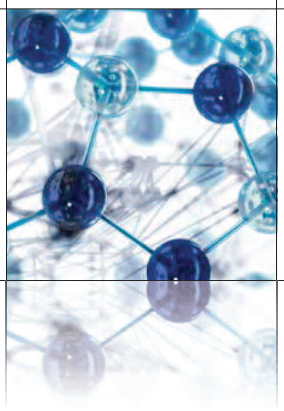
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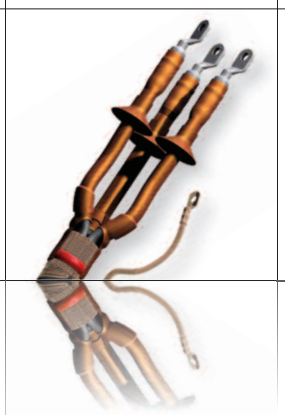
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RADPOL

HEAT-SHRINKABLE TECHNOLOGY









HEAT SHRINK TUBES AND ACCESSORIES

RADPOL



RADPOL was established on the foundations of a production facility in Człuchów Poland, founded over 40 years ago.

About Company

RADPOL S.A. builds its permanent competitive edge based on the use of innovative technologies in particular segments of operations. Principal recipients for the Group's products are such sectors, as the energy, railway or motor, marine industry, gas and heat.

RADPOL S.A. is one of the most important players on the market of heat-shrinkable products which are produced based on own material blends. Thanks to the use of a unique technology of radiation crosslinking the Company rivals successfully with its competitors. The Company as the only one in Poland and one of three in Europe uses two electron accelerators on an industrial scale with the capacity of 2.5 MeV and 4.5 MeV which allow for the application of most advanced solutions.

The full production process is carried out in our factory, which guarantees the high quality of our products. The quality is of key importance to us and verified in the modern equipped laboratory.

RADPOL S.A. based on a long experience in the industry provides customers with modern solutions on the market and thanks to the development of a unique offer of infrastructural systems.







RADPOL products become a comprehensive supplier of advanced solutions for various sectors of the industry.



RADPOL S.A. reserves the right to make changes in the offer, technical information and packaging units of products presented in this publication without prior notice. The drawings and photos provided are for illustration only and show the visual qualities of the products. This publication is commercial information and is not a commercial offer within the meaning of art. 66 of the Civil Code.

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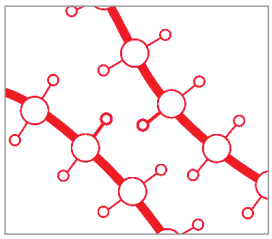
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Radiation crosslinked polyolefin

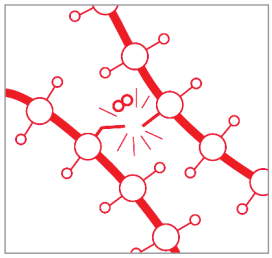


Polymer chains before crosslinking

What polyolefin is?
Polyolefin in made as an effect of polymerisation of unsaturated hydrocarbons.
Among the mostly used polyolefins there are:
- Polyethylene (PE)
- Ethylene copolymer / vinyl acetate (EVA).

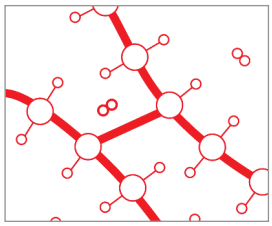
Kinds of PE
Linear low density polyethylene (LLDPE).
Low density polyethylene (LDPE).
Medium density polyethylene (MDPE).
High density polyethylene (HDPE).

Non-crosslinked polyethylene
Despite many advantages (goods dielectric properties, good mechanical and chemical properties, easiness in processing) non-crosslinked polyethylene has many disadvantages.
To improve its parameters (see the chart below), polyethylene should undergo the process of radiation crosslinking.



Splitting of hydrogen atoms during crosslinking

What is the radiation crosslinking consist of?
This process consists in exposing the material to the electron beams accelerated in vacuum up to the energy of several electron volts.
Thermoplastics, like polyethylene, are built of long irregular polymer chains. When exposed to radiation, two neighbouring chains make bonds in the places where hydrogen atoms split. This strong bond of chains is called "linked chains" (see the pictures at left).
The crosslinked polyethylene when heated to the temperature higher than crystal thawing, becomes soft and elastic, caoutchouc-like material. The non-crosslinked polyethylene would become ductile-fluid mass.
RADPOL S.A. is the only Polish company, which possesses an accelerator for industrial radiation crosslinking.



New stronger polymer bonds

Shape memory
The crosslinked products obtain the property called "shape memory". This is the most interesting property of the heat shrink. The heat shrink may be shaped variously but when heated it shrinks down returning to its initial shape. This property is mainly used for insulation recovery.
For that purpose a crosslinked expanded heat shrink product with adhesive layer is put on the broken insulation and heated up. The new insulation layer shrinks down tightly on the place of repair. This method of repair and insulation is considered to be the most effective as far as the work costs and time and also life-length are concerned. Crosslinked heat shrink products are used for insulation, protection, anti-corrosion layers and decorative elements.

Comparison of non-crosslinked PE to radiation crosslinked PE

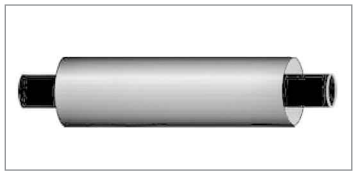
Non-crosslinked polyethylene	Radiation crosslinked polyethylene
in temperature over +120°C gets softened and thaws	in temperature over +120°C gets its initial form ("shape memory"), gets soft and flexible
maximum operation temperature up to +70°C	maximum operation temperature up to +135°C
does not resist thermal shock (over 4 hours)	withstands thermal shock up to +200°C (even up to +250°C)
susceptible to stress corrosion	fully stress corrosion resistant
low resistance to material creeping	high resistance to material creeping (in low temperatures)
resistant to chemical factors	resistant to aggressive chemical factors
soluble in solvents	almost non-soluble in solvents (susceptible for swelling)
low mechanical resistance	high mechanical resistance
resistant to incomplete discharge	highly resistant to incomplete discharges

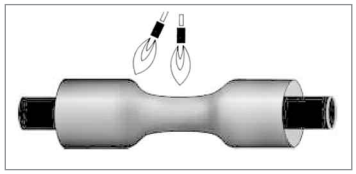
Installation manuals

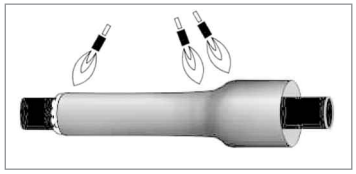
The installation of heat shrink products produced by RADPOL is quick and easy. In order to reach maximum satisfaction from the heat shrink products it is suggested to follow the instructions below.

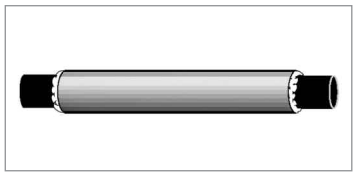
Tools
The heat shrink products should be shrunk with hot-air blowers, gas heating torches and other equipment able to reach the temperature of over +120°C.

Installation of heat shrink tubes thin wall, medium wall and thick wall







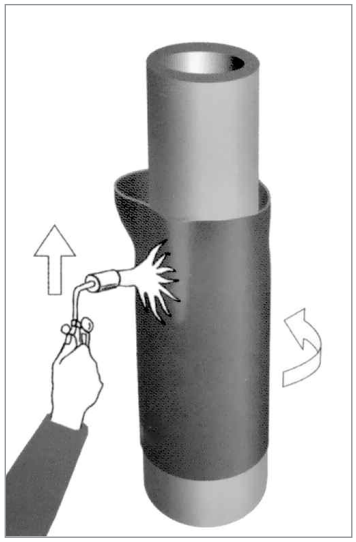


Prepare the surface of the object on which the heat shrink tube will be installed
1. Un-dust and degrease the surface of the object, e.g. with a non-oil solvent.
2. The PVC cable surface should be ground with a piece of abrasive cloth and heated up.
3. Metal surfaces should be polished with abrasive cloth and heated up.

Prepare the heat shrink tube
1. Choose the tube with the required insulation parameters and diameter (the diameter of the recovered heat shrink tube should be smaller than the circumference of the object).

Shrinking
1. Slide the heat shrink tube.
2. Set the temperature of hot-air blower between +120°C and +200°C.
   The shrinking temperature should not exceed +200°C which could cause local overheating of the material.
3. Start the shrinking process from the middle of the tube with constant round movements around the tube to achieve steady shrink.
   The middle part of the tube should shrink down and stick closely to the object.
4. Shrink the ends of the tube with constant movements from the middle towards the ends.
   The properly shrunk tube should be smooth, with no bulges and notches.
5. If the installed tube is a double layer tube - with adhesive - the adhesive should flow out at the ends of the heat shrink tube.
6. Leave the shrunk tube to cool down.

Installation of heat shrink tube of large diameter on posts (renovation)



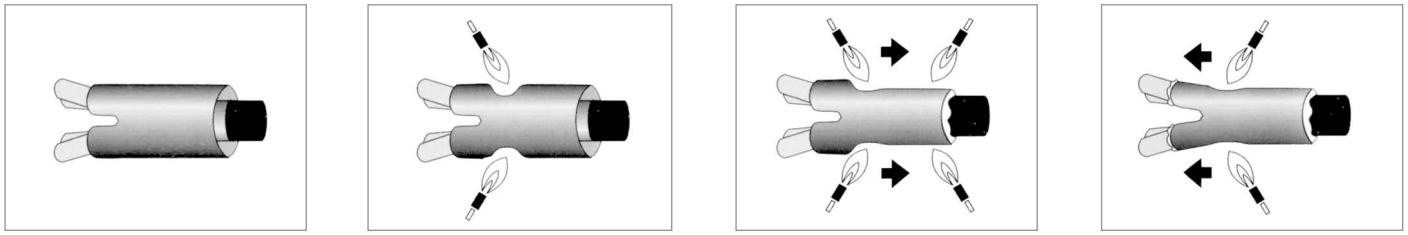
Prepare the post
1. Dismantle all the post's elements, e.g. lighting elements, for better heat shrink tube set up.
2. Clean and apply the ground coating on the bare part of the post..

Prepare the heat shrink tube
1. Choose the heat shrink tube with the required parameters and diameter.

Shrinking
1. Slide the heat shrink tube.
2. Set the temperature of hot air blower between +120°C and +200°C.
   The shrinking temperature should not exceed +200°C which could cause local overheating of the material.
3. Start the shrinking process from the bottom of the tube with constant round movements around the tube to achieve steady shrink.
   The bottom part of the tube should shrink down and stick closely to the object.
4. Shrink the other part of the tube with constant movements from the bottom up.
   The properly shrunk tube should be smooth, with no bulges and notches.
5. If the installed tube is a double layer tube - with adhesive - the adhesive should flow out at the ends of the heat shrink tube.
6. Leave the shrunk tube to cool down.

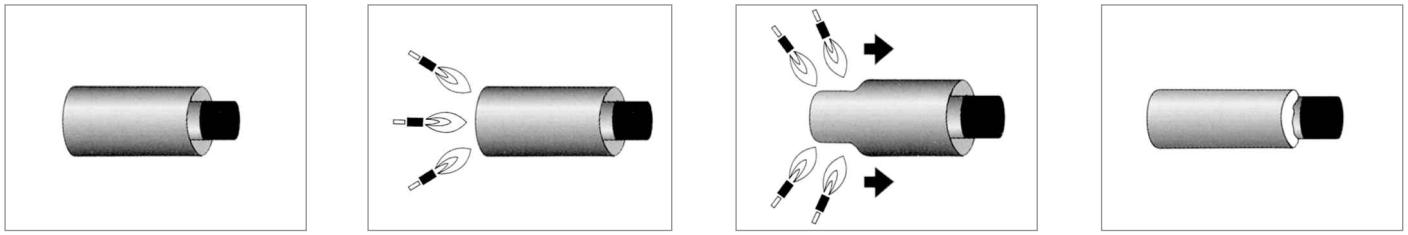
Installation of heat shrink breakout boots

Installation steps are similar to the installation of thin wall, medium wall and thick wall heat shrink tubes.



Installation of heat shrink end caps

Start the heating of the heat shrink end cap from the top of it towards the end. Keep the continuous movements of the heat torch or blower to gain a the steady shrink. After proper installation the adhesive should flow out at the end of the end cap.



Technical details and operational properties of heat shrink tubes

Material

The heat shrink tubes by RADPOL are made of polyolefin (e.g. polyethylene) radiation crosslinked.
They excellent insulate and seal also play roles of protective layers, anti-corroding shields and decorative elements.
Used as a part of the final product they increase its technical level.
The heat shrink tubes protect against changing weather conditions and aggressive underground factors.
They make perfect protection against moisture.
They adopt the shape of the object on which they are shrink and improve its mechanical protection.
Have very high shrink strengthand unlimited storage time.
Nie podlegają korozji zmęczeniowej.
They don't undergo fatigue corrosion and are resistant to UV radiation, fungus, mould and other corrosive agents; urine, salts, majority of oils, petrol, alcohols and grease. The black tubes are UV radiation resistant.
They perform a cathodic protection function, involving the shift of the potential of the protected object (steel pipe) towards more negative potentials.

Colours

Consult some tables for available colours of heat shrink tubes.
The non-standard colours (e.g. grey, fluorescent) are produced on request.
Heat shrink tubes of large diameters have black colour.

Lengths

Standard length is 1 meter.
Thin wall tubes - possibility on request of cutting into various length e.g. 2 cm, 20 cm etc.
or producing on 50, 100, 300 m spools.
Medium, thick wall tubes and tubes of large dimensions to the size of 195/90 - possibility on request manufacturing longer than 1 meter.
The cutting of the tubes according to a demanding length must be done with a sharp tool, and the front surface of the cut part should be equal, smooth, without burrs, etc.
On special demand, we make tubes of different diameters and insulation properties.
We guarantee short realisations of non-standard products' orders.

Shrink temperature

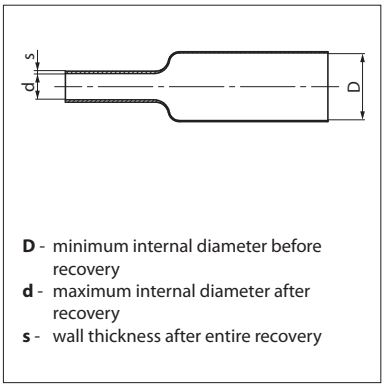
Shrink temperature is between +120°C to +200°C.
In case of temperature higher than +200°C, the overheating may occur..

Storage

Heat shrink products should be protected against direct sunray and stored in closed warehouses in temperatures between -10°C to +35°C.

Heat shrink thin wall tubes, heat-resistant - type +125°C - type RCH1





D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery

Application **Universal heat shrinkable tubes applied to perform electrical insulation, technical and moisture protection.** They assume a shape of the object on which they are shrinking down, form a tightly adherent layer of an insulating, anticorrosion and decorative character.

Operating temperature:	-55 up to +125°C
Shrink ratio:	2:1, 4:1
The minimum shrink temperature:	+115°C
Colours:	look below
Not self-extinguishing, halogen-free	
UV resistant	
In accordance with REACH, RoHS	

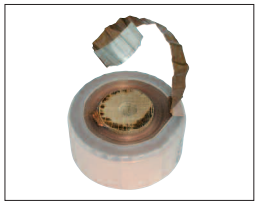
Tube type shrink ratio: 2:1	**Index** (black color)	**Dimensions** [mm] D	d	s	**Packing** [pcs. 1 m]	**Spools** [m]
RCH1 1,6 / 0,8	WRJCC1600080010030C1	1,6	0,8	0,45	100	100
RCH1 2,4 / 1,2	WRJCC2400120010030C1	2,4	1,2	0,5	100	100
RCH1 3,2 / 1,6	WRJCC3200160010030C1	3,2	1,6	0,5	100	100
RCH1 4,8 / 2,4	WRJCC4800240010030C1	4,8	2,4	0,5	100	100
RCH1 6,4 / 3,2	WRJCC6400320010030C1	6,4	3,2	0,6	100	100
RCH1 9,5 / 4,8	WRJCC9500480010030C1	9,5	4,8	0,6	100	100
RCH1 12,7 / 6,4	WRJCC1271640010030C1	12,7	6,4	0,6	100	100
RCH1 15,8 / 7,9	WRJCC1581790010030C1	15,8	7,9	0,8	50	100
RCH1 19 / 9,5	WRJCC1901950010030C1	19,0	9,5	0,9	50	100
RCH1 25,4 / 12,7	WRJCC2541127110030C1	25,4	12,7	0,9	50	100
RCH1 31,8 / 15,9	WRJCC3181159110030C1	31,8	15,9	1,0	50	50
RCH1 38 / 19	WRJCC3801190110030C1	38,0	19,0	1,1	50	50
RCH1 51 / 25,5	WRJCC5101255110030C1	51,0	25,5	1,1	40	25
RCH1 76 / 38	WRJCC7601380110030C1	76,0	38,0	2,3	20	25
RCH1 102 / 51	WRJCC1022510110030C1	102,0	51,0	2,0	20	25

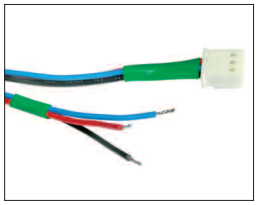
Tube type shrink ratio: 4:1	**Index** (black color)	**Dimensions** [mm] D	d	s	**Packing** [pcs. 1 m]	**Spools** [m]
RCH1 4 / 1	WRJCC4000100010030C1	4,0	1,0	1,0	100	100
RCH1 8 / 2	WRJCC8000200010030C1	8,0	2,0	1,0	100	100

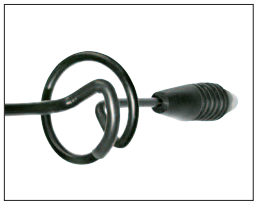
Standard length 1 meter. Tubes on spools are supplied round or flat up to dimension 12,7/6,4. Tubes on spools of larger dimensions than 12,7/6,4 are supplied flat.

