Scientific and production enterprise
“ApATeCh – Applied advanced technologies” ltd
www.apatech.ru, apatech@apatech.ru

APATECH PRODUCT CATALOGUE FOR TRANSPORT INFRASTRUCTURE

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APATECH INTERNATIONAL AWARDS AND ACHIEVEMENTS

"JEC Awards – 2002" (Paris, France)

In 2002 году ApATeCh won its first JEC Innovation Program Award for composite railway insulating joint

First Russian composite bridge, 2004

In 2004 ApATeCh produced the first Russian bridge all elements of which – load-bearing beams, handrailing and deck were made of glass fiber

"JEC Awards – 2007" (Paris, France)

In 2007, for the first time in history of "JEC Awards" contest,"ApATeCh" won its second JEC Innovation Proramme Award for the composite water removal channel

In 2011 «ApATeCh» company became a finalist of JEC Awards at the World Fair in Paris for the introduction of sea walls made of composite materials.

In 2014 "ApATeCh" company won the Grand Prix at the World Fair JEC AWARDS 2014 in Paris for the creation of a hopper car body made of composite materials.

Andrey Ushakov

General Director of "ApATeCh" ltd

Scientific and production enterprise "ApATeCh – APPLIED ADVANCED TECHNOLOGY COMPANY", LTD was founded in 1991.

The main area of business of "ApATeCh" is transport engineering: aircraft construction, automobile production, railway and urban transport and infrastructure of highways and municipal services. Since its foundation ApATeCh follows the following fundamental principles of its business:

- Development and management of production including mass production and products that haven`t been produced in Russia before;
- Development and mass introduction of composite structures by replacing the structures made of "traditional" materials in the most "conservative" branches : railway and city transport, infrastructure of transport and municipal services, highway and bridge construction at their reorganization and technical re-equipment stage;
- Profit markup by exploiting objective competitive advantages of composite materials on the most "capacious" markets: transport, city infrastructure, power engineering and communication;
- Maintenance and development of the Russian science-technical level in areas of design, analyses and testing, technologies and management of composite production particularly for defense industry.

The main periods of development and achievements of ApATeCh employees, forming the ApATeCh basis, are connected with introduction of new solutions into railway infrastructure.

In the period between 1993 and 1995 ApATeCh produced a composite railway insulating fishplate and started up mass production through the whole railway network of Russia, Baltic States and Kazakhstan where 500000 of insulating joints are currently in use.

In 1998 ApATeCh developed a composite water-removal channel which helped to considerably reduce installation and maintenance costs and could be installed in hard-to-reach places where use of reinforced concrete water-removal channels was impossible. More than 100 km of composite water-removal channels produced by "ApATeCh" are currently used on the Russian railways.

In 2004 ApATeCh produced the first composite bridge and started up batch production and certification by Russian standards for composite bridge structures.

ApATeCh achievements in these areas were recognized as the company twice received the JEC Award in the nomination "Surface transport" at the International JEC Exposition in 2002 and 2007 which is annually held in Paris, France

Best regards,

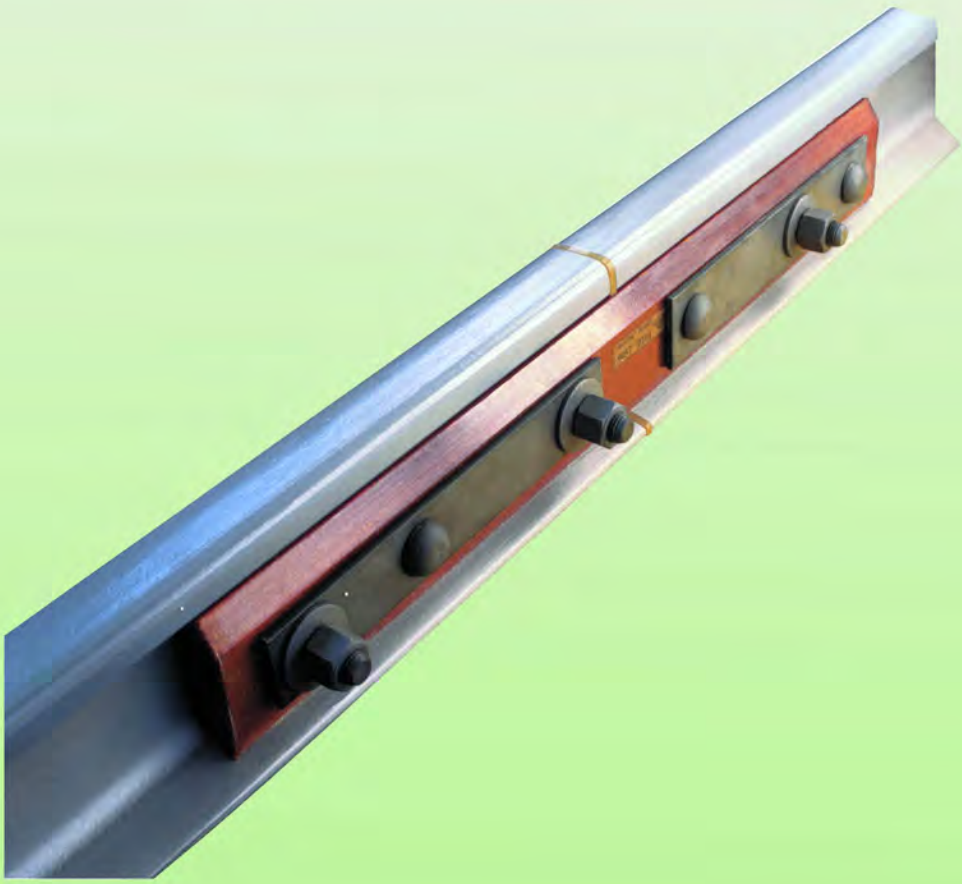
General Director SPE "ApATeCh" ltd **Ushakov A.E.**

INSULATING JOINTS AND RAILWAY FISHPLATES

"JEC Award – 2004"
WINNER

COMPOSITE FISHPLATES

For railway insulating joints



Quality management system of composite products for railway transport meets the requirements of the State Standard GOST P ИСО 9001-2001

РЕГИСТР ИСО 9001

CERTIFICATION SYSTEM GOST R

REGISTER OF QUALITY SYSTEMS

CERTIFICATION BODY ON QUALITY MANAGEMENT SYSTEMS
VNIIS-CERT "VNIIS" OJSC
Российская Федерация, 123557, Москва, Электрический пер., дом 3/10, стр. 1
№ РОСС RU.0001.13ИС11

К № 26590

CERTIFICATE OF CONFORMANCE

Edition 1. QMS has been certified scince February 2014

issued to the "Science and technology testing center ApATeCh-Dubna" Co ltd.
("STTC ApATeCh-Dubna" Co ltd.)
Russian Federation, 141982, Moscow Region, Dubna,
Universitetskaya str., 11, bld. 16

THIS IS TO CERTIFY THAT
the quality management system applied to

- research and development, design and production of composite products for the branches of railway and highway transport, aerospace, construction including pedestrian and highway bridges and overpasses, energy, communication and their infrastructure including noise barriers, supports, coast protection lines;
- strength analysis, development of test methods for determination of mechanical and physical-chemical properties and tests of composite structures and structural elements;
- mathematical simulation, development and implementation of new production technologies of composite materials and composite products including vacuum infusion, pultrusion, injection moulding, press moulding, autoclave moulding, hand layup, winding, prepreg production;
- development of the normative and technical documentation for composite materials and composite products

MEETS THE REQUIREMENTS OF
GOST ISO 9001 – 2011 (ISO 9001:2008)

Registration No. № РОСС RU.ИС11.К00981

Registration date: 10.02.2014 **Срок Valid till** 10.02.2017

Руководитель органа по сертификации систем менеджмента качества В.Г. Версан

Председатель комиссии С.М. Палей

Учетный номер Регистра систем качества № 21694

SYSTEM OF VOLUNTARY CERTIFICATION
ON THE RAILWAY TRANSPORT OF THE RUSSIAN FEDERATION
FEDERAL AGENCY FOR RAILWAY TRANSPORT

№ 010097

Federal budgetary institution
"Register of certification
on the federal railway transport"
(ФБУ «РС ФЖТ»)

Certificate of conformance

№ ССЖТ RU.ОО04.И.00199

Expiry date: June 14, 2015

ISSUED

to the Limited liability company
"Production enterprise
"ApATeCh-Dubna"

(Zhukovskogo str., 2, Dubna, Moscow Region, 141980)

THIS IS TO CERTIFY THAT
QUALITY MANAGEMENT SYSTEM APPLIED TO THE PRODUCTS FOR RAILWAY TRANSPORT MADE FROM COMPOSITE MATERIALS

MEETS THE REQUIREMENTS OF GOST R ISO 9001-2008
(except par. 7.3)

Руководитель Регистра сертификации Э.Н. Гунченко

3-я Мытищинская ул., 10, Москва, 107996, тел. 646-27-15, факс 687-66-36

РОССИЙСКАЯ ФЕДЕРАЦИЯ

PATENT

for an invention

№ 2278196

HIGH STRENGTH INSULATING JOINT

Patent holder(s): ***Limited liability company Scientific and production enterprise "APPLIED ADVANCED TECHNOLOGIES - ApATeCh" (RU)***

Author(s): ***see on the reverse side***

Application No. **2004115420**

Priority of invention **24 May 2004**

Registered in the State Invention Register of the Russian Federation on **June 20, 2006**

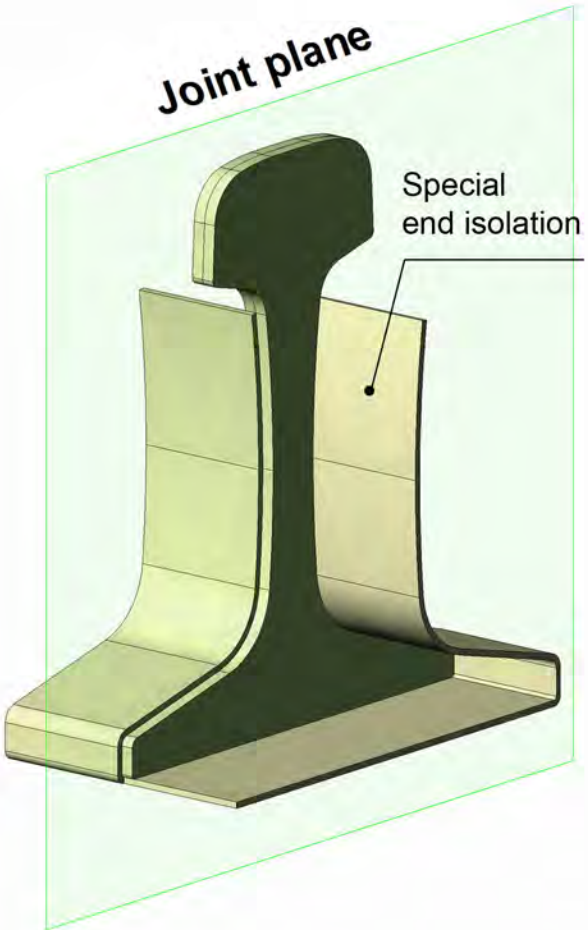
Patent expiry date **24 May 2024**

Head of the Federal Intellectual Property, Patent and Trademark Service

Simonov B.P.

JOINT GASKET ПС-65 ЦП 187-А

Joint gasket protects the insulating joint from shorting with alien metal objects on the rail foot and web.




РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ

НА ИЗОБРЕТЕНИЕ

№ 2289646

РЕЛЬСОВОЕ ИЗОЛИРУЮЩЕЕ СТЫКОВОЕ СОЕДИНЕНИЕ

Патентообладатель(ли): *Общество с ограниченной ответственностью Научно-производственное предприятие "ПРИКЛАДНЫЕ ПЕРСПЕКТИВНЫЕ ТЕХНОЛОГИИ-АпАТэК" (RU)*

Автор(ы): *см. на обороте*

Заявка № 2005115904

Приоритет изобретения 26 мая 2005 г.

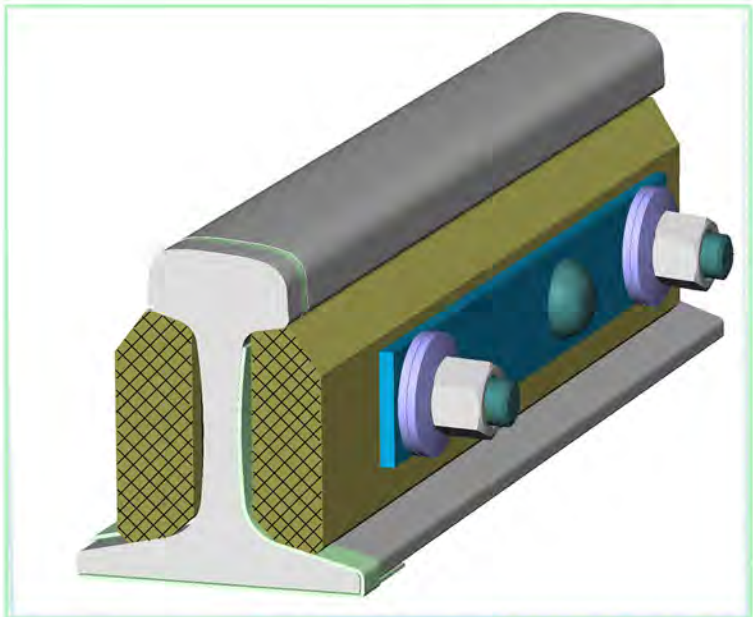
Зарегистрировано в Государственном реестре изобретений Российской Федерации 20 декабря 2006 г.

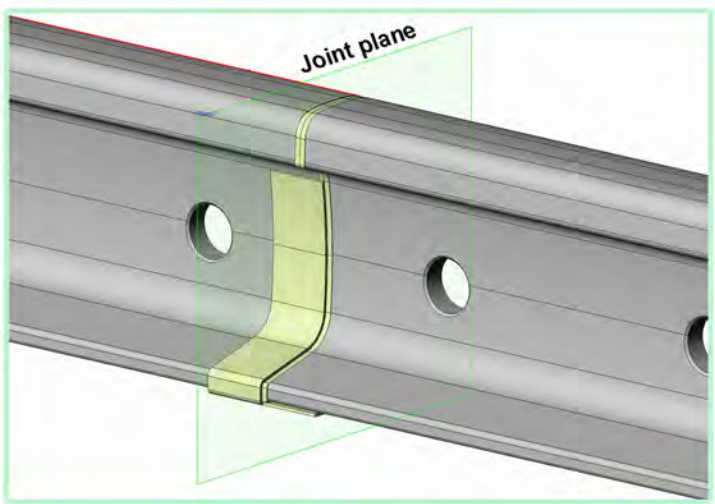
Срок действия патента истекает 26 мая 2025 г.

Руководитель Федеральной службы по интеллектуальной собственности, патентам и товарным знакам

Б.П. Симонов

Patent for an invention No. 2289646
RAIL INSULATING JOINT CONNECTION





“ApATeCh P-65ВП” — set of insulating fishplates P-65ВП ЦП 499-04 ОСТ 32.169-2000

Designation:

For insulating joints on the levelling flights of long-welded rails and in place of rail joining to the jointed rail track with P65 and P75 rails on the wooden or reinforced concrete sleepers and beams.

Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data:

Capacity during life cycle, mln. tons gross 500
Electrical resistance, kOm 100
Axial load from train suspension, not less than kN 350
Axial tension not less than, kN 1800
Service life, years 10
Weight, kg 8.7
Climatic conditions according to GOST 15150-69

Standard set includes:

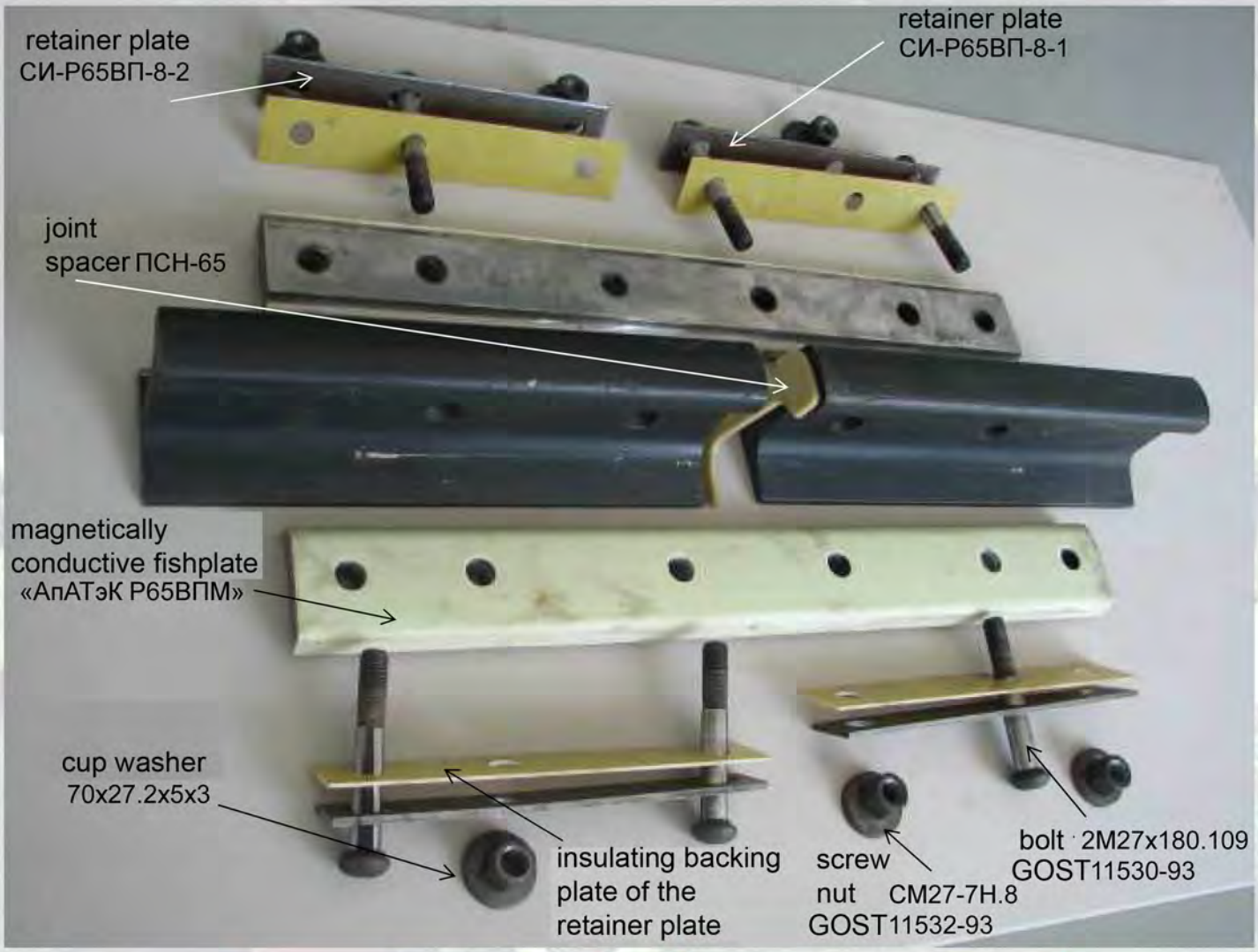
- Insulating fishplates P65 ВП ЦП 499-04 ОСТ 32.169-2000, pcs. 2
- Insulating fishplates ПС-65 ЦП 187-А, pcs. 2
- Stop plate СИ-65ВП-8-1 ЦП 503, pcs. 2
- Stop plate СИ-65ВП-8-2 ЦП 504, pcs. 2
- Bolt M27 x 180 ОП 525, pcs. 6
- Screw nut СМ27-7Н.8 GOST 11532-93, pcs.....6
- Spring disk 70x27,2x5x3 ЦП 375, pcs.....12

Reference designation when ordering:
“Fishplate P65 ВП ЦП 499-04” OST 32.169-2000

SET FOR THE MODULAR INSULATING JOINT WITH MAGNETICALLY CONDUCTIVE FISHPLATES ЦП 554.100 СБ

Designation:

For insulating joints in spans of continuous welded rail track and in the zones of rail joining to the jointed track of mainline railways with P65 and P 75 rails on wooden or ferroconcrete sleepers and bars.



ОТКРЫТОЕ АКЦИОНЕРНОЕ ОБЩЕСТВО
«РОССИЙСКИЕ ЖЕЛЕЗНЫЕ ДОРОГИ»

СОГЛАСОВАНО
Главный инженер Управления пути и сооружений Центральной дирекции инфраструктуры – филиала ОАО «РЖД»
_____ В.М. Ермаков
«16» 05 2013

УТВЕРЖДАЮ
Директор Проектно-технологическо-конструкторского бюро по пути и путевым машинам – филиала ОАО «РЖД»
_____ С.А.Рябчук
«___» _____ 2013

НАКЛАДКА МАГНИТОПРОВОДНАЯ «АпАТэК Р65ВПМ»
ТЕХНИЧЕСКИЕ УСЛОВИЯ
ЦП 554.010 ТУ

Срок введения: с 15.11.2008 Срок действия: без ограничения

Генеральный директор
ЦНИИ АпАТэК
_____ А.Е. Ушаков
«___» _____ 2013

КОПИЯ ВЕРНА УЧТЕНА

РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ
НА ПОЛЕЗНУЮ МОДЕЛЬ
№ 134176

СТЫК РЕЛЬСОВЫЙ ИЗОЛИРУЮЩИЙ С МАГНИТОПРОВОДНЫМИ НАКЛАДКАМИ

Патентообладатель(ли): *Общество с ограниченной ответственностью Научно-производственное предприятие "Прикладные перспективные технологии - АпАТэК" (RU)*

Автор(ы): *см. на обороте*

Заявка № 2013135801
Приоритет полезной модели 31 июля 2013 г.
Зарегистрировано в Государственном реестре полезных моделей Российской Федерации 10 ноября 2013 г.
Срок действия патента истекает 31 июля 2023 г.

Руководитель Федеральной службы по интеллектуальной собственности
Б.П. Симонов

SET FOR THE MODULAR INSULATING JOINT WITH MAGNETICALLY CONDUCTIVE FISHPLATES ЦП 554.100 СБ

Technical data:

Capacity during life cycle, mln. tons gross.....500
Electrical resistance, kOm.....1
Axial load from the rolling stock, not less than, kN.....350
Axial tension, not less than, kN 1800
Service life, years.....10
Weight, kg.....32
Climatic conditions .....according to GOST 15150-69

Standard set:

- Magnetically conductive fishplate “АрАТеСhР65ВПМ”, ЦП554.110, pcs.....2
- Insulating pad of the stop plate, ЦП554.002, pcs.....4
- Spring washer 70x27,2x5x3, ЦП 375, pcs.....12
- Stop plate СИ-65ВП-8-1, ЦП 503,pcs. 2
- Stop plate СИ-Р65ВП-8-2, ЦП504,pcs.....2
- Joint spacer ПСН-65, ЦП 507, pcs.....1
- Bolt 2М27х180.109 ГОСТ 11530-93, pcs.....6
- Screw nut СМ27-7Н.8 ГОСТ 11532-93, pcs.....6

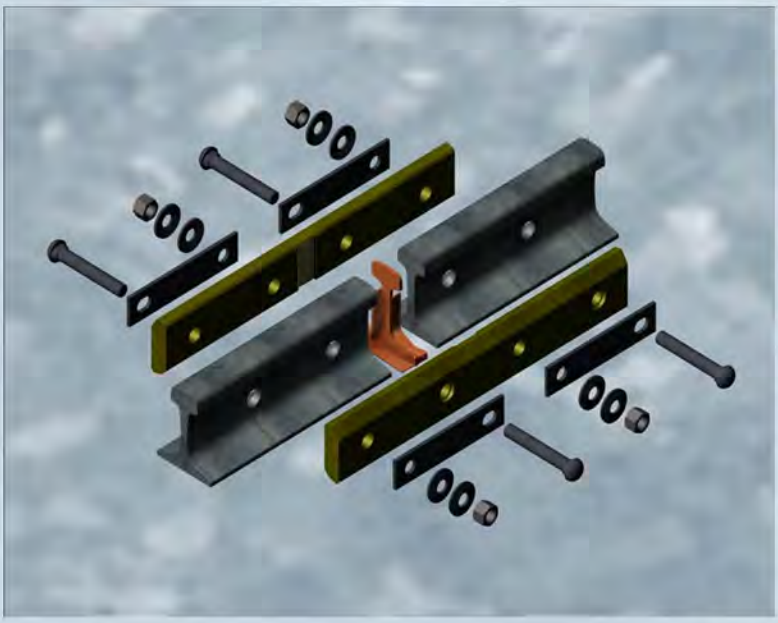
Reference designation when ordering:

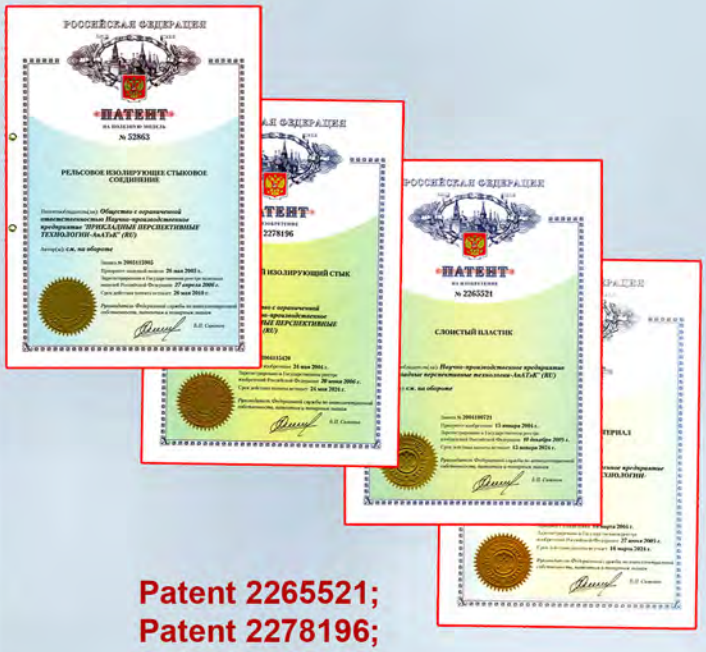
“Magnetically conductive fishplate Р65ВПМ ЦП 554.010ТУ”

“ApATeCh P-65” — set of insulating fishplates ЦП 450-04 ОСТ 32.169-2000

Designation:

For insulating joints of jointed tracks of the main railways, turnouts with the P65-type rails on the wooden or reinforced concrete sleepers and beams.





Patent 2265521;
Patent 2278196;
Patent 2255097;
Patent 2285766.

