



**МЕТАКЛЭЙ**

**METALEN K-21/K-31**

Silane crosslinkable composition based on EPR



# PROJECT SUMMARY METACLAY JSC

## GOALS



Organization of Russian polymer composite materials production from domestic raw materials.



Innovative products output at the level of the best world standards for domestic sales.

## PRODUCT MARKETS

- cable industry
- food industry
- pipe industry
- building industry

## PRODUCTION CAPACITY

METACLAY JSC has a set of European equipment for extrusion and compounding.

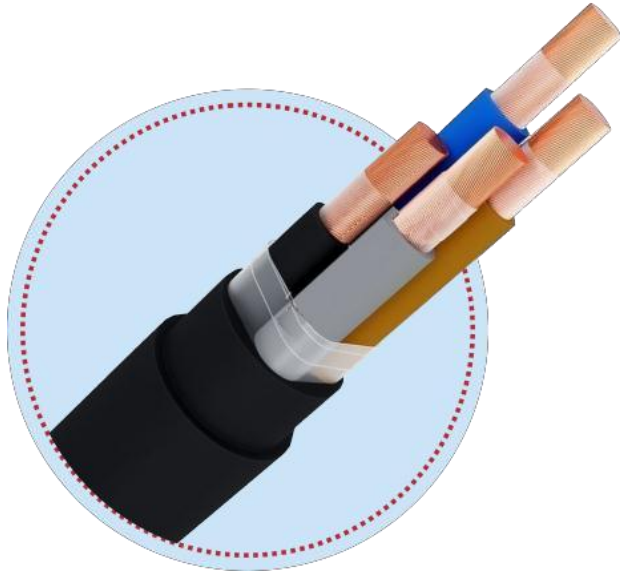
Production capacity is 90 thousand tons / year.

# METACLAY JSC HISTORY REFERENCE

- METACLAY JSC was established in 2009 in Karachev as a design company of UK RUSNANO LLC.
- In February 2012, production was launched with the RUSNANO top management participation. Production was started in two compounding shops with a 50 thousand tons products per year capacity.
- In 2013, Karachev received the status of a single-industry town by the METACLAY application to the Federal Fund for the Development of Single-Industry Towns. Participation in the Fund program gives new resources to small cities, when it is important for survival to develop not only industry, but also services, education, tourism and arranged urban environment. All of this is intended to attract young people to single-industry towns.
- In 2015, RUSNANO JSC ceded its share to an enterprise from Gazprom PJSC structure in the METACLAY project.
- In 2016, under the project with the Ministry of Industry and Trade of the Russian Federation represented by the Development Industry Fund, a new workshop with the "Megacompaunder" unit was opened, which allowed to increase enterprise capacity up to 90 thousand tons per year.
- In 2017, in the year of ecology, METACLAY JSC had successfully presented biodegradable composite material for the gas pipe plugs production in Gazprom PJSC. Today our company supplies Gazprom PJSC with several innovative products and technologies for gas pipelines construction.
- In 2018, METACLAY entered the market with a Koutmet AFM product for surfaces protection of maritime transport and port facilities from moisture and corrosion.

# METALEN K-21/K-31

Silane crosslinkable composition based on EPR



Use of this composition will optimize the cables production and expand the product line of previously unproduceable cables.

**Unpainted composition, chemically modified with silane.** Supplied with crosslinking catalysts in METAL K-51 or K-501 aqueous medium. Catalysts ensure the preservation of finished product properties during operation due to the composition ability to resist thermal aging. Insulating composition provides easy cable laying in any conditions due to the sheath material flexibility.



Cables with crosslinked EPR compound insulation can be laid at temperatures down to  $-40^{\circ}\text{C}$  and operated at temperatures down to  $-60^{\circ}\text{C}$  due to the material increased frost resistance.

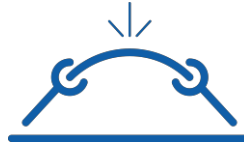
# ADVANTAGES OF METALEN K-21/K-31 COMPOUND



