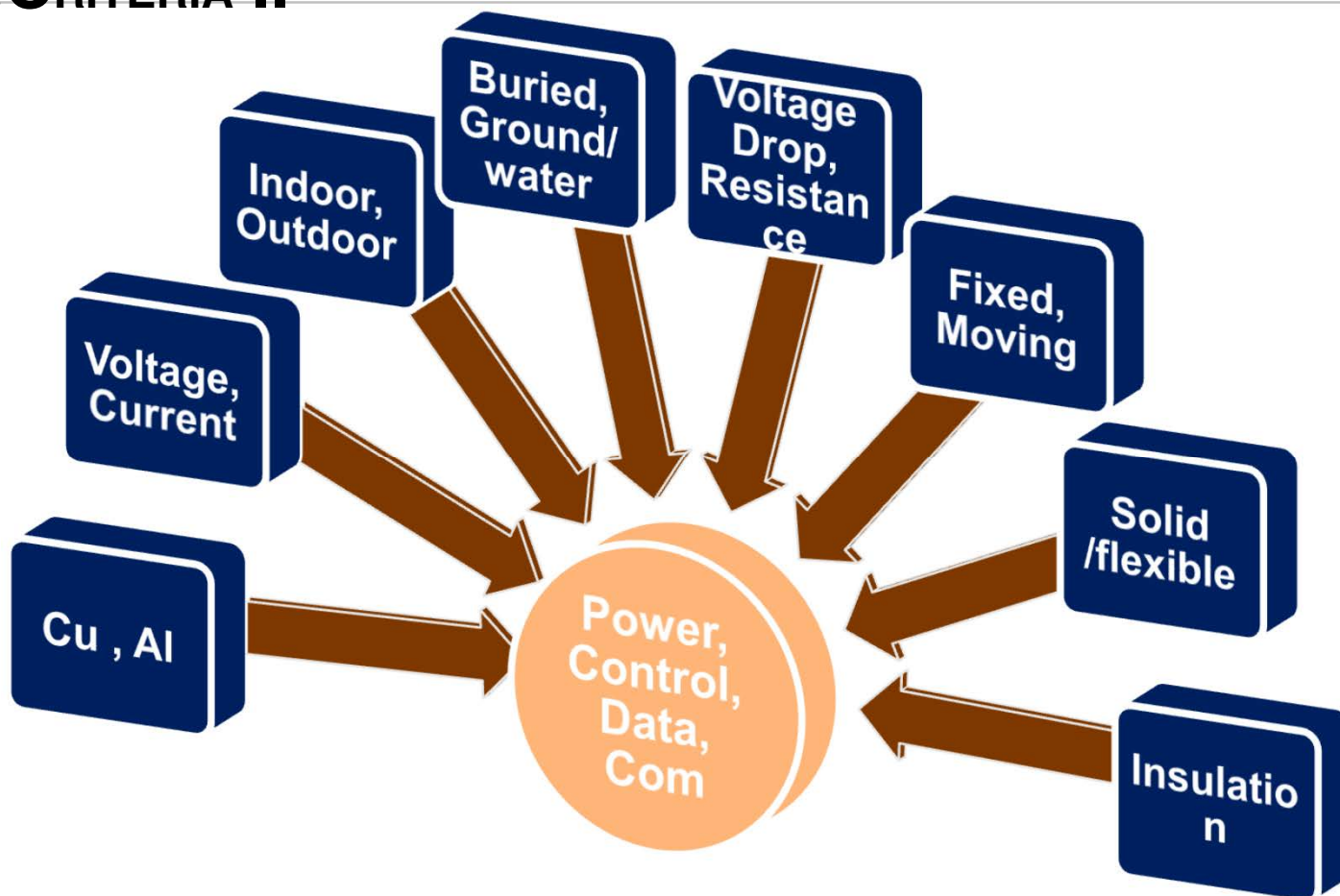
WHAT CONFIRMS SUPERIOR QUALITY ?