Technical data:

Capacity during life cycle, mln. tons gross 500
Electrical resistance, kOm 100
Axial load from train suspension, kN 270
Service life, years 10
Weight, kg 5,8
Climatic conditions acc. to GOST 15150-69

Standard set includes:

- Insulating fishplates ЦП 450-04 ОСТ 32.169-2000, pcs..... .2
- joint gasket ПС-65 ЦП 187-А, pcs. 1
- Stop plate СИ-65-8 ЦП 479, pcs. 4

Reference designation when ordering:
“Fishplate P65 ЦП 450-04 ОСТ 32.169-2000”

“ApATeCh P-50” — set of insulating fishplates P-50 ЦП 481 OCT 32.169-2000

Designation:

For insulating joints of jointed tracks of the main railways, turnouts with the P50 rails on the wooden or reinforced concrete sleepers and beams

Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data:

Capacity during life cycle, mln. tons gross 500
Electrical resistance, kOm 100
Axial load from train suspension not less than, kN 250
Service life, years 10
Weight, kg 5,8
Climatic conditions acc. to GOST 15150-69

Standard set includes:

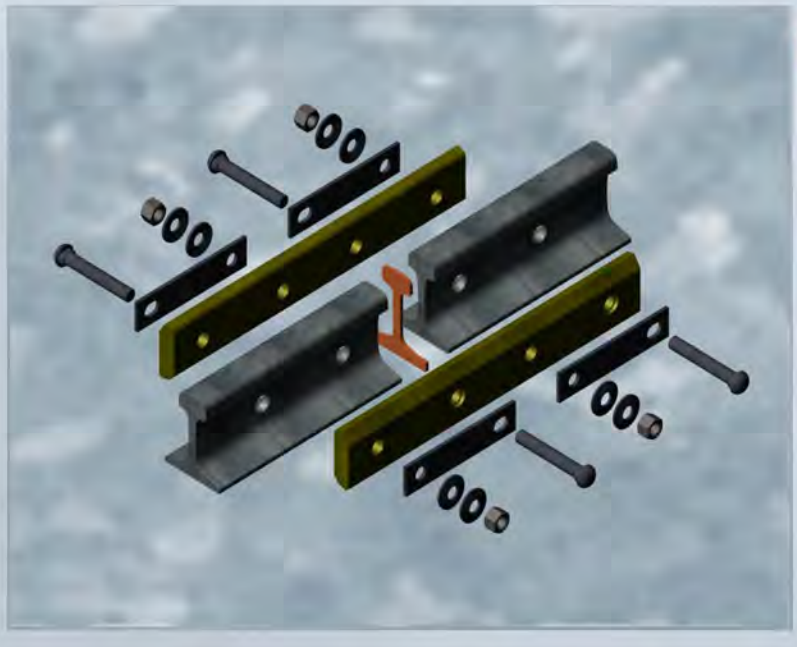
- Insulating fishplates P50 ЦП 481 OCT 32.169-2000, pcs. 2
- joint gasket ПСН-50 ЦП 508, pcs. 1
- Stop plate СИ-50-1 ЦП 222, pcs. 2
- Stop plate СИ-50-2 ЦП 223, pcs. 2

Reference designation when ordering:
“Fishplate P65 ЦП 481” OCT 32.169-2000

“ApATeCh UIC 60/4” — set of insulating fishplates NIJ.0114.200

Designation:

For insulating joints of jointed tracks, turnouts of the main railways with UIC60-type rails on the wooden or reinforced concrete sleepers and beams.



Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data:

Capacity during life cycle, mln. tons gross 500
Electrical resistance, kOm 100
Axial load from train suspension, kN 270
Service life, years 10
Weight, kg 5,6
Climatic conditions acc. to GOST15150-69

Standard set includes:

- Insulating fishplates “ApATeCh UIC 60/4” NIJ.0112.002, pcs..... 2
- joint gasket «ИТ-UIC60» NIJ.0114.001, pcs. 2
- Stop plate СИ-65-8 ЦП 479 pcs. 4

Reference designation when ordering:
“Fishplate “ApATeCh UIC 60/4” NIJ.0112.002”

“ApATeCh UIC 60/6” — set of insulating fishplates NIJ.0114.100

Designation:

For insulating joints of jointed tracks, in the levelling flights of long-welded rails and in place of rail joining to the jointed rail track with UIC60-type rails on the wooden or reinforced concrete sleepers and beams.

Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data:

Capacity during life cycle, mln. tons gross 500
Electrical resistance, kOm 100
Axial load from train suspension, kN 350
Axial tension not less than, kN 1800
Service life, years 10
Weight, kg 8.4
Climatic conditions acc. to GOST 15150-69

Standard set includes:

- Insulating fishplates “ApATeCh UIC 60 ВП” NIJ.0114.005, pcs. 2
- joint gasket «ИТ-UIC60» NIJ.0114.001, pcs. 1
- Stop plate СИ-65ВП-8-1 ЦП 503, pcs. 2
- Stop plate СИ-65ВП-8-2 ЦП 504, pcs. 2
- Bolt 2М27-8gх180.109.40Х GOST 11530-93, pcs. 6
- Screw nut СМ27-7Н.5 GOST 11532-93, pcs. 6
- Spring disk 70х27,2х5х3 ЦП 375, pcs. 12

Reference designation when ordering:
“Fishplate “ApATeCh UIC 60/6” NIJ.0114.004”

“ApATeCh UIC 60 ВП” — set of insulating fishplates NIJ.0114.200

Designation:

For insulating joints of jointed tracks, in the levelling flights of long-welded rails and in place of rail joining to the jointed rail track with UIC60-type rails on the wooden or reinforced concrete sleepers and beams.

Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data

Capacity during life cycle, mln. tons gross 500
Electrical resistance, kOm 100
Axial load from train suspension not less than, kN 350
Axial tension not less than, kN 1800
Service life, years 10
Weight, kg 8.4
Climatic conditions acc. to GOST 15150-69

Standard set includes:

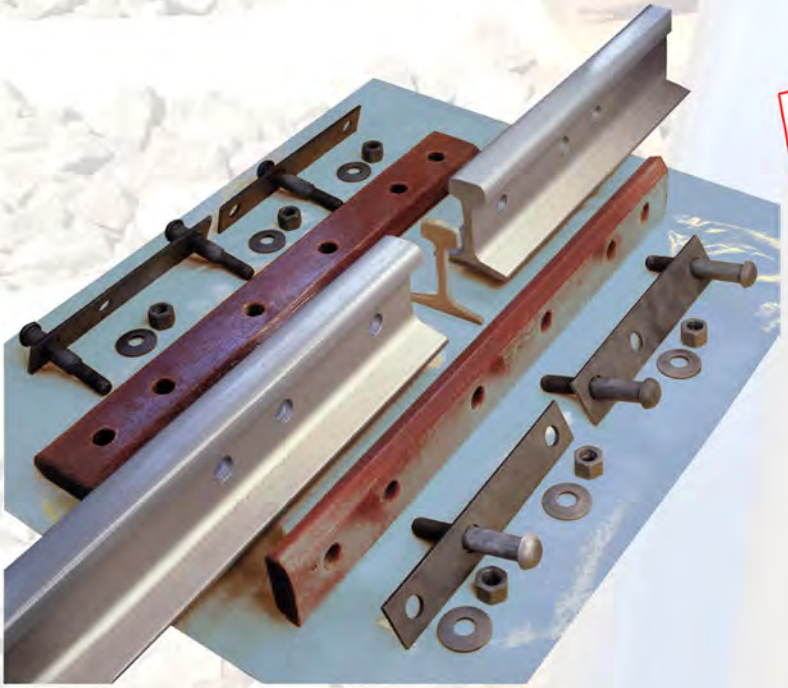
- Insulating fishplates “ApATeCh UIC 60 ВП” NIJ.0114.005, pcs. 2
- joint gasket «ИТ-UIC60» NIJ.0114.001, pcs. 1
- Stop plate СИ-65ВП-8-1 ЦП 503, pcs. 2
- Stop plate СИ-65ВП-8-2 ЦП 504, pcs. 2
- Bolt M27 x 180 ОП 525, pcs. 6
- Screw СМ27-7Н.8 ГОСТ 11532-93, pcs. 6
- Spring disk 70x27,2x5x3 ЦП 375, pcs. 12
-

Reference designation when ordering:
“Fishplate “ApATeCh UIC 60 ВП” NIJ.0114.005

“ApATeCh S60 ВП” — set of insulating fishplates NIJ.0140.000

Designation:

For insulating joints of jointed tracks, in the levelling flights of long-welded rails and in place of rail joining to the jointed rail track with S60-type rails on the wooden or reinforced concrete sleepers and beams.



Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data:

Capacity during life cycle, mln. tons gross	500
Electrical resistance, kOm	100
Axial load from train suspension not less than, kN	350
Axial tension not less than, kN	1800
Service life, years	10
Weight, kg	8.4

Climatic conditions acc. to GOST 15150-69

Standard set includes:

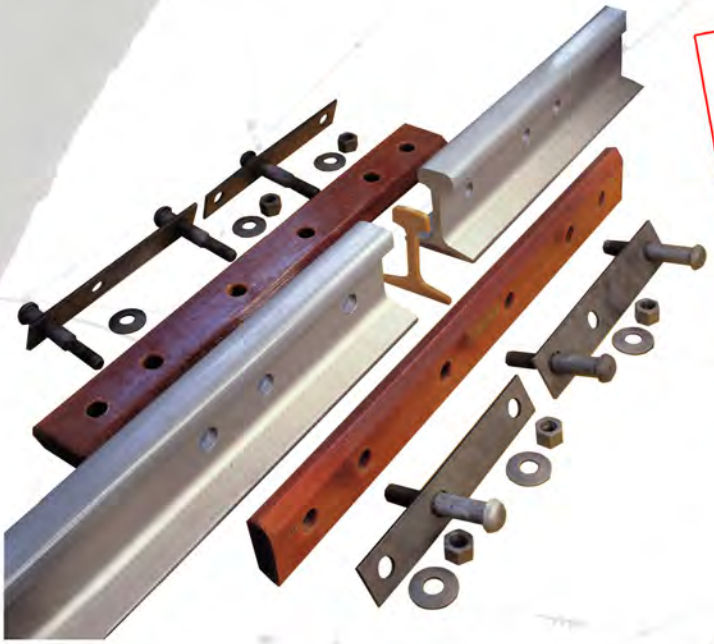
- Insulating fishplates «ApATeCh S60 ВП» NIJ.0140.002, pcs. 2
- joint gasket «ИТ-S60» NIJ.0140.001, pcs. 1
- Stop plate СИ- S60 -8-1 NIJ.0140.003, pcs. 2
- Stop plate СИ- S60 -8-2 NIJ.0140.004, pcs. 2
- Bolt M27 x 180 ОП 525, pcs. 6
- Screw СМ27-7Н.8 ГОСТ 11532-93, pcs. 6
- Spring disk 70x27,2x5x3 ЦП 375, pcs. 12
-

Reference designation when ordering:
«Fishplate «АпАТэК S60 ВП» NIJ.0140.002

“ApATeCh S50” — set of insulating fishplates NIJ.0145.000

Designation:

For insulating joints of jointed tracks of the main railways, turnouts with S50-type rails on the wooden or reinforced concrete sleepers and beams.



Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data:

Capacity during life cycle, mln. tons gross	500
Electrical resistance, kOm	100
Axial load from train suspension not less than, kN	250
Service life, years	10
Weight, kg	5,8

Climatic conditions acc. to GOST15150-69

Standard set includes:

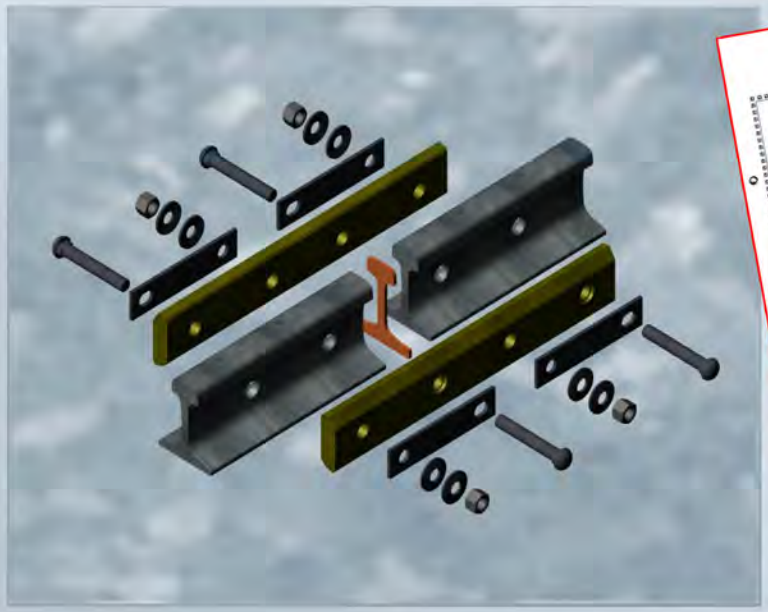
- Insulating fishplates «ApATeCh S50» NIJ.0145.002, pcs. 2
- joint gasket «ИТ-S50» NIJ.0140.001, pcs. 1

Reference designation when ordering:
«Fishplate «АпАТэК S50» NIJ.0145.002»

“ApATeCh 30кг” — set of insulating fishplates NIJ.0155.010

Designation:

For insulating joints of jointed tracks of the main railways, turnouts with 30 кг rails on the wooden or reinforced concrete sleepers and beams.



Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data:

Electrical resistance, kOm 100
Service life, years 10
Weight, kg 1,87
Climatic conditions acc. to GOST15150-69

Standard set includes:

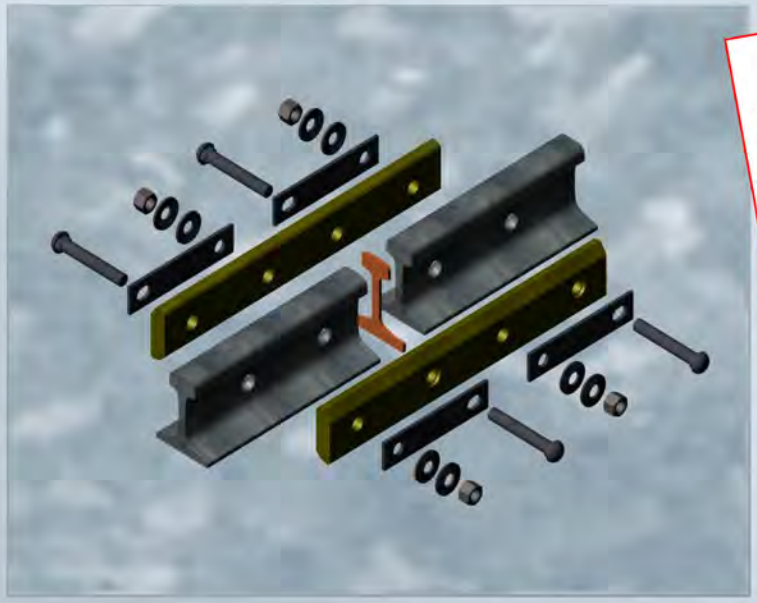
- Insulating fishplates «ApATeCh 30кг» NIJ.0155.012, pcs. 2
- joint gasket ИТ-30 NIJ.015.001, pcs. 1
- Stop plate СИ- 30-6-1, pcs. 2
- Stop plate СИ-30-6-2, pcs. 2

Reference designation when ordering:
«Fishplate «АпАТэК 30кг » NIJ.0155.012»

“ApATeCh 36кг” — set of insulating fishplates NIJ.0156.110

Designation:

For insulating joints of jointed tracks of the main railways, turnouts with 36 кг rails on the wooden or reinforced concrete sleepers and beams.



Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data:

Capacity during life cycle, mln. tons gross	500
Electrical resistance, kOm	100
Axial load from train suspension, kN	270
Service life, years	10
Weight, kg	2,50

Climatic conditions acc. to GOST15150-69

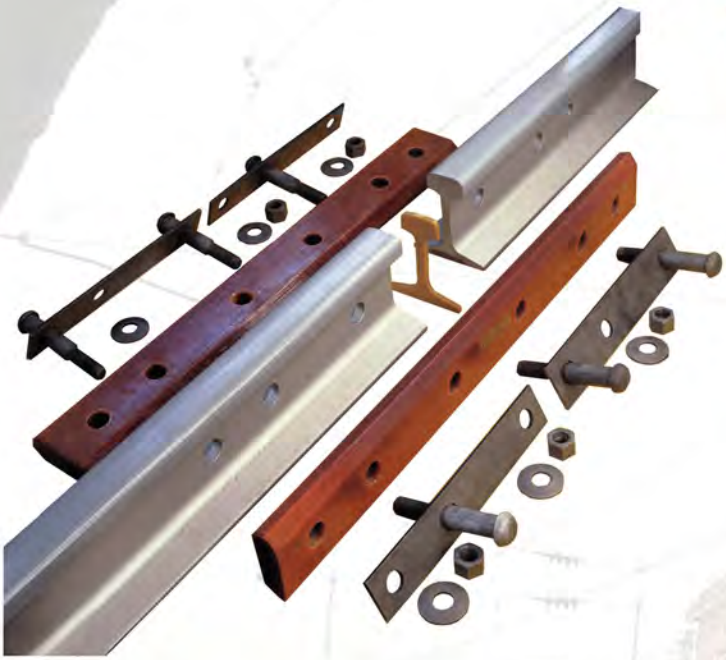
Standard set includes:

- Insulating fishplates «ApATeCh 36кг» NIJ.0156.112, pcs. 2
- joint gasket ИТ-36 NIJ.0156.001, pcs. 1
- Stop plate СИ- 30-6-1 NIJ.0155.004, pcs. 2
- Stop plate СИ-30-6-2 NIJ.0155.005, pcs. 2

Reference designation when ordering:
«Fishplate «АпАТэК 36кг » NIJ.0156.112»

“ApATeCh P65/6 MAV-TERMIT” – set of insulating fishplates NIJ.0162.009

Designation:
For insulating joints in the levelling flights of long-welded rails and in place of rail joining to the jointed rail track with P65 and P75 rails on the wooden or reinforced concrete sleepers and beams.



Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data:

Capacity during life cycle, mln. tons gross 500
Electrical resistance, kOm 100
Axial load from train suspension not less than, kN 250
Service life, years 10
Weight, kg 7,8
Climatic conditions acc. to GOST15150-69

Standard set includes:

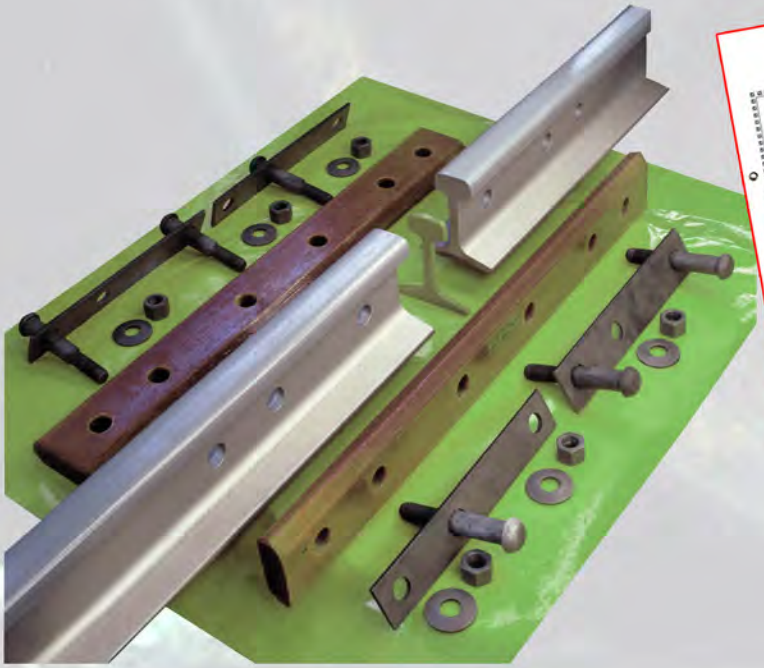
- Insulating fishplates «ApATeCh P65/6 MAV-TERMIT» NIJ.0162.009, pcs. 2
- joint gasket «ИТ-S50» NIJ.0140.001, pcs. 1

Reference designation when ordering:
«Fishplate «АпАТэК P65/6 MAV-TERMIT» NIJ.0162.009»

“ApATeCh UIC54/6 MAV-TERMIT” – set of insulating fishplates NIJ.0162.005

Designation:

For insulating joints of jointed tracks of the main railways, turnouts with P50 rails on the wooden or reinforced concrete sleepers and beams.



Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data:

Capacity during life cycle, mln. tons gross	500
Electrical resistance, kOm	100
Axial load from train suspension not less than, kN	350
Axial tension not less than, kN	1800
Service life, years	10
Weight, kg	6,42

Climatic conditions acc. to GOST15150-69

Standard set includes:

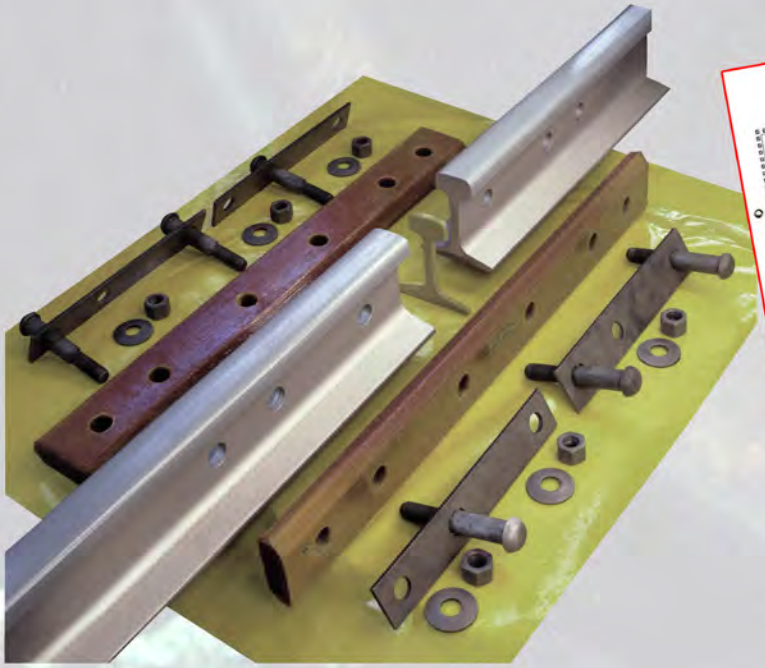
- Insulating fishplates “ApATeCh UIC54/6 MAV-TERMIT”, pcs. 2
- joint gasket ПС-65 ЦП 187-А, pcs. 2
- Stop plate СИ- 65ВП -8-1 ЦП 503, pcs. 2
- Stop plate СИ- 65ВП -8-2 ЦП 504, pcs. 2
- Bolt М27 х 180 ОП 525, pcs. 6
- Screw СМ27-7Н.8 ГОСТ 11532-93, pcs. 6
- Spring disk 70х27,2х5х3 ЦП 375, pcs. 12

Reference designation when ordering:
“Fishplate “ApATeCh UIC54/6 MAV-TERMIT”

“ApATeCh S49/6 MAV-TERMIT” – set of insulating fishplates NIJ.0162.003

Designation:

For insulating joints of jointed tracks of the main railways, turnouts with S49 rails on the wooden or reinforced concrete sleepers and beams.



Patent 2265521;
Patent 2278196;
Patent 2255097

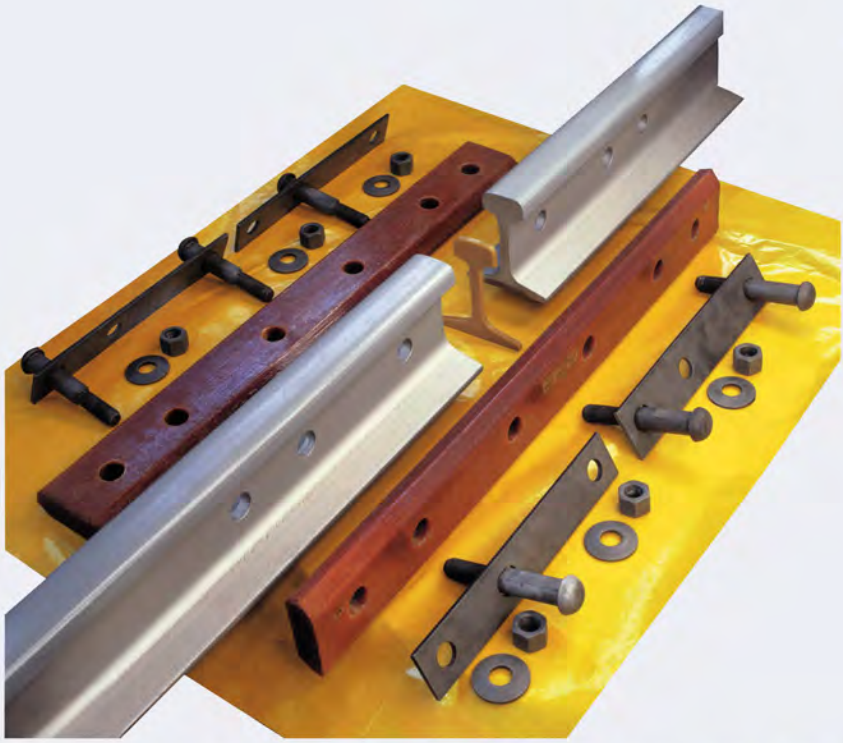
Technical data:

Capacity during life cycle, mln. tons gross	500
Electrical resistance, kOm	100
Axial load from train suspension not less than, kN	250
Service life, years	10
Weight, kg	5,8
Climatic conditions	acc. to GOST15150-69

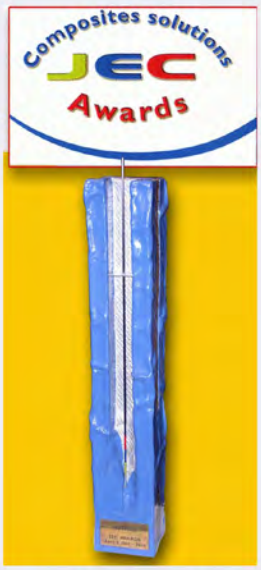
Standard set includes:

- Insulating fishplates Р50 ЦП 481 ОСТ 32.169-2000, pcs. 2
- joint gasket ПСН-50 ЦП 508, pcs. 1
- Stop plate СИ- 50-1 ЦП 222, pcs. 2
- Stop plate СИ- 50-2 ЦП 223, pcs. 2

Reference designation when ordering:
“Fishplate Р50 ЦП 481” ОСТ 32.169-2000



"JEC Award – 2004" winner



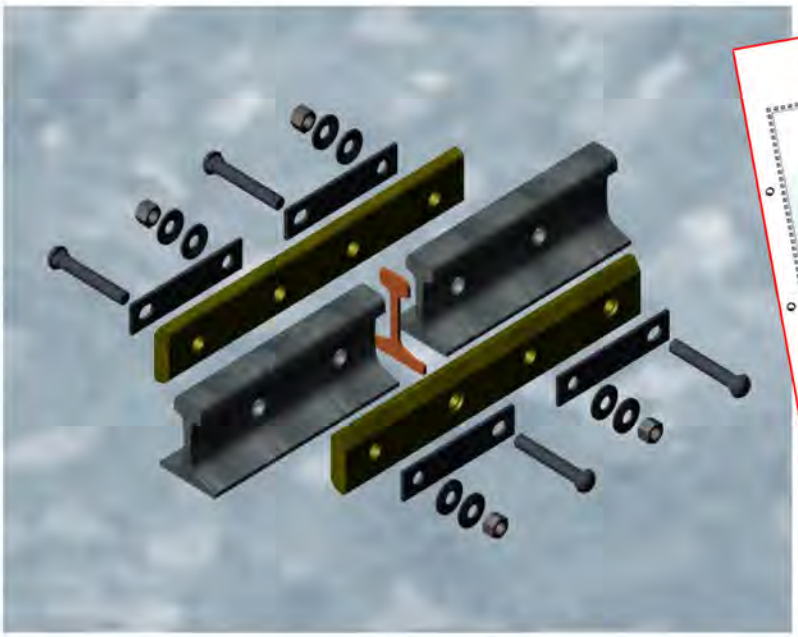
COMPOSITE FISHPLATES

For subway insulating joints

“ApATeCh P-43M» — set of insulating fishplates ТУ 3185-041-11567537-03

Designation:

For insulating joints of park (station) tracks, subway turnouts with P43-type rails on the wooden or reinforced concrete sleepers and beams.



Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data:

Capacity during life cycle, mln. tons gross 150
Electrical resistance, kOm 160
Axial load from train suspension, kN 100
Service life, years 10
Weight, kg 4
Climatic conditions acc. to GOST15150-69

Standard set includes:

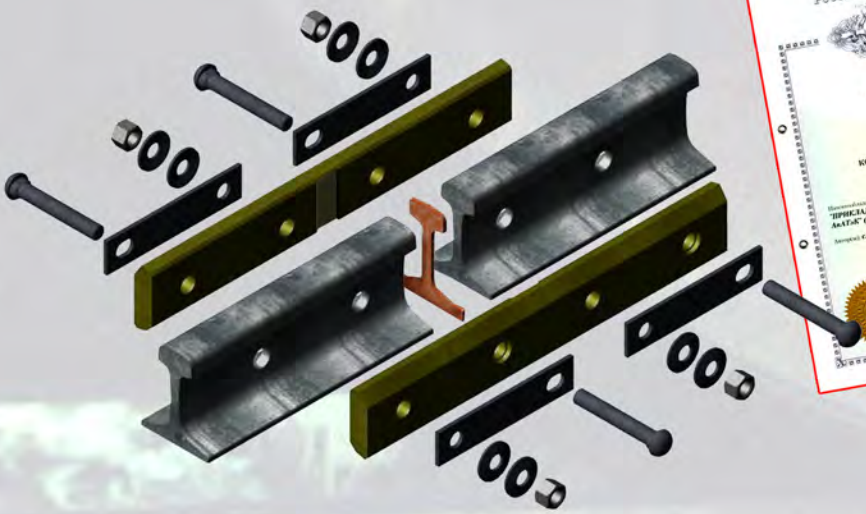
Insulating fishplates
“ApATeCh P-43M” ТУ 3185-041-11567537-03, pcs. 2

Reference designation when ordering:
Fishplate “ApATeCh P-43M” ТУ 3185-041-11567537-03”

“ApATeCh P-50M” — set of insulating fishplates ТУ 3185-041-11567537-03

Designation:

For insulating joints of jointed tracks, subway turnouts with P50-type rails on the wooden or reinforced concrete sleepers and beams.