Tubes of other colors and length (cut into pieces) are supplied on special request.
Tubes of other colours and length (cut into pieces) are supplied on special request. Color MIX + Standard packagingŁ black + other colors.

Examples of applications of heat shrink tubes



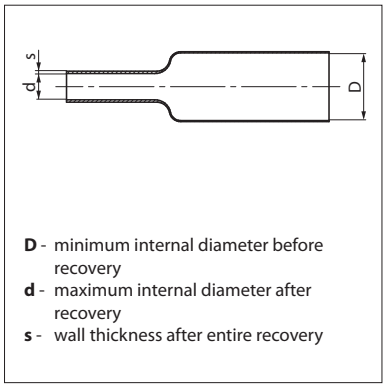




Properties	Test method	Tubes RCH1
Operating temperature		-55 up to +125°C
Length change after shrinking	EN 60684-2	+5 ÷ -10%
Tensile strength, min.	EN 60684-2	15MPa
Elongation at rupture, min.	EN 60684-2	350%
Heat ageing 168 hours	EN 60684-2	158°C
Tensile strength after heat ageing, min.	EN 60684-2	12MPa
Elongation at rupture after heat ageing, min.	EN 60684-2	250%
Heat shock (4 hours, temperature)	EN 60684-2	175°C no dripping, breaking and wall spreading
Contact with Cu after heat ageing (168 hours, temperature): elongation at rupture, min.	EN 60684-2	158°C: 100%
Cu corrosion	EN 60684-2	doesn't corrode
Cold bend; 4 hours	EN 60684-2	doesn't break in temp. -55°C
Flammability	EN 60684-2	firearms
Water absorptivity, max	ISO 62	0,1%
Dielectric resistance, min.	EN 60684-2; IEC 60243-1	16kV/mm
Volume resistivity, min.	EN 60684-2; IEC 60093	$10^{12}\Omega m$

Heat shrink thin wall tubes, flexible, heat-resistant +125°C - type RCEH1





D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery

Application **Heat shrinkable tubes, flexible, rapidly shrinkable are used for insulating components that are sensitive to high temperatures, perfectly fit to the steel and aluminum components.**

Operating temperature: RCEH1 -40 up to +125°C.
Shrink ratio: 2:1, 4:1
The minimum shrink temperature: +95°C
Colours: standard black, others on request
Do not self-extinguishing, halogen-free
UV resistant
In accordance with REACH, RoHS

Tube type	Index	Dimensions [mm]			Packing	Spools
shrink ratio: 2:1	(black color)	D	d	s	[pcs. 1 m]	[m]
RCEH1 1,6 / 0,8	WRJCI1600080010030C1	1,6	0,8	0,45	100	100
RCEH1 2,4 / 1,2	WRJCI2400120010030C1	2,4	1,2	0,5	100	100
RCEH1 3,2 / 1,6	WRJCI3200160010030C1	3,2	1,6	0,5	100	100
RCEH1 4,8 / 2,4	WRJCI4800240010030C1	4,8	2,4	0,5	100	100
RCEH1 6,4 / 3,2	WRJCI6400320010030C1	6,4	3,2	0,6	100	100
RCEH1 9,5 / 4,8	WRJCI9500480010030C1	9,5	4,8	0,6	100	100
RCEH1 12,7 / 6,4	WRJCI1271640010030C1	12,7	6,4	0,6	100	100
RCEH1 19 / 9,5	WRJCI1901950010030C1	19,0	9,5	0,9	50	100
RCEH1 25,4 / 12,7	WRJCI2541127110030C1	25,4	12,7	0,9	50	100
RCEH1 38 / 19	WRJCI3801190010030C1	38,0	19,0	1,1	50	50
RCEH1 51 / 25,5	WRJCI5101255110030C1	51,0	25,5	1,1	40	50
RCEH1 76 / 38	WRJCI7601380110030C1	76,0	38,0	2,3	20	-
RCEH1 102 / 51	WRJCI1022510110030C1	102,0	51,0	2,0	20	-

Tube type	Index	Dimensions [mm]			Packing	Spools
shrink ratio: 4:1	(black color)	D	d	s	[pcs. 1 m]	[m]
RCEH1 4 / 1	WRJCI4000100010030C1	4,0	1,0	1,0	100	100
RCEH1 8 / 2	WRJCI8000200010030C1	8,0	2,0	1,0	100	100

Standard length 1 meter. Tubes on spools are supplied round or flat up to dimension 12,7/6,4. Tubes on spools of larger dimensions than 12,7/6,4 are supplied flat.

Tubes of other colours and length (cut into pieces) are supplied on special request.
If a minimum quantity is agreed with Client. Colour MIX+Standard packaging black +other colours.

Properties	Test method	Tubes RCEH1
Operating temperature		-40 up to +125°C
Length change after shrinking	EN 60684-2	+5 ÷ -10%
Tensile strength, min.	EN 60684-2	15 MPa
Elongation at rupture, min.	EN 60684-2	450%
Heat ageing 168 hours	EN 60684-2	158°C
Tensile strength after heat ageing, min.	EN 60684-2	13 MPa
Elongation at rupture after heat ageing, min.	EN 60684-2	300%
Heat shock (4 hours, temperature)	EN 60684-2	200°C no dripping, breaking and wall spreading
Contact with Cu after heat ageing (168 hours, temperature): elongation at rupture, min.	EN 60684-2	158°C 100%
Cu corrosion	EN 60684-2	doesn't corrode
Cold bend; 4 hours	EN 60684-2	doesn't break in temp. -40°C
Flammability	EN 60684-2	firearms
Water absorptivity, max	ISO 62	0,1%
Dielectric resistance, min.	EN 60684-2; IEC 60243-1	20kV/mm
Volume resistivity, min.	EN 60684-2; IEC 60093	$10^{12}\Omega m$

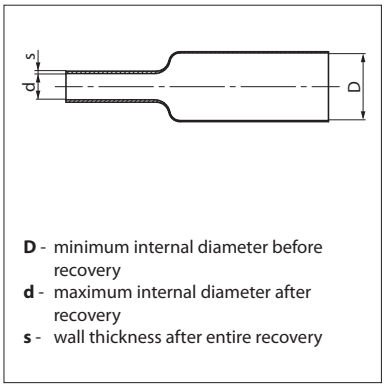
Examples of applications of heat shrink tubes






Heat shrink thin wall tubes, self-extinguishing, heat-resistant +125°C - type RCH1S





D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery

Application **Heat shrinkable tubes flame retardant used to perform an electrical insulation, bonding cable harnesses, provide a mechanical shield and marking cables in the automotive and electronics industry, as well as in household appliances.**

Operating temperature:	RCH1S - 40 up to +125°C.
Shrink ratio:	2:1, 4:1
The minimum shrink temperature:	+105°C
Colours:	standard black, others on request
UV resistant	black color
Tubes self-extinguishing	
In accordance with REACH, RoHS	

Tube type shrink ratio: 2:1	Index (black color)	Dimensions [mm] D	d	s	Packing [pcs. 1 m]	Spools [m]
RCH1S 1,6 / 0,8	WRJCE1600080010030C1	1,6	0,8	0,45	100	100
RCH1S 2,4 / 1,2	WRJCE2400120010030C1	2,4	1,2	0,5	100	100
RCH1S 3,2 / 1,6	WRJCE3200160010030C1	3,2	1,6	0,5	100	100
RCH1S 4,8 / 2,4	WRJCE4800240010030C1	4,8	2,4	0,5	100	100
RCH1S 6,4 / 3,2	WRJCE6400320010030C1	6,4	3,2	0,6	100	100
RCH1S 9,5 / 4,8	WRJCE9500480010030C1	9,5	4,8	0,6	100	100
RCH1S 12,7 / 6,4	WRJCE1271640010030C1	12,7	6,4	0,6	100	100
RCH1S 19 / 9,5	WRJCE1901950010030C1	19,0	9,5	0,9	50	100
RCH1S 25,4 / 12,7	WRJCE2541127110030C1	25,4	12,7	0,9	50	100
RCH1S 38 / 19	WRJCE3801190110030C1	38,0	19,0	1,1	50	50
RCH1S 51 / 25,5	WRJCE5101255110030C1	51,0	25,5	1,1	40	50
RCH1S 76 / 38	WRJCE7600380010030C1	76,0	38,0	2,3	20	-
RCH1S 102 / 51	WRJCI1022510110030C1	102,0	51,0	2,0	20	-

Tube type shrink ratio: 4:1	Index (black color)	Dimensions [mm] D	d	s	Packing [pcs. 1 m]	Spools [m]
RCH1S 4 / 1	WRJCE4000100010030C1	4,0	1,0	1,0	100	100
RCH1S 8 / 2	WRJCE8000200010030C1	8,0	2,0	1,0	100	100

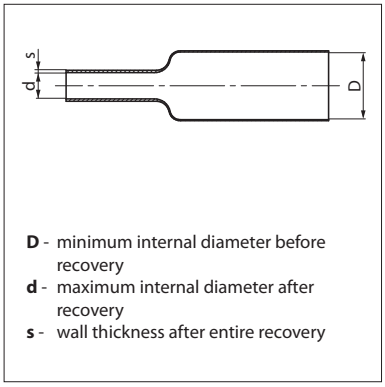
Standard length 1 meter. Tubes on spools are supplied round or flat up to dimension 12,7/6,4. Tubes on spools of larger dimensions than 12,7/6,4 are supplied flat.

Tubes of other colors and length (cut into pieces) are supplied on special request.If a minimum quantity is agreed with Client.
Colour MIX+Standard packaging black +other colours

Properties	Test method	Tubes RCH1S
Operating temperature		-40 up to +125°C
Length change after shrinking	EN 60684-2	+5 ÷ -10%
Tensile strength, min.	EN 60684-2	10 MPa
Elongation at rupture, min.	EN 60684-2	200%
Heat ageing 168 hours	EN 60684-2	158°C
Tensile strength after heat ageing, min.	EN 60684-2	7 MPa
Elongation at rupture after heat ageing, min.	EN 60684-2	100%
Heat shock (4 hours, temperature)	EN 60684-2	200°C no dripping, breaking and wall spreading
Contact with Cu after heat ageing (168 hours, temperature): elongation at rupture, min.	EN 60684-2	158°C 100%
Cu corrosion	EN 60684-2	doesn't corrode
Cold bend; 4 hours	EN 60684-2	doesn't break in temp. -40°C
Flammability	EN 60684-2	self-extinguishing
Water absorptivity, max	ISO 62	0,5%
Dielectric resistance, min.	EN 60684-2; IEC 60243-1	16kV/mm
Volume resistivity, min.	EN 60684-2; IEC 60093	$10^{12}\Omega m$

Heat shrink thin wall tubes, flexible, self-extinguishing, quick-shrink, heat-resistant +125°C - type RCEH1S

Application **Heat shrinkable tubes used to perform electrical insulation in conditions requiring increased resistance to high temperatures.**



D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery



Operating temperature: RCEH1S -30 up to +125°C
Shrink ratio: 2:1, 4:1
The minimum shrink temperature: +90°C
Colours: standard black, others on request
UV resistant black color
Tubes self-extinguishing
In accordance with REACH, RoHS

Tube type shrink ratio: 2:1	Index (black color)	Dimensions [mm] D	d	s	Packing [pcs. 1 m]	Spools [m]
RCEH1S 1,6 / 0,8	WRJCK1600080010030C1	1,6	0,8	0,45	100	100
RCEH1S 2,4 / 1,2	WRJCK2400120010030C1	2,4	1,2	0,5	100	100
RCEH1S 3,2 / 1,6	WRJCK3200160010030C1	3,2	1,6	0,5	100	100
RCEH1S 4,8 / 2,4	WRJCK4800240010030C1	4,8	2,4	0,5	100	100
RCEH1S 6,4 / 3,2	WRJCK6400320010030C1	6,4	3,2	0,6	100	100
RCEH1S 9,5 / 4,8	WRJCK9500480010030C1	9,5	4,8	0,6	100	100
RCEH1S 12,7 / 6,4	WRJCK1270640010030C1	12,7	6,4	0,6	100	100
RCEH1S 19 / 9,5	WRJCK1900950010030C1	19,0	9,5	0,9	50	100
RCEH1S 25,4 / 12,7	WRJCK2540127010030C1	25,4	12,7	0,9	50	100
RCEH1S 38 / 19	WRJCK3800190010030C1	38,0	19,0	1,1	50	50
RCEH1S 51 / 25,5	WRJCK5100255010030C1	51,0	25,5	1,1	40	50
RCEH1S 76 / 38	WRJCK7670380010030C1	76,0	38,0	2,3	20	-
RCEH1S 102 / 51	WRJCK1020510010030C1	102,0	51,0	2,0	20	-

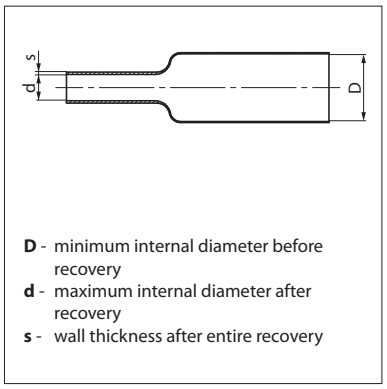
Tube type shrink ratio: 4:1	Index (black color)	Dimensions [mm] D	d	s	Packing [pcs. 1 m]	Spools [m]
RCEH1S 4 / 1	WRJCK4000100010030C1	4,0	1,0	1,0	100	100
RCEH1S 8 / 2	WRJCK8000200010030C1	8,0	2,0	1,0	100	100

Standard length 1 meter. Tubes on spools are supplied round or flat up to dimension 12,7/6,4. Tubes on spools of larger dimensions than 12,7/6,4 are supplied flat. Tubes of other colors and length (cut into pieces) are supplied on special request.
If a minimum quantity is agreed with Client. Colour MIX+Standard packaging black +other colours.

Properties	Test method	Tubes RCEH1S
Operating temperature		-30 up to +125°C
Length change after shrinking	EN 60684-2	+5 ÷ -10%
Tensile strength, min.	EN 60684-2	12 MPa
Elongation at rupture, min.	EN 60684-2	200%
Heat ageing 168 hours	EN 60684-2	158°C
Tensile strength after heat ageing, min.	EN 60684-2	10 MPa
Elongation at rupture after heat ageing, min.	EN 60684-2	150%
Heat shock (4 hours, temperature)	EN 60684-2	250°C no dripping, breaking and wall spreading
Contact with Cu after heat ageing (168 hours, temperature): elongation at rupture, min.	EN 60684-2	158°C 100%
Cu corrosion	EN 60684-2	doesn't corrode
Cold bend; 4 hours	EN 60684-2	doesn't break in temp -30°C
Flammability	EN 60684-2	self-extinguishing
Water absorptivity, max	ISO 62	0,5%
Dielectric resistance, min.	EN 60684-2; IEC 60243-1	16kV/mm
Volume resistivity, min.	EN 60684-2; IEC 60093	$10^{12}\Omega m$

Heat shrink thin wall tubes, flexible, self-extinguishing, quick-shrink, heat-resistant +135°C - type RCEH2S





D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery

Application **Heat shrinkable tubes used to perform electrical insulation in conditions requiring increased resistance to high temperatures.**

Standards UL224, 125°C, 600 V
Certyficate Number E478953

Operating temperature:	RCEH2S -40 up to +135°C
Shrink ratio:	2:1, 4:1
The minimum shrink temperature:	+90°C
Colours:	standard black, others on request
UV resistant	
Tubes self-extinguishing	
In accordance with UL, REACH, RoHS	

Tube type shrink ratio: 2:1	**Index** (black color)	**Dimensions** [mm] D	d	s	**Packing** [pcs. 1 m]	**Spools** [m]
RCEH2S 1,6 / 0,8	WRJCL1600080010030C1	1,6	0,8	0,5	100	100
RCEH2S 2,4 / 1,2	WRJCL2400120010030C1	2,4	1,2	0,5	100	100
RCEH2S 3,2 / 1,6	WRJCL3200160010030C1	3,2	1,6	0,5	100	100
RCEH2S 4,8 / 2,4	WRJCL4800240010030C1	4,8	2,4	0,5	100	100
RCEH2S 6,4 / 3,2	WRJCL6400320010030C1	6,4	3,2	0,6	100	100
RCEH2S 9,5 / 4,8	WRJCL9500480010030C1	9,5	4,8	0,6	100	100
RCEH2S 12,7 / 6,4	WRJCL1271640010030C1	12,7	6,4	0,6	100	100
RCEH2S 19 / 9,5	WRJCL1901950010030C1	19,0	9,5	0,9	50	100
RCEH2S 25,4 / 12,7	WRJCL2541127110030C1	25,4	12,7	0,9	50	100
RCEH2S 38 / 19	WRJCL3801190110030C1	38,0	19,0	1,1	50	50
RCEH2S 51 / 25,5	WRJCL5101255110030C1	51,0	25,5	1,1	40	50
RCEH2S 76 / 38	WRJCL7601380110030C1	76,0	38,0	2,3	20	-
RCEH2S 102 / 51	WRJCL1022510110030C1	102,0	51,0	2,0	20	-

Tube type shrink ratio: 4:1	**Index** (black color)	**Dimensions** [mm] D	d	s	**Packing** [pcs. 1 m]	**Spools** [m]
RCEH2S 4 / 1	WRJCL4000100010030C1	4,0	1,0	1,0	100	100
RCEH2S 8 / 2	WRJCL8000200010030C1	8,0	2,0	1,0	100	100

Standard length 1 meter. Tubes on spools are supplied round or flat up to dimension 12,7/6,4. Tubes on spools of larger dimensions than 12,7/6,4 are supplied flat. Tubes of other colors and length (cut into pieces) are supplied on special request.
If a minimum quantity is agreed with Client. Colour MIX+Standard packaging black +other colours



CERTIFICATE OF COMPLIANCE

Certificate Number 20151124-E478953
Report Reference E478953-20151123
Issue Date 2015-NOVEMBER-24

Issued to: RADPOL S A
Ul Batorego 14
77-300 Czluchow POLAND

This is to certify that representative samples of: COMPONENT - TUBING, EXTRUDED INSULATING
Flexible Heat-Shrinkable Polyolefin Tubing, Model RCEH2S

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 224, Extruded Insulating Tubing
Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.