**Best material Best
production Best
Testing**

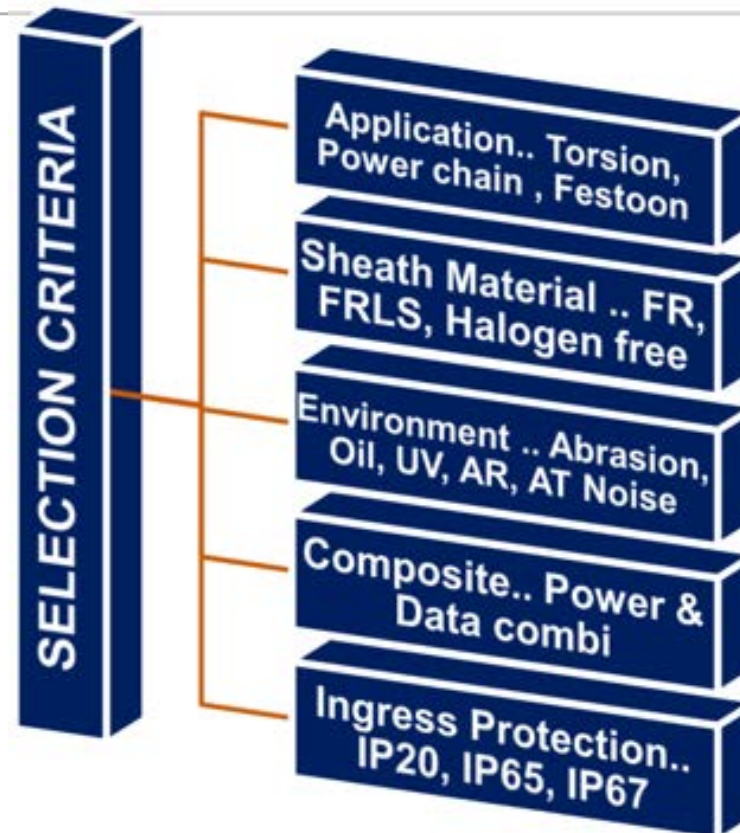
- **Best of the raw materials**
- **Best of the manufacturing
machineries and processes**
- **Best of the testing
Lab- NABL Accredited**
- **Best of the R & D facilities**
- **Company Values – Global Value Propositions**



SELECTION CRITERIA ..