Patent 2265521;
Patent 2278196;
Patent 2255097

Technical data:

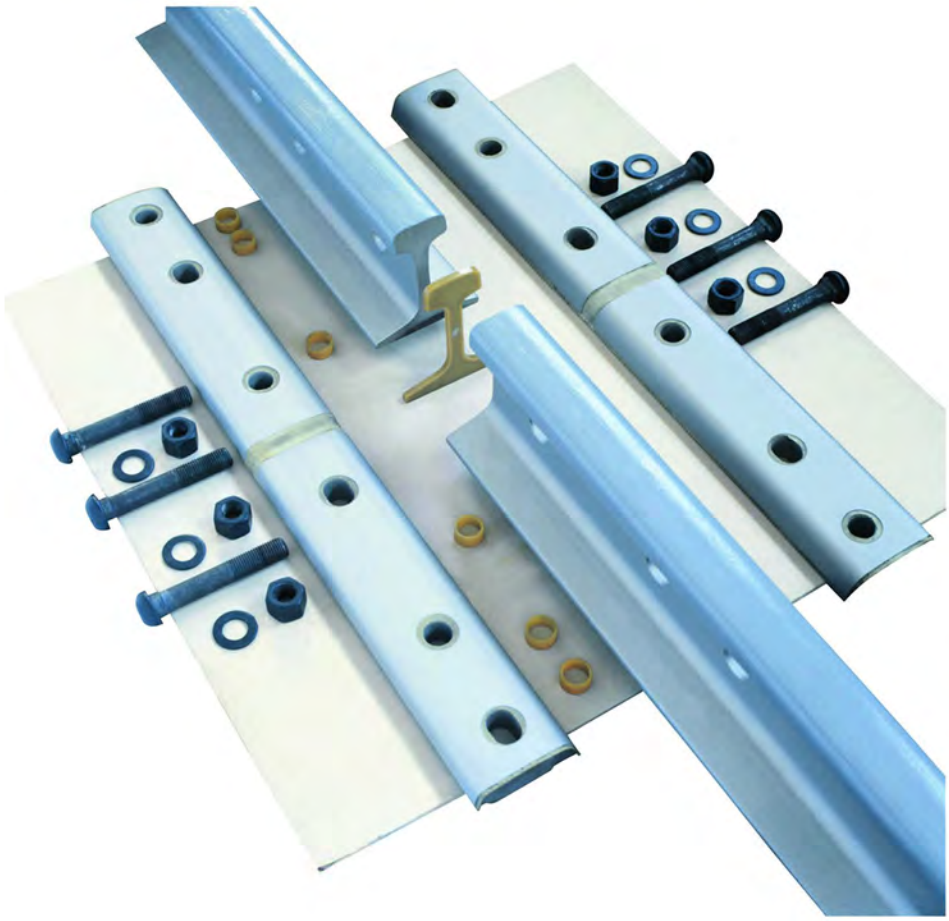
Capacity during life cycle, mln. tons gross 500
Electrical resistance, kOm 100
Axial load from train suspension, kN 250
Service life, years 10
Weight, kg 4
Climatic conditions acc. to GOST 15150-69

Standard set includes:

Insulating fishplates
“ApATeCh P-50M” ТУ 3185-041-11567537-03, pcs. 2

Reference designation when ordering:
“Fishplate “ApATeCh P-50M” ТУ 3185-041-11567537-03

INSULATING JOINTS WITH METAL-COMPOSITE FISHPLATES



“ApATeCh P65 MK” — insulating joint for P65 ТУ 32 ЦП 829-98 type of rails with hybrid (metal-composite) fishplates ТУ 2724.01.000

Designation:

For electrical insulation from one block to another on the main railways with P65-type rails.


РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ

№ 48329

ЭЛЕКТРИЧЕСКИ ИЗОЛИРУЮЩЕЕ НЕРАЗЪЕМНОЕ РЕЛЬСОВОЕ СТЫКОВОЕ СОЕДИНЕНИЕ

Патентообладатель(и): *Общество с Ограниченной Ответственностью Научно-производственное предприятие "Прикладные перспективные технологии - АпАТэК" (ООО НПП "АпАТэК") (RU)*

Автор(ы): *см. на обороте*

Заявка № 2004126767

Приоритет полезной модели **16 декабря 2004 г.**

Зарегистрировано в Государственном реестре полезных моделей Российской Федерации **10 октября 2005 г.**

Срок действия патента истекает **16 декабря 2014 г.**

Руководитель Федеральной службы по интеллектуальной собственности, патентам и товарным знакам

Б.П. Симонов

Patent 48329

Technical data:

Capacity during life cycle, mln. tons gross 500
Electrical resistance, kOm 100
Axial load from train suspension not less than, kN 350
Axial tension not less than, kN 2500
Service life not less than, years 10
Climatic conditions acc. to GOST15150-69

Standard set includes:

- Metal-composite fishplate
  “ApATeCh P65 MK” ТУ 2724.000, pcs. 2
  - Joint liner 2724.00.001, pcs. 1
- Plug 2724.00.003, pcs. 6
- Bolt M27 x 160.109.40X ГОСТ 11530-93, pcs. 6
- Screw CM27-7H.8 ГОСТ 11532-93, pcs. 6
- Washer 2724.00.02, pcs. 6
- Adhesive, kg 1
-

Reference designation when ordering:
“ApATeCh P65 MK” ТУ 32 ЦП 829-98


ON-THE-WAY INSTALLATION OF INSULATING JOINTS of P65 rails with hybrid (metal-composite) fishplates "ApATeCh P65 M-K"

Designation:

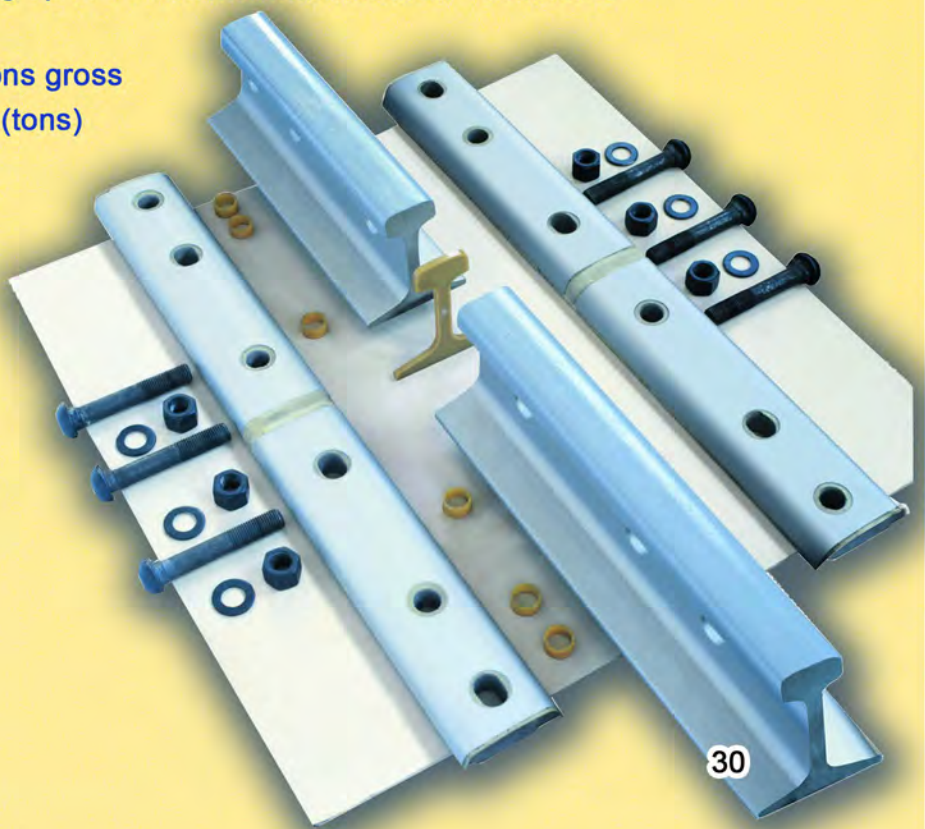
On-the-way installation of insulating joints with hybrid (metal-composite) fishplates «ApATeCh P65 M-K» in long-welded rails designed for electrical insulation from one block to another on the main railways with P-65 rails.

Sphere of application:

1. Installation of insulating joints on the functioning railway track with traffic interruption uo to 2,5 hours.
2. Installation of insulating joints on the rails unloaded in the middle of the railway gauge.
3. Installation in field or shop conditions .

Technical properties:

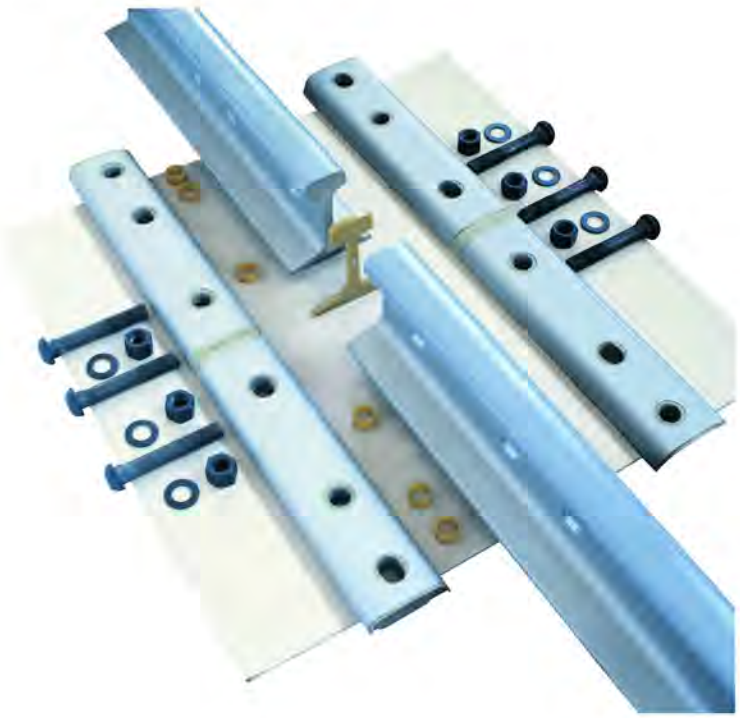
- maximal traffic interruption.....up to 2,5 hours.
- temperature rangeof joint installation .....from +10^{0}C to+ 40^{0}C
- curing time of a glue line at joint heating up to 60^{0}C..... 40 minutes
- warranty operation life of insulating joints .....200 mln. tons gross
- maximal wheelpair load on the rail, kN (tons)
  from the carriage..... .....250 (25)
  from the locomotive.....270 (27)
- joint gap in the joint..... 8 mm
- electrical resistance between the joined rails not less than.....1 kOm
- shear force MN (tons) not less than.....2,3 (230)
- equipment power supply for installation process .....mobile power station with power of 4 kW.



Insulating joint P50 ТУ МКС-P50.10.000 with hybrid (metal-composite) fishplates

Designation:

For electrical insulation from one block to another in subway with P50 rails.



Technical data:

Capacity during life cycle, mln. tons gross 500
Electrical resistance, kOm 100
Axial load from train suspension not less than, kN 270
Axial tension not less than, kN 2000
Service life, years 10
Climatic conditions acc. to GOST15150-69

Standard set includes:

- Metal-composite fishplates «ApATeCh P50 MK» ТУ МКС-P50.11.000, pcs. 2
- Joint liner МКС-P50.10.001, pcs. 1
- Plug МКС-P50.00.003, pcs. 6
- Bolt M24 x 150.109.40Х ГОСТ 11530-93, pcs. 6
- Screw СМ24-7Н.8 ГОСТ 11532-93, pcs. 6
- Washer 24.02.05 ГОСТ 11371-78, pcs. 6
- Adhesive, kg 1
- **Reference designation when ordering:**

Insulating joint P50 ТУ МКС-P50.10.000

“ApATeCh UIC60/Lat. MK” — insulating joint for UIC60 rails with hybrid (metal-composite) fishplates BIJ.0118.00.000

Designation:

For electrical insulation from one block to another on the main railways with UIC60 rails.

Technical data:

Capacity during life cycle, mln. tons gross 500
Electrical resistance, kOm 100
Axial load from train suspension not less than, kN 350
Axial tension not less than, kN 2500
Service life, years 10
Climatic conditions acc. to GOST15150-69

Standard set includes:

Metal-composite fishplates
“ApATeCh UIC60/Lat. MK” BIJ.0118.01.000, pcs. 2

Reference designation when ordering:

“ApATeCh UIC60/Lat. MK” BIJ.0118.01.000

“ApATeCh S60 MK” — insulating joint for S60 rails with hybrid (metal-composite) fishplates BIJ.0145.10.000

Designation:

For electrical insulation from one block to another on the main railways with S60 rails.

Technical data:

Capacity during life cycle, mln. tons gross 500
Electrical resistance, kOm 100
Axial load from train suspension not less than, kN 350
Axial tension not less than, kN 2500
Service life not less than, years 10
Climatic conditions acc. to GOST15150-69

Standard set includes:

- Metal-composite fishplates
“ApATeCh S60 MK” BIJ.0145.11.000, pcs. 2

Reference designation when ordering:

“ApATeCh S60 MK” BIJ.0145.11.000

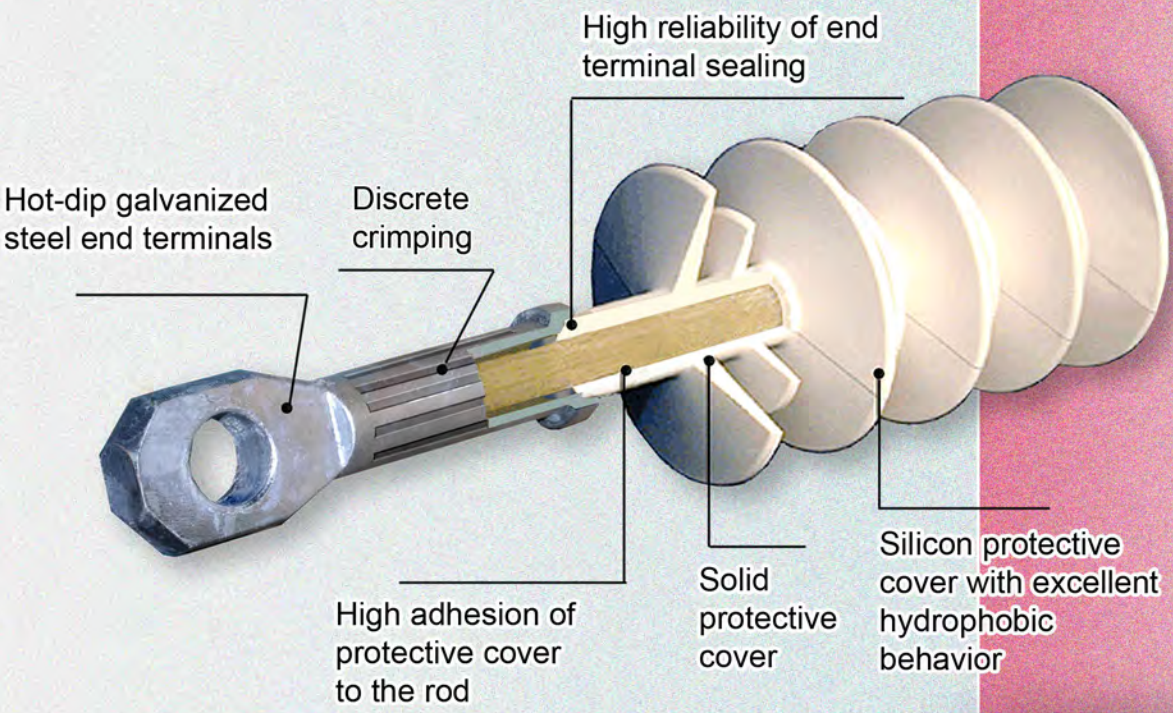
Polymer rod insulators

Structure

Time-proved and new solutions are used in the structure of insulators:

- Solid silicon protective cover
- Uniform crimping of end terminals with the help of matrices
- High reliability of interfaces
- Hot-dip galvanized steel end terminals

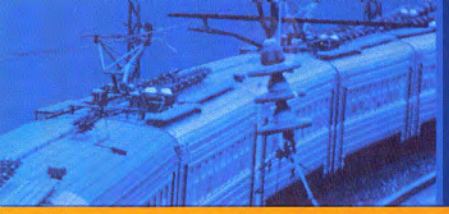
Patent 2262760



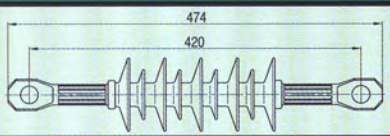
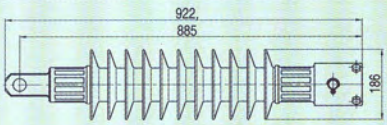
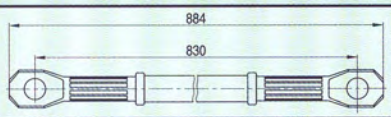
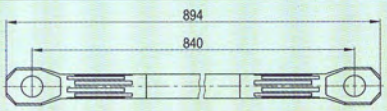
Silastic used as a protective cover of insulators in operation showed itself as a highly reliable polymer material which provides surface electric strength of the insulator and protection of a glass fiber rod from environmental exposure.

Due to excellent hydrophobic behavior of silastic the insulators can be used even in highly contaminated area. High resistance to UV radiation, moisture, heat and cold allows using silicon insulators in all climatic zones.

Due to diffusing of molecule with low molecular weight on the contamination layer even contaminated insulators stay hydrophobic. Experience in operation has shown that hydrophobic behavior of the surface of silicon insulators is kept at the high level during the whole service life. In most cases this feature makes it possible to eliminate or considerably reduce frequency of insulator washing which considerably reduces maintenance costs.



SERIALLY PRODUCED COMPOSITE ROD INSULATORS FOR DIRECT CURRENT RAILWAY CONTACT SYSTEM OF 3 kV VOLTAGE

Picture	Draft	Designation	Weight, kg	Instead of porcelain (F) and glass (S) insulators	
				Type	Weight, kg
1		NSPKr 120-3/0,6	1,2	NSF 70-3/0,5 NSF 100-3/0,6	11,5 16,0
2		FSPKr 70-3/0,6	2,2	FSF 70-3/0,5 FSF 100-3/0,6	11,6 16,1
3		KSPK 120-3/0,6	5,05	KSF 70-3/0,5 KSF 100-3/0,6	13,0 16,5
4		NSPK 120-3/0,6	1,5	No porcelain and composite insulators for substitution	
5		NSPFt 120-3/0,6	1,48		

Legend of insulators

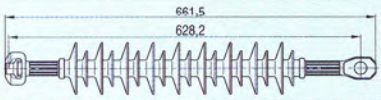
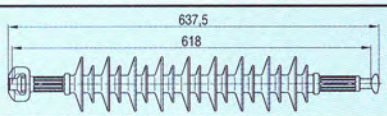
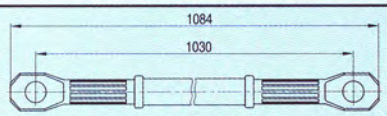
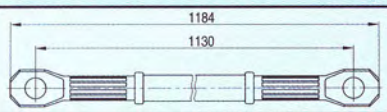
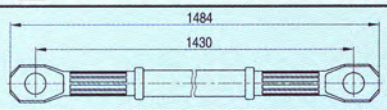
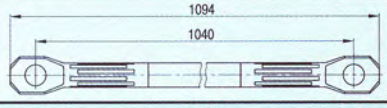
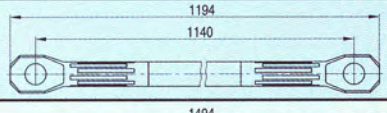
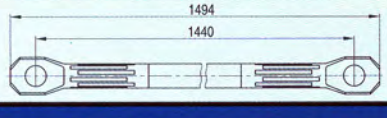
NSPKr	FSPKr	KSPK	NSPFt	PSPKr
N - strained S- rod P - polymer K - silicone rubber r - ribbed	F - fixed S- rod P - polymer K - silicone rubber r - ribbed	K - console S- rod P - polymer K - silicone rubber	N - strained S- rod P - polymer Ft - fluorine plastic covering	P - suspended S- rod P - polymer K - silicone rubber r - ribbed

Technical characteristics of insulators for direct current (3 kV)

Characteristics	Requirements of GOST R51204-98	Factual figures of the tests conducted in The All-Russian Energy Institute				
		Pic. 1	Pic. 2	Pic. 3	Pic. 4	Pic. 5
1. Nominal tension, kV	3	3	3	3	3	3
2. Leakage distance, m	0,6	0,6	0,6	0,6	0,6	0,6
3. Normalized destructive mechanical strength during straining, kN, not less than	120	145	125	170	145	145
4. Normalized destructive bending moment, kN, not less than	3,5*; 6,0**	-	3,6*	8,0**	-	-
5. Short-term (one-minute) tension of industrial frequency, kV: - in dry condition; - in the rain horizontally/vertically	 80 70/50	 107 86/70	 117 117/75	 112 95/80	 215 130/90	 210 135/95
6. Test tension, kV: - thunderstorm impulse; - industrial frequency in moistening and polluting condition	 +125, -125 15	 +152, -178 20	 +165, -200 20	 +161, -183 22	 +370, -370 25	 +325, -255 28
7. Weight of insulator, kg	-	1,2	2,2	5,05	1,5	1,48
8. Atmosphere pollution degree	III -VII					

* - fixed insulator ** - console insulator

SERIALLY PRODUCED COMPOSITE ROD INSULATORS FOR ALTERNATING CURRENT RAILWAY CONTACT SYSTEM OF 25 kV VOLTAGE

Picture	Draft	Designation	Weight, kg	Instead of porcelain (F) and glass (S) insulators	
				Type	Weight, kg
6		NSPKr 120-25/1,1	1,95	4 x PS 120-B garland of four insulators	15,6
7		PSPKr 70-25/1,1-Y	2,24	4 x PSD 70-E garland of four insulators	17,6
8		PSPKr 70-25/1,1-II	2,2	4 x PSD 70-E garland of four insulators	17,6
9		FSPKr 70-25/0,95	4,13	FSF 70-25/0,95 VKL 60-7	18,5 7,8
10		NSPK 120-25(3)/0,8	1,72	No porcelain and composite insulators for substitution	
11		NSPK 120-25/0,9	1,82		
12		NSPK 120-25/1,2	2,13		
13		NSPFt 120-25(3)/0,8	1,69		
14		NSPFt 120-25/0,9	1,81		
15		NSPFt 120-25/1,2	2,14		

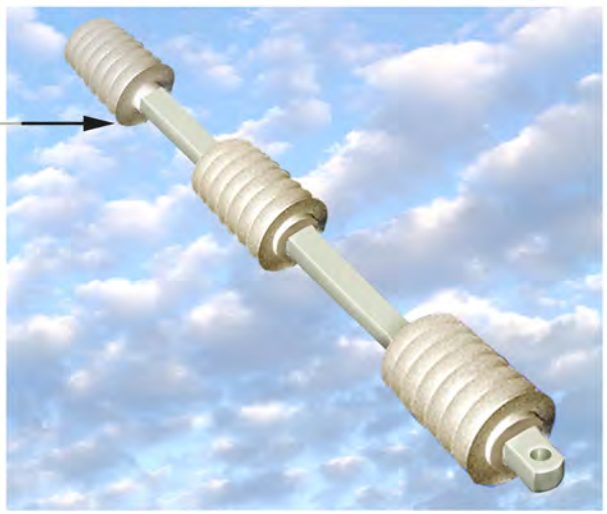
Technical characteristics of insulators for alternating current (25 kV)

Characteristics	Requirements of GOST R51204-98	Factual figures of the tests conducted in The All-Russian Energy Institute								
		Pic. 6	Pic. 7,8	Pic. 9	Pic. 10	Pic. 11	Pic. 12	Pic. 13	Pic. 14	Pic. 15
1. Nominal tension, kV	25	25	25	25	25	25	25	25	25	25
2. Leakage distance, m		1,2	1,2	0,95	0,8	0,9	1,2	0,8	0,9	1,2
3. Normalized destructive mechanical strength during straining, kN, not less than	120, 70*	145	110*	125	143	143	143	143	145	147
4. Short-term (one-minute) tension of industrial frequency, kV: - in dry condition; - in the rain horizontally/vertically	 145 125/70	 176 132/162	 176 132/162	 158 152/115	 292 193/166	 322 220/185	 435 267/202	 292 193/166	 328 215/185	 435 260/200
5. Test tension, kV: - thunderstorm impulse; - industrial frequency in moistening and polluting condition	 +240, -240 40	 +290, -328 46	 +290,-328 46	 +264,-283 48	 +390,-390 55	 +450,-450 46	 +590,-590 44	 +390,-390 55	 +450,-450 56	 +600,-600 55
6. Weight of insulator, kg	-		2,24; 2,2	4,13	1,72	1,82	2,13	1,69	1,81	2,14
7. Atmosphere pollution degree	III -VII	V-VI	V - VI	V	III - IV	V	VI - VII	III - IV	V	VI - VII

New generation polymer insulators designed for municipal services

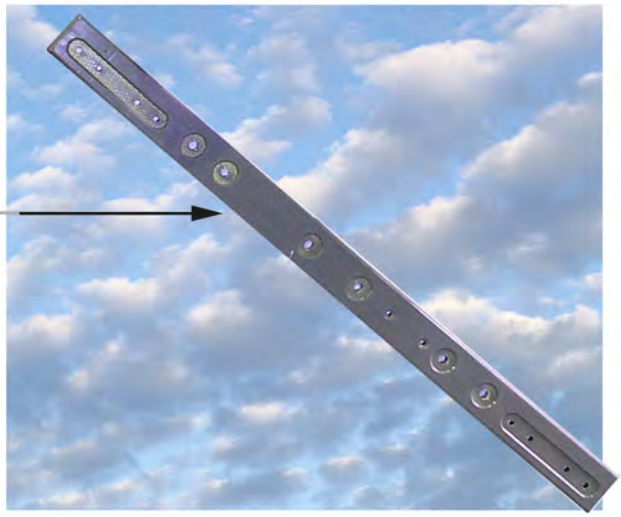
Fixing insulator ИФСКр - 200/800

Fixing and insulation of contact-wire lines of tunnel suspension of contact system



