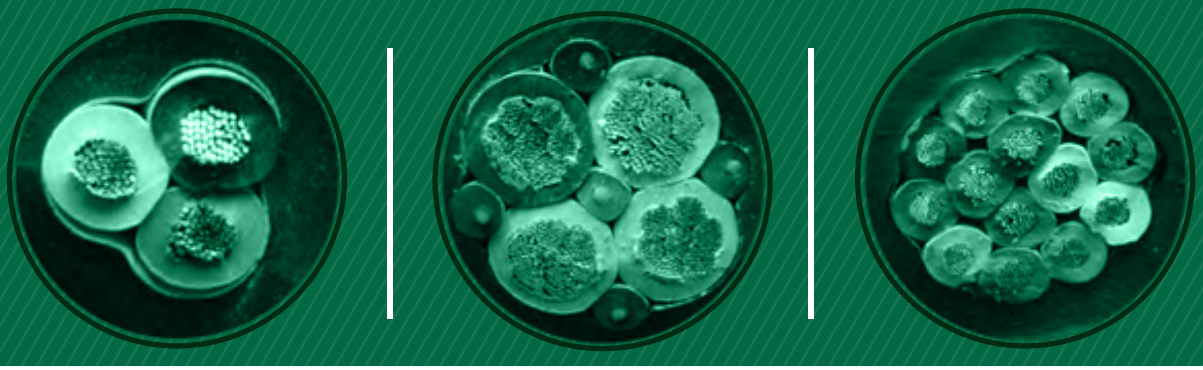
TF Kable

Connecting globally



Flextreme

FLEXTREME AND FLEXTREME-IF SOOW/SJOOW FLEXIBLE CORD

TF Cable manufactures a superior industrial cable that offers a high-value cosmetic appearance and greater mechanical strength by eliminating design flaws found in all other outdated competitive designs. This brochure discusses FLEXTREME and FLEXTREME-IF.

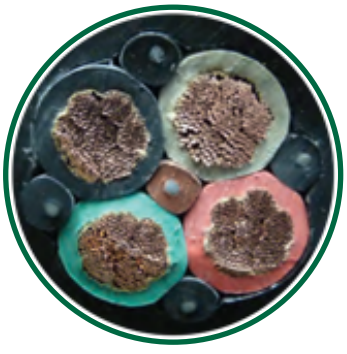
What is FLEXTREME - A high-end product design at no additional cost.

RUBBER VERSUS PAPER AND JUTE

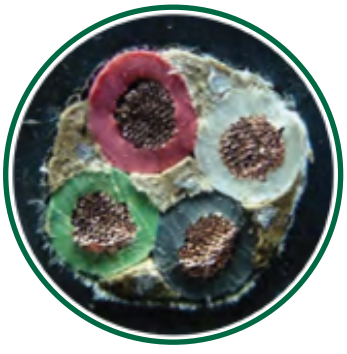
FLEXTREME - IF CIRCUIT SIZE CORD

COMPETITION

FLEXTREME POWER



COMPETITION



FLEXTREME - IF CIRCUIT SIZE CORD

COMPETITION

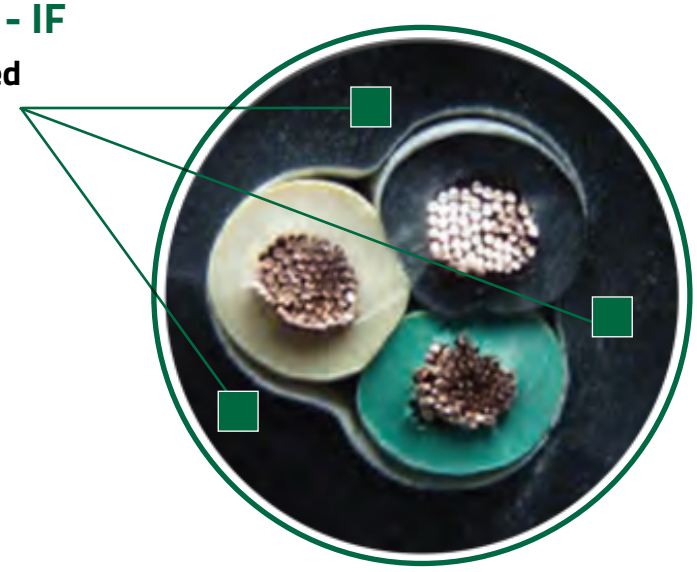
For more SOOW cable images showing Tele-Fonika Kable vs Competitors constructions please refer to the back cover of this brochure.