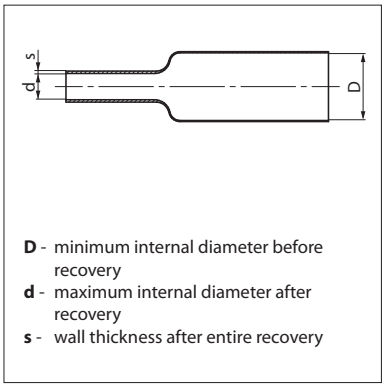
Look for the UL Certification Mark on the product.

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Properties	Test method UL224, EN 60684-2	Tubes RCEH2S
Operating temperature		-40 up to +135°C
Rated voltage	UL 224	600 V
Length change after shrinking	UL 224	±3%
Tensile strength, min.	UL 224	min. 10,4 MPa
Elongation at rupture, min.	UL 224	min. 200%
Secant module at elongation	UL 224	max. 175%
Heat shock (4 hours, temperature 250°C)	UL 224	no dripping, breaking and wall spreading
Heat ageing 168 hours	EN 60684-2	168 h, temperature 175°C
Tensile strength after heat ageing	UL 224	min. 7,3 MPa
Elongation at rupture after heat ageing, min.	UL 224	min. 200%
Cold bend (4 h, temperature -40°C)	UL 224	doesn't break in temp -40°C
Cu corrosion (168 h, temperature 158°C)	UL 224	doesn't corrode
Flammability (test wszystkie rury)	UL 224	self-extinguishing – max 30 sec
Dielectric resistance, min.	UL 224	min. 16kV/mm
Volume resistivity, min.	UL 224	min. $10^{14}\Omega$cm

Heat shrink tubes, self-extinguishing , halogen-free, flexible – type RCH1S(BH)





D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery

Application

Dedicated for electrical insulation where improved protection against high temperature is required. Recommended for halogen-free ducts, cables used in automotive, railway, aviation and ship building industry.

Operating temperature	-45°C to +125°C
Shrink ratio	2:1
The minimum shrink temperature	+70°C
Standard colours	black, red, blue, green, yellow, purple
In accordance with REACH, ROHS	

Tube type	Index (black colours)	Index (red colours)	Index (blue colours)	Dimensions [mm] D	d	s	Spool standard length [m]
RCH1S(BH) 3,2/1,6	TRJBE3200160020050C1	TRJBE3200160020050D1	TRJBE3200160020050E1	3,2	1,6	0,40	200
RCH1S(BH) 4,8/2,4	TRJBE4800240010050C1	TRJBE4800240010050D1	TRJBE4800240010050E1	4,8	2,4	0,50	100
RCH1S(BH) 6,4/3,2	TRJBE6400320010050C1	TRJBE6400320010050D1	TRJBE6400320010050E1	6,4	3,2	0,55	100
RCH1S(BH) 9,5/4,8	TRJBE9500480010050C1	TRJBE9500480010050D1	TRJBE9500480010050E1	9,5	4,8	0,60	100
RCH1S(BH) 12,7/6,4	TRJBH1271640010050C1	TRJBE1271640010050D1	TRJBE1271640010050E1	12,7	6,4	0,60	100
RCH1S(BH) 19/9,5	TRJBH1901950010050C1	TRJBE1901950010050D1	TRJBE1901950010050E1	19	9,5	0,80	100
RCH1S(BH) 25,4/12,7	TRJBE2541127110050C1	TRJBE2541127110050D1	TRJBE2541127110050E1	25	12,7	0,90	50

Tube type	Index (green colours)	Index (yellow colours)	Index (violet colour)	Dimensions [mm] D	d	s	Spool standard length [m]
RCH1S(BH) 3,2/1,6	-	-	-	3,2	1,6	0,40	200
RCH1S(BH) 4,8/2,4	TRJBE48002400100501I1	TRJBE4800240010050J1	TRJBE4800240010050P1	4,8	2,4	0,50	100
RCH1S(BH) 6,4/3,2	TRJBE64003200100501I1	TRJBE6400320010050J1	TRJBE6400320010050P1	6,4	3,2	0,55	100
RCH1S(BH) 9,5/4,8	TRJBE95004800100501I1	TRJBE9500480010050J1	TRJBE9500480010050P1	9,5	4,8	0,60	100
RCH1S(BH) 12,7/6,4	TRJBE12716400100501I1	TRJBE1271640010050J1	TRJBE1271640010050P1	12,7	6,4	0,60	100
RCH1S(BH) 19/9,5	TRJBE190195001005011I1	TRJBE1901950010050J1	TRJBE1901950010050P1	19	9,5	0,80	100
RCH1S(BH) 25,4/12,7	TRJBE254112711005011I1	TRJBE2541127110050J1	TRJBE2541127110050P1	25	12,7	0,90	50

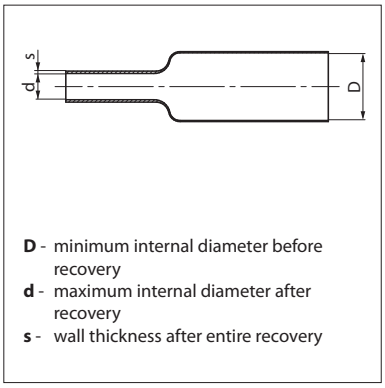
Properties	Test method	Tubes RCH1S(BH)
Tensile strength	ASTM D 2671	≥10,4 MPa
Elongation at rupture	ASTM D 2671	≥200%
Tensile strength after heat aging (+158°C, 168h)	ASTM D 2671	≥7,3 Mpa
Elongation at rupture after heat aging (+158°C, 168h)	ASTM D 2671	≥100%
Length change after shrinking	ASTM D 2671	-5% +5%
Flammability	ASTM D 2671	VW-1
Dielectric resistance	ASTM D 149	≥15kV
Volume resistivity	ASTM D 876	$\geq 10^{14}\Omega m$

Polyolefin heat shrink tubes, very flexible, self-extinguishing, shrink ratio 3:1 and 4:1 - type RC3S and RC4S

Application

RC3S: wide application in the performance of electrical insulation, connecting cable bundles and marking to protect against corrosion and to provide a mechanical shield.
Shrink ratio 3:1 is more suitable for applications in irregular shapes.

RC4S: widely used in the military, aircraft and electronics industry. Also applied to insulate and repair of wire, cable and line bundles.
Pipes are manufactured using a special utility and technology formula . It is easy to slide on a large diameter and after shrink down on a small diameter of connector or transition.



D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery



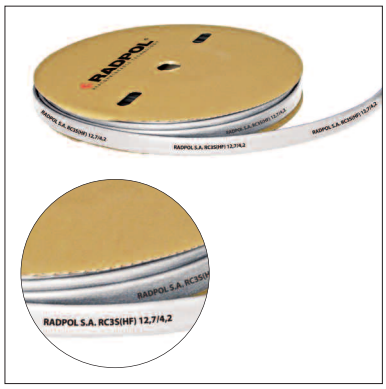
Operating temperature: -55 up to +135°C
Shrink ratio: 3:1, 4:1
The minimum shrink temperature: +70°C
Standard colours: black
Tubes self-extinguishing

Tube type shrink ratio: 2:1	Index (black color)	Dimensions [mm] D	d	s	Standard length of the spool [m]
RC3S 1,6 / 0,5	TRJHL1600050020050C1	1,6	0,5	0,45	200
RC3S 3,2 / 1	TRJHL3200100020050C1	3,2	1,0	0,55	200
RC3S 4,8 / 1,5	TRJHL4800150010050C1	4,8	1,5	0,60	100
RC3S 6,4 / 2	TRJHL6400200010050C1	6,4	2,0	0,65	100
RC3S 9,5 / 3	TRJHL9500300010050C1	9,5	3,0	0,75	100
RC3S 12,7 / 4	TRJHL1271400050020C1	12,7	4,0	0,80	50
RC3S 19,1 / 6	TRJHL1911600050040C1	19,1	6,0	0,90	50
RC3S 25,4 / 8	TRJHL2541800050040C1	25,4	8	1,00	50
RC3S 39 / 13	TRJHL3901130150040C1	39,0	13	1,25	50

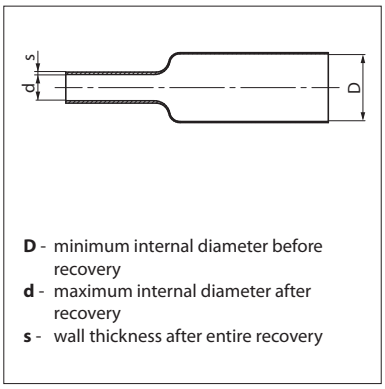
Tube type shrink ratio: 4:1	Index (black color)	Dimensions [mm] D	d	s	Packing [pcs. 1 m]	Cut in lengths [m]
RC4S 19,1 / 4,6	TRJHL1911460012230C1	19,1	4,6	1,7	50	1,22
RC4S 25,4 / 7	TRJHL2541700012230C1	25,4	7,0	1,7	50	1,22
RC4S 38,1 / 9,5	TRJHL3811950012230C1	38,1	9,5	1,7	50	1,22
RC4S 50,8 / 14	TRJHL5081140112230C1	50,8	14,0	1,7	20	1,22

Properties	Test method	Tubes RC3S / RC4S
Tensile strength	ASTM D 2671	14 MPa
Elongation at rupture	ASTM D 2671	800%
Tensile strength after heat ageing, (+175°C, 168 h)	ASTM D 2671	14 MPa
Elongation at rupture after heat ageing (+175°C, 168 h)	ASTM D 2671	350%
Attempt of flammability	UL 224 VW1, SAE-AMS-DTL-23053/5	positive
Heat shock (+250°C, 4 h)	ASTM D 2671	no breaking
Cold bend test (-55°C, 4 h)	ASTM D 2671	no breaking
Dielectric resistance	ASTM D 150	20kV/mm
Volume resistivity	ASTM D 876	$10^{14}\Omega m$
Cu corrosion	UL 224	doesn't corrod
Water absorptivity	ASTM D 570	0,15%
Chemical resistance	SAE-AMS-DTL-23053/5	positive
Length change after shrinking	UL 224	0 ±5

Heat shrinkable tubes for thermaltransfer print, thin wall tubes, very flexible, self-extinguishing, halogen-free - type RC2S(HF), RC3S(HF)







Application

Specially prepared surface of heat shrink tubing ensures high quality printing by thermal transfer printer. In this way you can mark any wire, cable, and finally improve the safety of its operation. Tubes recommended for insulating wires, cables do not contain halogen, used in automotive, rail, aircraft, shipbuilding industry. Pipe surface suitable for printing by thermal transfer printer. Pipes flattened, self-extinguishing, halogen-free, low smoke emission during combustion.

Operating temperature:	-55 up to +105°C
Shrink ratio:	2:1, 3:1
The minimum shrink temperature:	+70°C
Standard colours:	white, yellow, others on request
In accordance with	REACH, RoHS

Tube type shrink ratio: 2:1	Index (white color)	Index (yellow color)	Dimensions [mm] D	d	s	Standard length of the spool [m]
RC2S(HF) 2,4/1,2	TRJBH2400120010050AT	TRJBH2400120010050JT	2,4	1,2	0,48-0,52	100
RC2S(HF) 3,2/1,6	TRJBH3200160010050AT	TRJBH3200160010050JT	3,2	1,6	0,52-0,56	100
RC2S(HF) 4,8/2,4	TRJBH4800240010050AT	TRJBH4800240010050JT	4,8	2,4	0,54-0,58	100
RC2S(HF) 6,4/3,2	TRJBH6400320010050AT	TRJBH6400320010050JT	6,4	3,2	0,54-0,58	100
RC2S(HF) 9,5/4,8	TRJBH9500480010050AT	TRJBH9500480010050JT	9,5	4,8	0,60-0,64	100
RC2S(HF) 12,7/6,4	TRJBH1271640010050AT	TRJBH1271640010050JT	12,7	6,4	0,62-0,66	100
RC2S(HF) 19/9,5	TRJBH1901950010050AT	TRJBH1901950010050JT	19	9,5	0,62-0,66	100

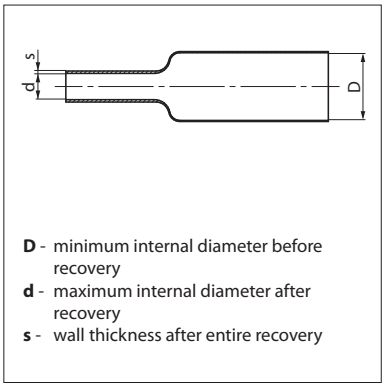
Tube type shrink ratio: 3:1	Index (white color)	Index (yellow color)	Dimensions [mm] D	d	s	Standard length of the spool [m]
RC3S(HF) 3,2/1,1	TRJBH3200110010050AT	TRJBH3200110010050JT	3,2	1,1	0,45-0,48	100
RC3S(HF) 4,8/1,6	TRJBH4800160010050AT	TRJBH4800160010050JT	4,8	1,6	0,48-0,52	100
RC3S(HF) 6,4/2,1	TRJBH6400210010050AT	TRJBH6400210010050JT	6,4	2,1	0,50-0,54	100
RC3S(HF) 9,5/3,1	TRJBH9500310010050AT	TRJBH9500310010050JT	9,5	3,1	0,62-0,66	100
RC3S(HF) 12,7/4,2	TRJBH1271420010050AT	TRJBH1271420010050JT	12,7	4,2	0,63-0,68	100
RC3S(HF) 19,1/6,3	TRJBH1911630010050AT	TRJBH1911630010050JT	19,1	6,3	0,82-0,88	100

Properties	Test method	Tubes RC2S(HF) / RC3S(HF)
Length change after shrinking	UL 224	-6%
Tensile strength	ASTM D 2671	14 MPa
Elongation at rupture	ASTM D 2671	400%
Tensile strength after heat ageing (158°C, 168 h)	ASTM D 2671	12 MPa
Elongation at rupture after heat ageing (158°C, 168 h)	ASTM D 2671	350%
Heat shock (+250°C, 4 h)	UL 224	no breaking and wall spreading
Dielectric resistance test (2500V, 1min)	UL 224	no breaking
Volume resistivity	IEC 93	$10^{14}\Omega m$
Cu corrosion	UL 224	doesn't corrode
Flammability	UL 224	in line
Adhesion printing	SAE-AS-81532 4.6.2	positive
Printing solvent resistance	MIL-STD-202F Method 215	positive

Polyolefin heat shrink tubes, ultra thin - type RUC

Application

Especially recommended in areas where it has meaning of fast shrinking and space savings.
The low shrink temperature reduces installation time and risk of damaging components sensitive to temperature.