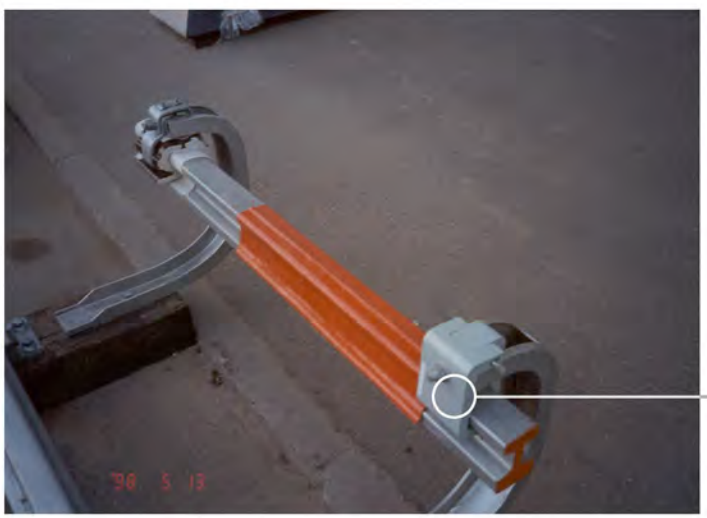
Hinged girder

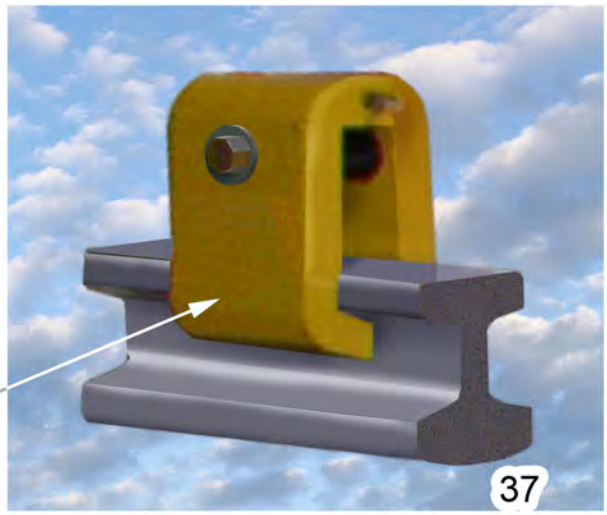
Bearing insulating element for contact system of urban transport



Insulating staple of the attachment point of a subway contact rail

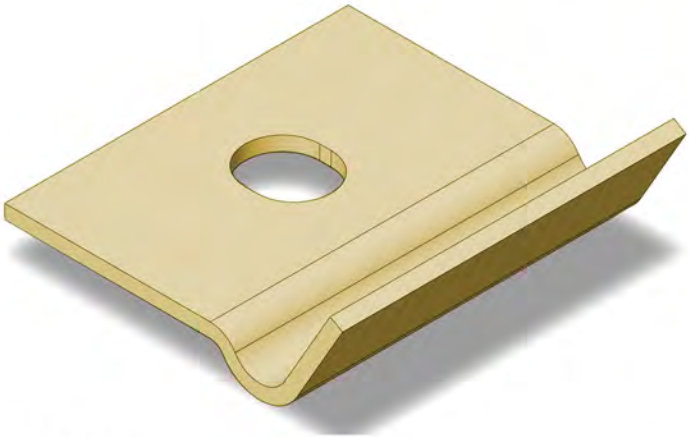
Fastening of a contact rail and its insulation from the bracket

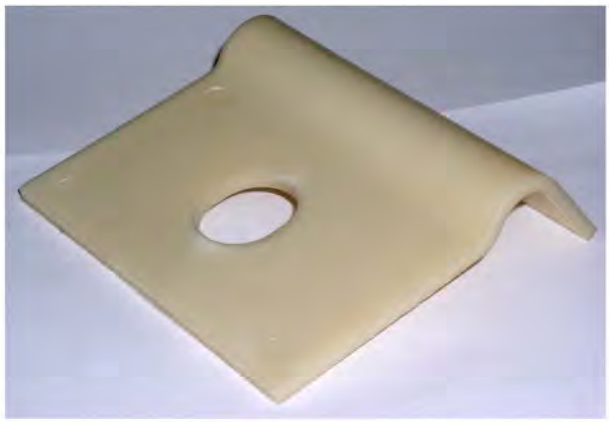




Components for railways

Elastic spacer ЦП 369.104 for rail fastening ЖБР-65



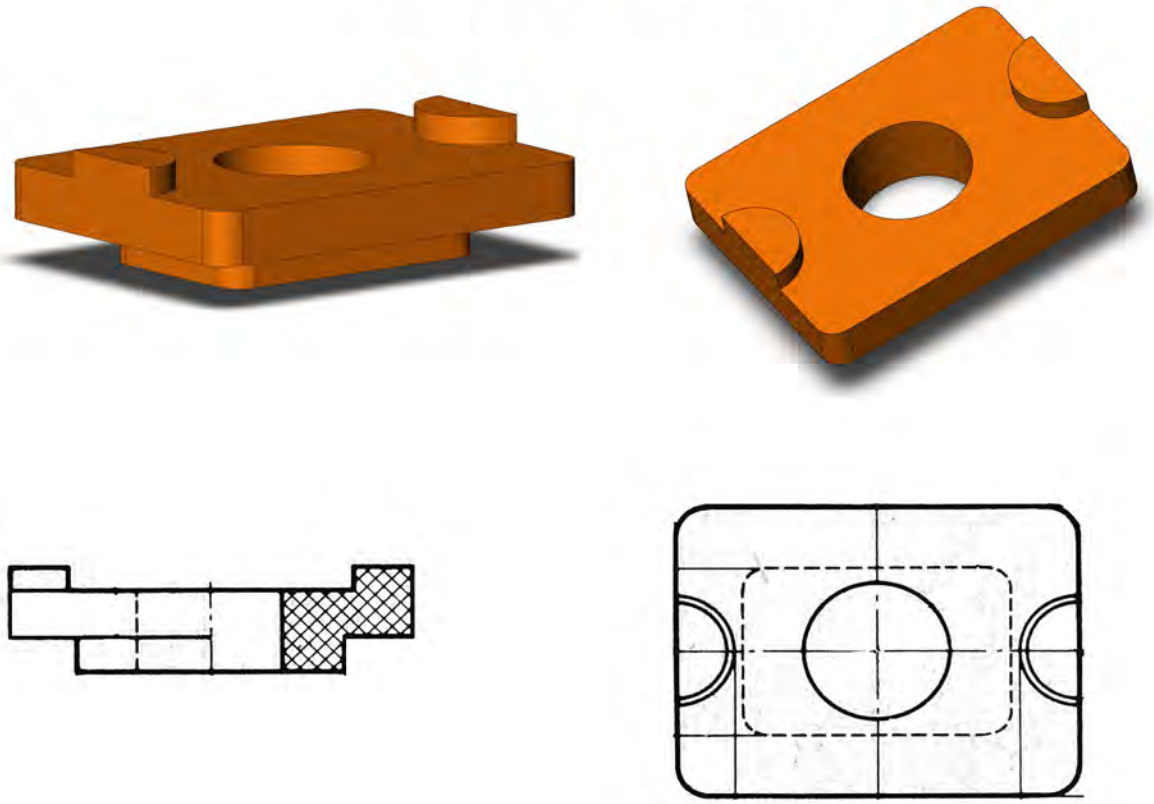


Weight - 0,10
Requirements specifications and material according to ЦП 369 ТУ-4

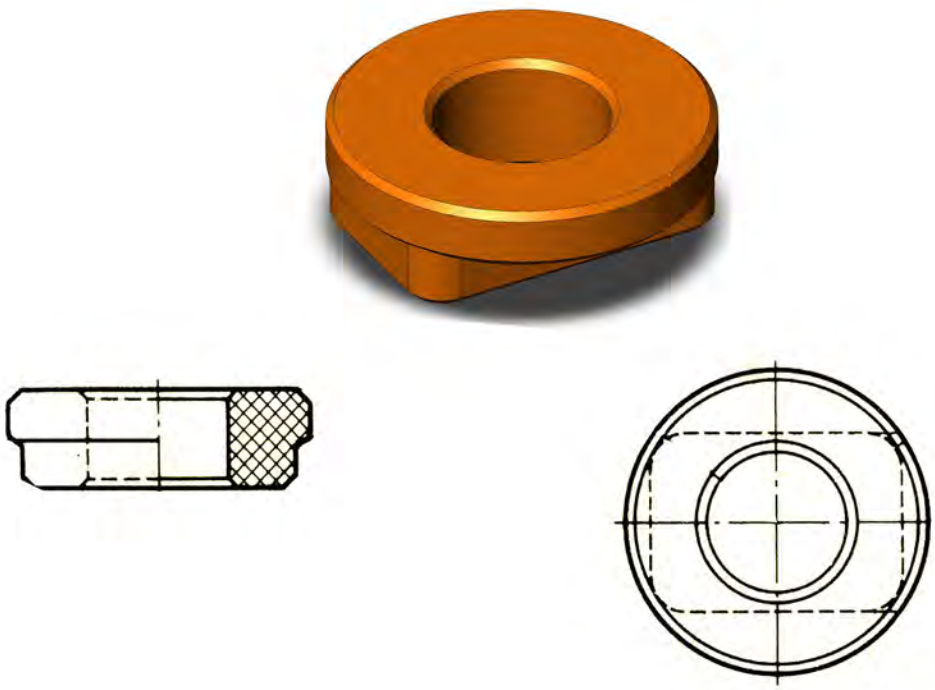
Insulating angle bar of anchor rail fastening АРС-4

Polymer insulating plugs for the rail fastening of the railway track

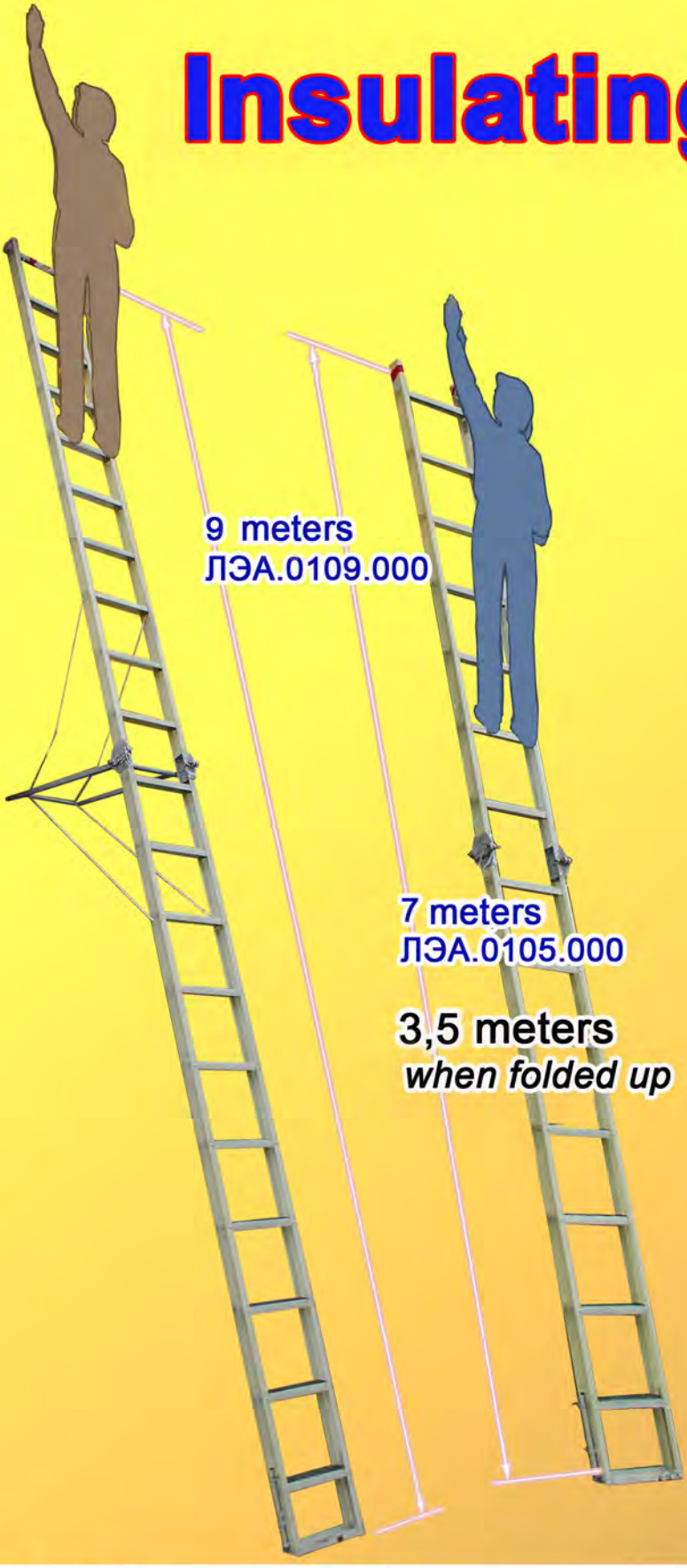
Insulating plug КБ

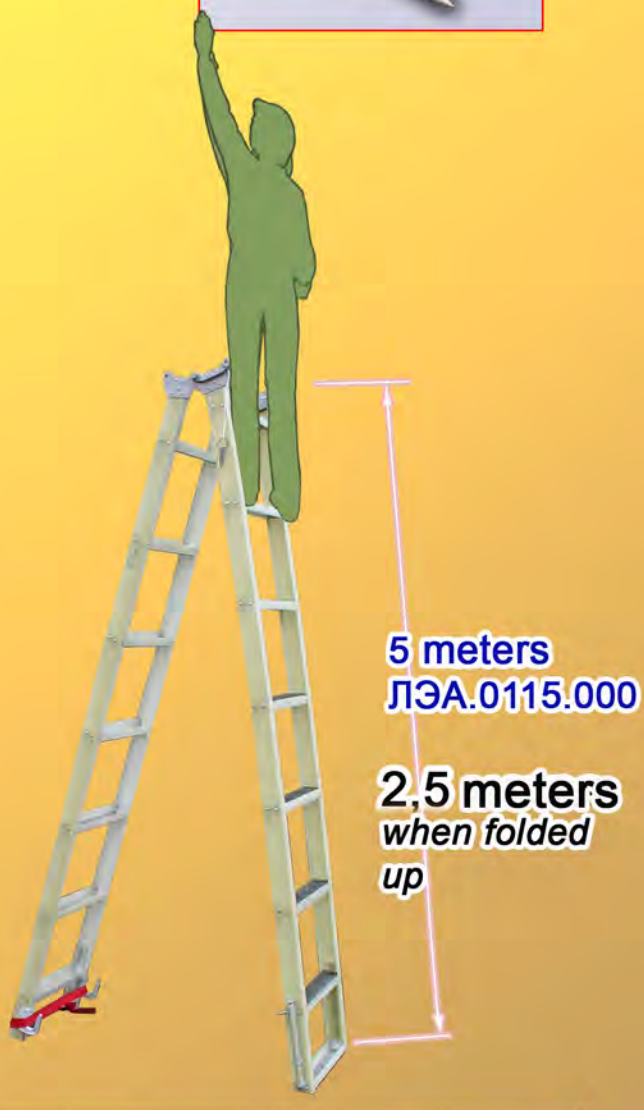


Insulating plug КВ-1-22



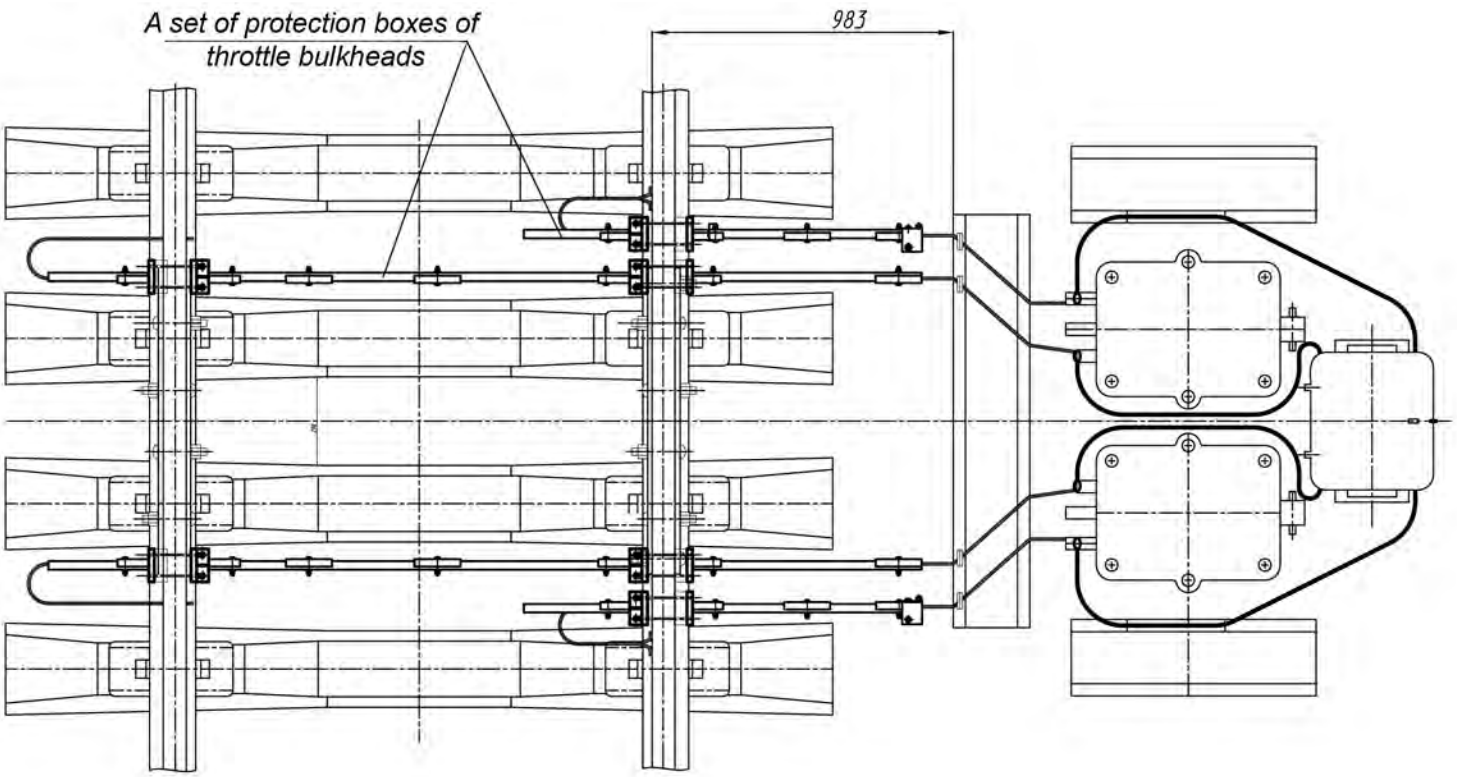
Insulating stairs

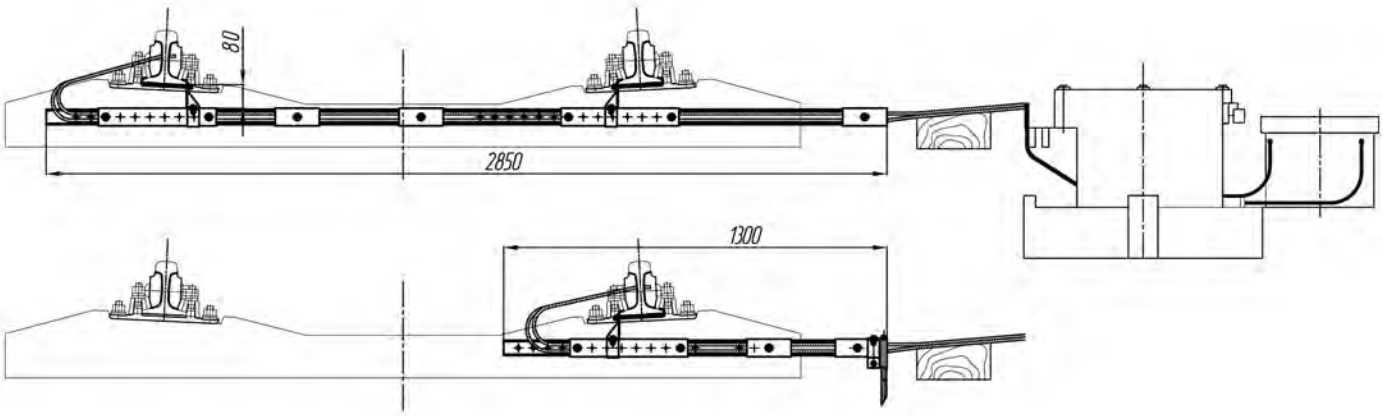




Height	5 m	7 m	9 m
Weight	18 kg	26 kg	33 kg
Load acting on stairs	200 kg	200 kg	200 kg
Design resistance	10^{12} Ohm*m	10^{12} Ohm*m	10^{12} Ohm*m

A set of protection boxes of throttle bulkheads





Protection box of throttle bulkheads
К33.0216.001
(L = 2850мм)

Protection box of throttle bulkheads
К33.0216.002
(L = 1300мм)

Components for the underground

Insulating staples СИ-0154
ТУ 3494-036-11567537-02

Technical requirements
Insulating braces should have tracking erosion resistant coating of 1A0 class according to GOST 27474-87
Mechanical strength
Failure static vertical load – 40 kN (in the direction of gravitational vector).
Failure static horizontal load - 30 kN (perpendicular to track centerline).
Braces should withstand discharge pressure of industrial frequency:
- In dry condition – not less than 23 kV.
In dirty and wet condition – not less than 3 kV.
Service life - 50 years

For electrical strength providing the braces are covered with special tracking resistant sealant

For contact rail fixing at curvilineal track sections with curve radius more than 300 m, suspension point with anti-theft parameters «СУК-П» was developed, TU 3494-021-93660864-2010

Tunnel bracket “ApATeCh” ПК.0209.030.000
ТУ-3494-001-93660864-06

Technical requirements
Bracket and lower clamps should have tracking erosion resistant coating of 1A0 class according to GOST 27474-87
Mechanical strength
Failure static vertical load – 20 kN (in the direction of gravitational vector).
Failure static horizontal load - 10 kN (perpendicular to track centerline).
The bracket should withstand discharge pressure of industrial frequency:
- In dry condition – not less than 23 kV.
in dirty and wet condition – not less than 6 kV.
Service life - 50 years

РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ

№ 91033

КРОНШТЕЙН ПОДВЕСКИ КОНТАКТНОГО РЕЛЬСА

Патентообладатель(и): *Общество с ограниченной ответственностью Научно-производственное предприятие "ПРИКЛАДНЫЕ ПЕРСПЕКТИВНЫЕ ТЕХНОЛОГИИ-АпАТеК" (RU)*

Автор(ы): *см. на обороте*

Заявка № 2009131868

Приоритет изобретения 25 августа 2009г

Зарегистрировано в Государственном реестре изобретений Российской Федерации 20 декабря 2006 г.

Срок действия патента истекает 25 августа 2019г

Руководитель Федеральной службы по интеллектуальной собственности, патентам и товарным знакам

Б.П.Симонов

Patent 91033

Advantages:
1. Due to large bracket leakage from insulating GFRP electric strength is provided through
painting with epoxy enamel;
2. Brackets have high operational reliability and low maintenance costs.

Renovation of the electric train railcar interior at a major overhaul

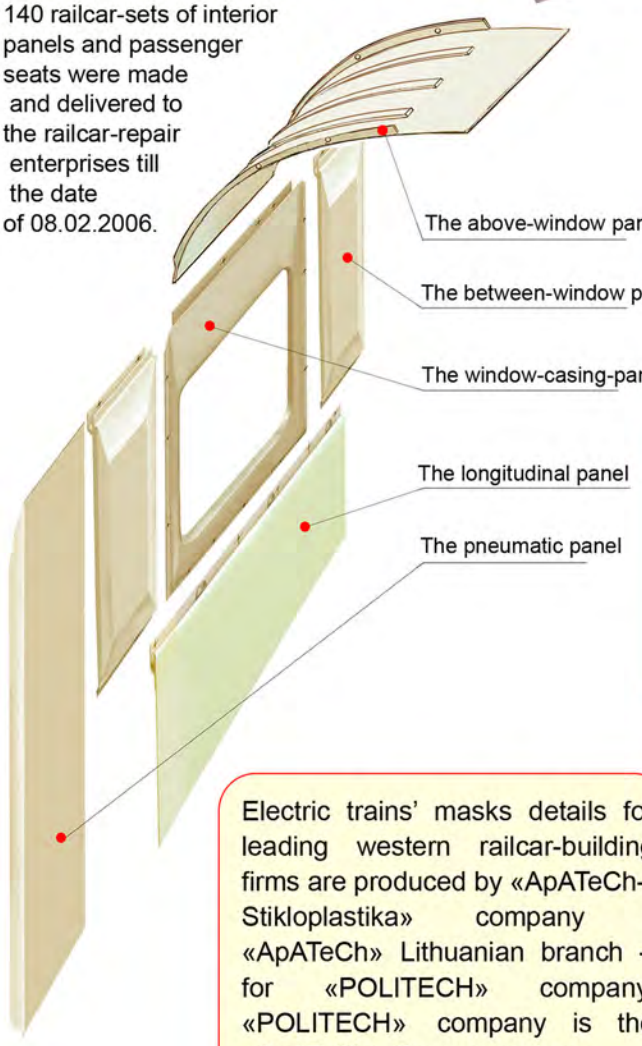
Appearance of rail car interior before repair

New materials for railcar building

The soft combination of white ceiling panels, light-cream wall panels and armchairs creates a light and solar atmosphere in the railcar. Blue fabric seats bring cleanliness, cordiality and cosiness to the railcar interior atmosphere. Light-grey color of floor covering complete sensation of lightness and freshness.

The scheme of panels' location

140 railcar-sets of interior panels and passenger seats were made and delivered to the railcar-repair enterprises till the date of 08.02.2006.



A six-seater passenger seat KAD 0400.000.

A two-seater passenger seat KAD 0600.000.

More than 13 thousand of passenger seats were delivered to the railways of Russia

Single, double and three-seater seats with head-rests and elbow-rest are producing for the Hungarian railways

Electric trains' masks details for leading western railcar-building firms are produced by «ApATeCh-Stikloplastika» company - «ApATeCh» Lithuanian branch – for «POLITECH» company. «POLITECH» company is the «ApATeCh» German partner.

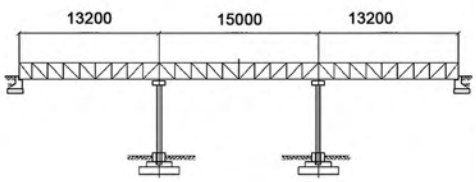
COMPOSITE BRIDGE STRUCTURES

RAILWAY BRIDGES

Pedestrian bridge over the platform “Kosino”. Moscow

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow Platform “Kosino	Beam bridge	Length – 47m Width – 5 m	2spans 3 stairs	July 2005

Pedestrian bridge at a platform Chertanovo, Moscow (establisned in October, 2004)

Structural Layout	Technical parameters	Technology
	Dimensions: Length – 41,4 m Width – 3 m Weight: Total weight – 11865 kg 1 sq. meter weight – 97 kg Number of assembling units -	1.Production of profiles by Pultrusion 2.Assembling of spans in the factory 3.Assembling on site 4.Assembling time on site – 4,5 hours

Bridge pedestrian passage across the platform «DEPO». Moscow railways. Track section “Moscow-Tula”

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow, Near the Subway “Lublino”	Beam structure	Length – 277,5m Width – 3 m	Deck with railings, Railings of stairs, sheeting	January 2008

Loading of the finished bridge span at the warehouse of the enterprise

Unloading of spans from railway platform and assembly of the spans on the site.

Installation of composite railings on reinforced-concrete stairs

A new pedestrian passage with deicing coating

Pedestrian bridge near the station of 586km of the section Ryazhsk-Chertkovo (South-East railway).

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Stop station near the section Ryazhsk-Chertkovo South-East railway	Beam structure of the section 12+18+12m Covered with polycarbonate	Length – 42m Width of 3 m. pedestrian part	The whole bridge	May 2008

Pedestrian bridge Moscow-Kuskovo 7km.

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow 2-oi Karochaevskiy proezd.	Girder with closed upper flange L=22 m. passage width 3.06 m.	Length (with upper platforms) -31.0 m. Width-3.464 m.	Full bridge	April 2009

Ramps for people with limited mobility at pedestrian crossings

Assembling of ramp for people with limited mobility at pedestrian crossing of Zabaikalsk station, Transbaikalian railway

Parameters:

1 ramp: length - 129.8 m, width - 1.082 m
2 ramp: length - 167.08 m, width - 1.082 m

Structures made of composite materials:

Ramp spans, turning platforms,
intermediate platforms, railings, lighting poles.