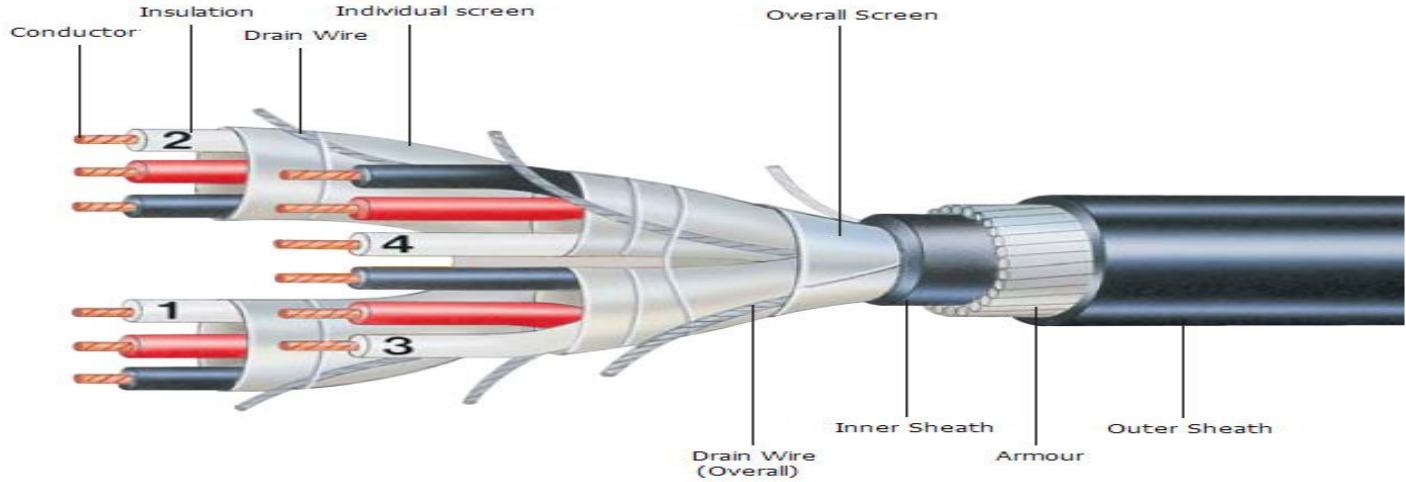
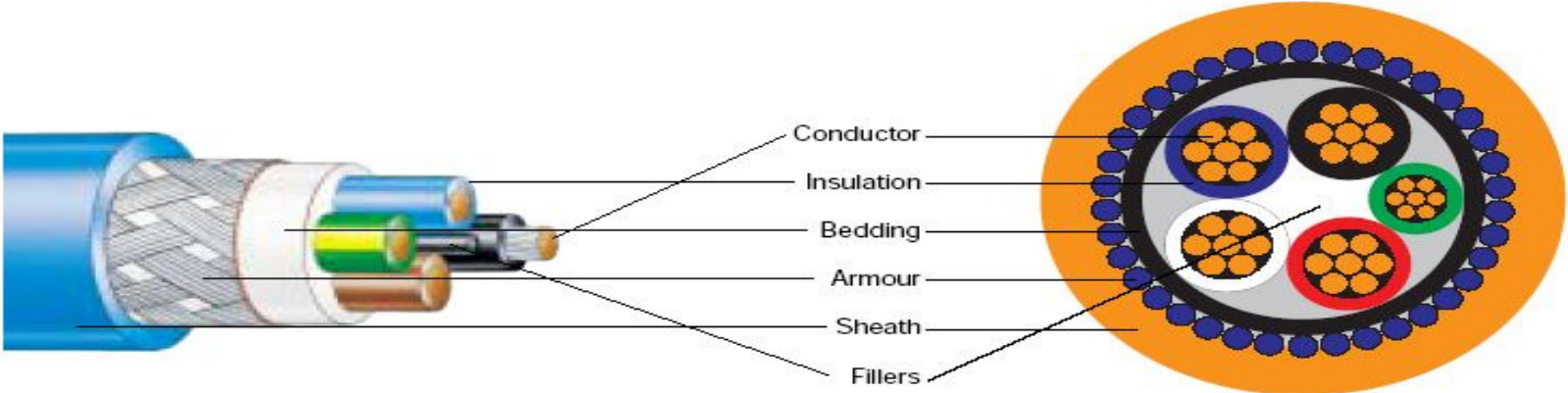


CHALLENGES..