D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery



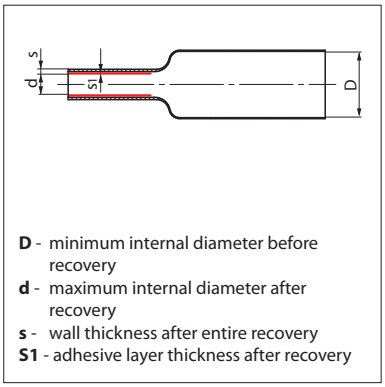
Operating temperature: from -55°C up to +125°C
Shrink ratio: 2:1
Minimum shrink temperature: +70°C
Standard colours: black color
Self-extinguishing polyolefin tubes
Environment-friendly
Ultra thin and flexible

Tube type	Index	Dimensions [mm]			Standard length of the spool [m]
		D	d	s	
RUC 1,4/0,6	TRJHU1400060020050C1	1,4	0,6	0,20	200
RUC 1,9/0,8	TRJHU1900080010050C1	1,9	0,8	0,20	100
RUC 3/1,2	TRJHU3000120010050C1	3,0	1,2	0,25	100
RUC 3,5/1,6	TRJHU3500160010050C1	3,5	1,6	0,25	100
RUC 5,5/2,4	TRJHU5500240010050C1	5,5	2,4	0,25	100
RUC 6,5/3,2	TRJHU6500320010050C1	6,5	3,2	0,28	100
RUC 10,5/ 4,8	TRJHU1051480010050C1	10,5	4,8	0,28	100
RUC 13,5/6,4	TRJHU1351640050040C1	13,5	6,4	0,28	50

Properties	Test method	Tubes RUC
Operating temperature:	IEC 216	-55 do +125°C
Tensile strength	ASTM D 2671	> 14 MPa
Elongation at rupture	ASTM D 2671	> 400%
Length change after shrinking	UL 224	0 ±5%
Elongation at rupture after heat ageing	158°C, 168 h	> 300%
Inflammability test	VW-1	positive
Dielectric resistance	IEC 243	> 20kV/mm
Volume resistivity	IEC 93	$>10^{14}$ Ωcm
Infuence on copper	ASTM D 2671	doesn't corrode

Thin wall heat shrink tubes, heat-resistant +125 +135°C with adhesive - type RCKH1 i RCEH2KS





D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery
S1 - adhesive layer thickness after recovery

Application

Heat shrinkable tubes with adhesive layer protect against water and moisture also among others cables and other cable bundles exposed to moisture penetration.
They are also used in the performance and repair of electrical insulation, connecting cable bundles and as protection against corrosion.

Operating temperature:	RCKH1 -25 up to +125°C*, RCEH2KS -30 up to +135°C* *outer layer
Tubes self-extinguishing:	only RCEH2KS
Tubes halogen-free:	only RCKH1
Shrink ratio:	3:1, 4:1.
Minimum shrink temperature:	+115°C.
Colours:	look below
UV resistant	black color
In accordance with REACH, RoHS	

Thin wall tubes with adhesive, heat-resistant +125°C - RCKH1

Tube type	Index (black color)	Dimensions [mm] D	d	s	Adhesive layer thickness after recovery [mm] - S1	Packing [pcs. 1 m]
RCKH1 3 / 1	3	1	1,0	0,40	10	
RCKH1 4 / 1	4	1	1,0	0,40	10	
RCKH1 6 / 2	6	2	1,2	0,50	10	
RCKH1 8 / 2	8	2	1,2	0,50	10	
RCKH1 12 / 3	12	3	1,2	0,50	10	

Standard length 1 meter. Mixed - tubes of 5 different colors. Tubes of other colors and length (cut into pieces) are supplied on special request. If a minimum quantity is agreed with Client
Indexes: if you choose pipes with different colors, please replace the last two characters in the index black tubes (**C1**) on: **D1** (red colour), **E1** (blue), **I1** (green), **J1** (yellow), **L1** (mix of colors), **O1** (colorless).

Thin wall tubes with adhesive, heat-resistant +135°C, self-extinguishing, flexible, quick-shrink - RCEH2KS

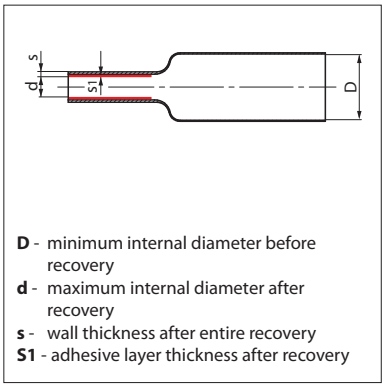
Tube type	Index (black color)	Dimensions [mm] D	d	s	Adhesive layer thickness after recovery [mm] - S1	Packing [pcs. 1 m]	Spools [m]
RCEH2KS 3 / 1	3	1	1,0	0,4	10	100	
RCEH2KS 4 / 1	4	1	1,0	0,4	10	100	
RCEH2KS 6 / 2	6	2	1,2	0,5	10	100	
RCEH2KS 8 / 2	8	2	1,2	0,5	10	100	
RCEH2KS 12 / 3	12	3	1,2	0,5	10	100	

Properties	Test method	Tubes RCKH1	Tubes RCEH2KS
Operating temperature		-25 up to +125°C*	-30 up to +135°C* *outer layer
Length change after shrinking	EN 60684-2	+5 ÷ -10%	+5 ÷ -10%
Tensile strength, min.	EN 60684-2	15 MPa	12 MPa
Elongation at rupture, min.	EN 60684-2	350%	350%
Heat ageing 168 hours	EN 60684-2	158°C	175°C
Tensile strength after heat ageing, min.	EN 60684-2	12 MPa	10 MPa
Elongation at rupture after heat ageing, min.	EN 60684-2	250%	200%
Heat shock (4 hours, temperature)	EN 60684-2	175°C	250°C
		no dripping, breaking and wall spreading	
Contact with Cu after heat ageing (168 hours, temperature): elongation at rupture, min.	EN 60684-2	158°C 100%	160°C 100%
Cu corrosion	EN 60684-2	doesn't corrode	
Cold bend; 4 hours	EN 60684-2	doesn't break in temp. -55°C	doesn't break in temp. -30°C
Flammability	EN 60684-2	firearms	self-extinguishing
Water absorptivity, max	ISO 62	0,1%	0,5%
Dielectric resistance, min.	EN 60684-2; IEC 60243-1	16kV/mm	16kV/mm
Volume resistivity, min.	EN 60684-2; IEC 60093	$10^{12}\Omega$m	$10^{12}\Omega$m

Polyolefin heat shrink tubes, very flexible, adhesive-layered, shrink ratio 3:1, 4:1 - RC3K and RC4K

Application

Designed for making protection on cable bundles and metal pipes against water and moisture.
They make both good insulation and sealing.
Manufactured by coextrusion of polyolefin and a hotmelt.



D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery
S1 - adhesive layer thickness after recovery



Operating temperature:	from -45 up to +125°C
Shrink ratio:	3:1, 4:1
Minimum shrink temperature:	+80°C
Standard colour:	black
Custom color:	colorless

Outer shell - self-extinguishing (except a colorless)

Tube type shrink ratio: 3:1	Index (black color)	Dimensions [mm] D	d	s	Adhesive layer thickness after recovery [mm] - S1	Standard length of the spool [m]
RC3K 3 / 0,6	TRDHL300006002005KC1	3,0	0,6	1,0	0,50	200
RC3K 4,8 / 1,5	TRDHL480015001005KC1	4,8	1,5	1,1	0,50	100
RC3K 6 / 2	TRDHL600020001005KC1	6,0	2,0	1,2	0,50	100
RC3K 9 / 3	TRDHL900030005004KC1	9,0	3,0	1,3	0,60	50
RC3K 12 / 4	TRDHL120140002504KC1	12,0	4,0	1,7	0,80	25
RC3K 19 / 6	TRDHL190160002504KC1	19,0	6,0	2,0	0,80	25
RC3K 24 / 8	TRDHL240180002504KC1	24,0	8,0	2,2	1,05	25
RC3K 30 / 10	TRDHL300110011223KC1	30,0	10,0	2,4	1,05	Cut into 1,22 m
RC3K 40 / 13	TRDHL400113012504KC1	40,0	13,0	2,5	1,05	25
RC3K 50 / 19	TRDHL500119011223KC1	50,0	19,0	2,5	1,05	Cut into 1,22 m

Tube type shrink ratio: 4:1	Index (black color)	Dimensions [mm] D	d	s	Adhesive layer thickness after recovery [mm] - S1	Standard length of the spool [m]
RC4K 4 / 1	TRDHL400010001005KC1	4	1,00	1,00	0,50	100
RC4K 6 / 1,27	TRDHL600012701005KC1	6	1,27	1,20	0,60	100
RC4K 8 / 1,65	TRDHL800016505004KC1	8	1,65	1,55	0,75	50
RC4K 12 / 2,41	TRDHL120124102504KC1	12	2,41	1,95	1,00	25
RC4K 16 / 4	TRDHL160140002504KC1	16	4,00	2,10	1,05	25
RC4K 18 / 4,45	TRDHL180144502504KC1	18	4,45	2,40	1,20	25
RC4K 24 / 6	TRDHL240160002504KC1	24	6,00	2,50	1,25	25
RC4K 32 / 8	TRDHL320180002504KC1	32	8,00	2,50	1,25	25
RC4K 52/13	TRDHL520113011223KC1	52	13,00	2,50	1,25	Cut into 1,22 m

Properties	Test method	Tubes RC3K / RC4K
Tensile strength	ASTM D 2671	minimum 10,4 MPa
Tensile strength after heat ageing (+158°C, 168 h)	ASTM D 2671	remains 70%
Elongation at rupture	ASTM D 2671	minimum 200%
Length change after shrinking	UL 224	0 -10%
Heat shock (+250°C, 4 h)	ASTM D 2671	no cracks
Cold bend (-30°C, 1 h)	ASTM D 2671	no cracks
Voltage test AC (2500 V, 60 s)	ASTM D 2671	No breakdowns
Volume resistivity	ASTM D 876	minimum 10^{14} Ωcm
Inflammability test	SAE-AMS-DTL-23053/5	self-extinguishing after 30 s
Infuence on copper (+158°C, 168 h)	UL 224	no corrosion

DIY Smallsters - type PRCH1-1, PRCH1-2, PRCH1-3



Application

**Meant for electricians, car fitters, handymen and other users who need handy sets of heat shrink tubes to DIY works.
Sets consist of different colors short length tubes.**

Type of Smallster	Index	Heat shrink tubes Type	Length [mm]	Quantity [pcs]	Packing Quantity [set]
PRCH1-1	WET0011	RCH1 2,4 / 1,2	50	6	10
		RCH1 3,2 / 1,6	50	6	
		RCH1 4,8 / 2,4	50	5	
		RCH1 6,4 / 3,2	50	5	
PRCH1-2	WET0021	RCH1 4,8 / 2,4	70	5	10
		RCH1 6,4 / 3,2	70	5	
		RCH1 9,5 / 4,8	70	3	
		RCH1 12,7 / 6,4	70	3	
PRCH1-3	WET0031	RCH1 2,4 / 1,2	90	6	10
		RCH1 3,2 / 1,6	90	6	
		RCH1 4,8 / 2,4	90	6	
		RCH1 6,4 / 3,2	90	6	
		RCH1 9,5 / 4,8	90	6	
		RCH1 12,7 / 6,4	90	6	

Mix of heat shrink tubes in phase colors - type RCH1



Application

One package contains most popular colors used by fitters and electricians (50 m of each dimension).

Type of tube	Index	Mix of phase colors Quantity [szt. 1 m] black	brown	blue	red	yellow-green
RCH1 6,4/3,2x1-MF	WRJCC6400320000000T1	20	10	10	5	5
RCH1 8/2x1-MF	WRJCC8000200010030T1	20	10	10	5	5
RCH1 9,5/4,8x1-MF	WRJCC9500480010030T1	20	10	10	5	5
RCH1 12,7/6,4x1-MF	WRJCC1271640010030T1	20	10	10	5	5
RCH1 19/9,5x1-MF	WRJCC1901950010030T1	20	10	10	5	5
RCH1 25,4/12,7x1-MF	WRJCC2541127110030T1	20	10	10	5	5
RCH1 38/19x1-MF	WRJCC3801190110030T1	20	10	10	5	5

Thin wall tube on spools - type BOX



Application

**Thin wall heat shrink tubes supplied on spools in convenient boxes.
You may cut a piece of tube to whatever length is needed.**

Type of tube	Index	Dimensions [mm] D	d	s	Spool [m]
BOX RCH1 1,6/0,8x20-C	WRJCC1600080020040C1	1,6	0,8	0,45	20
BOX RCH1 2,4/1,2x20-C	WRJCC2400120020040C1	2,4	1,2	0,5	20
BOX RCH1 3,2/1,6x20-C	WRJCC3200160020040C1	3,2	1,6	0,5	20
BOX RCH1 4/1x10-C	WRJCC4000100010040C1	4,0	1,0	1,0	10
BOX RCH1 4,8/2,4x10-C	WRJCC4800240010040C3	4,8	2,4	0,5	10
BOX RCH1 6,4/3,2x10-C	WRJCC6400320010040C2	6,4	3,2	0,6	10
BOX RCH1 8/2x10-C	WRJCC8000200010040C2	8,0	2,0	1,0	10
BOX RCH1 9,5/4,8x10-C	WRJCC9500480010040C2	9,5	4,8	0,6	10
BOX RCH1 12,7/6,4x10-C	WRJCC1271640010040C2	12,7	6,4	0,6	10
BOX RCH1 19/9,5x5-C	WRJCC1901950050030C2	19	9,5	0,9	5
BOX RCH1 25,4/12,7x5-C	WRJCC2541127150030C2	25,4	12,7	0,9	5

Cases - type ZDM

Elements sets are packed in a handy cassette with dimensions 210 x 105 x 50 mm.
Standard colour - black.
Other colors - available on request.
Properties - see table technical and operational properties of heat shrink tubes.



Content	Type of element	Set ZDM 1 Index WET010		Set ZDM 2 Index WET012		Set ZDM 3 Index WET014	
		Length [mm]	Quantity [pcs]	Length [mm]	Quantity [pcs]	Length [mm]	Quantity [pcs]
Heat shrink tube	RCH1 1,6 / 0,8	-	-	55	60	55	30
	RCH1 2,4 / 1,2	95	60	55	30	55	20
	RCH1 3,2 / 1,6	95	40	55	25	55	14
	RCH1 4,8 / 2,4	95	24	55	15	55	10
	RCH1 6,4 / 3,2	95	14	100	15	100	14
	RCH1 12,7 / 6,4	95	2	100	8	100	5
	RCH1 19 / 9,5	95	2	100	3	100	5
	RCH1 25,4 / 12,7	95	2	-	-	-	-
	RCH1 2,4 / 1,2	195	3	-	-	-	-
	RCH1 3,2 / 1,6	195	2	-	-	-	-
	RCH1 4,8 / 2,4	195	3	-	-	-	-
	RCH1 6,4 / 3,2	195	2	-	-	-	-
	RCH1 9,5 / 4,8	195	1	100	8	100	8
	RCH1 12,7 / 6,4	195	1	-	-	-	-
	RPH1 12 / 4	-	-	100	6	100	4
Copper cable lug	RCH1 1,6 / 0,8	-	-	55	60	55	30
	RCH1 2,4 / 1,2	95	60	55	30	55	20
Copper ring cable lug	RCH1 3,2 / 1,6	95	40	55	25	55	14
Copper connection lugs	RCH1 6,4 / 3,2	95	14	100	15	100	14
	RCH1 12,7 / 6,4	95	2	100	8	100	5
Copper compression connector	RCH1 19 / 9,5	95	2	100	3	100	5
	RCH1 25,4 / 12,7	95	2	-	-	-	-
Tin and resin	RCH1 2,4 / 1,2	195	3	-	-	-	-

Stand with medium wall, heat-resistants adhesive-layered tubes - type KRPKH1-1

Comfortable exposition cardboard contains a set of medium wall heat shrink tubes adhesive-layered in black colour.
The stand is made of moisture-proof polypropylene material.
Shrink temperature heat-shrinkable tubing from +90 up to + 200°C.
Easier product identification. Printed size on all tubes.
Quick and easy installation. A big shrink strength.
Possibility of insulation and cable coating reconstruction.
Protection against moisture. High resistance to changing weather conditions, UV radiation.

Index: WET0211.

Type of tube	Length [mm]	Quantity [pcs]
RPKH1 9/3	1000	5
RPKH1 12/4	1000	13
RPKH1 17/3	1000	4
RPKH1 18/6	1000	5
RPKH1 22/6	1000	5
RPKH1 25/10	1000	10
RPKH1 30/8	1000	4
RPKH1 35/12	1000	5
RPKH1 40/16	1000	5
RPKH1 52/20	1000	4
RPKH1 63/19	1000	4



Easier product identification.
Overprint with size on every tube.



Dimension: - width 59 cm - height 133 cm - depth 34 cm

Stand with thin wall heat-resistants tubes - type: KRCH1-2 and KRCH1S-3

The STAND for Heat Shrink Tubes is designed for supermarket chains and wholesale. Project STAND - proposal for 2 formats:
• STAND Large Format is designed for DIY supermarket chains • STAND Small Format Is designed for wholesale outlets.
Standard Composition of the STANDS as shown on the table below. Could be adapted to the need of the specific market.
Proposed graphics for boxes: RADPOL standard with requested language version or graphic customized according to the customer request.
Labeling: in shape of a "flag" on small diameter tubes and labels stick on the width on tubes for larger diameter.