BRIDGES FOR URBAN INFRASTRUCTURE

Inventory bridge over the Garden circle. Moscow

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow Garden circle	With the closed top chord	Length – 49,78m Width – 2,5 m	6 blocks 2 stairs	December 2006

Pedestrian bridge for recreation zone in Dubna-city (Moscow region)

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow region, Dubna-city, Bogolubovo Avenue	1 x 16,0 Cable structure	Length – 16 mWidth – 3 m Weight- 6,8 tones	Span, deck, railings	July 2005

Pedestrian park bridge across the river Lihoborka

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow, Hachaturyana str	Horizontal area, 2 stairs, 16 steps,12 steps, Beams on arches	Length – 20 m Width – 2,3 m Weight-2,6 tones	Railings, blocks of steps, Deck made of H-04m profile	September 2005

Pedestrian bridge on the Highway “Starokashirskoe”

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow,Highway “Starokashirskoe” Subway station “Orehovo” Dr. “Shipilovskii	2 x 11,06= 6,59 Beam structure	Length – 28,61m Width – 2,25 m Weight-5,83 tones	Spans, Railings, Deck	August 2007

Aqueduct bridge in “Rostokino”

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow, Rostokino, Kasatkina str.	Deck on stands and longitudinal beams	Length – 335,448m Width – 2,4 m	Deck with longitudinal beams with the length = 336m, supply conduit.	1st of September 2007

Pedestrian bridge across the river Lihoborka. Second construction stage. (bridge 1)

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow, Hachaturyana str.	1 x 11,2 Beam structure	Length – 11,2 m Width – 2,25 m Weight-3,77 tones	Spans, Railings, Deck made of profile H-04m	August 2006

Pedestrian bridge across the river Lihoborka. Second construction stage. (bridge 2)

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow, Hachaturyana str.	1 x 11,2 Beam structure	Length – 11,2 m Width – 2,25 m Weight-3,77 tones	Spans, Railings, Deck made of profile H-04m	August 2006

Pedestrian bridge in recreation zone of the river “Lihoborka”. 3rd construction stage. (bridge 1)

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow, Kronshtadtskiy avenue.	1 x 24 Beam structure	Length – 25m Width – 2,6 m Weight-2,526 tones	Railings, Deck made of H-04m profile	September 2006

Pedestrian bridge in recreation zone of the river Lihoborka. 3rd construction stage (bridge2)

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow, Lihoborskaya quay	1 x 24 Beam structure	Length – 22m Width – 2,6 m Weight-2,29 tones	Railings, Deck made of profile H-04m	March 2007

Pedestrian bridge in Sochi

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Sochi. Pedestrian bridge in the park near the Museum of Arts.	Arched bridge with the night illumination.	Length – 12.8m Width – 1.6m (pedestrian part)	The whole bridge	May 2008 .

Bridge view at night time

Stages of assembly on the site of arched bridge.

РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ

НА ПОЛЕЗНУЮ МОДЕЛЬ

№ 87711

АРОЧНЫЙ МОСТ

Патентообладатель(ли): *Общество с ограниченной ответственностью "Научно-технологический испытательный центр "АпАТэК-Дубна" (RU)*

Автор(ы): *см. на обороте*

Заявка № 2009122638

Приоритет полезной модели **16 июня 2009 г.**

Зарегистрировано в Государственном реестре полезных моделей Российской Федерации ***20 октября 2009 г.***

Срок действия патента истекает **16 июня 2019 г.**

Руководитель Федеральной службы по интеллектуальной собственности, патентам и товарным знакам

Б.П. Симонов

Patent for the utility model №87711 “ARCHED BRIDGE”

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow Park” “50-years anniversary of October revolution”	Arched bridge with night illumination	Length – 22,6m Width – 2.5 m (pedestrian part)	the whole bridge	July 2008

DECKS OF BRIDGE PEDESTRIAN CROSSINGS

For the first time in Russia since 2004


РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ

№ 87712

КОМПОЗИТНЫЙ НАСТИЛ

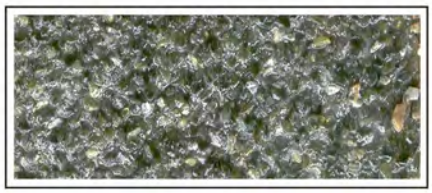
Patent 87712
"COMPOSITE DECK"

Decks present panels assembled from pultruded profiles. The panels are designed towithstand the loads for pedestrian bridges according to СНиП 2.05.03-84 "Bridges and pipes" and are intended for use as:
- Decks of pedestrian bridges
- Remote footpaths of overhead roads, automotive bridges
- Lightweight transportable technological bridges and crossings
- Decks of stopping points and platforms
- Decks of piers and jetties.

Decks present the optimal choice at the construction of objects in different industries: chemical, power, food, construction of waste disposal plants, shipbuilding, pulp and paper industry, petrochemical industry, construction of offshore platforms, automotive, paint and lacquer production, bridge and tunnel construction, agriculture and animal farming and others.

Air pedestrian crossing on 23rd km of Leningradskoe highway
with deck made of ApATeCh composite materials

Antiskid wearproof coating is applied on external deck surface



Mineral filler
"Serpentinite"

Mineral filler
"Red granite"

Also available with internal heating system to avoid icing

Composite ramps with "smart" heating system instead of de-icing chemical compositions

Heated ramp for limited mobility people, Moscow, metro station Petrovsko-Razumovskaya

- Lightweight design
- Easy replacement of any separate panel
- Energy efficient solution
- Energy saving control system

Dimensions: 1100 x 500 x 40
Power: W/m2 200...300 Вт/м²
Min. surface temperature +2°C

ApATeCh testing of heated deck in heavy snowfall conditions

Bridge pedestrian crossing on the 23rd km of the Leningradskoe highway

Composite plates-modules are transported from workshops of the enterprise and mounted in installation site.

Bridge pedestrian crossing over platform “DEPO” in the area of “Liublino” underground station

Loading of the finished bridge span in the workshop of the enterprise

Assembling of the span on primary beam

Length - 277,5 m; Width - 3,16 m

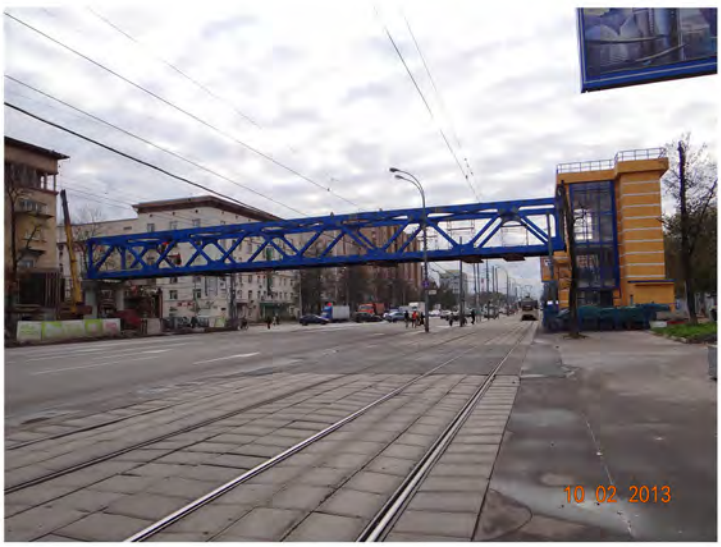
Decks of pedestrian bridges in Tsaritsino park

Advantages of ApATeCh composite decks:

Light weight, that facilitates the delivery and installation of the deck.

- nonsusceptible to corrosion and decay under the influence of water, salts, acid solutions, alkalis, anti-icing reagents
- durability
- strength is at the level of high-quality structural steels
- low costs of installation, operation and maintenance
- possibility of quick replacement at the repair
- electrical safety
- Wear resistance, equal to concrete

5 pedestrian bridges at the Entusiastov highway



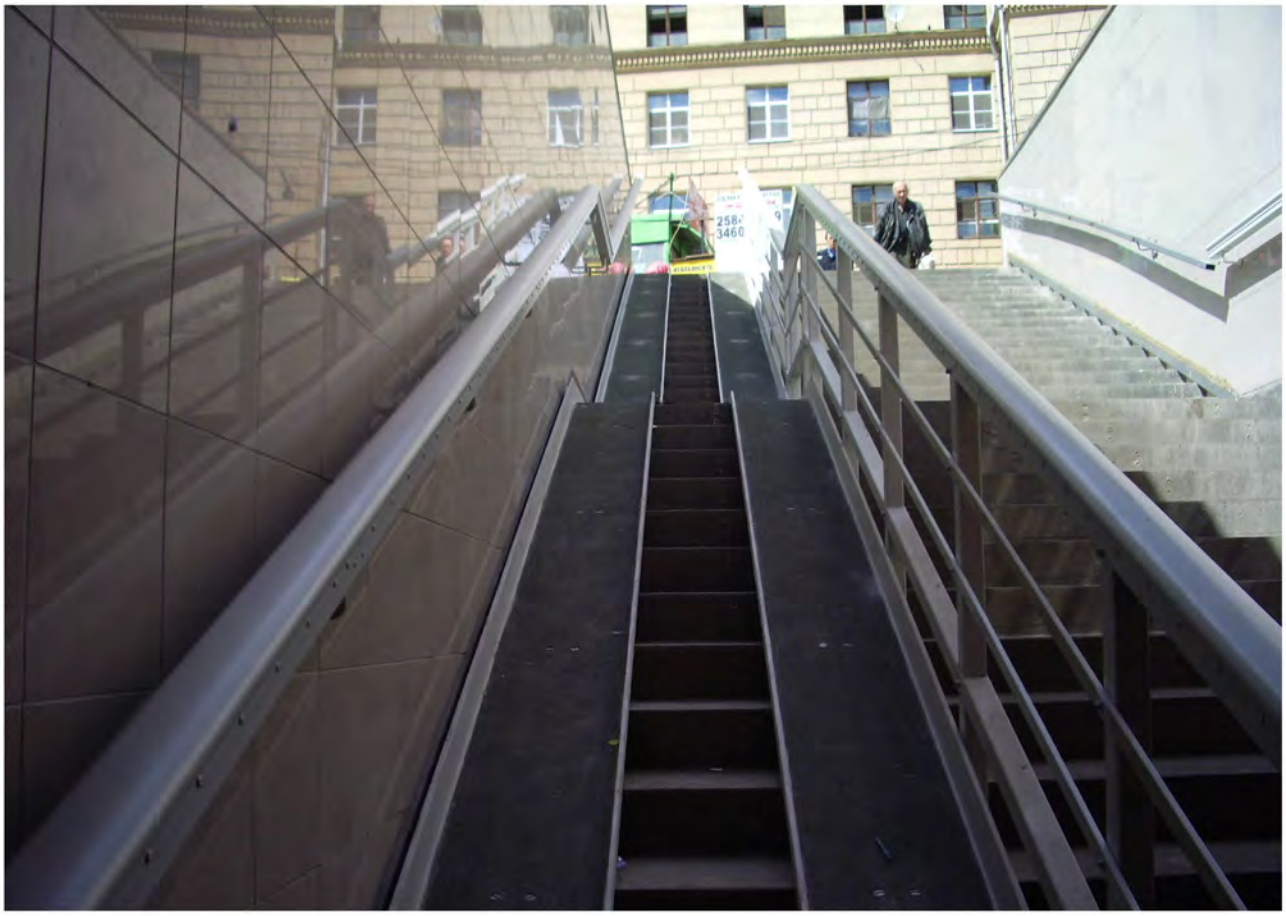
Pedestrian bridge in recreation zone “Tsaritsino-1”

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow, Tsaritsino ponds, Near the island “Horseshoe”	Deck 79,5 Arched	Length – 79,5m Width – 3,72 m Weight-6,113 tones	Deck	1st of September 2007

Pedestrian bridge in recreation zone “Tsaritsino-2”

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow, Tsaritsino ponds, Near the island “Horseshoe”	Deck 58,22 Arched	Length – 58,22m Width – 3,72 m Weight-4,63 tones	Deck	1st of September 2007

Underground passage at Smolenskaya Square



Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Moscow, Smolenskaya Square, Subway station "Smolenskaya	2 stairs	Length – 12,38m Width – 2,4 m	Stairs, Railings	September 2007

"Volzhskiy" highway bridge

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
City Nizhniy Novgorod "Volzhskiy" bridge on the highway "Moscow-Kirov"	Pedestrian deck along both sides of the roadway	Length of the deck – 112 x 2 = 224m Width – 1,16 m Weight of 1 running meter = 26 kg	Pedestrian deck	October 2007

BRIDGES FOR HIGHWAYS

Footbridge over Mozhaiskoye highway in Moscow Region near Odintsovo.
Installed in September 2010

Location	Scheme, type of bridge structure	Overall dimensions		Weight of 1 m2 (by structure size)	Scope of work	Date of putting into operation
		Span structure	Stairs			
Moscow Region, Mozhaiskoe highway 30 km	31,4 (three blocks 9,76 + 11,88 + 9,76) Width of passageway – 3,0 m Closed top chord of truss and translucent passageway	Span length (stairs and top platforms of stairs) – 37,7 m Width – 3,66 m Area – 138,0 m2	Two stairs, each 3,0 m wide and 20 m long, One stairs 17,8 m long, 2,24 m wide	Span (with platforms) – 138,0 kg; without reinforcement – 122,5 kg Stairs 2,24 m, with reinforcement – 163,0 tons	Spans, Stairs, Handrails, Deck, Bridging arcs	September 2010

Composite pedestrian crossing at the 378 km of the M-7 Volga highway, Nizhni Novgorod Region

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
378 km of M-7 Volga highway, near Pyra settlement	Closed top chord of truss L=33,4 m Width of passageway 3,0 m	Length (with top platforms) – 40,85 m; Width – 3,837 m	All bridge	November 2010

Pedestrian crossing in Tambov, route M6 “Caspian” 6 +250 km

Location	Scheme, type of bridge structure	Dimensions	Volume of works	Date of putting into operation
Tambov, Kikvidze street, 6+250 km of the route M6 “Caspian”	A truss with the closed top chord L=28,5 m passageway width - 3,06m	A truss with the closed top chord L=28,5 m passageway width - 3,06m	Central span	October 2013

Bridge pedestrian crossing at 302 km of the 1P 119 highway in Lipetsk

Location	Scheme, type of bridge structure	Overall dimensions	Date of construction
302 km of the 1P 119 highway in Lipetsk	Span, two stairswidth of the passageway – 3m	span length – 30.04 m width of the passageway – 3mweight – 14,68 tons	2013

Bridge pedestrian crossing at 613+00 km - 623+500 km of the M7 highway

Location	Scheme, type of bridge structure	Overall dimensions	Date of construction
613 – 623 km of the M7 highway	Bridge, two stairs, trussed, width of the passageway – 3m	length – 38 m width– 3.6 m weight – 20,082 tons	2013r.

Pedestrian crossing at the 553 km of the M-4 "Don" highway

Location	Scheme, type of bridge structure	Overall dimensions	Date of construction
553 km of the M4 "Don" highway	Bridge, span, two stairs	span length – 33 m width of the passageway – 3m weight – 15,174 tons	2013г.

Pedestrian crossing at the 929 +417 km of the M-4 "Don" highway

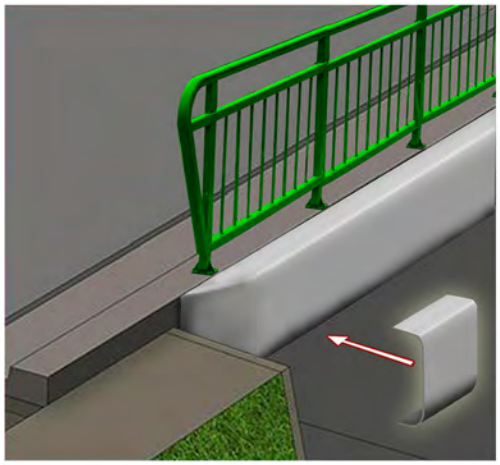
Location	Scheme, type of bridge structure	Overall dimensions	Date of construction
929 + 417 km of the M4 "Don" highway	Bridge span, two stairs	length – 38,07 m width– 3.3 m weight – 20.082 tons	2013 г.

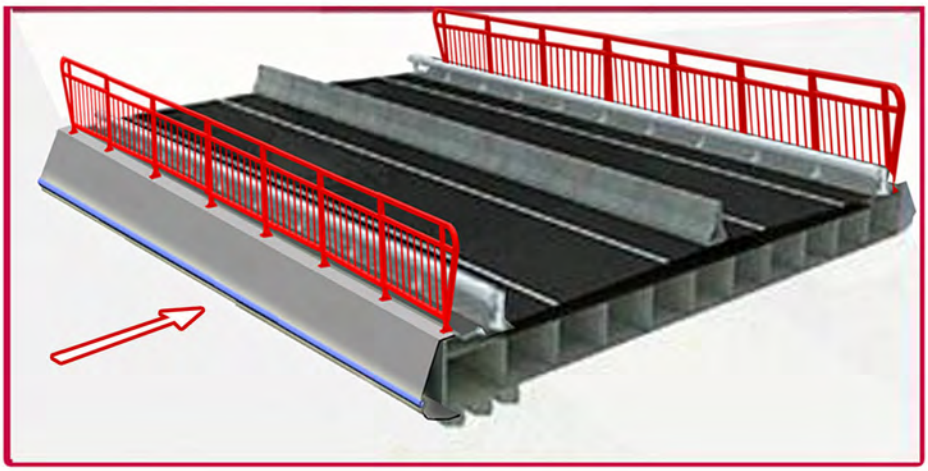
ARCHITECTURAL ELEMANTS

Architectural grids of composite pedestrian crossing, installed over Jubileiny prospect in Khimki

Location	Grids of towers and stairs	General data	Scope	Date of putting into operation
Khimki, Moscow Region	Number of towers 4 Height .....11.83 m Circumference ....11.96 m	Span length – 32 m , 4 spans Width of pedestrian area – 3 m Total grid weight – 74697 kg	Architectural grids of towers and stairs	September 2011

Coping block





HANDRAILS

Composite components for highways

Composite water removal channels are designed for application in areas with temperate and cold climate. Composite materials used for their production are neither toxic nor explosive, do not emit environmentally hazardous substances in normal service conditions.

Channels can be mechanically cleaned..

Manual channels' installation .

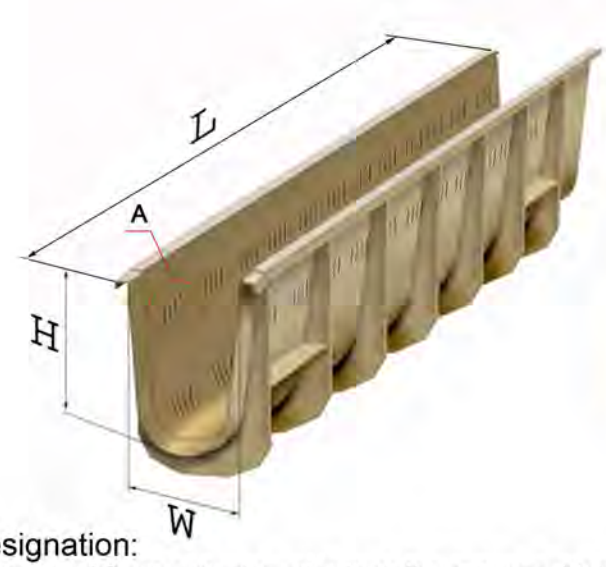
Channels are easily installed in the field in one drainage line and have anti-vandal protection.

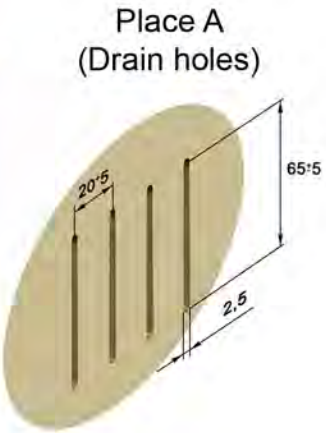
Channels are designed for water removal from the railway bed at direct contact with water (pH=6-8) and sun exposure.

Channels can be used either with lids or without lids.

Concrete lids should be used according to the Album of standard decisions "Composite drainage facilities on the railways" РД. ЦПВС.201-2000.

Composite lids should be used according to the Requirements ТУ 3185-017-93660864-08.





Designation:

Removal of flood and rain water from the railways, highways and overpasses.

Advantages:

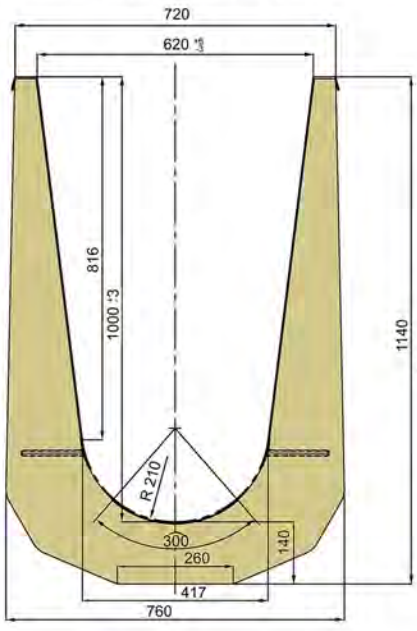
1. Reduction of installation costs. Installation by hand with no special machinery.
2. Reduction of operation costs: service life of a composite water removal channel is much longer than that of a concrete channel.
3. Possibility to install in hard-to-reach places (marshes and areas with rugged relief) where machinery can't be used.

Technical data: Estimated life cycle – 50 years. Weight of 1 linear meter – 6 … 23 kg

Geometry properties

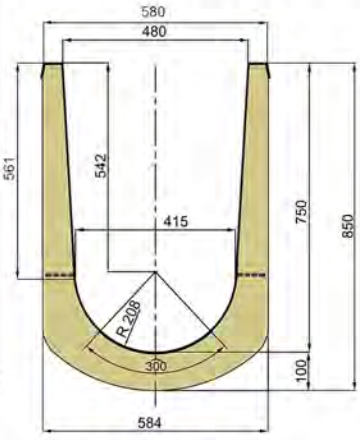
Type	ЛАД.0301.000.	ЛАД.0251.000	ЛАД.0201.000	ЛАД.0151.000	ЛАД.242.000
Height, H, m	1.0	0.75	0.5	0.4	0,7
Width, W, m	0.62	0.48	0.43	0.45	1,2
Length mm	2080	2480	4080	4080	3080
Weight kg	46,3	32,8	33,5	28,5	30,5

Channel 1,0



ЛАД.0301.000-
L = 2080 mm Weight 46,3 kg

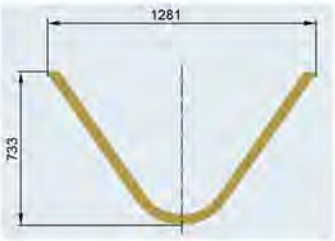
Channel 0,75



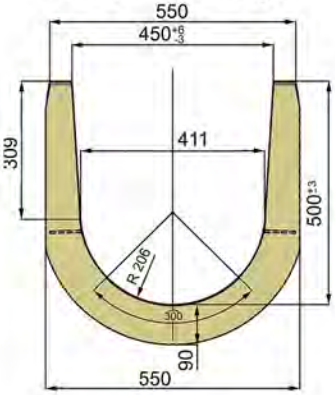
ЛАД.0251.000-
L = 2480 mm Weight 32,8 kg