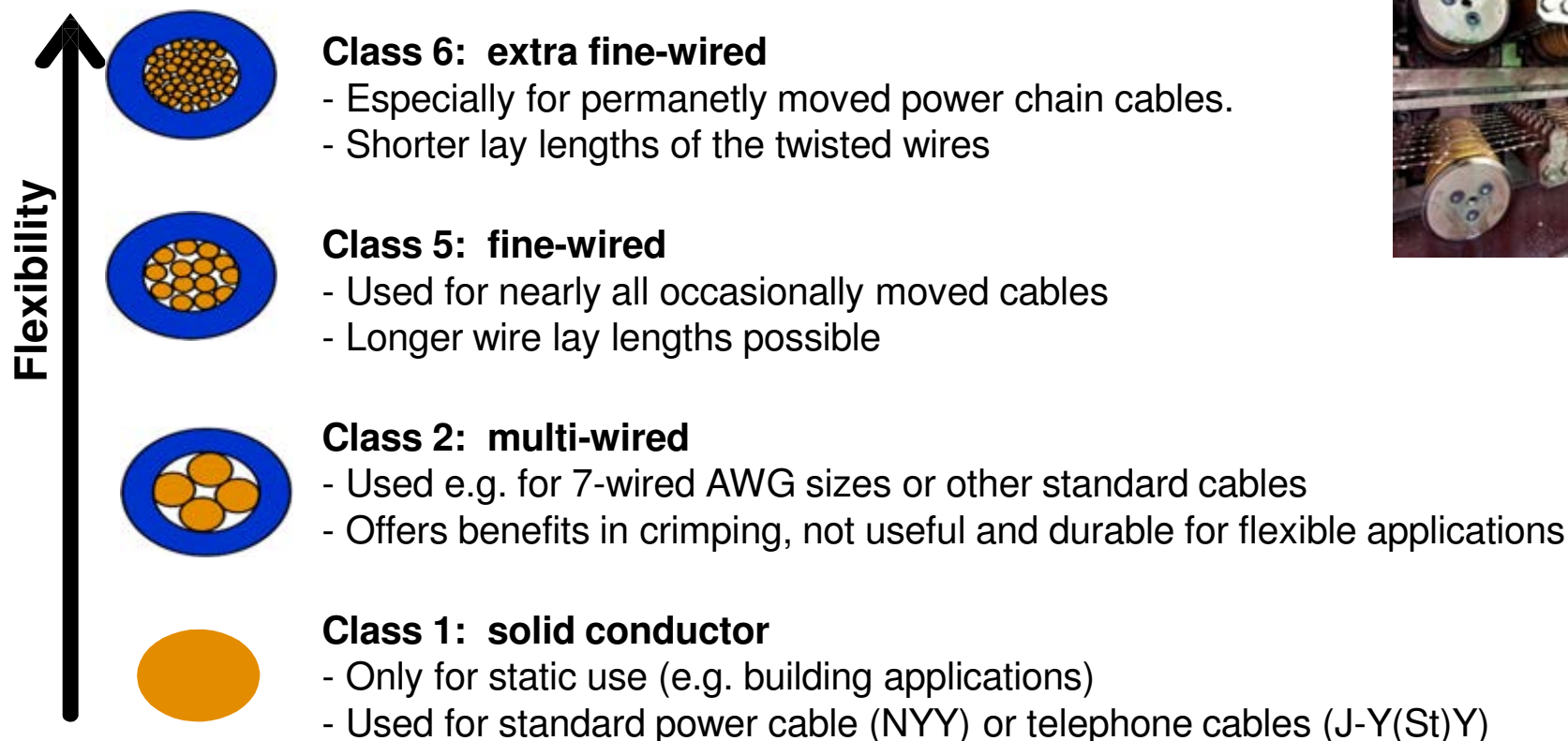
different applications ...
different cable design!

Cable Construction



Conductor design of highly flexible cables

Conductor classes define the wire diameter of stranded conductors.



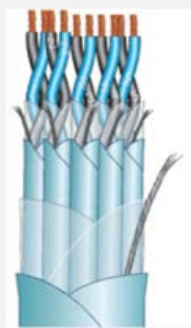
Insulation

- Volume Resistivity
 - Dissipation of Heat
 - Temperature rating
 - Heat Resistance
 - Electrical properties relating to signal transmission
 - Behaviour with fire
 - Resistance to radiation
 - Behaviour with oils and chemical agents
-
- Polyvinyl chloride (PVC) – Upto 105⁰ C
 - Thermoplastic Polyethylene (PE) – Upto 70⁰ C
 - Crosslinked polyethylene (XLPE) – Upto 90⁰ C
 - Silicon Rubber – Upto 180⁰ C
 - Fluorinated ethylene propylene (FEP) – Upto 200⁰ C
 - Polytetrafluoroethylene (PTFE) – Upto 250⁰ C
 - Ethylene Polypropylene Rubber (EPR) – Upto 90⁰ C
 - Paper Insulated
 - Mica Taping on Conductor before insulation for fire resistant cables
-

Shielding

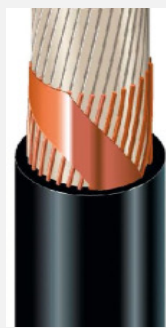
- Braiding with ATC
- Screening with Aluminium Foil + Drain Wire
- Screening with Copper Tape
- Aluminium Wire Armouring
- Aluminium Strip Armouring

- Coverage 85%
- Coverage 100%
- Coverage 100%
- Coverage 90%
- Coverage 90%

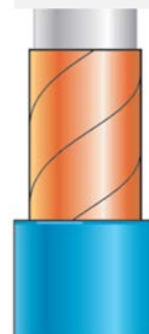


AL/PET Aluminum Polyester foil

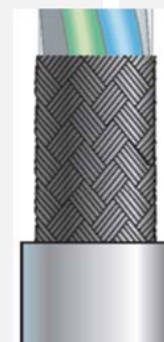
Cu/PET Copper Polyester foil



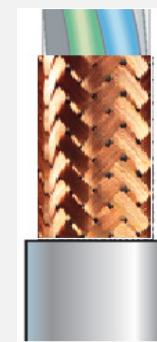
CuW Copper Wires + Counterspiral Copper Tape (Optional)