STAND Large Format
Index: WET0241



Dimension:
- width 590 mm
- height 1330 mm
- depth 340 mm

STAND Small Format
Index: WET041



Dimension:
- width 400 mm
- height 1330 mm
- depth 300 mm

Type of tube	Length [mm]	Quantity [pcs]
RCH1 1,6 / 0,8	1 000	30
RCH1 2,4 / 1,2	1 000	40
RCH1 3,2 / 1,6	1 000	70
RCH1 4 / 1	1 000	40
RCH1 4,8 / 2,4	1 000	70
RCH1 6,4 / 3,2	1 000	60
RCH1 8 / 2	1 000	45
RCH 19,5 / 4,8	1 000	40
RCH1 12,7 / 6,4	1 000	30
RCH1 19 / 9,5	1 000	15
RCH1 25,4 / 12,7	1 000	15
RCH1 38 / 19	1 000	5
RCKH1 4 / 1	500	10
RCKH1 6 / 2	500	10
RCKH1 8 / 2	500	10
RCKH1 12 / 3	500	10

Index WET041	Type KRCH1S-3 color/label	Quantity [m]
6 colors for each dimension, tubes with label	RCH1S 2,4/1,2x1	50
	RCH1S 3,2/1,6x1	50
	RCH1S 4/1x1	50
	RCH1S 4,8/2,4x1	50
	RCH1S 6,4/3,2x1	30
	RCH1S 9,5/4,8x1	30
	RCH1S 12,7/6,4x1	30
	RCH1S 19/9,5x1	20
	RCH1S 25,4/12,7x1	20

The STAND for – market chaine of DIY store, electrical wholesale





Rotating stand with three perforated display walls.

Dimension: high H= 190 cm, diameter of the base 50 cm.
Pendants included.

Stand composition could be doneas a mixt of products shown on both type of stands.

The most popular assortment displayed on the stand:
Stand type CT FLOP: Cable holders (FO, FP), cable ties (CT),
Stand type AI LI: Cable lugs, insulated (LI) and insulated cable lugs (AI).

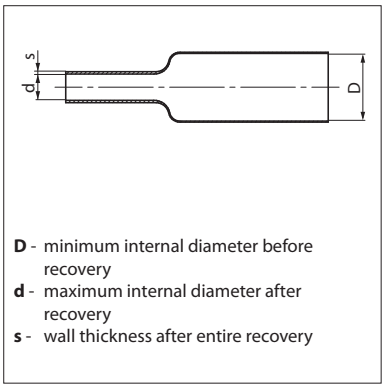
The standard composition of the stands:
- **TYPE AI LI**
  49 different products in the stand
  17 types - Cable terminals LI

- **TYPE CT FLOP**
  36 different products in the stand
  20 types - Cable ties CT,
  15 types - Cable grips FO, FP,
  1 type - Pull apart pins KR.

Medium wall heat shrink heat-resistant tubes +125°C - type RPH1, RPKH1, RPH1S, RPKH1S

Application

Used to restore the insulation and the outer cable coating, high shrink ratio and a wall thickness guarantee excellent insulating properties, and provide a close fit to a wide variety of irregular shapes.
The applied hot-melt adhesive provides an additional moisture barrier needed in the construction cable joints and terminations.



D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery



Operating temperature: RPH1 -55 up to +125°C*, RPKH1 -25 up to +125°C*, RPH1S -40 up to +125°C*, RPKH1S -40 up to +125°C* *outer layer
Tubes halogen-free: RPH1, RPKH1
Tubes self-extinguishing: RPH1S, RPKH1S
Shrink ratio: 3:1, 4:1
The minimum shrink temperature: +120°C
Colours: black
UV resistant
In accordance with REACH, RoHS

Tube type	Index (black color)	Tube type	Index (black color)	Dimensions [mm] D	d	s	Packing [pcs. 1 m]
RPH1 9 / 3	WRJPC9000300010030C1	RPKH1 9 / 3	WRDPC900030001003KC1	9	3	2,0	50
RPH1 12 / 4	WRJPC1200400010030C1	RPKH1 12 / 4	WRDPC120040001003KC1	12	4	2,0	50
		RPKH1 17 / 3	WRDPC170030001003KC1	17	3	2,5	50
RPH1 18 / 6	WRJPC1800600010030C1	RPKH1 18 / 6	WRDPC180160001003KC1	18	6	2,0	50
RPH1 22 / 6	WRJPC2200600010030C1	RPKH1 22 / 6	WRDPC220060001003KC1	22	6	2,0	50
RPH1 25 / 10	WRJPC2500100010030C1	RPKH1 25 / 10	WRDPC250110001003KC1	25	10	2,0	50
		RPKH1 30 / 8	WRDPC300080001003KC1	30	8	2,0	30
RPH1 35 / 12	WRJPC3500120010030C1	RPKH1 35 / 12	WRDPC350012001003KC1	35	12	2,0	30
RPH1 40 / 16	WRJPC4000160010030C1	RPKH1 40 / 16	WRDPC400016001003KC1	40	16	2,0	50
RPH1 52 / 20	WRJPC5200200010030C1	RPKH1 52 / 20	WRDPC520020001003KC1	52	20	2,5	40
RPH1 63 / 19	WRJPC6300190010030C1	RPKH1 63 / 19	WRDPC630019001003KC1	63	19	2,5	30
RPH1 80 / 35	WRJPC8000350010030C1	RPKH1 80 / 35	WRDPC800035001003KC1	80	35	4,0	20
RPH1 103 / 45	WRJPC1030450010030C1	RPKH1 103 / 45	WRDPC103045001003KC1	103	45	4,5	15
RPH1 132 / 58	WRJPC1320580010030C1	RPKH1 132 / 58	WRDPC132058001003KC1	132	58	4,5	10

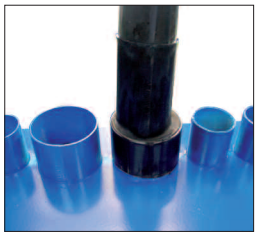
Standard length = 1 m, longer RPH1, RPKH1 tubes available on special request.

Tube type	Index (black color)	Tube type	Index (black color)	Dimensions [mm] D	d	s	Packing [pcs. 1 m]
RPH1S 9 / 3	WRJPE9000300010030C1	RPKH1S 9 / 3	WRDPE900030001003KC1	9	3	2,0	50
RPH1S 12 / 4	WRJPE1200400010030C1	RPKH1S 12 / 4	WRDPE120040001003KC1	12	4	2,0	50
RPH1S 22 / 6	WRJPE2200600010030C1	RPKH1S 22 / 6	WRDPE220060001003KC1	22	6	2,0	50
RPH1S 25 / 10	WRJPE2500100010030C1	RPKH1S 25 / 10	WRDPE250010001003KC1	25	10	2,0	50
RPH1S 30 / 8	WRJPE3000800010030C1	RPKH1S 30 / 8	WRDPE300080001003KC1	30	8	2,5	30
RPH1S 35 / 12	WRJPE3500120010030C1	RPKH1S 35 / 12	WRDPE350010001003KC1	35	12	2,0	30
RPH1S 40 / 16	WRJPE4000160010030C1	RPKH1S 40 / 16	WRDPE400016001003KC1	40	16	2,0	50
RPH1S 52 / 20	WRJPE5200200010030C1	RPKH1S 52 / 20	WRDPE520020001003KC1	52	20	2,5	40
RPH1S 63 / 19	WRJPE6300190010030C1	RPKH1S 63 / 19	WRDPE630019001003KC1	63	19	2,5	30
RPH1S 80 / 35	WRJPE8000350010030C1	RPKH1S 80 / 35	WRDPE800035001003KC1	80	35	4,0	20
RPH1S 103 / 45	WRJPE1030450010030C1	RPKH1S 103 / 45	WRDPE103045001003KC1	103	45	4,5	15
RPH1S 132 / 58	WRJPE1320580010030C1	RPKH1S 132 / 58	WRDPE132058001003KC1	132	58	4,5	10

Standard length = 1 m, longer RPH1S, RPKH1S tubes available on special request.

Properties	Test method	Tubes RPH1 RPKH1	Tubes RPH1S RPKH1S
Operating temperature		-55 up to +125°C* -25 up to +125°C*	-40 up to +125°C -40 up to +125°C* *outer layer
Length change after shrinking	EN 60684-2	+5 ÷ -10%	+5 ÷ -10%
Tensile strength, min.	EN 60684-2	14 MPa	9 MPa
Elongation at rupture, min.	EN 60684-2	350%	200%
Heat ageing 168 hours	EN 60684-2	158°C	158°C
Tensile strength after heat ageing, min.	EN 60684-2	12 MPa	7 MPa
Elongation at rupture after heat ageing, min.	EN 60684-2	250%	150%
Heat shock (4 hours, temperature)	EN 60684-2	200°C no dripping, breaking and wall spreading	
Contact with Cu after heat ageing (168 hours, temperature): elongation at rupture, min.	EN 60684-2	158°C 100%	158°C 100%
Cu corrosion	EN 60684-2	nie koroduje	
Cold bend; 4 hours	EN 60684-2	doesn't break in temp. -55°C	doesn't break in temp. -40°C
Flammability	EN 60684-2	firearms	self-extinguishing
Water absorptivity, max	ISO 62	0,1%	0,5%
Dielectric resistance, min.	EN 60684-2; IEC 60243-1	16kV/mm	15kV/mm
Volume resistivity, min.	EN 60684-2; IEC 60093	$10^{12}\Omega m$	$10^{11}\Omega m$

Examples of applications of heat shrink tubes.

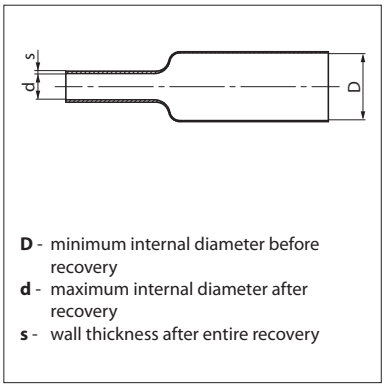





Medium wall heat shrink tubes with mastic - type RPM

Application

RPM tubes are on all length covered with mastic sealing. They are designed for the protection of metal pipes' joints and other connections which require reliable sealing.
Radiation crosslinked covering guarantee effective mechanical protection.
Mastic layer protects against moisture and water penetration.

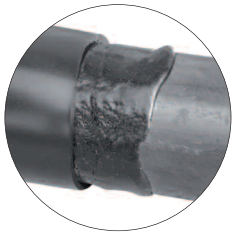


D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery



Operating temperature: from -35 up to +110°C (IEC 216)
Shrink ratio: 3:1
The minimum shrink temperature: +120°C
Standard color: black
UV resistant
Covered on all length with mastic sealing
Good insulation properties



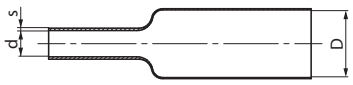


Tube type	Indekx	Dimensions [mm] D	d	s	Packing [pcs. 1 m]
RPM 30/6	TRJHA300160001003MC1	30	6	2,5	10
RPM 33/8	TRJHA330180001003MC1	33	8	2,5	10
RPM 40/12	TRJHA400112011003MC1	40	12	2,5	10
RPM 55/20	TRJHA550120011003MC1	55	20	2,0	10
RPM 75/25	TRJHA750125011003MC1	75	25	2,0	10
RPM 95/30	TRJHA950130011003MC1	95	30	2,0	10
RPM 120/40	TRJHA120240011003MC1	120	40	2,0	1
RPM 140/50	TRJHA140250011003MC1	140	50	2,3	1
RPM 160/50	TRJHA160250011003MC1	160	50	2,3	1
RPM 180/66	TRJHA180266011003MC1	180	66	2,5	1
RPM 205/66	TRJHA205266011003MC1	205	66	2,5	1
RPM 235/70	TRJHA235270001003MC1	235	70	2,5	1
RPM 265/75	TRJHA265275011003MC1	265	75	3,0	1
RPM 300/85	TRJHA300285011003MC1	300	85	3,0	1
RPM 350/100	TRJHA350210021003MC1	350	100	3,0	1

Properties	Test method	Tubes RPM
Tensile strength	ASTM D 2671	≥ 14 MPa
Elongation at rupture	ASTM D 2671	≥ 400%
Longitudinal change after recovery	UL 224	0-10%
Elongation at rupture after heat ageing, min.	+150°C, 168h	≥ 300%
Dielectric strength	IEC 243	≥ 20kV/mm
Volume resistivity	IEC 93	≥ 10^{14}Ωcm
Infuence on copper	ASTM D 2671	doesn't corrode
Stress cracking resistance (+50°C)	ASTM D 1693	doesn't break
Cold bend (-55°C, 4h)	ASTM D 2671	doesn't break
Properties of mastic		
Water absorption	ISO 62	< 0,1%
Softening point	ASTM D E8	80°C
Peel strength	ASTM D 1000	50N/25 mm
Influence on copper	ASTM D 2671	doesn't corrode
Fungus resistance	ISO 846	resistant

Heat shrink tubes of large diameters - type RDK, RDM, RD





D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery

Application

They are designed for insulation of metal elements, lampposts, masts, pipelines and elements of bridges. Due to high shrink ratio, they are a great insulation for cable culverts ends e.g. under the streets.
RDK tubes are wholly adhesive-layered and RDM are supplied with mastic stripes at the ends.

Both adhesive layer and mastic stripes are tight insulation and protect against any moist penetration under the heat shrink layer.

The dimensions of RDK and RDM tubes are specially matched to the sizes of lamposts. They protect them effectively against salt, animals' urine and gases in the air.

Operating temperature:	RDK -15 up to +125°C*, RDM -40 up to +125°C*, RD -55 up to +125°C *outer layer
Tubes with adhesive:	RDK
Tubes with with mastic:	RDM
Tubes without adhesive and mastic:	RD
Shrink ratio:	2:1, 4:1
The minimum shrink temperature:	+120°C
Colours:	black
Tubes halogen-free	
UV resistant	
In accordance with REACH, RoHS	

Tube with adhesive		Tube with mastic		Dimensions [mm]			Packing
Tube type	**Index**	**Tube type**	**Index**	**D**	**d**	**s**	[pcs. 1 m]
RDK 55 / 15	WRDDA550115011003KC1			55	15	4,5	40
RDK 76 / 18	WRDDA760118011003KC1	RDM 76 / 18	WRJDA760118011003MC1	76	18	4,0	15
RDK 95 / 25	WRDDA950125011003KC1	RDM 95 / 25	WRJDA950125011003MC1	95	25	4,5	15
RDK 105 / 32	WRDDA1052320011003KC1	RDM 105 / 32	WRJDA1052320011003MC1	105	32	4,0	12
RDK 140 / 34	WRDDA1402340011003KC1	RDM 140 / 34	WRJDA1402340011003MC1	140	34	4,5	8
RDK 155 / 90	WRDDA1552900011003KC1	RDM 155 / 90	WRJDA1552900011003MC1	155	90	2,9	1
RDK 175 / 90	WRJDA1752900011003KC1	RDM 175 / 90	WRJDA1752900011003MC1	175	90	2,9	1
RDK 195 / 90	WRJDA1952900011003KC1	RDM 195 / 90	WRJDA1952900011003MC1	195	90	2,5	1
RDK 225 / 90	WRJDA2252900011003KC1	RDM 225 / 90	WRJDA2252900011003MC1	225	90	2,5	1
RDK 245 / 125	WRJDA2452125210003KC1	RDM 245 / 125	WRJDA2452125210003MC1	245	125	2,8	1
RDK 255 / 125	WRJDA2552125210003KC1	RDM 255 / 125	WRJDA2552125210003MC1	255	125	2,8	1
RDK 275 / 125	WRJDA2752125210003KC1	RDM 275 / 125	WRJDA2752125210003MC1	275	125	2,8	1
RDK 300 / 125	WRJDA3002125210003KC1	RDM 300 / 125	WRJDA3002125210003MC1	300	125	2,8	1
RDK 350 / 125	WRJDA3502125210003KC1	RDM 350 / 125	WRJDA3502125210003MC1	350	125	2,8	1
RDK 390 / 200	WRJDA3902200210003KC1	RDM 390 / 200	WRJDA3902200210003MC1	390	200	3,0	1
RDK 400 / 200	WRJDA4002200210003KC1	RDM 400 / 200	WRJDA4002200210003MC1	400	200	3,0	1
RDK 440 / 200	WRJDA4402200210003KC1	RDM 440 / 200	WRJDA4402200210003MC1	440	200	3,0	1
RDK 460 / 200	WRJDA4602200210003KC1	RDM 460 / 200	WRJDA4602200210003MC1	460	200	3,0	1
RDK 500 / 200	WRJDA5002200210003KC1	RDM 500 / 200	WRJDA5002200210003MC1	500	200	3,0	1
RDK 530 / 200	WRJDA5302200210003KC1	RDM 530 / 200	WRJDA5302200210003MC1	530	200	3,0	1
RDK 560 / 250	WRJDA5602250210003KC1	RDM 560 / 250	WRJDA5602250210003MC1	560	250	3,2	1
RDK 620 / 250	WRJDA6202250210003KC1	RDM 620 / 250	WRJDA6202200210003MC1	620	250	3,2	1
RDK 710 / 250	WRJDA7102250210003KC1	RDM 710 / 250	WRJDA7102250210003MC1	710	250	3,2	1

Tube without adhesive and mastic		Dimensions [mm]			Packing
Tube type	**Index**	**D**	**d**	**s**	[pcs. 1 m]
RD 55 / 15	WRJDA5501150110030C1	55	15	4,5	40
RD 76 / 18	WRJDA7601180110030C1	76	18	4,0	15
RD 95 / 25	WRJDA9501250110030C1	95	25	4,5	15
RD 105 / 32	WRJDA1052320110030C1	105	32	4,0	12
RD 140 / 34	WRJDA1402340110030C1	140	34	4,5	8
RD 155 / 90	WRJDA1552900110030C1	155	90	2,9	1
RD 175 / 90	WRJDA1750900010030C1	175	90	2,9	1
RD 195 / 90	WRJDA1952900110030C1	195	90	2,5	1
RD 225 / 90	WRJDA2252900110030C1	225	90	2,5	1
RD 245 / 125	WRJDA2452125210030C1	245	125	2,8	1
RD 255 / 125	WRJDA2552125210030C1	255	125	2,8	1
RD 275 / 125	WRJDA2752125210030C1	275	125	2,8	1
RD 300 / 125	WRJDA3002125210030C1	300	125	2,8	1
RD 350 / 125	WRJDA3502125210030C1	350	125	2,8	1
RD 390 / 200	WRJDA3902200210030C1	390	200	3,0	1
RD 400 / 200	WRJDA4002200210030C1	400	200	3,0	1
RD 440 / 200	WRJDA4402200210030C1	440	200	3,0	1
RD 460 / 200	WRJDA4602200210030C1	460	200	3,0	1
RD 500 / 200	WRJDA5002200210030C1	500	200	3,0	1
RD 530 / 200	WRJDA5302200210030C1	530	200	3,0	1
RD 560 / 250	WRJDA5602250210030C1	560	250	3,2	1
RD 620 / 250	WRJDA6202250210030C1	620	250	3,2	1
RD 710 / 250	WRJDA7102250210030C1	710	250	3,2	1

Standard length 1 m. Up to the dimension 140/34 lengths > 1 m are possible.
On special demand we can produce tubes of non standard sizes.