ЛАД.242.000

Weight 30,5 kg

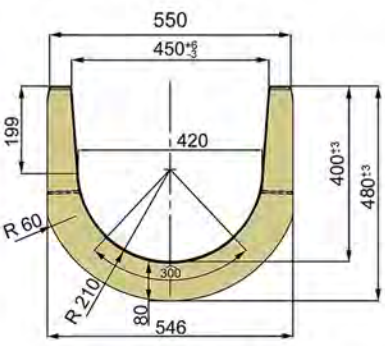


Channel 0,5



ЛАД .0201.000-
L = 4080 mm Weight 38,8 kg

Channel 0,4



ЛАД.0151.000-
L = 4080 mm Weight 28,5 kg

ЛАД.0151.000-01

Weight 28,5 kg

Patent 2285766

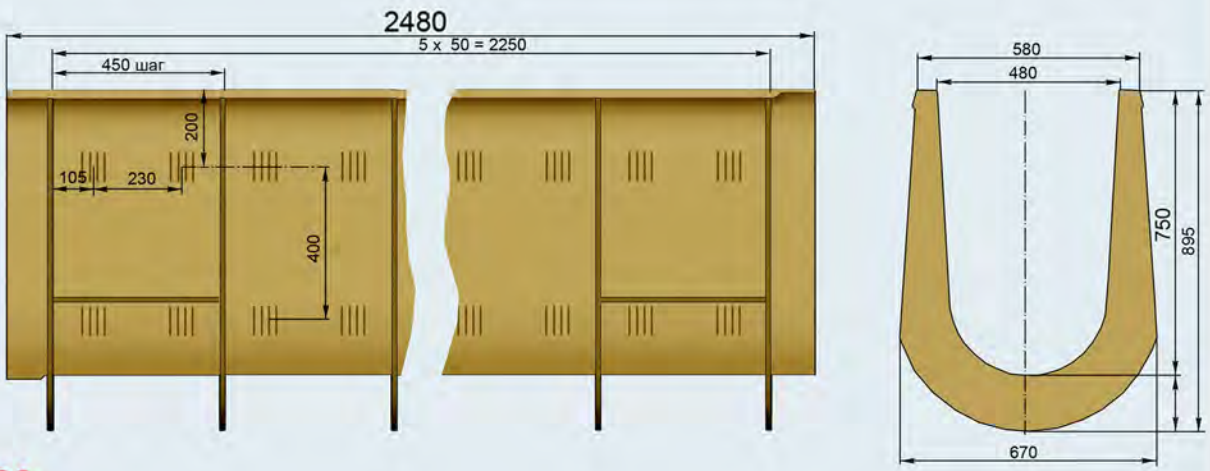
ЛАД.0201.000-70

Weight 38,8 kg

Patent 2285766

ЛАД.0251.000-40

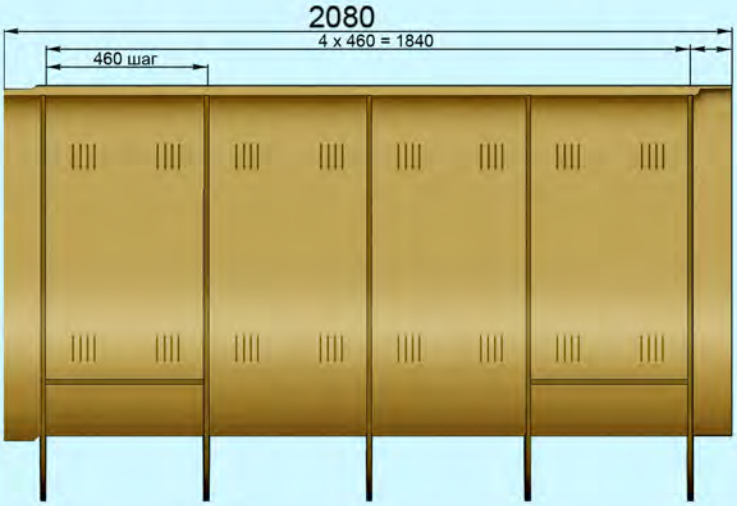
Weight 32,8 kg

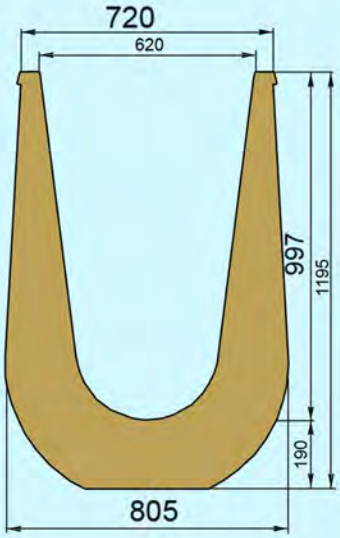


Patent 2285766

ЛАД.0301.000-09

Weight 46,3 kg






РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ

№ 2285766

ЛОТОК ВОДООТВОДНОЙ

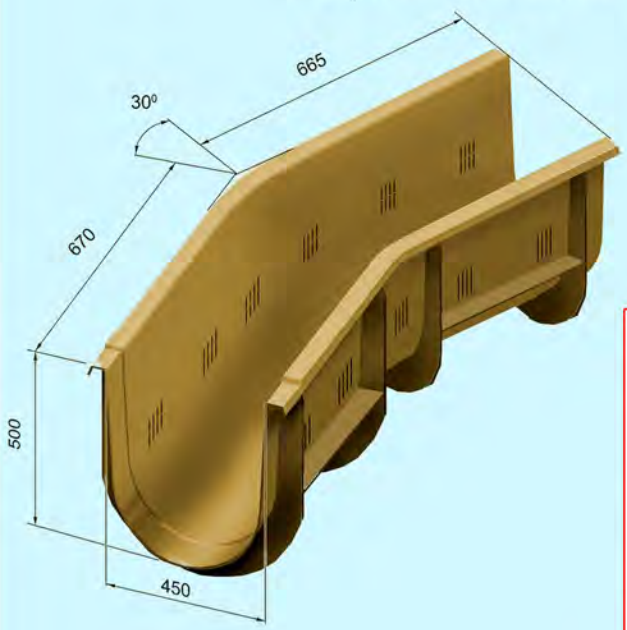
Patent 2285766

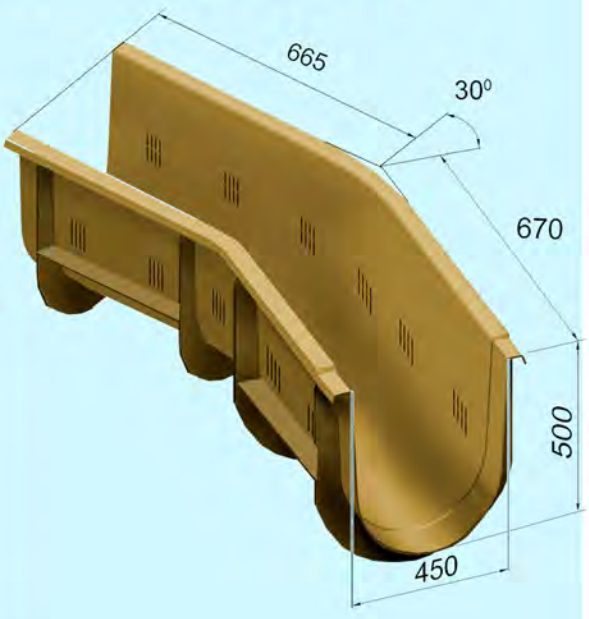
ЛАД.0202.000

ЛАД.0202.000-01

Water removal channel H=0,5 30 degrees rotary

Weight 11,36 kg






РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ

№ 2285766

ЛОТОК ВОДООТВОДНОЙ

Patent 2285766

ЛАД.0203.000 ЛАД.0203.000-01

Water removal channel H=0,5 45 degrees rotary

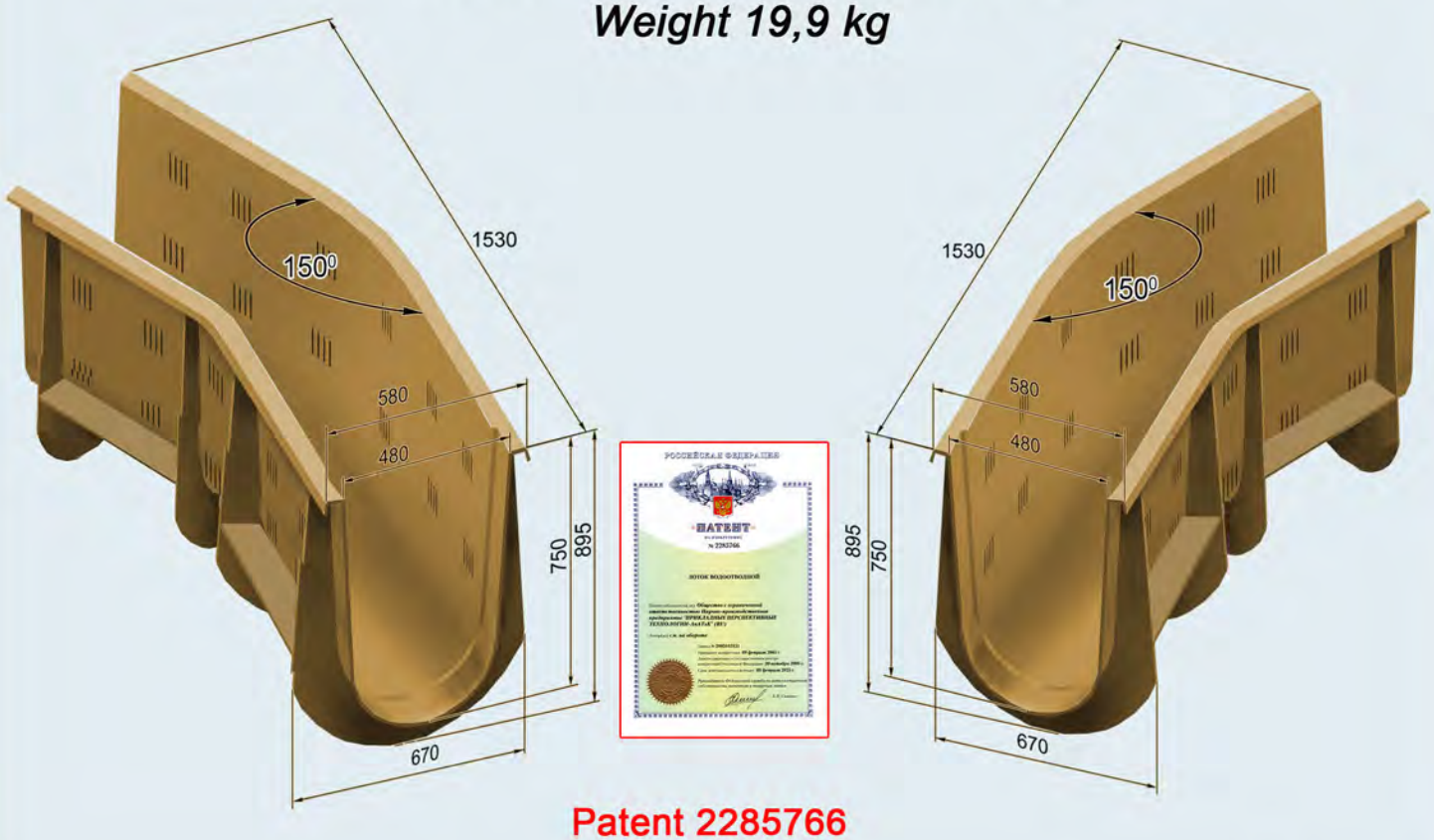
Weight 11,64 kg

Patent 2285766

ЛАД.251.000-30 ЛАД.251.000-30-01

Water removal channel H=750 30 degrees rotary

Weight 19,9 kg



Patent 2285766

ЛАД.251.000-45 ЛАД.251.000-45-01

Water removal channel H=750 45-degrees rotary

Weight 21,17 kg

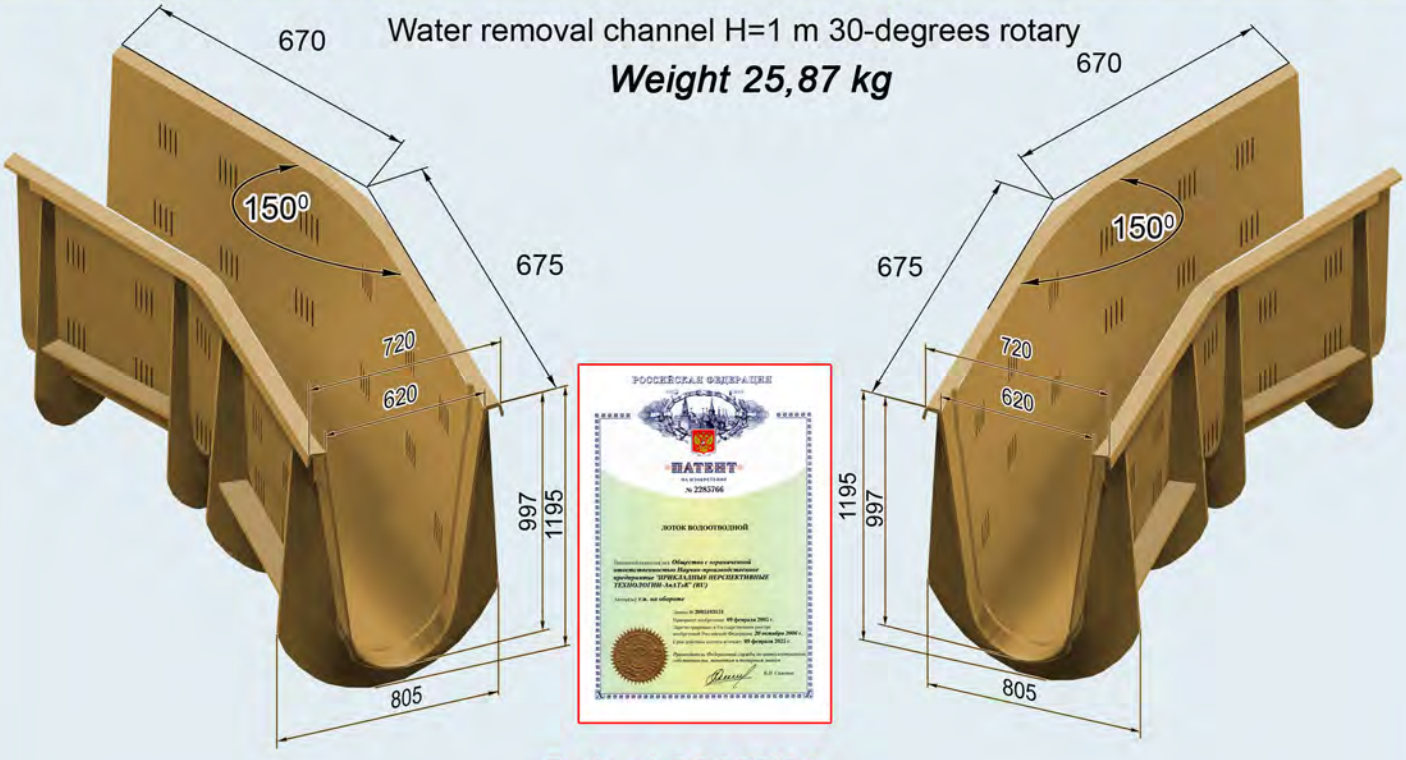
РОССИЙСКАЯ ФЕДЕРАЦИЯ
ПАТЕНТ
№ 2285766
ЛОТОК ВОДООТВОДНОЙ

Patent 2285766

ЛАД.0301.000-30 ЛАД.0301.000-30-01

Water removal channel H=1 m 30-degrees rotary

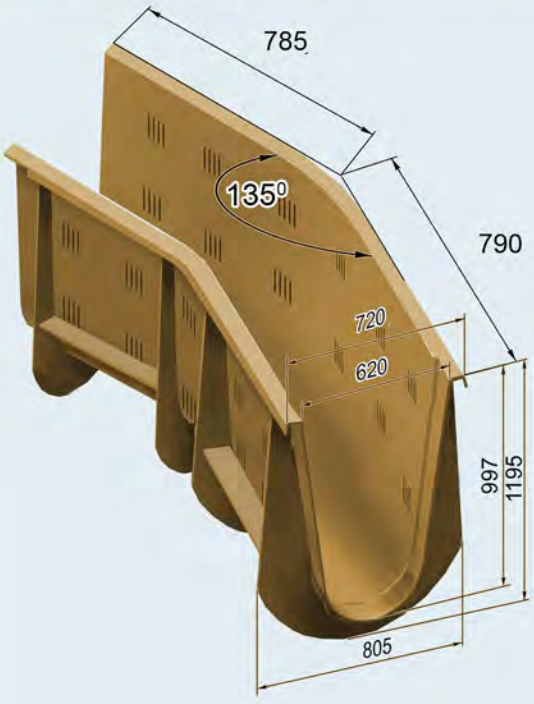
Weight 25,87 kg



РОССИЙСКАЯ ФЕДЕРАЦИЯ
ПАТЕНТ
№ 2285766
ЛОТОК ВОДООТВОДНОЙ

Patent 2285766

ЛАД.0301.000-45



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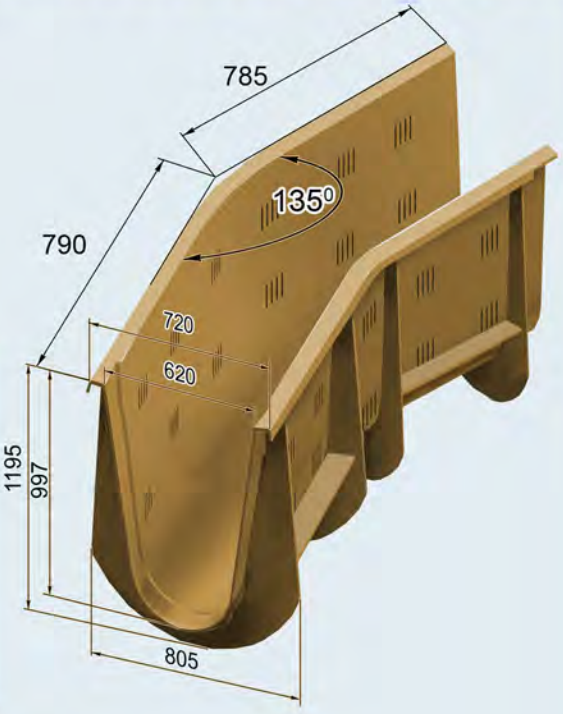



РОССИЙСКАЯ ФЕДЕРАЦИЯ
ПАТЕНТ
№ 2285766
ЛОТОК ВОДООТВОДНОЙ

Patent 2285766

Water removal channels are installed at the railway station “Vnukovo”, Moscow by a team of 3 workers.
Properties of composite material and effective thickness of channel sides allow easy cutting of channel sidewalls in the zones necessary for insert of drainage and drainage pipes.

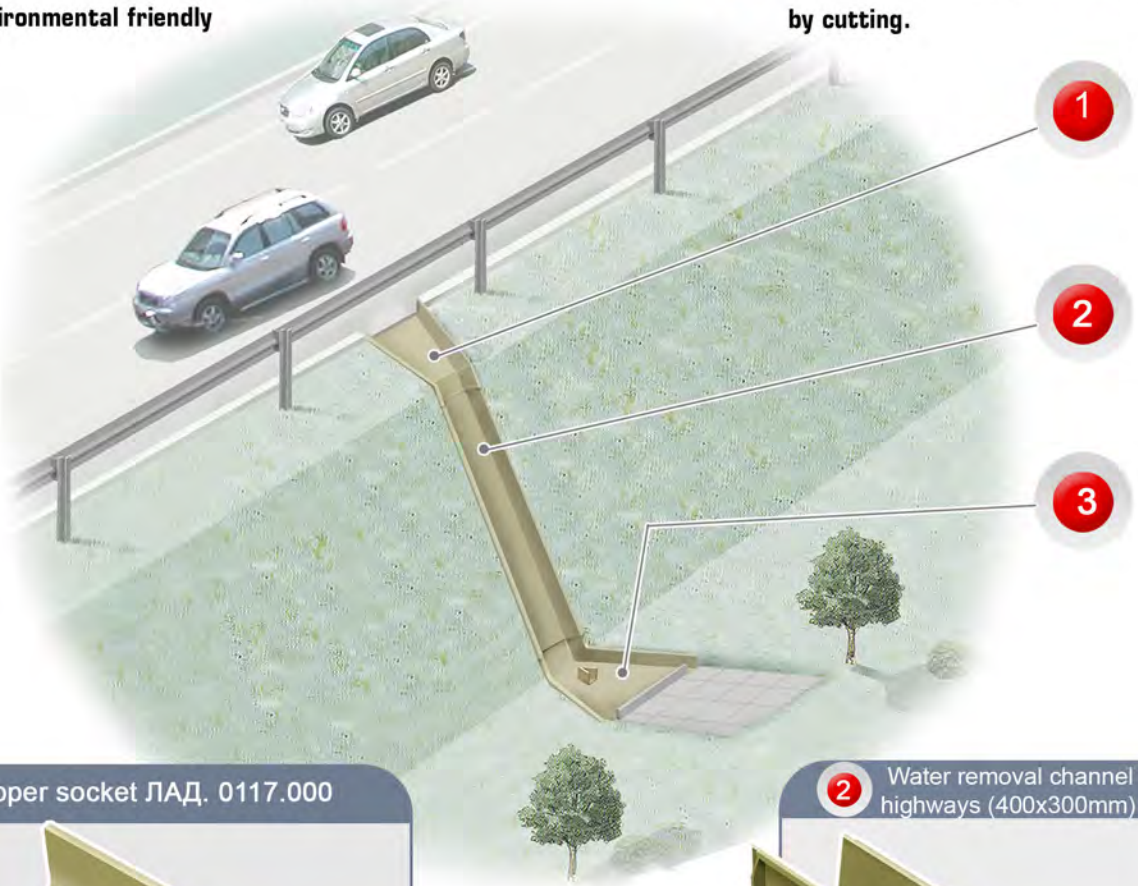
Water removal channels for roads

Properties

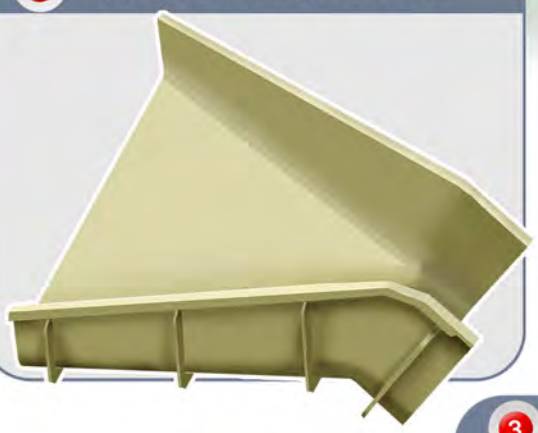
- Light weight
- High stability and stiffness
- High resistance to chemicals and oil products
- Frost resistance up to -60єС
- High resistance to ultraviolet rays and ice-melting chemicals
- Stacking at storage and transportation
- Environmental friendly

Advantages

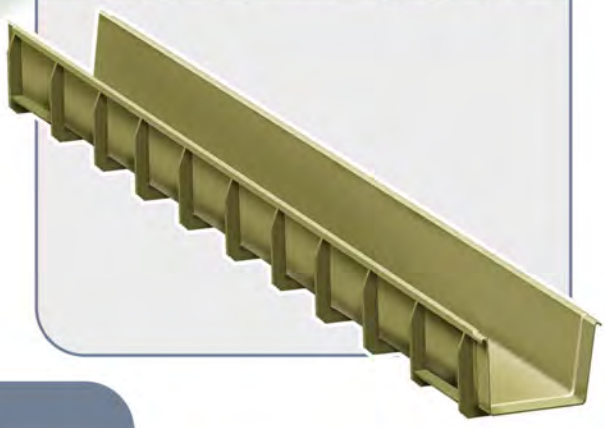
- Light weight and min transportation costs
- Easy and quick installation
- Easy maintenance
- High quality of the material (resistant to break and damage). Not easy combustible.
- Possibility to change the water drain length by cutting.



1 Upper socket ЛАД. 0117.000

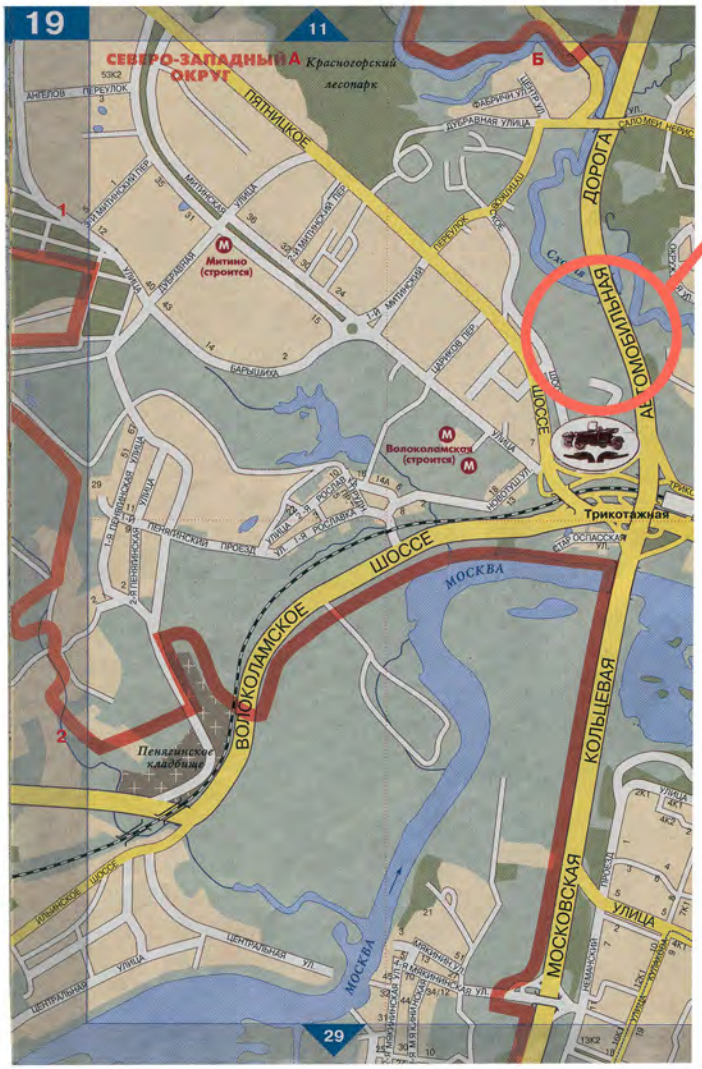


2 Water removal channel for highways (400x300mm) ЛАД. 0116.000



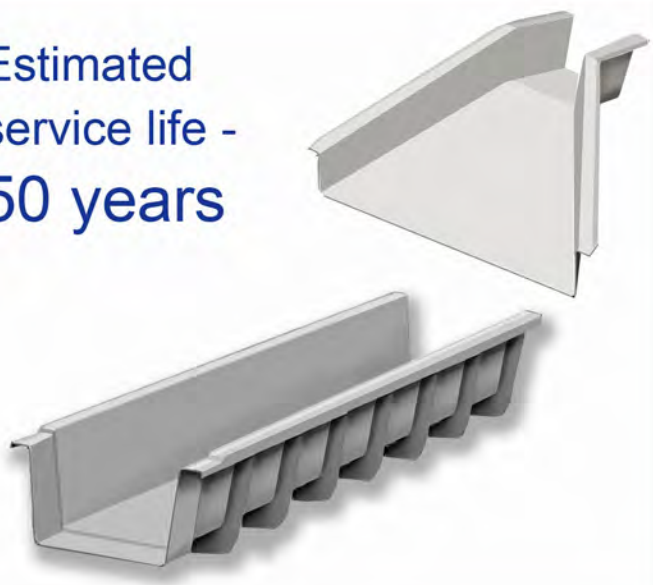
3 Bottom socket with divider ЛАД. 0118.000

Water removal channels for roads



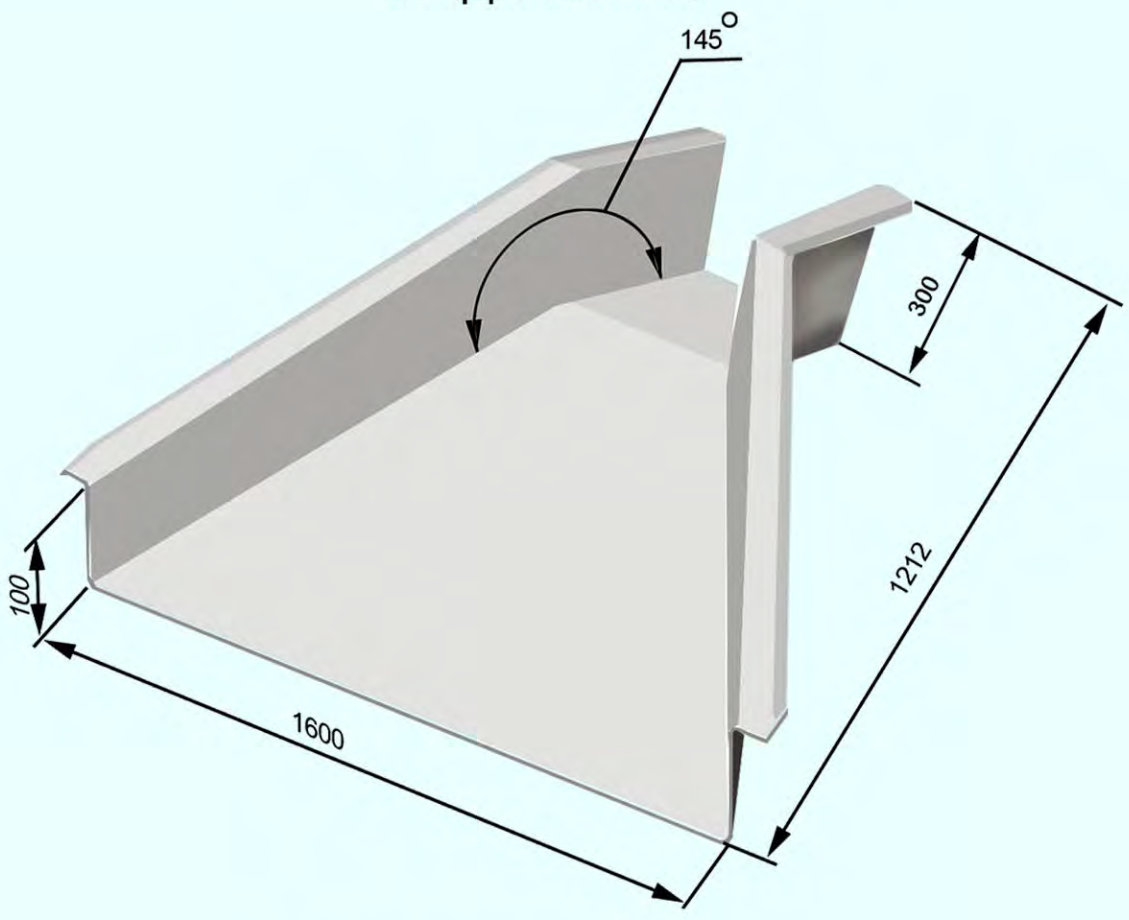
Pilot batch of water removal channels was installed on the Moscow ring road in 2002

Estimated service life - 50 years



Water removal socket for roads

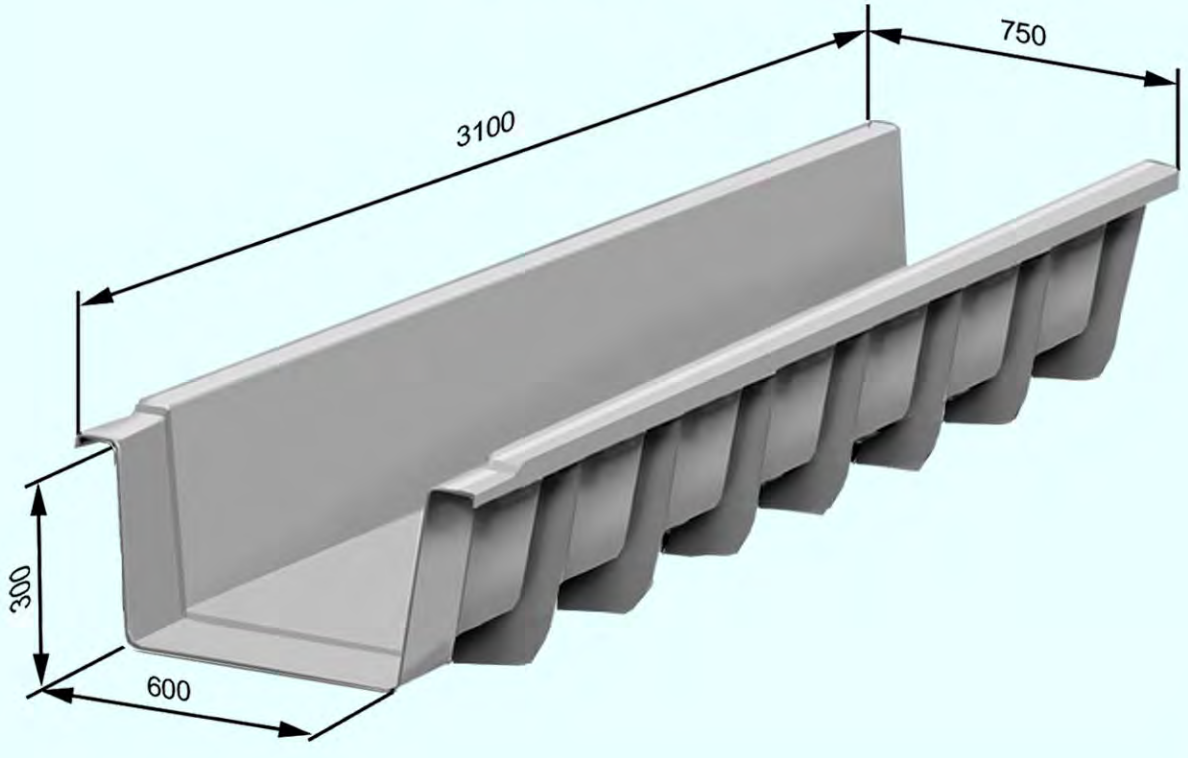
ЛАД.0450.000



Water removal channel

ЛАД. 0400.000

(for roads)