LIMITATIONS OF PAPER AND JUTE

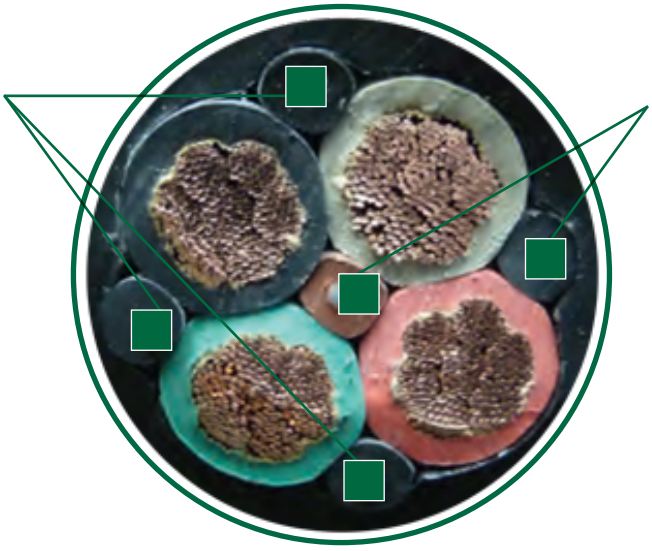
- **HIGH MOISTURE ABSORBANCE -** Jute and paper materials absorb moisture which decreases cable performance and accelerates cable deterioration. Paper is inferior to rubber filler material.
- **LIMITED DURABILITY -** Jute and paper materials have inferior mechanical durability which speeds up their wear and tear caused by repetitive cable movement and flexing.
- **TERMINATION PROBLEMS -** Messy jacket stripping during terminations process due to paper and jute particles.
- **LESS MECHANICAL PROTECTION -** Lower impact resistance than TF Cable's FLEXTREME construction as rubber-filled interstices provide improved protection over soft paper and jute material.
- **POOR APPEARANCE -** Far less appealing cosmetic appearance in comparison to TF Cable's FLEXTREME construction.

FLEXTREME - IF

Interstices Filled with Jacket Compound



FLEXTREME
Rubber Fillers



FLEXTREME
Rubber Fillers

FLEXTREME AND FLEXTREME - IF

Cable constructions utilizing a manufacturing process that fills the conductor interstices with the same rubber compounds used in the insulation and jacket results in a superior design and higher product performance than paper constructions offered by competition

Two (2) through four (4) conductor circuit size cable constructions, TF Cable offers interstice filled jackets (IF). In power size cable constructions, it is impractical to use an IF solution due to the large size of the interstices. TF Cable's FLEXTREME utilizes rubber fillers which offers the same high performance benefits as IF construction. "Rubber on Rubber" keeps the constructors intact to maintain the ruggedized performance.

FLEXTREME PRODUCT FAMILY BENEFITS

- **JACKET TEAR RESISTANCE -** FLEXTREME integral filled rubber construction offers superior resistance to jacket tear and damage due to bending and flexing occurring in reeling applications.
- **CONDUCTOR SLIP PREVENTION -** FLEXTREME integrally filled rubber construction prevents conductors from shifting inside and moving during flexing and bending which is a leading cause of conductor "corkscrewing" and convolutions.
- **IMPROVED APPEARANCE -** The symmetrical cable core of the FLEXTREME construction greatly improves the overall appearance because the cable is more round and smooth.
- **IMPROVED FLEXING AND MOVEMENT -** FLEXTREME constructions offer superior performance over paper and jute used by competitors due to more durable material that resists wear and tear during cable operation and movement.
- **TERMINATION EASE -** The simplified FLEXTREME cable core improves speed of termination and ease of jacket stripping. This is achieved with the use of a separator tape or talc between the cable core and jacket.
- **HIGH CHEMICAL RESISTANCE -** Specially formulated jacket material provides high resistance to oils, solvents and acids.
- **HIGH WEATHERABILITY PERFORMANCE -** Cable design allows for high performance under severe heat and cold weather conditions and long term exposure to sunlight.
- **HIGH FLAME RESISTANCE -** Cable design meets, CSA's FT2 and MSHA's flame test requirements.
- **INDEPENDENTLY CERTIFIED –** by UL, CSA and MSHA.
- **PROLONGED CABLE LIFE -** All of the above benefits ensure a prolonged cable life.