Properties	**Test method**	**Tubes RDK / RDM / RD**
Operating temperature		-15 up to +125°C / -40 up to +125°C / -55up to +125°C *outer layer
Length change after shrinking	EN 60684-2	+5 ÷ -15%
Tensile strength, min	EN 60684-2	12 MPa
Elongation at rupture, min.	EN 60684-2	300%
Heat ageing (168 h, temperature)	EN 60684-2	158°C
Tensile strength after heat ageing, min.	EN 60684-2	10 MPa
Elongation at rupture after heat ageing, min.	EN 60684-2	200%
Heat shock (4 hours, temperature)	EN 60684-2	200°C no dripping, breaking and wall spreading
Contact with Cu after heat ageing (168 hours, temperature): elongation at rupture, min.)	EN 60684-2	158°C 100%
Cu corrosion	EN 60684-2	doesn't corrodee
Cold bend; 4 hours	EN 60684-2	doesn't break in temp. -55°C
Flammability	EN 60684-2	firearms
Water absorptivity, max	ISO 62	0,1%
Dielectric resistance, min.	EN 60684-2; IEC 60243-1	16kV/mm
Volume resistivity, min.	EN 60684-2; IEC 60093	$10^{12}\Omega m$

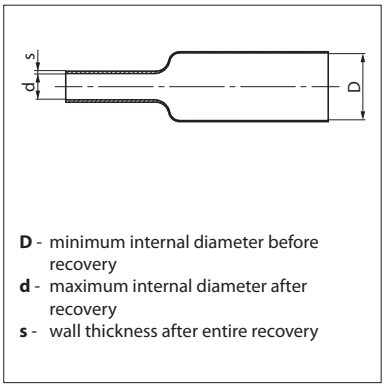
Examples of applications of heat shrink tubes





Thick wall heat shrink tubes, adhesive-layered, high shrink ratio 6:1 - type RBG





D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery

Application

Ideal insulation on objects with different diameters - cables, connectors and other elements.
High shrink strength guarantees good adherence to the objects of various shapes. They make a good mechanical protection of cable joints and terminations.
Full protection against environmental influence.

Operating temperature:	-55 up to +110°C (IEC 216)
Shrink ratio:	6:1
The minimum shrink temperature:	+120°C
Colours:	black
UV resistant	
Very high mechanical protection	

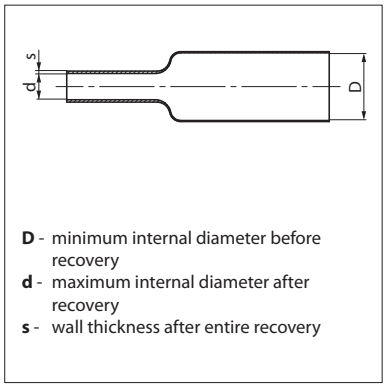
Tube type	Index	Dimensions [mm			Packing	Cut into
		D	d	s	[pcs. 1 m]	[m]
RBG 19,0 / 3,2	TRDHA190132001223KC1	19,0	3,2	3,2	20	1,22
RBG 33,0 / 5,5	TRDHA330155001223KC1	33,0	5,5	3,4	20	1,22
RBG 44,4 / 7,4	TRDHA444174001223KC1	44,4	7,4	3,6	20	1,22
RBG 50,8 / 8,3	TRDHA508183001223KC1	50,8	8,3	4,3	20	1,22
RBG 69,8 / 11,7	TRDHA698111711223KC1	69,8	11,7	4,8	20	1,22
RBG 88,9 / 17,1	TRDHA889117111223KC1	88,9	17,1	4,8	20	1,22
RBG 119,4 / 22,9	TRDHA1192229111223KC1	119,4	22,9	4,8	10	1,22
RBG 235 / 40	TRDHA235240011003KC1	235,0	40,0	4,8	1	1

Properties	Test method	Tubs RBG
Tensile strength	ASTM D 2671	> 14 MPa
Elongation at rupture	ASTM D 2671	> 400%
Density	ASTM D 792	1,05 g/cm^3
Longitudinal change after shrink	UL 224	0 - 10%
Elongation at rupture after heat ageing, min.	+150°C, 168 ч	> 300%
Dielectric strength	IEC 243	> 20kV/mm
Volume resistivity	IEC 93	> 10^{14}Ωm
Infuence on copper	ASTM D 2671	doesn't corrode
Stress cracking resistance (+50°C)	ASTM D 1 693	doesn't break
Properties of adhesive		
Water absorption	ISO 62	< 0,2%
Softening temperature	ASTM D E8	85°C
Peel strength	DIN 30672	4 N/cm
Influence on copper	ASTM D 2671	doesn't corrode
Fungus resistance	ISO 846	resistant

Medium wall heat shrink tubes, insulation, for Medium Voltage up to 36kV, anti-tracking - type RPAT

Application

Designed for insulation in cable terminations and joints for Medium Voltage up to 36kV.
Their anti-tracking properties guarantee maximum reliability when installed.



D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery



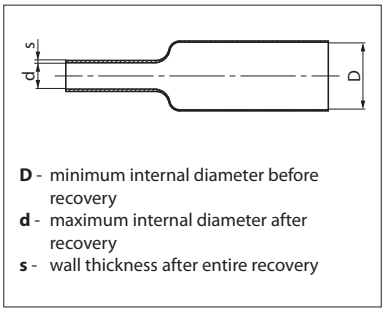
Operating temperature: -55 up to +125°C
The minimum shrink temperature: +110°C
Standard color: red
Halogen-free
UV resistant
Produced from special formula of radiation crosslinked polyethylene

Tube type	Index	Dimensions [mm]			Standard length of spool [m]
		D	d	s	
RPAT 19 / 6	TRJHQ1901600030040D1	19	6	2,5	30
RPAT 30 / 10	TRJHQ3001100115040D1	30	10	3,0	15
RPAT 35 / 12	TRJHQ3501120115040D1	35	12	3,0	15
RPAT 40 / 16	TRJHQ4001160115040D1	40	16	3,0	15
RPAT 45 / 18	TRJHQ4501180115040D1	45	18	3,0	15
RPAT 54 / 24	TRJHQ5401240115040D1	54	24	3,0	15
RPAT 60 / 29	TRJHQ6001290115040D1	60	29	3,0	15
RPAT 76 / 38	TRJHQ7601380115040D1	76	38	3,0	15
RPAT 100 / 49	TRJHQ1002490115040D1	100	49	3,0	15
RPAT 130 / 50	TRJHQ1302500100000D1	130	50	4,0	cut into 1 [m] lengths

Properties	Test method	Tubs RPAT
Tensile strength	ASTM D 2671	minimum 11 MPa
Elongation at rupture	ASTM D 2671	minimum %
Longitudinal change after shrink	ASTM D 2671	0 - 10%
Tensile strength after ageing (+120°C,168 h)	ASTM D 2671	minimum 13 MPa
Elongation at rupture after ageing (+120°C,168 h)	ASTM D 2671	minimum 350%
Dielectric strength	IEC 243	minimum 19kV/mm
Anti-tracking test	ASTM D 2303	3,75kV, 1 h, brak
Dielectric constant	IEC 250	maximum 3,0
Volume resistivity	ASTM D 2303	minimum $10^{13}\Omega$cm
Flammability (oxygen index)	IEC 93	minimum 25
Infuence on copper (+120°C, 168 h)	ASTM D 2671	doesn't corrode
Cold bend (-40°C, 4 h)	ASTM D 2671	doesn't break

Medium and thick wall heat shrink tubes for Medium Voltage bus bar insulation - type RBM i RBH





D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery

Application

Designed for better insulation of bus bars in switchgears and substations. They guarantee high anti-tracking protection and arcing resistance. The form of the tube makes the installation of it more comfortable and cheaper.

Operating temperature: -40 up to +125°C
The minimum shrink temperature: +110°C
Standard color: red
Halogen-free
Produced from modified radiation crosslinked polyethylene

Tube type	Index	Dimensions [mm]]			Recommended bus bar size	Standard length of spool
		D	d	s		
RBM 25 / 10	TRJHP2501100130040D1	25	10	2,0	25 x 3	30
RBM 30 / 12	TRJHP3001120130040D1	30	12	2,0	35 x 4	30
RBM 35 / 14	TRJHP3501140130040D1	35	14	2,0	35 x 4	30
RBM 40 / 16	TRJHP4001160130040D1	40	16	2,0	40 x 5	30
RBM 50 / 20	TRJHP5001200115040D1	50	20	2,0	50 x 5	15
RBM 65 / 25	TRJHP6501250115040D1	65	25	2,0	65 x 8	15
RBM 75 / 30	TRJHP7501300115040D1	75	30	2,0	75 x 8	15
RBM 100 / 40	TRJHP1002400115040D1	100	40	2,0	100 x 10	15

Tube type	Index	Dimensions [mm]]			Recommended bus bar size	Standard length of spool
		D	d	s	[mm]	[m]
RBH 19 / 6	TRJHO1901600115040D1	19	6	3,0	15 x 3	15
RBH 25 / 10	TRJHO2501100115040D1	25	10	3,0	25 x 3	15
RBH 30 / 12	TRJHO3001120115040D1	30	12	3,0	35 x 4	15
RBH 40 / 16	TRJHO4001160115040D1	40	16	3,0	40 x 5	15
RBH 50 / 20	TRJHO5001200115040D1	50	20	3,0	50 x 5	15
RBH 65 / 25	TRJHO6501250115040D1	65	25	3,0	65 x 8	15
RBH 75 / 30	TRJHO7501300115040D1	75	30	3,0	75 x 8	15
RBH 85 / 35	TRJHO8501350115040D1	85	35	3,0	85 x 10	15
RBH 100 / 40	TRJHO1002400115040D1	100	40	3,0	100 x 10	15
RBH 120 / 50	TRJHO1202500115040D1	120	50	3,0	120 x 12	15
RBH 150 / 60	TRJHO1502600100000D1	150	60	3,0	150 x 15	cut into 1 [m] lengths

Rated voltage	Minimal distances without insulation [mm]	Phase to Phase [mm]		Phase to Ground [mm]	
		RBM	RBH	RBM	RBH
12kV	120	65	35	75	45
17,5kV	160	85	55	105	65
24kV	220	115	70	150	100
36kV	320	200	140	285	190

Properties	Test method	Tubes RBM / RBH
Tensile strength	ASTM D 2671	minimum 11,8 MPa
Tensile strength after ageing (+120°C,168 h)	ASTM D 2671	minimum 10 MPa
Longitudinal change after shrink	ASTM D 2671	0 - 10%
Elongation at rupture	ASTM D 2671	700%
Elongation at rupture after ageing (+120°C,168 h)	ASTM D 267 1	minimum 500%
Dielectric strength	IEC 243	minimum 20kV/mm
Dielectric constant	IEC 250	maksimum 3,0
Volume resistivity	IEC 93	minimum $10^{13}\Omega$cm
Flammability (oxygen index)	ASTM 4589	minimum 25
Infuence on coppe (+120°C, 168 h)	ASTM D 2671	doesn't corrode
Cold bend (-40°C, 4 h)	ASTM D 2671	doesn't break
Water absorption (+23°C, 14 day)	ISO 62	minimum 0,5%

Insulating tapes for bus bars - typu RTBB

Application

They are very flexible and easy to install. They are designed for bus bar insulation in all the places the tube could not be installed.
Guarantee a good electrical and percussive insulation of bus bars up to 24kV.
Easy to remove for review or maintenance.



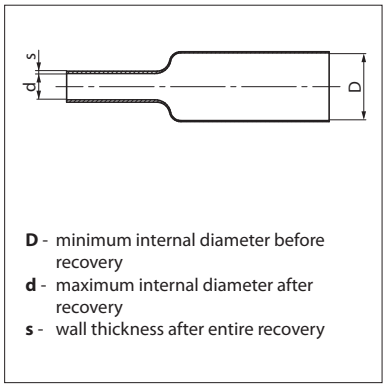
Operating temperature: -55 up to +105°C
The minimum shrink temperature: +110°C
Standard color: red
UV resistant
Produced from radiation crosslinked polyethylene

Tube type	Index	Wymiary [mm]		Packing	Standard lengt
		Width	Thickness after recovery	[pcs]	[m]
RTBB-1	TTHS0025051	25	1,00 + 0,10	1	5
RTBB-2	TTHS0050051	50	1,00 + 0,15	1	5

Properties	Test method	Tubs RTBB
Tensile strength	ASTM D 638	minimum 13 MPa
Tensile strength after ageing (+120°C,168 h)	ASTM D 2671	minimum 10 MPa
Longitudinal change after shrink	ASTM D 638	550%
Elongation at rupture after ageing (+120°C,168 h)	ASTM D 2671	minimum 450%
Dielectric strength	IEC 243	minimum 20kV/mm
Dielectric constant	IEC 250	maximum 3,0
Volume resistivity	IEC 93	minimum $10^{13}\Omega$cm
Flammability	ASTM D 2671	self-extinguishing after 60 s
Infuence on copper (+120°C, 168 h)	ASTM D 2671	doesn't corrod
Water absorption (+23°C, 14 dni)	ISO 62	minimum 0,5%
Shrink ratio		30%

Heat shrink tubes of modified elastomer – type REL





D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery

Application

Robust and resistant for long term exposure to high-temperature liquids.
Provide efficient protection for connections and ties.
Feature with perfect mechanical properties.
Resistant to abrasion, chemicals and fuel oil.

Operating temperature: -55 up to +150°C (IEC 216)
The minimum shrink temperature: +150°C
Standard colours: black
Self-extinguishing
Made from special formula of radiation crosslinked elastomer

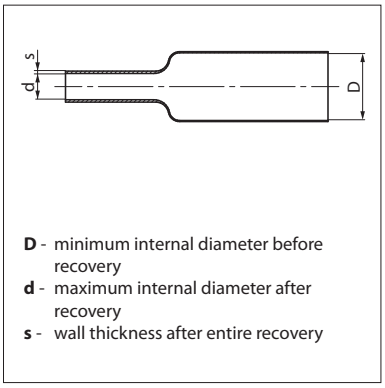
Tube type	Index	Dimensions [mm]			Spool standard length
		D	d	s	[m]
REL 12,7 / 6,4	TRJHW1271640025040C1	12,7	6,4	1,05 - 1,15	25
REL 19,1 / 9,5	TRJHW1901950025040C1	19,1	9,5	1,2 - 1,3	25
REL 25,4 / 12,7	TRJHW2541127125040C1	25,4	12,7	1,6 - 1,8	25
REL 38,1 / 19,0	TRJHW3811190125000C1	38,1	19,0	2,0 - 2,20	25

Properties	Metoda badań	Tubs REL
Tensile strength	ASTM D 2671	minimum 13 MPa
Tensile strength after agi	+160°C, 168 h	minimum 220%
Heat shock	+215°C, 4 h	no cracks
Secant modulus (at 2% elongation)	ASTM D 882	maximum 50 MPa
Volume resistivity	ASTM D 876	10^{14} Ωcm
Flammability	ASTM D 2671	self-extinguishing after 15 s

Heat shrink tubes of modified fluoroelastomer, very flexible - type RFE

Application

They are recommended for installation where a high resistance to corrosive liquids - oils, lubricants, solvents - in higher temperatures occurs.
The tubes guarantee high abrasion-resistance, unchangeable flexibility in low and high temperatures.
No cracks.