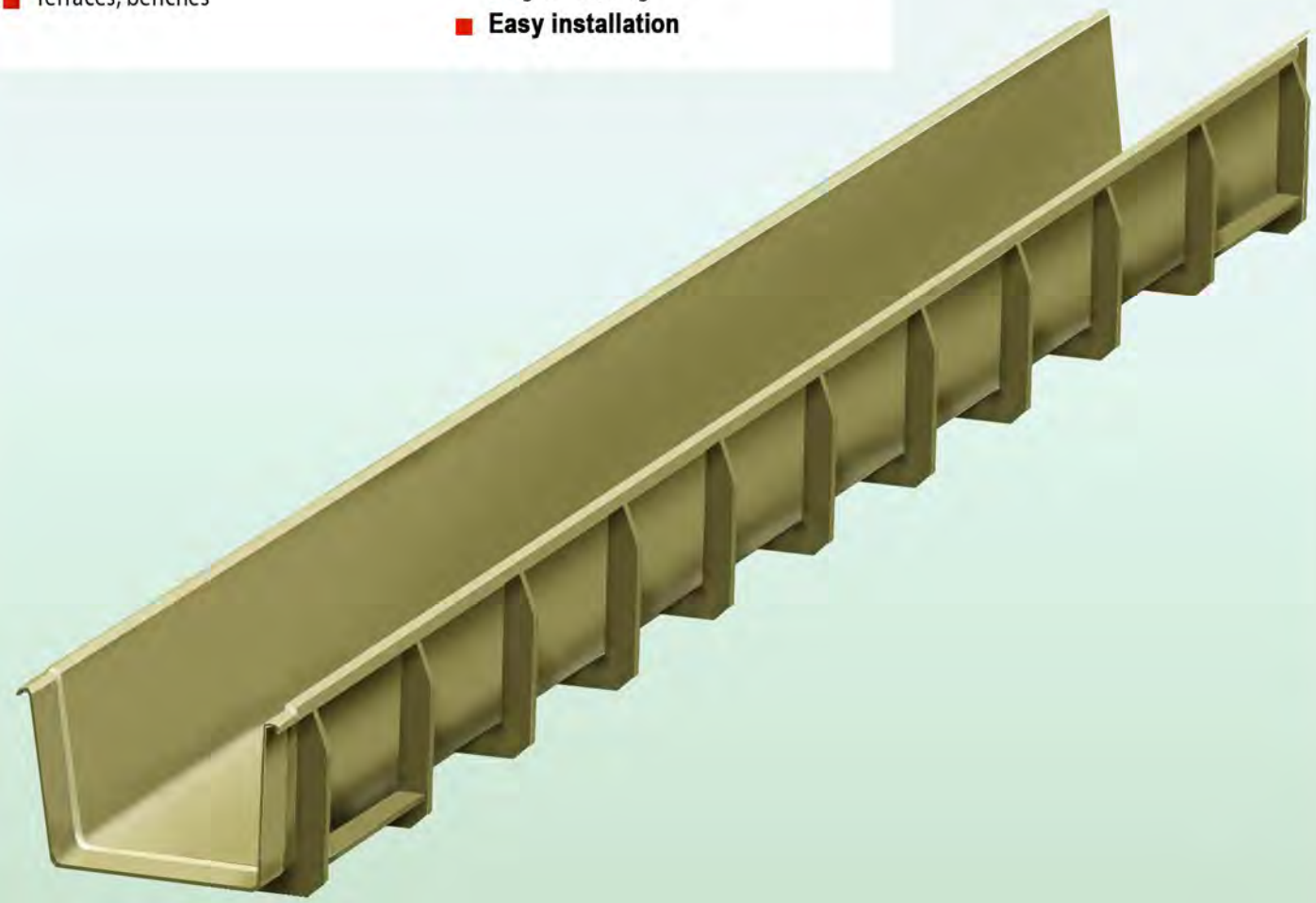
Road water removal channel 400 x 300 mm
ЛАД.0116. 000

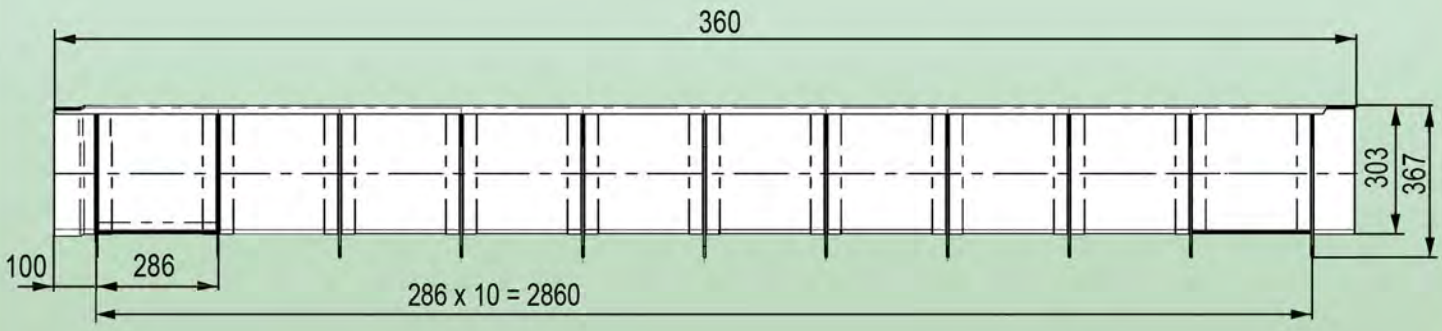
Fields of application

- Slopes for highways
- Terraces, benches

Characteristics

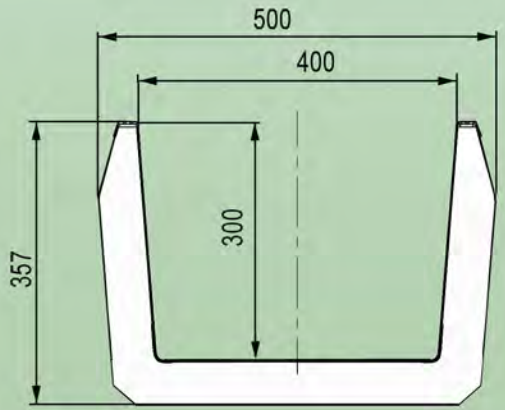
- Extremely lightweight - weight - 22,8 kg
- **Easy installation**





Installation

Water removal channels should be installed, assembled and filled up according to design documentation and «Installation and maintenance guide for composite water removal channels ЛАД.0400.000РЭ».



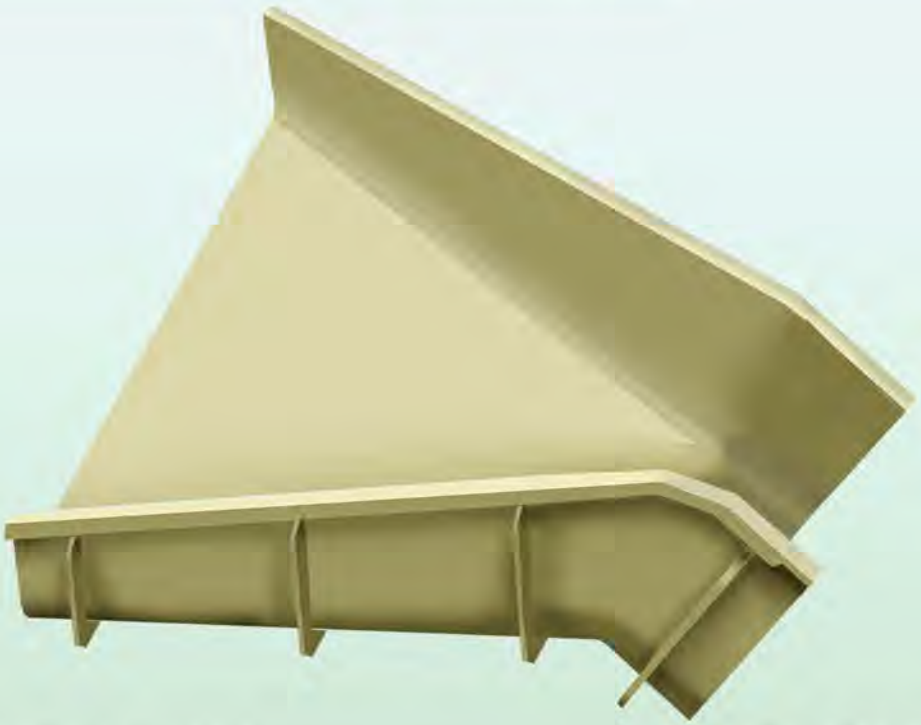
Upper socket ЛАД.0117.000

Fields of application

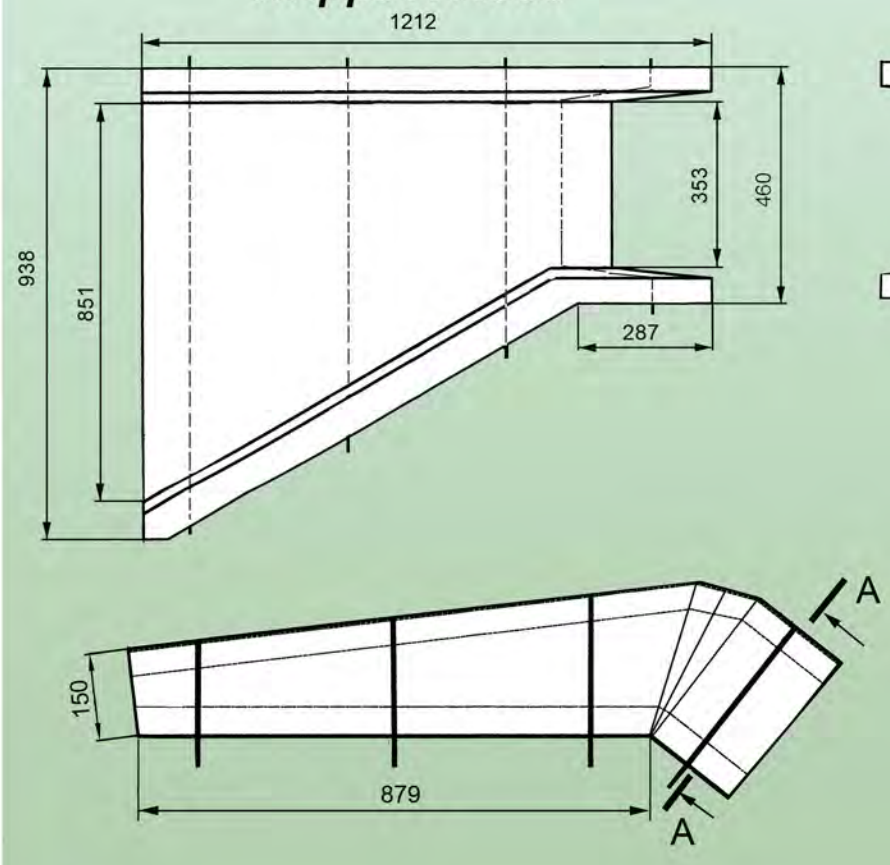
- For water removal from highways

Characteristics

- Extremely lightweight weight - 22 kg
- **Easy installation and maintenance**

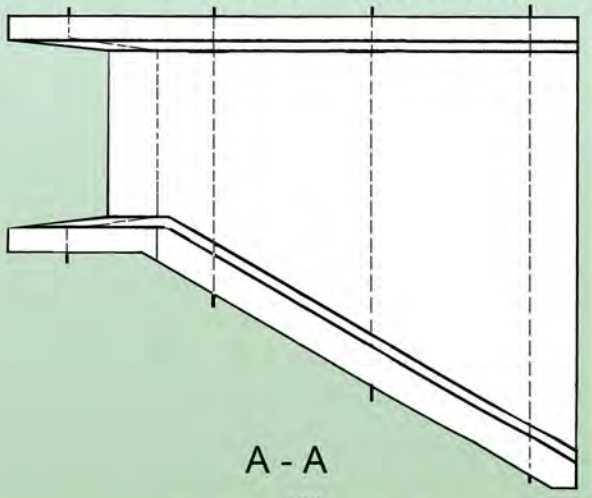


ЛАД.0117.000

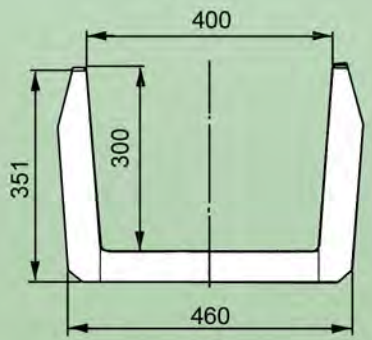


ЛАД.0117.000 - 01

(mirror reflection ЛАД.0117.000)



A - A



Installed at the beginning of the gutter

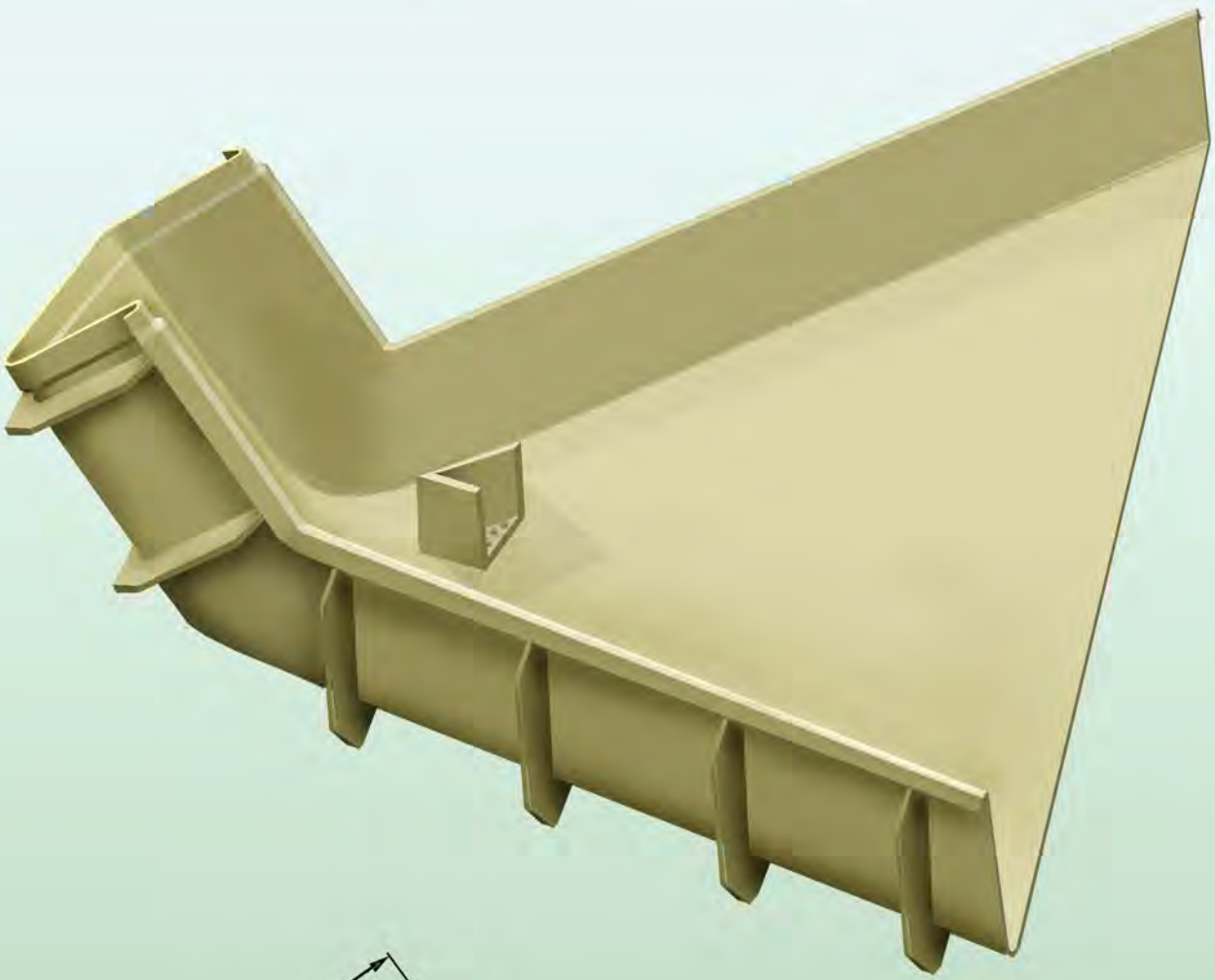
Bottom socket with divider
ЛАД. 0472. 000

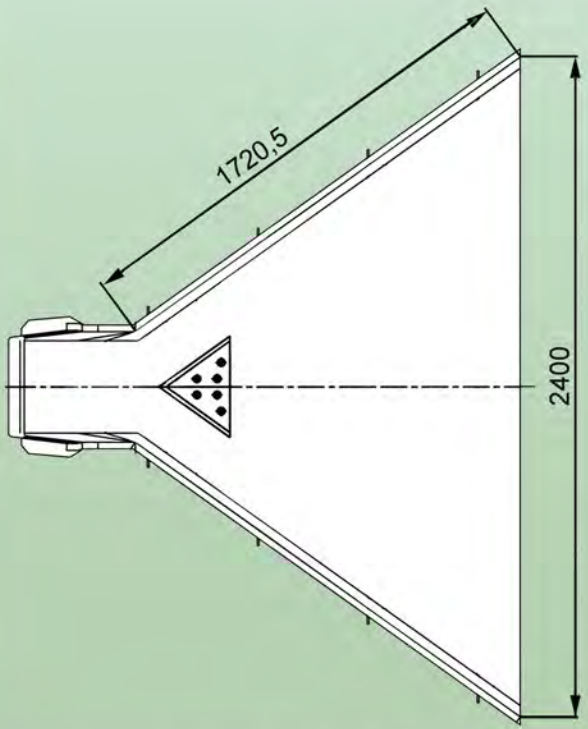
Field of application

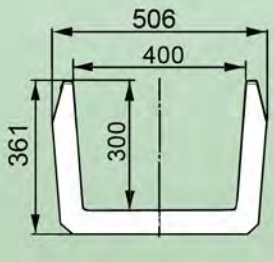
- Slopes of highways
- Terraces, bermes

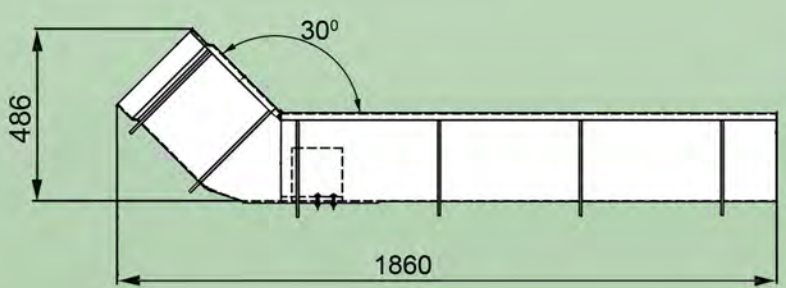
Properties

- Exceedingly low weight - 23,4 kg
- Easy installation









Installed at the end of the drain

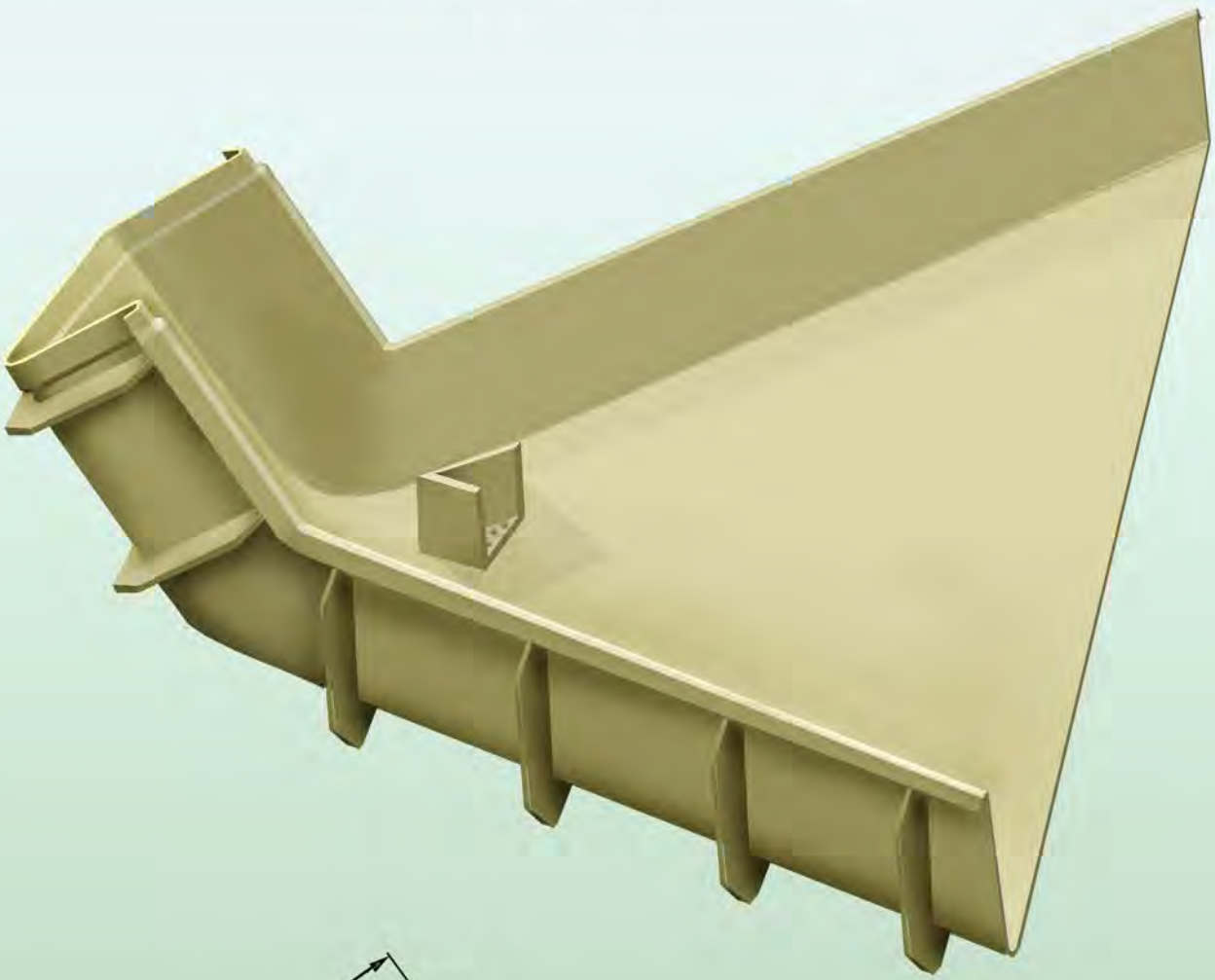
Bottom socket with divider
ЛАД. 0118. 000

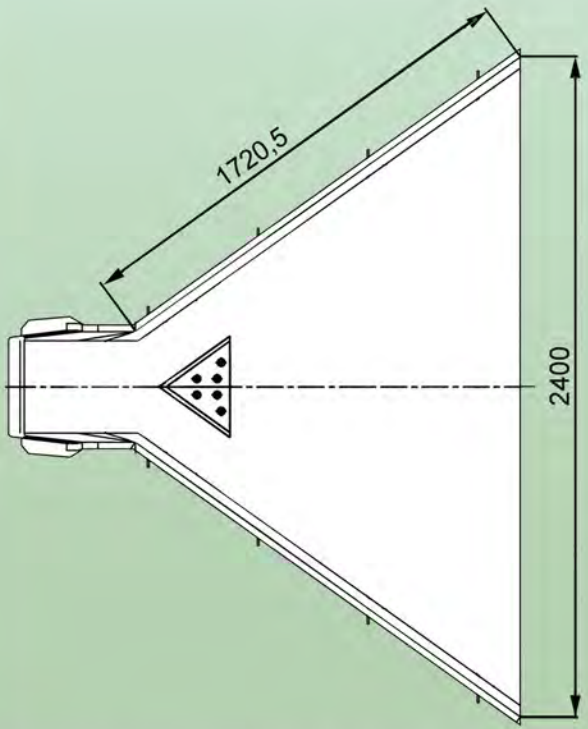
Fields of application

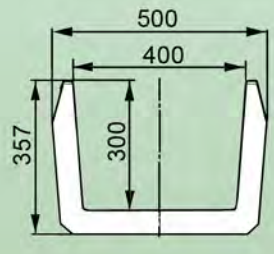
- Slopes of highways
- Terraces, benches