CuT Copper Tapes



CWB Copper Wire Braid



TCWB Tinned Copper Wire Braid

Armouring

- Steel Wire Armouring
- Steel Strip Armouring
- Steel Wire Flexible Armouring

- Coverage 90-95%
- Coverage 90-95%
- Coverage 65-85%



SWACS

Steel Wires +
Counterspiral Steel
Tape Armour



SWA

Single Layer of
Galv. Steel
Wire Armour



SWB

Steel Wire Braid



CSTA

Corrugated Steel
Tape Armour



STA

Steel
Tape Armour

AWACS

Alum. Wires +
Counterspiral Alum.
Tape Armour

AWA

Single Layer of Aluminum
Wire Armour

Fire Mishap - Fatalities

- More than 100,000 fatalities in last 5 Years
- Fire accidents in 10 major buildings resulted in 1200 fatalities
- eg: Mumbai Secretariat Building, 2012



Fire Mishap-Reasons

- Flame Propagation
- Halogens & Corrosive Gases
- Smoke

Smoke and fumes hinder fire rescue operations and endangers life

Flame retardance is one of the key parameters for cable development

Periodic System of Elements

The image shows a standard periodic table of elements. A red circle highlights the halogen group, which includes Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I), and Astatine (At). The table is labeled with 'Hauptgruppen' (Main Groups) I through VIII and 'Nebengruppen' (Subgroups) IIIA through VIIIA. It also includes Lanthanoids and Actinoids at the bottom.



	PVC	FR	FRLS	LSZH
Oxygen Index	23 %	29%	29%	30%
Temperature Index	160 °C	250 °C	250 °C	250-280 °C
Smoke Density (Visibility)	15%	25%	40%	80%
Acid Gas Generation	50%	40%	20%	<0.5%

State-of-the-art laboratory

- 3200 Sq ft area located in Bangalore factory
- Certified under ISO and IEC17025
- Over 240 measuring & test equipments
- Performs internal & customer specific inspections
- External testing services to customers with NABL accreditation



Laboratory can Perform test under



IS(Indian Standard)



BS(British Standard)



IEC



VDE

Certifications



"Conformité Européene" Certification for health, safety and environmental protection.



Product Safety certification from VDE Institute.



Compliance to **EurAsEC Customs Union** safety standards.

We comply to global standards



Resistance to cleaning agents and disinfectants.



Product Safety certification for Under writers Laboratories.

SEGMENTS & SOLUTIONS

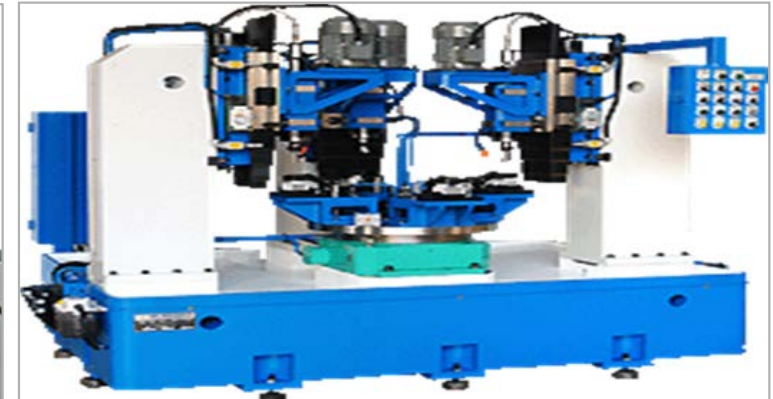


Machine Tools

TITAN
MACHINERY



AMS[®]
In Pursuit of Excellence



LAPP Products

- ÖLFLEX® SERVO 720
- UNITRONIC® LiYCY TP

Application

- Servo resolver and encoder cable with EMC compliant

LAPP Solution

- ÖLFLEX® SERVO 720 cables are light in weight and thin cables with reliable functionality
- UNITRONIC® LiYCY TP is a screened data transmission cable, de coupling of circuits by means of a twisted pair design.
- Braiding/Screening : Minimizes electrical interference from the nearby cables

Textile



RIETER

ærlikon

SAURER.