D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery



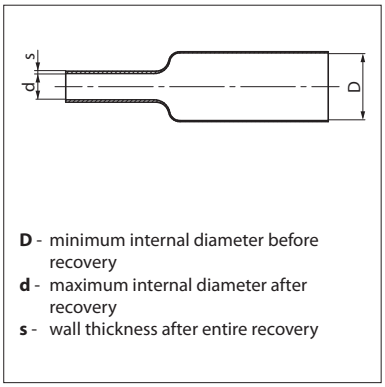
Operating temperature: -55 up to +200°C (IEC 216)
The minimum shrink temperature: +150°C
Standard colours: black
Self-extinguishing
Made from special formula of radiation crosslinked elastomer

Tube type	Index	Dimensions [mm]			Standard length of spool [m]
		D	d	s	
RFE 3,2 / 1,6	TRJHR3200160010050C1	3,2	1,6	0,76	50
RFE 4,8 / 2,4	TRJHR4800240050040C1	4,8	2,4	0,90	50
RFE 6,4 / 3,2	TRJHR6400320010050C1	6,4	3,2	0,90	50
RFE 9,5 / 4,8	TRJHR9500480050040C1	9,5	4,8	0,90	50
RFE 12,7 / 6,4	TRJHR1271640030040C1	12,7	6,4	1,10	30
RFE 19,1 / 9,5	TRJHR1911950030040C1	19,1	9,5	1,30	30
RFE 25,4 / 12,7	TRJHR2541127115040C1	25,4	12,7	1,65	30
RFE 38,1 / 19,1	TRJHR3811191115040C1	38,1	19,1	1,90	15

Properties	Test method	Tubs RFE
Tensile strength	ASTM D 2671	minimum 8,5 MPa
Tensile strength after ageing	+250°C, 168 h	minimum 200%
Heat shock	+300°C, 4 h	no cracks
Secant modulus	ASTM D 412	maximum 13,8 MPa
Dielectric strength	ASTM D 2671	minimum 7,9kV/mm
Volume resistivity	ASTM D 876	$10^{14}\Omega$cm
Infuence on copper (+120°C, 168 h)	SAE-AMS-DTL-23053/13	doesn't corrod
Flammability	ASTM D 2671	self-extinguishing after 15 s

Teflon heat shrink tubes - type RTE





D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery

Application

Designed for application in places where good resistance to high temperatures and chemicals is required.
They are meant for military, motorization, aviation and others due to their good electrical insulation and high heat-resistance.
They provide total protection against environmental influences.

Operating temperature:	-65 up to +260°C
The minimum shrink temperature:	+350°C
Standard color:	transparent

Tube type	Index	Dimensions [mm]			Packing	Cut into
		D	d	s	[pcs]	[m]
RTE 1,52 / 0,97	TRJHV152009701223O1	1,52	0,97	0,3	10	1,22
RTE 1,93 / 1,17	TRJHV193011701223O1	1,93	1,17	0,3	10	1,22
RTE 2,36 / 1,45	TRJHV236014501223O1	2,36	1,45	0,30	10	1,22
RTE 3,05 / 1,82	TRJHV305018201223O1	3,05	1,82	0,30	10	1,22
RTE 3,81 / 2,26	TRJHV381022601223O1	3,81	2,26	0,30	10	1,22
RTE 4,85 / 2,80	TRJHV485028001223O1	4,85	2,80	0,30	10	1,22
RTE 6,10 / 3,55	TRJHV610035501223O1	6,10	3,55	0,38	10	1,22
RTE 7,67 / 4,40	TRJHV767044001223O1	7,67	4,40	0,38	10	1,22
RTE 9,40 / 5,45	TRJHV940054501223O1	9,40	5,45	0,38	10	1,22
RTE 10,92 / 6,90	TRJHV109169001223O1	10,92	6,90	0,38	10	1,22
RTE 11,94 / 8,56	TRJHV119185601223O1	11,94	8,56	0,38	10	1,22

Properties	Test method	Tubs RTE
Tensile strength	ASTM D 2671	17 MPa
Tensile strength after ageing	ASTM D 2671	200%
Specific gravity	ASTM D 792	2,3
Heat shock (+400°C, 4 h)	ASTM D 2671	no cracks
Cold bend (-65°C, 4 h)	ASTM D 2671	no cracks
Volume resistivity	ASTM D 2671	$10^{18}\Omega$cm
Dielectric strength	ASTM D 2671	34kV/mm
Infuence on copper	UL 224	doesn't corrode
Flammability	ASTM D 2671	self-extinguishing
Chemical resistance	SAE-AMS-DTL-23053/12	perfect
Water absorption	ASTM D 570	maximum 0,1%

Insulation tubes fibreglass coated by silicone – type RFG

Application

Designed for electrical insulation where a good resistance to high temperature and puncture is required. Provide protection for bundles, wiring and terminals inside lighting fixtures, distribution boards, control cabinets and engines.



Material: Glass fibre braided with silicone (outer coating)
High flexibility
Resistance to arch and surface discharge
Operating temperature -55°C up to +200°C
Self-extinguishing
In accordance with ROHS
Colour natural: white
Range of use: 1.5 – 2.5 kV

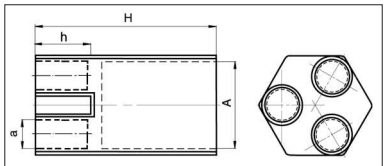
Tube type	Index (white colour)	Inner diameter [mm]	Wall thickness [mm]	Spool standard length [m]
RFG 1x100-B	TTENB10001005A1	1,0±0,3	0,20±0,1	100
RFG 1,5x100-B	TTENB15001005A1	1,5±0,3	0,20±0,1	100
RFG 2x100-B	TTENB20001005A1	2,0±0,3	0,20±0,1	100
RFG 2,5x100-B	TTENB25001005A1	2,5±0,3	0,20±0,1	100
RFG 3x100-B	TTENB30001005A1	3,0±0,35	0,23±0,1	100
RFG 3,5x100-B	TTENB35001005A1	3,5±0,35	0,23±0,1	100
RFG 4x100-B	TTENB40001005A1	4,0±0,35	0,23±0,1	100
RFG 4,5x100-B	TTENB45001005A1	4,5±0,35	0,23±0,1	100
RFG 5x100-B	TTENB50001005A1	5,0±0,45	0,30±0,1	100
RFG 6x100-B	TTENB60001005A1	6,0±0,45	0,30±0,1	100
RFG 7x50-B	TTENB70005004A1	7,0±0,60	0,35±0,1	50
RFG 8x50-B	TTENB80005004A1	8,0±0,60	0,35±0,1	50
RFG 9x50-B	TTENB90005004A1	9,0±0,60	0,35±0,1	50
RFG 10x50-B	TTENB10015004A1	10,0±0,80	0,43±0,1	50
RFG 12x50-B	TTENB12015004A1	12,0±0,80	0,43±0,1	50

Properties	Test method	Tubs RFG
Tensile strength	ASTM D 412	≥4 MPa
Elongation at rupture	ASTM D 412	≥200%
Flammability	ISO 1210	FV-1
Dielectric resistance	IEC 243	≥18kV/mm
Volume resistivity	IEC 93	$\geq 10^{14}\Omega m$

Heat shrink breakout boots

Heat shrink breakout boots: 2-core, 3-core, 4-core and 5-core - type AK





A - inner diameter before shrinking
A1 - inner diameter of after shrinking
a - the inner diameter of the finger
a1 - inner diameter of the finger after shrinking
H - length
H1 - length after shrinking
h - the length of a finger
h1 - finger length after shrinking

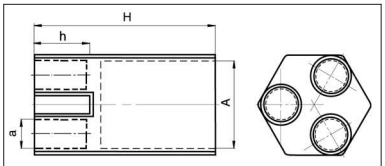
Properties

Heat shrink breakout boots AK are designed for insulation of cable ends at separated cores.
They are elements for both indoor and outdoor terminations and cable joints of polymer or paper insulated cables.
Voltage: 0,6/1kV and 3,5/6kV

Product name	Index	Number of cores	Dimensions [mm] A	A1	a	a1	H	H1	h	h1	Wall thickness	Core thickness	Cumulative packing [sets]
AK2 1,5-25	TKP2K030101204C1	2	30,0	10,0	12,0	4,0	70,0	95,0	18,0	28,0	2,0	2,0	10
AK2 25-120	TKP2K050242107C1	2	50,0	24,0	21,0	7,0	85,0	120,0	29,0	40,0	3,0	3,0	10
AK2 120-240	TKP2K098422808C1	2	98,0	42,6	28,4	8,2	147,4	165,3	65,8	68,8	3,3	3,3	5
AK3 1,5-16	TKP3K025090903C1	3	25,0	9,0	9,0	3,0	45,0	76,0	14,0	20,0	2,5	1,2	10
AK3 4-35	TKP3K035151304C1	3	35,0	11,6	13,0	3,5	85,0	117,0	18,0	31,0	2,2	1,4	10
AK3 25-120	TKP3K050212209C1	3	50,0	21,1	22,0	9,0	165,4	164,3	31,0	50,0	3,5	2,2	10
AK3 95-300	TKP3K075313214C1	3	75,0	31,0	32,0	14,0	190,0	220,0	55,0	60,0	3,5	2,7	5
AK4 1,5-10	TKP4K028090802C1	4	28,0	9,0	8,0	2,0	50,0	78,0	16,0	21,0	2,7	2,7	10
AK4 6-35	TKP4K035161205C1	4	35,0	16,0	12,0	5,0	85,0	105,0	14,0	20,0	2,3	1,4	10
AK4 25-95	TKP4K055202006C1	4	55,0	20,0	20,0	6,0	140,0	150,0	30,0	38,0	3,0	2,5	10
AK4 35-150	TKP4K060262210C1	4	60,0	26,0	22,0	10,0	154,5	187,4	38,4	51,5	5,6	2,5	10
AK4 95-300	TKP4K090353414C1	4	90,0	35,0	34,0	14,0	170,0	218,0	51,0	58,0	4,0	2,8	5
AK4 240-400	TKP4K135515114C1	4	135,0	50,6	51,5	13,9	213,2	241,8	68,0	78,7	4,2	4,2	1
AKF1	TKP4K162706418C1	4	162,0	70,0	64,0	18,0	240,0	260,0	75,0	80,0	4,2	4,2	1
AK5 1,5-16	TKP5K032071103C1	5	31,5	6,1	11,2	2,7	50,0	60,0	20,0	28,0	1,5	1,8	10
AK5 10-70	TKP5K058151604C1	5	57,0	14,7	15,8	2,9	83,0	112,0	20,5	30,5	2,0	1,9	10
AK5 70-185	TKP5K081312707C1	5	81	31	27	6,9	155	190	46	66	1,6	2,6	10
AK5 150-240	TKP5K102423308C1	5	102,0	41,8	33,6	7,7	162,9	196,7	64,5	71,3	4,1	3,2	5

3-core heat shrink breakout boots for MV up to 36kV - type AKR





A - inner diameter before shrinking
A1 - inner diameter of after shrinking
a - the inner diameter of the finger
a1 - inner diameter of the finger after shrinking
H - length
H1 - length after shrinking
h - the length of a finger
h1 - finger length after shrinking

Application

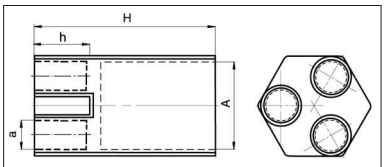
Heat shrink breakout boots AKR are designed for insulation of MV cable ends at separated cores.
They are an integral part of MV indoor and outdoor cable terminations.

Product name	Index	Number of cores	Dimensions [mm] A	A1	a	a1	H	H1	h	h1	Wall thickness	Core thickness	Cumulative packing [sets]
AKR 1	TKP3K050212209D1	3	50	21	22	9	180	187	45	50	3,0	2,5	1
AKR 2	TKP3K075313214D1	3	75	31	32	14	160	210	56	60	4,0	2,2	1
AKR 3	TKP3K110455521D1	3	110	45	55	21	160	230	53	55	3,5	2,2	1
AKR 4	TKP3K135566428D1	3	135	55	64	27	230	250	52	56	3,8	2,8	1
AKR 5	TKP3K170568528D1	3	170	56	68	28	230	250	40	65	3,8	2,8	1

Heat shrink breakout boots - type AKR, AKB, AKF

Application

Heat shrink breakout boots AKR (red) AK, AKB and AKF (black ones) are designed for cable insulation at the end of mechanical casing (plastic or metal) on the overhead transmission line of MV.
The heat shrink boots protect the cable against water penetration, dust, insects and other dirt.
These breakout boots are meant for Low and Medium Voltage cables.



A - inner diameter before shrinking
A1 - inner diameter of after shrinking
a - the inner diameter of the finger
a1 - inner diameter of the finger after shrinking
H - length
H1 - length after shrinking
h - the length of a finger
h1 - finger length after shrinking



Typ palczatki	Indeks	Ilość palców	Wymiary [mm] A	A1	a	a1	H	H1	h	h1	gr. ściany	gr. palca	Opak. zbiorcze [szt.]
AKR 3	TKP3K110455521D1	3	110	45	55	21	160	230	53	55	3,5	2,2	1
AKR 4	TKP3K135566428D1	3	135	55	64	27	230	250	52	56	3,8	2,8	1
AKR 5	TKP3K170568528D1	3	170	56	68	28	230	250	40	65	3,8	2,8	1
AKB 3	TKP3K125465222C1	3	125	46	52	22	160	230	40	60	3,8	2,5	1
AKB 4	TKP3K135606426C1	3	135	60	64	26	230	250	40	65	3,8	2,8	1
AKB 5	TKP3K170568528C1	3	170	56	68	28	230	250	40	65	3,8	2,8	1
AK 4 240-400	TKP4K135515114C1	4	135	50,6	51,5	13,9	213,2	241,8	68	78,7	4,2	4,2	1
AKF1	TKP4K162706418C1	4	162	70,0	64	18	240	260	75	80	4,2	4,2	1

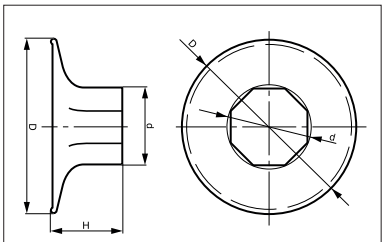
Properties	
Operating temperature	**AK**, **AKB**, **AKF**: from -30 up to +135°C **AKR**: from -40 up to +120°C
Shrink temperature	> +125°C
Elongation at rupture	minimum 300%
Tensile strength	no less than 13 MPa
Longitudinal shrink	not more than 10%
Volume resistivity	**AK**, **AKB**, **AKF**: minimum 10^{13} Ωcm **AKR**: minimum 10^{12} Ωcm
Self-extinguishing	relates to AKR
No corrosion In contact with CU	
Resistant to UV radiation	
Resistant to creeping current	(breakouts red - AKR)
Dielectric strength	minimum 10kV/mm
Resistance to heat shock	no cracks, no flow (measurement for 4 hours at 250°C)
Heat ageing	no cracks, no flow (measurement for 500 hours at 120°C)
They have excellent insulating properties and sealing	
Colours	**AK, AKB, AKF**: black color, **AKR**: red colour

Example of applications of breakout boots



Heat shrink sheds - type CES





d_1 - inner diameter after recovery
s - wall thickness after total recovery

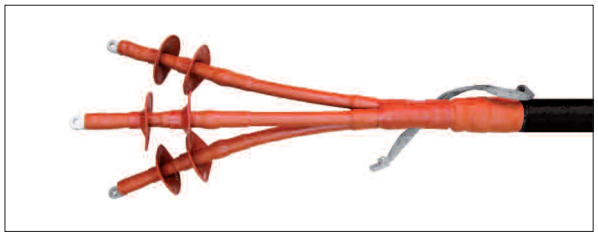
Application

They play an integral role in the installation of indoor and outdoor cable up to 72kV.
Their job is to prevent occurring fault paths.
CES heat shrink sheds have very good physical properties and resistance to ageing and also chemical factors.

Operating temperature:	-40 up to +120°C
Shrink temperature:	>120°C
Volume resistivity:	minimum $10^{12}\Omega$cm
Dielectric strength:	minimum 10kV/mm
Heat ageing:	tested for 500 hours at a temperature120°C - no cracks, no flowing

Product name	Index	Dimensions [mm]					Inclination angle	Cumulative packing [sets]
		D	d	d_1	s	H		
CES-1	TKC001	92	35	13	2,7	37	10°	3
CES-2	TKC002	124	47	21	2,8	40	10°	3
CES-3	TKC003	142	57	31	2,9	45	10°	3

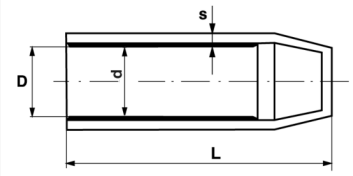
Example of applications of sheds



Heat shrink cable end caps - type KTK

Application

They are applied as insulation of power and telecommunication cables' ends. They also make an ideal insulation on bolts against the weather conditions at e.g. bridges or lampposts.
They are resistant to acids and basics.
The inner double layer of end caps – melt adhesive - increases the tightness of the insulation.