INSULATION AND JACKET COMPOUND OVERVIEW:

"In-house" specially formulated and mixed **CPE** (Chlorinated Poly-Ethylene) and **EPR** (Ethylene Propylene Rubber) compounds used by TF Cable for insulating and jacketing of conductors, offer superior performance that not only meets but also **greatly exceeds mechanical parameter requirements of UL 62** "Flexible Cords and Cable" standard.

Cable EPR Insulation test: acc.to UL 62
Aging temp 110°C/240 hrs in hot air oven
Aging temp 121°C/18 hrs in oil

TYPE TEST	UNIT	TF CABLE AVERAGE RESULT	UL 62 REQUIRED
Tensile strength (un-aged samples)	MPa	6.8	min: 3.4
Tensile strength (aged samples @110°C/240 hrs in hot air oven)	MPa	8.1	Not specified
Tensile strength change (un-aged vs. aged)	%	118	min: 50
Tensile strength (aged samples @121°C/18 hrs in oil)	MPa	5.1	Not specified
Tensile strength change (un-aged vs. aged)	%	76	min: 60
Elongation at break (un-aged samples)	%	370	min: 200
Elongation at break (aged samples @110°C/240 hrs in hot air oven)	%	282	Not specified
Elongation at break (un-aged vs. aged)	%	77	min: 50
Elongation at break (aged samples @121°C/18 hrs in oil)	%	242.7	Not specified
Elongation at break (un-aged vs. aged)	%	65.8	min: 60

INSULATION TEST RESULTS ANALYSIS:

Analyzing mechanical performance of TF Cable's EPR and CPE compounds, we can see that our insulation material on an un-aged sample possesses extremely high "tensile strength" and "elongation at break" which are double in value in comparison to the minimum requirement by UL 62 standard.

Even after sample aging in hot oil and air oven for an extended period of time, our EPR insulating compound still shows great performance when tested, greatly exceeding requirements by Underwriters Laboratories in their "Flexible Cord" standard.

Cable CPE jacket test: acc.to UL 62
Aging temp 110°C/240 hrs in hot air oven
Aging temp 121°C/18 hrs in oil

TYPE TEST	UNIT	TF CABLE AVERAGE RESULT	UL 62 REQUIRED
Tensile strength (un-aged samples)	MPa	12.97	min: 8.3
Tensile strength (aged samples @110°C/240 hrs in hot air oven)	MPa	14.73	Not specified
Tensile strength change (un-aged vs. aged)	%	113	min: 50
Tensile strength (aged samples @121°C/18 hrs in oil)	MPa	12.04	Not specified
Tensile strength change (un-aged vs. aged)	%	92.8	min: 60
Elongation at break (un-aged samples)	%	376	min: 200
Elongation at break (aged samples @110°C/240 hrs in hot air oven)	%	254	Not specified
Elongation at break (un-aged vs. aged)	%	67	min: 50
Elongation at break (aged samples @121°C/18 hrs in oil)	%	322	Not specified
Elongation at break (un-aged vs. aged)	%	85.6	min: 60

JACKET TEST RESULTS ANALYSIS:

Un-aged of our CPE jacketing compound show superior performance when tested for "tensile strength" and "elongation at break", surpassing UL 62 specified values by 56% and 88% respectively.

Samples subjected to aging due to hot air and hot oil also demonstrated their excellent mechanical durability by beating UL 62 minimum values by an average of 48% on the "tensile strength" test and 21% average on the "elongation at break" test.

These high endurance mechanical characteristics ensure superior performance of our cable in the field, providing high resistance to mechanical abuse and resistance to other factors such as heat, temperature and chemicals, the leading causes of cable aging and deterioration.

EXTREME CONDITIONS CALL FOR FLEXTREME

TELE-FONIKA'S PRODUCT

FLEXTREME - IF CIRCUIT SIZE CABLE

FLEXTREME - IF CIRCUIT SIZE CORD

FLEXTREME - IF

COMPETITOR'S PRODUCT

COMPETITION

COMPETITION

COMPETITION

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