LAPP Product

- ÖLFLEX® CLASSIC FD 810
- ÖLFLEX® 110
- ÖLFLEX® 110 CY
- UNITRONIC® LiYCY
- UNITRONIC® LAN

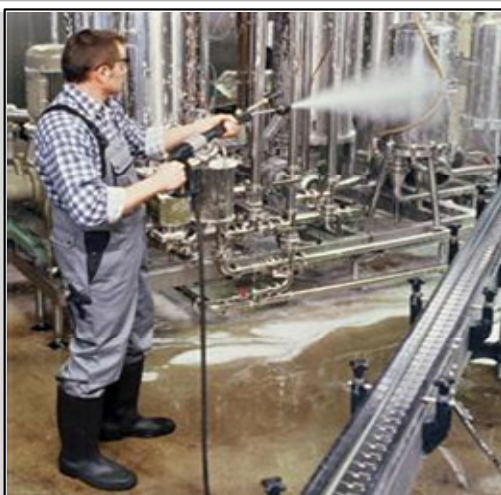
Application

- Control application
- Instrumentation
- Data communication

LAPP Solution

- ÖLFLEX® CLASSIC FD 810 for moving application.
- ÖLFLEX® 110 & 110 CY for Control application

Food & Beverage



LAPP Product

- ÖLFLEX® ROBUST
- ÖLFLEX® HEAT
- ÖLFLEX® SERVO
- SKINDICHT® CN-M
- SKINTOP® COLD
- FLEXIMARK® Stainless

Application

- Control application with oil, chemical and solvent resistance
- Cable exposure high temperature exposure during the processing and steam cleaning.
- Sealing of ports with glands hesitant to chemical corrosion and high pressure cleaning.

LAPP Solution

- ÖLFLEX® ROBUST cables are resistant to organic oils, ammonia based compounds.
- ÖLFLEX® HEAT cables are most suitable for usage in area with high temperature application.
- ÖLFLEX® SERVO most suitable for Servo motor application.

Mobility



LAPP Products

- OLFLEX® Fire Power, Control & Instrumentation Cable

Application

- Underground Stations power & control
- HVAC
- TVS
- Fire Alarm

LAPP Solution

- LAPP cables as per BS standards to Metro
- Subsequently the existing specifications were amended to BS standards

Renewable Energy



STERLING & WILSON



LAPP Products

- ÖLFLEX® SOLAR
- EPIC® SOLAR
- UNITRONIC®
- ÖLFLEX® ROBUST
- ÖLFLEX® UNIPLUS
- ACCESSORIES

Application

- PV String Cable
- PV Connectors
- MODBUS Cables
- SOLAR Inverter
- SOLAR Combiner Boxes
- Control Cable in WTG

LAPP Solution

- EN Certified PV cable for grid-connected & Rooftop PV projects.
- Water Proof PV cables for grid-connected & Floating PV projects
- ÖLFLEX CONNECT solution to PV Inverter manufacturers
- Cables & Accessories to Solar Combiner box manufacturers.
- Nacelle wiring control & Data cables in WTG

Automation



LAPP Product

- ÖLFLEX® CLASSIC 110 CY
- ÖLFLEX® HEAT
- UNITORNIC® LiYCY/LiYCY TP
- UNITONIC® BUS FF
- ETHERLINE® CAT5e/CAT6A/CAT7

Application

- Control applications in regular and harsh environment.
- Data communication in both Bus and Industrial Ethernet protocols

LAPP Solution

- ÖLFLEX® HEAT cables are most suitable for high temperature application.
- UNITORNIC® products are designed with appropriate screens for effective data communication in EMI/EMC prone areas.
- ETHERLINE® are designed to meet the various needs of Industrial data communication.

Why LAPP?



**Technology
leader
ship**



**Peace
of
mind**



**We are
where you
are**



**Best
value
for money**

THANK YOU