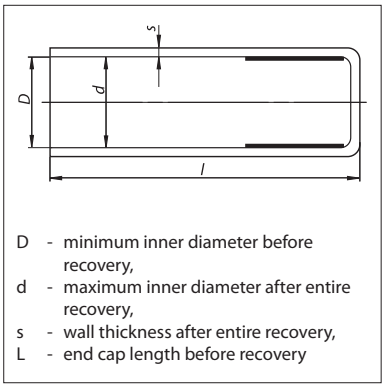
D - minimum inner diameter before recovery,
d - maximum inner diameter after entire recovery,
s - wall thickness after entire recovery,
L - end cap length before recovery



Product name	Index	Dimensions [mm] D	d	s	L	Packing [pcs]	Cumulative packing [sets]
KTK 3 / 1	TKKK34001000025C0	3,4	1,0	1,0	25	100	10
KTK 4,8 / 1,5	TKKK50001500030C0	5,0	1,5	1,0	30	100	10
KTK 6 / 2	TKKK64002000030C0	6,4	2,0	1,0	30	100	10
KTK 9 / 3	TKKK10013000035C0	10,0	3,0	1,4	35	100	10
KTK 10 / 4	WKKK11014000048C0	11,0	4,0	2,4	48,5	100	100
KTK 14 / 4	WKKK14514000048C0	14,5	4,0	2,4	48,5	100	100
KTK 16 / 8	WKKK16018000085C0	16,0	7,9	2,9	85,0	100	100
KTK 18 / 6	WKKK18016000020C0	18,0	6,0	2,1	20,0	100	100
KTK 21 / 6	WKKK21016000020C0	21,0	6,0	2,1	20,0	100	100
KTK 23 / 8	WKKK23017900085C0	23,0	7,9	2,9	85,0	100	100
KTK 33 / 15	WKKK33011461106C0	33,0	14,6	3,5	106,0	100	50
KTK 40 / 15	WKKK40011461106C0	40,0	14,6	3,5	106,0	100	50
KTK 52 / 25	WKKK53012421160C0	53,0	24,2	3,5	160,0	50	10
KTK 70 / 25	WKKK70012421115C0	70,0	24,2	3,5	115,0	50	10
KTK 90 / 45	WKKK91014381160C0	91,0	43,8	4,7	160,0	10	10
KTK 120 / 60	TKKK12026001150C0	121,0	43,8	4,7	160,0	10	10
KTK 145 / 60	TKKK14526001150C0	145,0	60	4,0	150,0	10	10
KTK 160 / 82	TKKK16028201150C0	160,0	82	4,0	150,0	10	100
KTK 200 / 90	TKKM20029001160C0	200,0	90	4,2	160,0	10	100

Heat shrink cable end caps - type KTM





D - minimum inner diameter before recovery,
d - maximum inner diameter after entire recovery,
s - wall thickness after entire recovery,
L - end cap length before recovery

Application

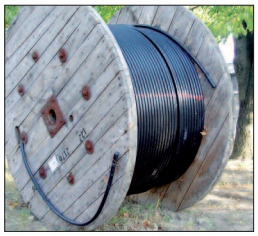
They are applied for the protection of concrete poles end against water penetration.
Inner surface of KTM end caps is covered with butyl rubber mastic which guarantee tightness of the insulation.

Product name	Index	Dimensions [mm]				Packing [pcs]
		D	d	s	L	
KTM 190 / 120	TKKM19021202160C0	190	120	4,2	160	1
KTM 230 / 120	TKKM23021202160C0	230	120	5,5	160	1
KTM 310 / 200	TKKM31022002160C0	310	200	5,5	160	1

Properties	Cable end caps KTK / KTM
Operating temperature	-55up to +105°C
Shrink temperature	from 120 up to 200°C
Tensile strength	minimum 8 MPa
Elongation at rupture	minimum 200%
Resistance to heat shock	Measured for 4 hours at + 200°C no cracks, flowing and deformation
Water absorption:	0,1% of weight (24 hours, temperature +25°C ±2)
Dielectric strength	minimum 16kV/mm
Longitudinal shrink	not more than 25%.
Resistant to UV radiation	
Colour	black

Examples of applications of end caps





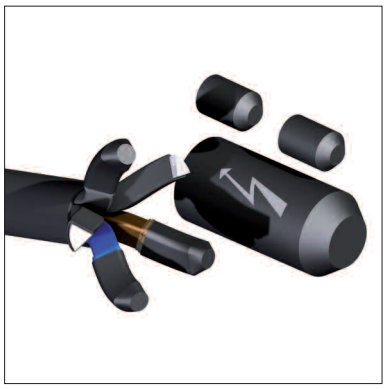


Heat shrink protection kits for 0,6/1kV - type ZO 4, ZO 5

Application

Protection kits are meant for cable ends protection. They allow the operation of cable under tension of 1kV.
The cleaning tissue attached to the kit should be used for degreasing of cable surface before the installation.





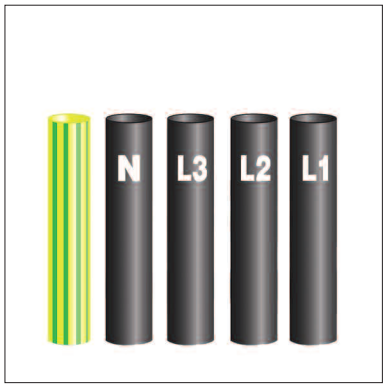
For 4-core cables

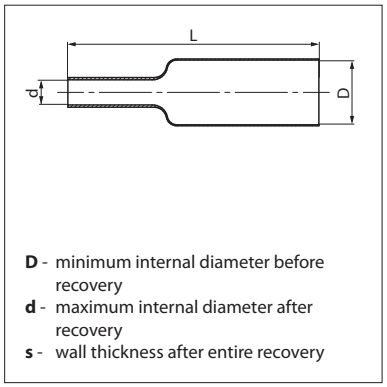
Product name	Index	Cable cross-section [mm²]		Components of set				Cleaning tissue
				Insulation cap		Covering cap		
		from	to	Type	Quantity [pcs]	Type	Quantity [pcs]	Quantity [pcs]
ZO 4 16-25	WGE0AI4FGKK01	16	25	10 / 4 x 48,5	4	33 / 15 x 106	1	1
ZO 4 35	WGE0AI4H0KK01	35		16 / 8 x 50	4	40 / 15 x 106	1	1
ZO 4 50-70	WGE0AI4IJKK01	50	70	16 / 8 x 50	4	52 / 25 x 160	1	1
ZO 4 95-120	WGE0AI4KLKK01	95	120	23 / 8 x 50	4	52 / 25 x 160	1	1
ZO 4 150	WGE0AI4M0KK01	150		23 / 8 x 50	4	70 / 25 x 160	1	1
ZO 4 185	WGE0AI4N0KK01	185		33 / 15 x 50	4	70 / 25 x 160	1	1
ZO 4 240	WGE0AI4O0KK01	240		33 / 15 x 50	4	90 / 45 x 160	1	1

For 5-core cables

Product name	Index	Cable cross-section [mm²]		Components of set				Cleaning tissue
				Insulation cap		Covering cap		
		from	to	Type	Quantity [pcs]	Type	Quantity [pcs]	Quantity [pcs]
ZO 5 16-25	WGE0AI5FGKK01	16	25	10 / 4 x 48,5	5	40 / 15 x 106	1	1
ZO 5 35	WGE0AI5H0KK01	35		16 / 8 x 50	5	52 / 25 x 160	1	1
ZO 5 50-70	WGE0AI5IJKK01	50	70	16 / 8 x 50	5	70 / 25 x 160	1	1
ZO 5 95-120	WGE0AI5KLKK01	95	120	23 / 8 x 50	5	70 / 25 x 160	1	1
ZO 5 150	WGE0AI5M0KK01	150		23 / 8 x 50	5	90 / 45 x 160	1	1
ZO 5 185-240	WGE0AI5NOKK01	185	240	33 / 15 x 50	5	90 / 45 x 160	1	1

Heat shrink phase markers - type ZOK, ZOKżt





D - minimum internal diameter before recovery
d - maximum internal diameter after recovery
s - wall thickness after entire recovery

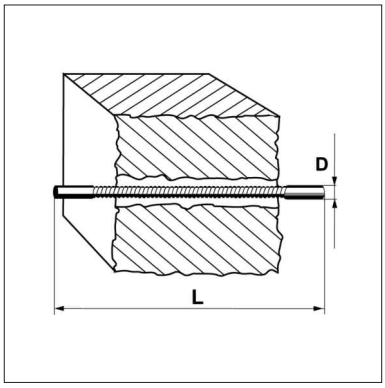
Application **Designed for phase marking of conductors finished with copper or aluminum lugs for installation outdoor, indoor and underground.**
They are good electrical insulators, they protect against mechanical and corrosion damages.
The double layer hot-melt protection guarantees tightness of insulated connection.

Colours: set ZOK - 4 black phase markers with white marking: L1, L2, L3 i N.
set ZOKżt - 4 black phase markers with white marking: L1, L2, L3 i N and one yellow-green phase marker.
Material: made of medium wall heat shrink adhesive layered tubes (RPK).

Type of ph. marker	Index	Type of ph. marker	Index	Type of terminals Al	Cu	Dim. of phase marker [mm] D	d	L	Cumulative packing [sets]
ZOK-1	WGE0AI4FGOF01	ZOKżt-1	WGE0AI4FGOF0Z	-	16, 25	12	4	40	50
ZOK-2	WGE0AI4FJOF01	ZOKżt-2	WGE0AI4FJOF0Z	16, 25, 35	35, 50, 70	18	6	50	50
ZOK-3	WGE0AI4INOF01	ZOKżt-3	WGE0AI4INOF0Z	50, 70, 95	95, 120, 150, 185	25	10	80	50
ZOK-4	WGE0AI4LOOF01	ZOKżt-4	WGE0AI4LOOF0Z	120, 150, 185	240	32	12	100	50
ZOK-5	WGE0AI4O0OF01	ZOKżt-5	WGE0AI4O0OF0Z	240	-	40	16	120	50

Heat shrink wall ducts - type TPM





Application **Meant for tight ducts through walls, ceilings, partitions.**
They guarantee water-proof and gas-proof insulation.
They are resistant to changing weather conditions.
Make good protection of cables and wires against mechanical abrasion, damages by rodents and insect penetrations.

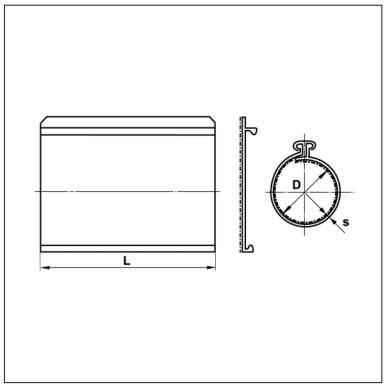
Design: They are made of heat shrink tube and galvanized steel spiral
They are supplied double layered - with adhesive.

Tye of wall ducts	Index	Dim. of heat shrink duct [mm] D	d	L	Dimensions of wall [mm] Max. wall thickness	Required diameter of wall hole
TPM 14 / 10	WKZ001	14	10	800	500	50
TPM 23 / 12	WKZ002	23	12	800	500	55
TPM 28 / 16	WKZ003	28	16	800	500	60
TPM 38 / 20	WKZ004	38	20	800	500	70
TPM 48 / 19	WKZ005	48	19	800	500	85
TPM 86 / 45	WKZ007	86	45	800	500	125

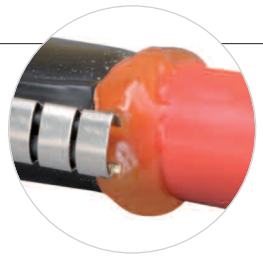
d - inner diameter after entire recovery.

Heat shrink repair wrap-arounds - type RM

Application **They are designed for installation on single cores of multicore cables. They are also used for making and repairing straight and branch power cable joints and for telecommunication cables.**
The wrap-arounds are supplied covered with thermosensitive paint (visible spots) which plays role of shrink temperature indicator protecting against local overheating.
The spots disappear when the shrink temperature is appropriate.







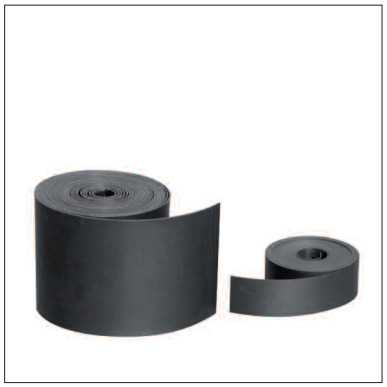
Tensile strength: minimum 13 MPa
Longitudinal shrink: not more than 10%
The unit dielectric strength: no less than 12kV/mm
Resistance to UV

Product name	Index for length 250 [mm]	500 [mm]	750 [mm]	1000 [mm]	1500 [mm]	Dimensions [mm] D	d	s
RM 52 / 14	TKR152011402	TKR252011402	TKR352011402	TKR452011402	TKR552011402	52	14	3,0
RM 62 / 22	TKR162012201	TKR262012201	TKR362012201	TKR462012201	TKR562012201	62	22	3,0
RM 92 / 30	TKR192013001	TKR292013001	TKR392013001	TKR492013001	TKR592013001	92	30	3,0
RM 122 / 38	TKR112223801	TKR212223801	TKR312223801	TKR412223801	TKR512223801	122	38	3,0
RM 160 / 55	TKR116025501	TKR216025501	TKR316025501	TKR416025501	TKR516025501	160	55	3,0
RM 210 / 55	TKR121025501	TKR221025501	TKR321025501	TKR421025501	TKR521025501	210	55	3,0

Heat shrink tapes - type T, TKT

Application **They are mainly applied for cable bundling, repair and insulation of damaged cables and wires and for protecting the cables against mechanical defects and corrosion.**

Advised for application for any constructional joints as a tight and durable protection.
Good adherence of applied adhesive layer to metals, wood, ceramics and plastics guarantees good insulation of ventilation ducts, jacket pipes, wires, power and telecommunication cables.
The conjunctions with TKT tape aren't prone to abrasion and corrosion.



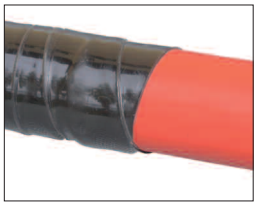
Tensile strength: minimum 13 MPa
Longitudinal shrink: not more than 10%
The unit dielectric strength: no less than 12kV/mm
Resistance to UV

Type of tape	Index	Length [m]	Width [mm]	Thickness [mm]
T-25 (15m)	TTHN0025151	15	25	0,9
T-50 (15m)	TTHN0050151	15	50	0,9
T-100 (15m)	TTHN0100151	15	100	0,9

Type of tape	Index	Length [m]	Width [mm]	Thickness [mm]	Thickness of adhesive layer [mm]
TKT-25(15m)	TTHNK025151	15	25	1,0	0,1
TKT-50(15m)	TTHNK050151	15	50	1,0	0,1
TKT-75(15m)	TTHNK075151	15	75	1,0	0,1
TKT-100(15m)	TTHNK100151	15	100	1,0	0,1
TKT-150(15m)	TTHNK150151	15	150	1,0	0,1

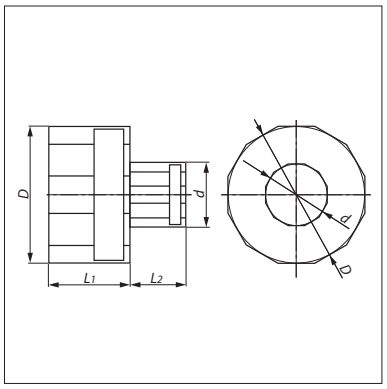
Example of use of tapes





Heat shrink end caps pipe - type „End-Cap"





Application **Designed for insulation of cable outlets from cable ducts and for insulation of pre-insulated pipes' ends.**
They seal and protect against moisture penetration.
They are applied in district heating industry, power engineering, construction engineering and telecommunication.
They are resistant to: UV radiation, corrosive agents, fungus and mildew.

Tensile strength: minimum 13 MPa
Longitudinal shrink: not more than 10%
The unit dielectric strength: no less than 12kV/mm

Type of end caps	Index	End cap dimension [mm] D	D_1	d	d_1	L_1	L_2	Cumulative packing [sets]
REC 50	TKE1K0600	60	30	45	10	70	50	10
REC 75	WKE1M0850	85	20	42	20	60	40	5
REC 90	WKE1M1050	105	27	45	27	60	40	5
REC 110	WKE1M1250	125	27	65	27	60	40	5
REC 125	WKE1M1400	140	35	76	35	60	40	5
REC 140	WKE1M1560	156	45	95	45	60	40	5
REC 160	WKE1M1780	178	58	105	58	80	50	5
REC 160(S)	TKE1K1700	170	92	60	20	80	40	5

Attention - dimensions D_1, d_1 diameter after entire shrink.

Example of use of end caps



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