impact strength



abrasion resistance



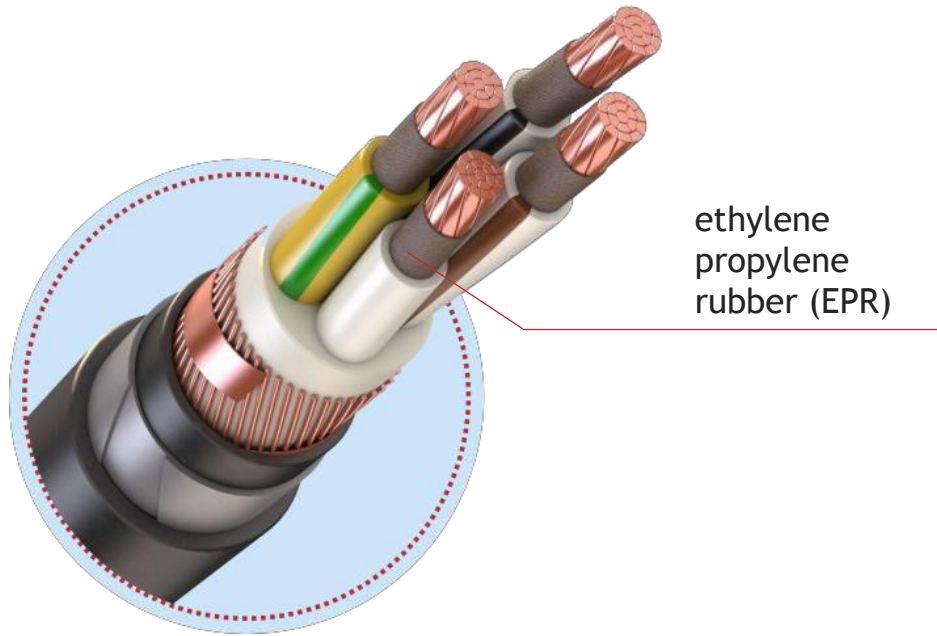
mechanical stress resistance



stretching, compression and  
bending resistance

- Can be recycled at any extruder, at any speed and cross-sections.
- Thermal deformation test is  $> 250\text{ C}^0$ . Tests are held with the cable insulation based on EPR and K-501 catalyst.
- Increased flexibility and wear resistance.
- Does not accumulate static electricity during operation.
- Cost effective in comparison with rubber due to much lower density, lack of waste and an innovative approach.
- Low-smoke compound that does not contain toxic elements and halogens.

# APPLICATION OF METALEN K-21/K-31 COMPOUND



**Movable power cable for harsh environments with increased requirements for explosion-fire safety. Designed for circuits with voltages up to 2,000 volts. Designed for equipment such as:**

- excavation combined machine for long backwalls;
- continuous mountain combined machine;
- forklifts;
- rock-drilling machine;
- conveyors;
- pumps;
- mobile equipment that requires a ground control wire and a metal shield.

Use of METALEN EPR compositions combined with catalysts is provided in cases where wear resistance, long bending time and a high degree of flexibility is required.

# METALEN K-21 PROPERTIES

Combined with METALEN K-501 catalyst

Item	Unit	Value	Test method
<b>Melt Flow Index (190°C/5kg)</b>	g/10min	1,0-5,0	GOST 11645
<b>Shore A hardness</b>	y.e.	82	GOST 24621
<b>Density</b>	г/см <sup>3</sup>	0,9	GOST 15139
<b>Tensile stress at break, min</b>	МПа	13,0	GOST R MEK 60811
<b>Elongation at break, min</b>	%	600	
<b>Thermal ageing: 136°C, 168 hours (7 days)</b> <b>Tensile stress at break</b> <b>Elongation at break</b>	%	+11 -3	
<b>Thermal ageing: 150°C, 168 hours (7 days)</b> <b>Tensile stress at break</b> <b>Elongation at break</b>	%	+26 +1	
<b>Thermal deformation test, 250°C</b>	%	70/0	

METALEN K-21 combined with METALEN K-51 / METALEN K-501 catalyst ensures the preservation of finished product properties during operation due to the composition ability to resist thermal aging.

# METALEN K-31 PROPERTIES

Combined with METALEN K-501 catalyst

Item	Unit	Value	Test method
Melt Flow Index (190°C/5kg)	г/10мин	1,0-5,0	GOST 11645
MFI variation in a batch, max	%	±10	GOST 16337
Shore A hardness	с.у.	90±2	GOST 24621
Density	g/sm <sup>3</sup>	0,915±0,5	GOST 15139
Volume resistivity	ohm x m	>1x10 <sup>i 6</sup>	GOST 50499
Tensile stress at break, min	МПа	18,0	GOST IEC60811-1-1
Elongation at break, min	%	600	
<b>Thermal ageing at (150±3) C° during 168 hours:</b>			
Change in tensile stress at break	МПа	±30	GOST IEC60811-1-2
Change in elongation at break	%	±30	

METALEN K-31 combined with METALEN K-51 / METALEN K-501 catalyst ensures the preservation of finished product properties during operation due to the composition ability to resist thermal aging.



# CONTACTS

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## **Common Use Center (Laboratory)**

### **METACLAY Research&Development LLC**

Skolkovo innovative center

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