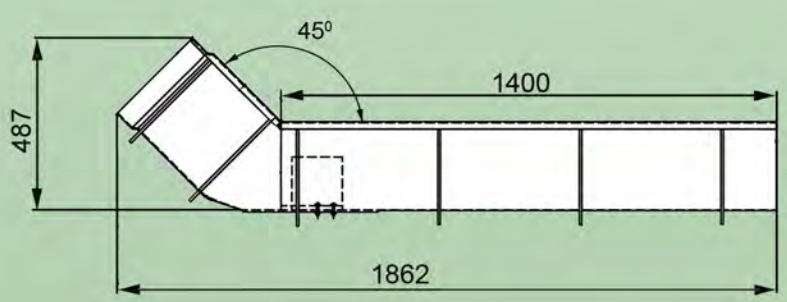
Characteristics

- Extremely lightweight weight - 21 kg
- **Easy installation**



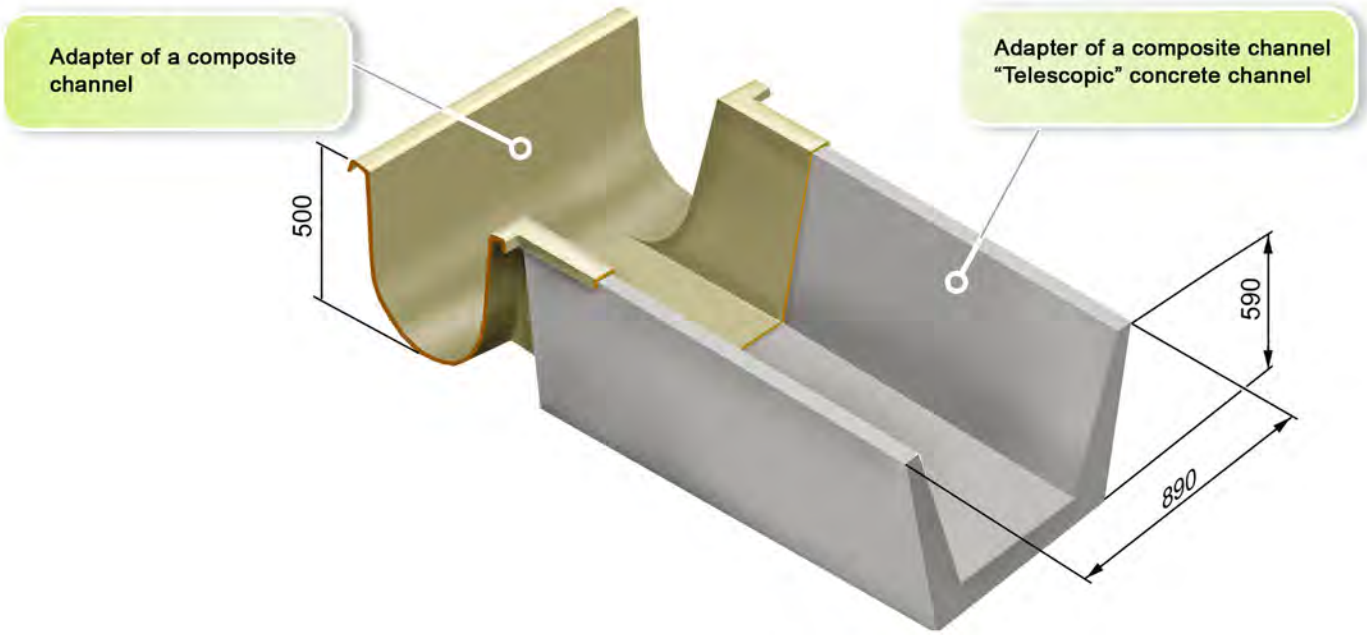


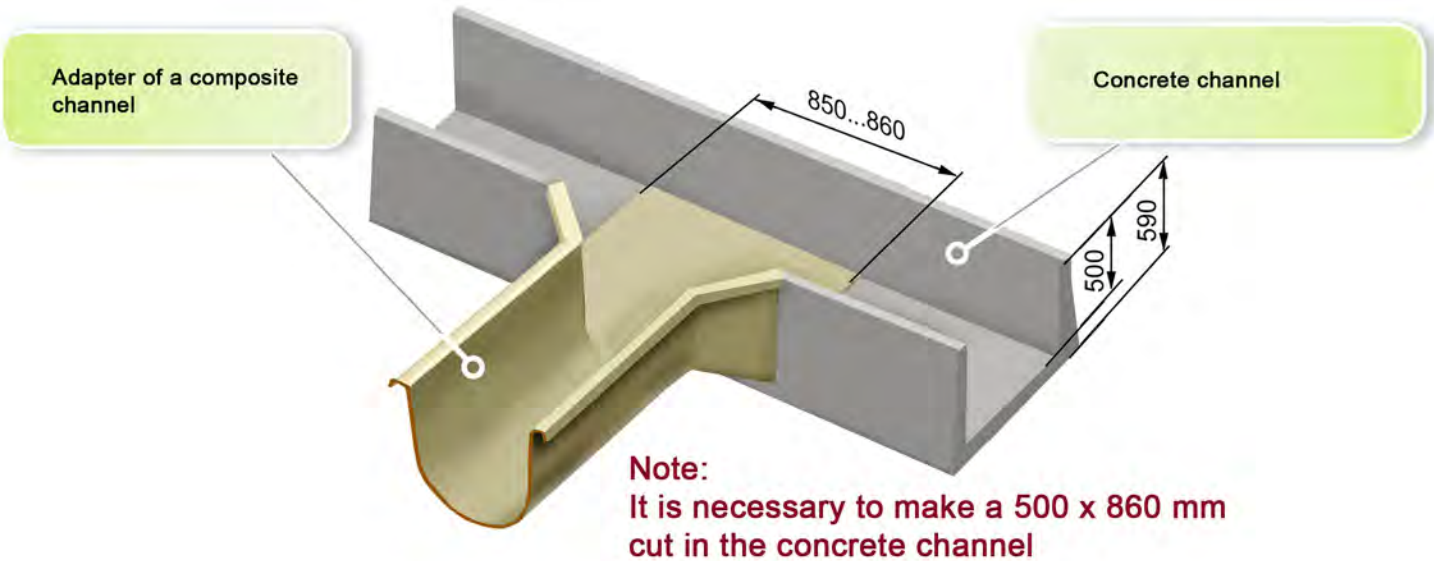




Installed in the end of the gutter

Alternatives for connection of composite channels with concrete ones

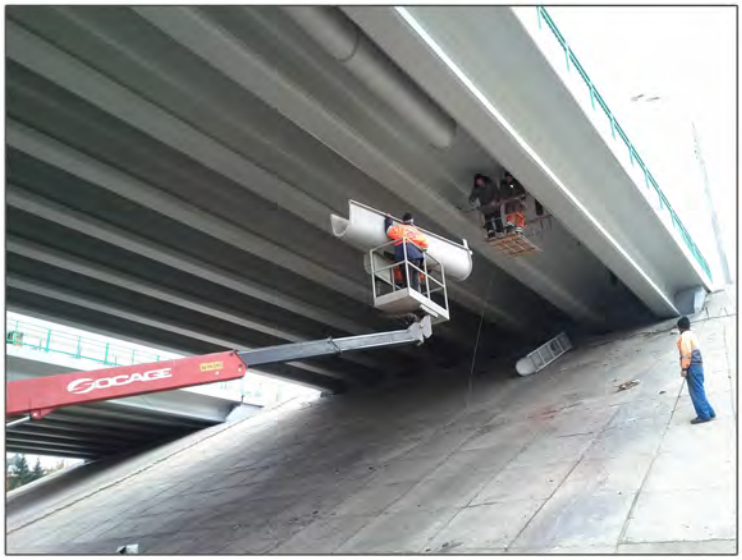




Note:
It is necessary to make a 500 x 860 mm cut in the concrete channel

Suspended water removal channels for bridges

Channels for water removing from the surface of highway bridges



Starting channel
Dimensions : L x 500 x 450
Weight 5,6 kg/lm
(L = 600 - 3000mm)
ЛАД.0494.20.00

Regular channel
Dimensions: 3005 x 500 x 450mm
Weight 16,7 kg/lm
ЛАД.0494.10.00

End channel
Dimensions : 3005 x 500 x 450
Weight 21,2 kg
ЛАД.0494.30.00

Short channel
Dimensions: L x 500 x 450
Weight 5,6 kg/lm, (L = 600 - 3000)
ЛАД.0494.40.00

Composite cable trays

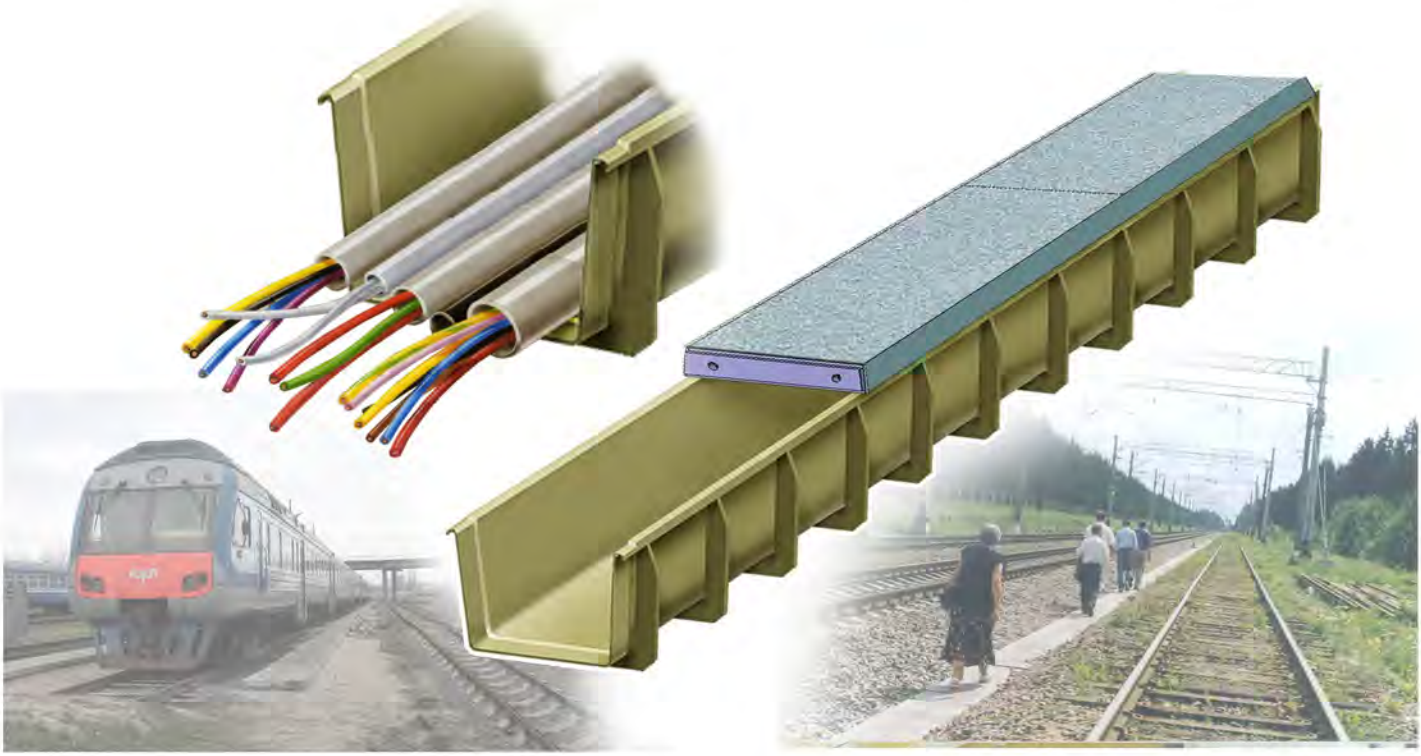
Cable channels are produced according to ТУ 3185-009-39790001-2005 and made of composite materials. They are used for signal-blocking cable channels at the railway stations and spans. Trays are placed in the ground or, in some cases, on the ground surface. Type of climatic version УХЛ 1 according to GOST 15150-69.

Parameters:

- – Very light weight
- – hHigh stability and strength
- – Absolute resistance to the chemical attack and petroleum products
- – Absolute resistance to the ultraviolet attack
- – Stacking during storage and transportation
- – Freeze resistance up to – 60°C
- – Weak influence on the environment

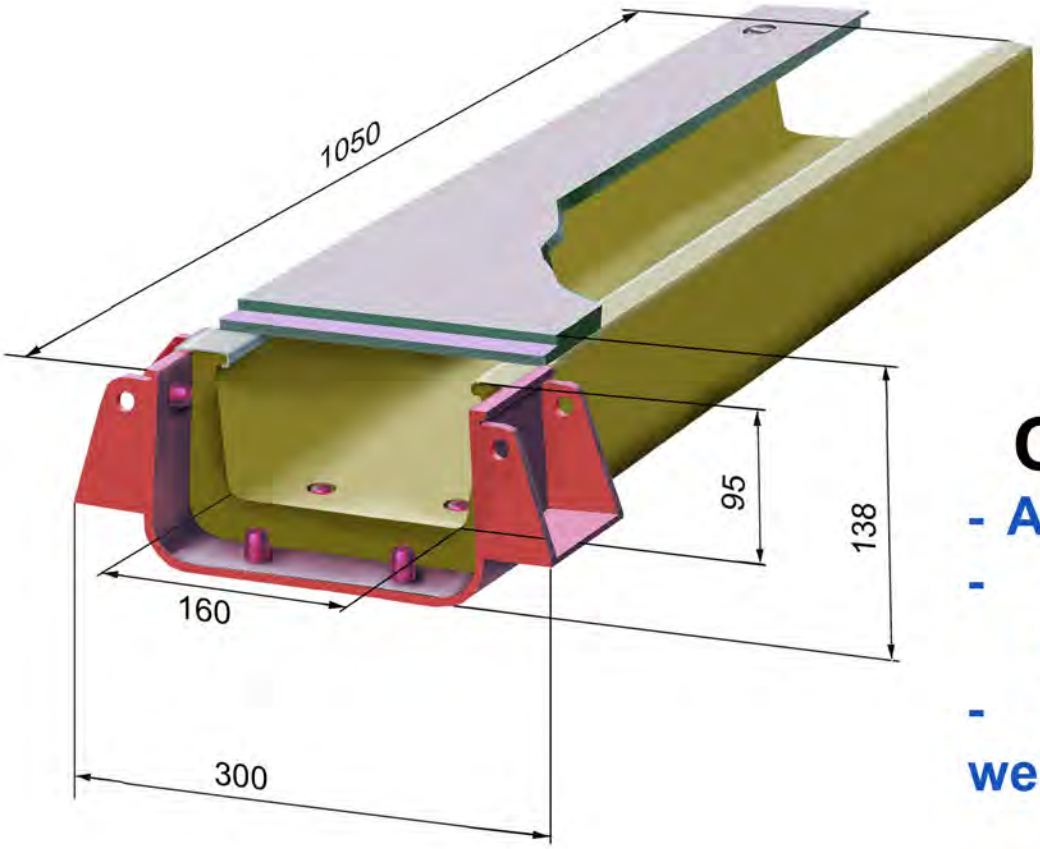
Advantages:

- – Light weight and minimum costs during transportation
- – Fast and easy mounting
- – Simple maintenance
- – High quality of the material (doesn't get damaged). Hardly combustible
- – Opportunity to change the length of the water drain by cutting/section
- – Target life cycle – 25 years



Parameters	Tray/Chanel designation			
	ЛАД.0100.010	ЛАД.0110.000	ЛАД.0112.000	ЛАД.0115.000
Height, mm	3060±10	3060±10	3060±10	3060±10
Depth, mm	200±5	200±5	300±5	300±5
Width, mm	200^{+6}_{-3}	300^{+6}_{-3}	300^{+6}_{-3}	400^{+6}_{-3}
Mass, kg	14.8±0.5	17.9±0.6	21.3±0.8	22.8±1

COMMUNICATIONAL CHANNELS FOR ELECTRIC CABLES OF SCB AND TELECOMMUNICATION



Can stand

- A hammer blow
- Burning hot break shoe
- Car with the weight of 3.5 tons

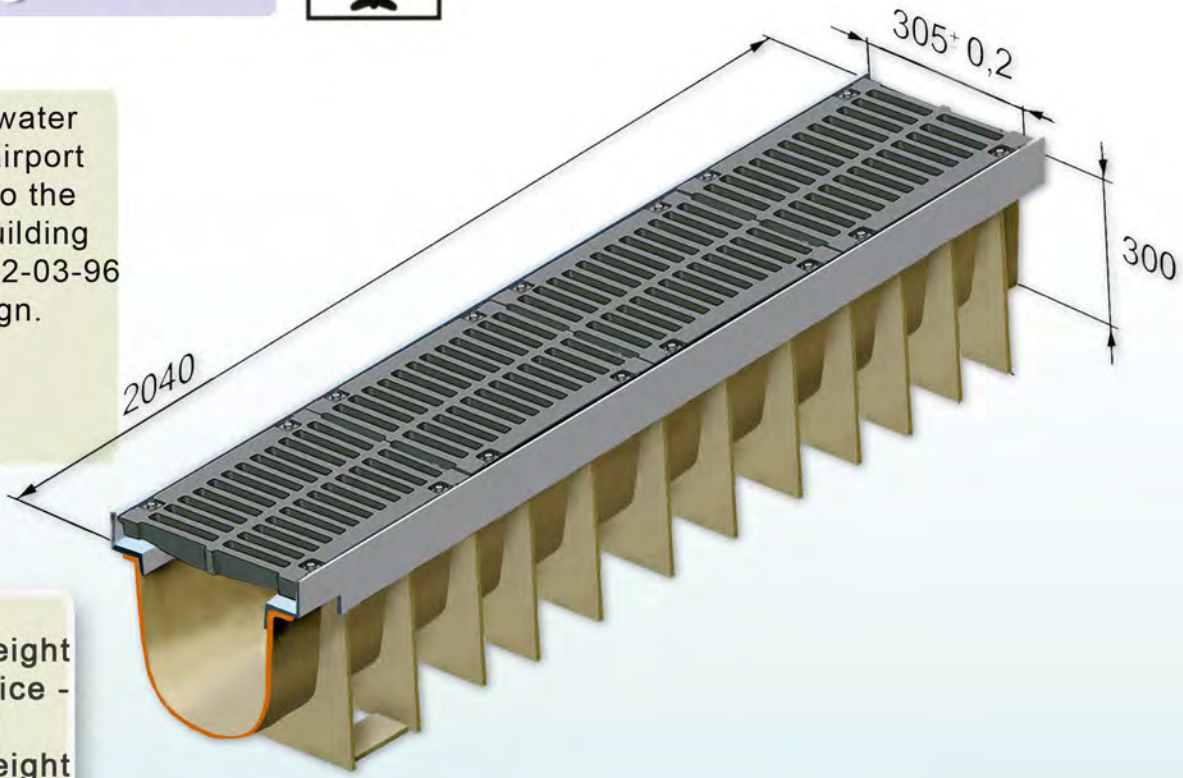
Identification	Working volume	Body weight	Weight of the set*
ЛКАД.0253.000	160 x 82 x 1000 mm	11,3 kg	24 kg
ЛКАД.0254.000	282 x 85 x 1000 mm	15,6 kg	36,24 kg

*** - Components of the cable channel: a case, a lid, a connector, clamps**

Composite aerodrome water removal channel with grating

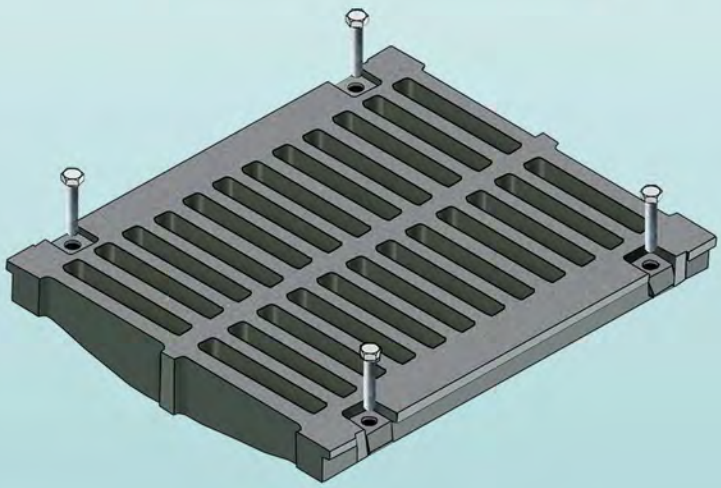
Category F 900

Channels provide water removal from the airport airfield according to the requirements of Building regulations SNiP 32-03-96 and hydraulic design.



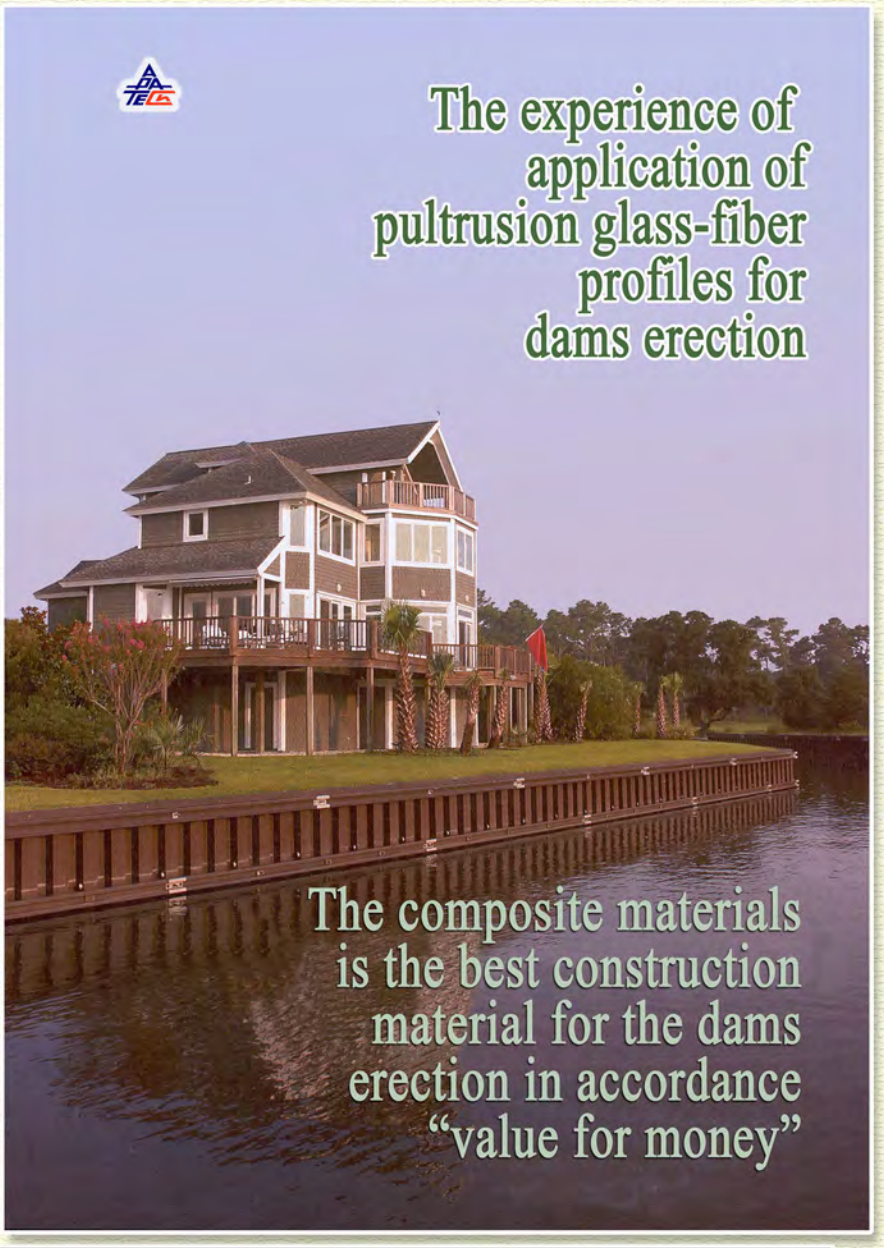
Channel weight without lattice - 18,7 kg
Channel weight with grating - 137 kg

Channel is supplied with cast-iron grating (4 pcs.)



Building structures

Composite retaining walls

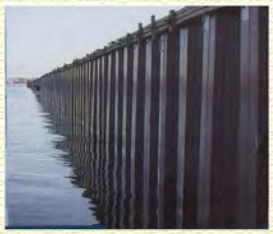


Profiles unloading on the site. Light weight of the profiles allows to unload by large consignments

6-meter profile is stricken into the ground by using vibro-machine

Installation of the wall, made of profiles en block structure

Manufacturing of composite profiles in the shopfloor of the enterprise by using pultrusion machine



Pultrusion glass-fiber profiles – is quite a new material on the market, but in particular the customers prefer this kind of material due to its outstanding durability and high strength comparable to steel.
The composite material, as distinguished from steel, won't be eaten away by brackish sea water.

The stages of sheet pilings' manufacturing made of "ApATeCh" profiles

Step 1:
Loading of glass-fillers into the die

Step 2:
Impregnation of glass-filler with resin

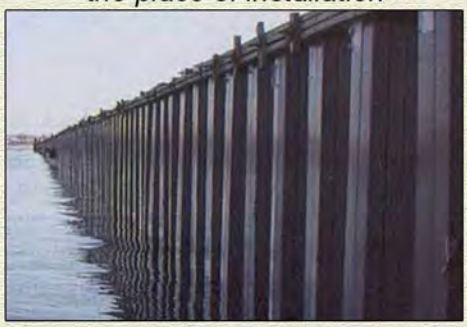
Step 3:
Molding of profile in a die

Step 4: Displacement of the profiles by using pulling machine

Step5: Profiles' cutting of determined length

Step 6: The finished products are packed and dispatched to the place of installation

Step 7: Profiles' installation on the site to the bearing composite basic structure



Step 8: The sheet piling is installed. The guaranteed service life is 70 years

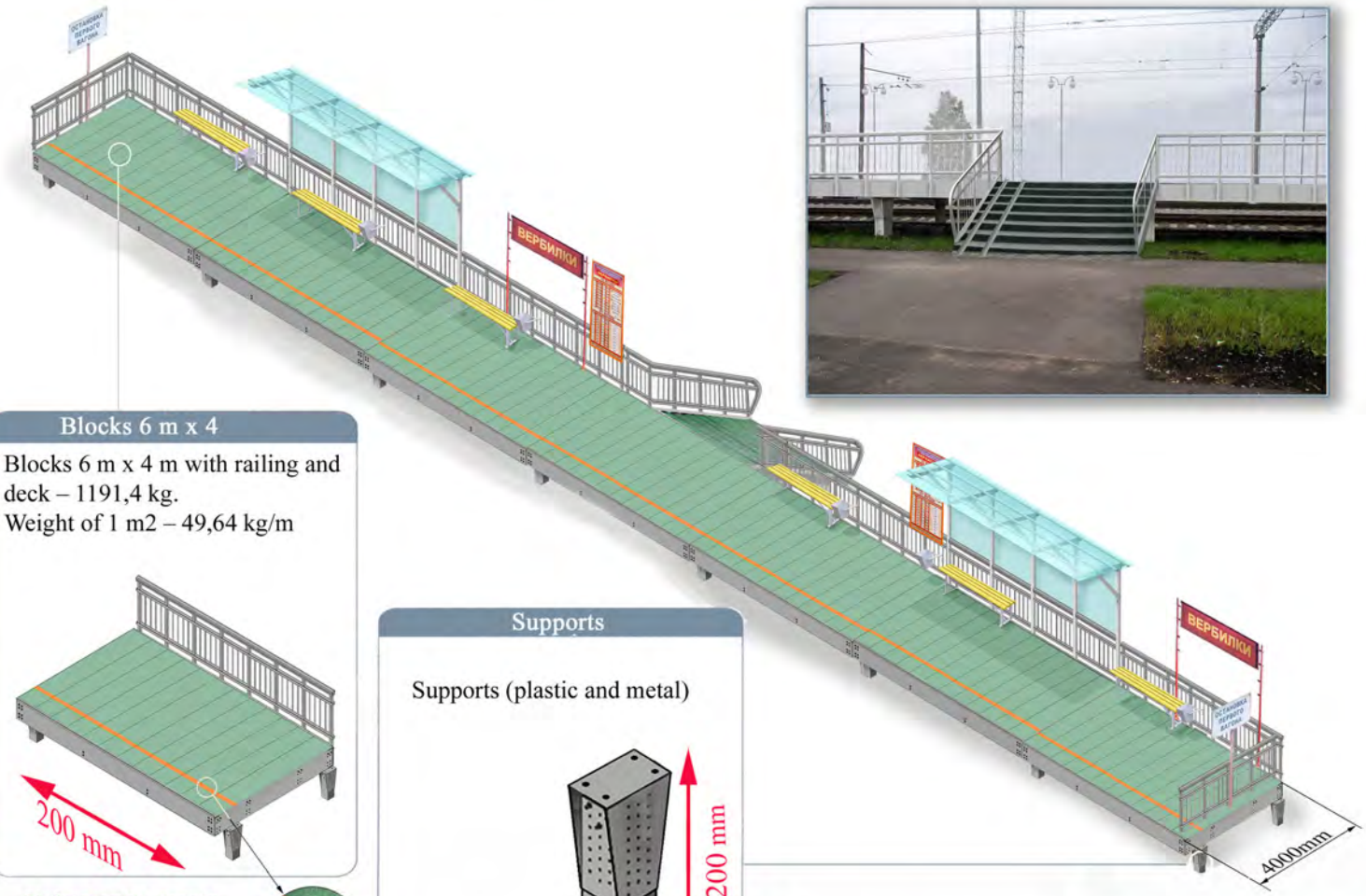
The installation of sheet pilings made of glass-fiber profiles is comparable to the installation of those made of other profile types

The choice of installation method depends on specific conditions and can be realized by using lift crane, digger and also manually with installation in a trench which was prepared in advance. During sheet piling installation, the glass-fiber profiles should be jointed.

The manual installation of the profiles in a swimming –pool in advance prepared trench.

COMPOSITE ADJUSTABLE PLATFORMS

Composite materials reinforced by glass filler are the present-day building material alternative to the traditional materials like concrete, steel and wood. Suggested variants of platform modules can be delivered to the customer individually or updated according to the requirements.



Blocks 6 m x 4

Blocks 6 m x 4 m with railing and deck – 1191,4 kg.
Weight of 1 m2 – 49,64 kg/m

Platform module structure and antiwear coating material provide layout for people with poor eyesight

Supports

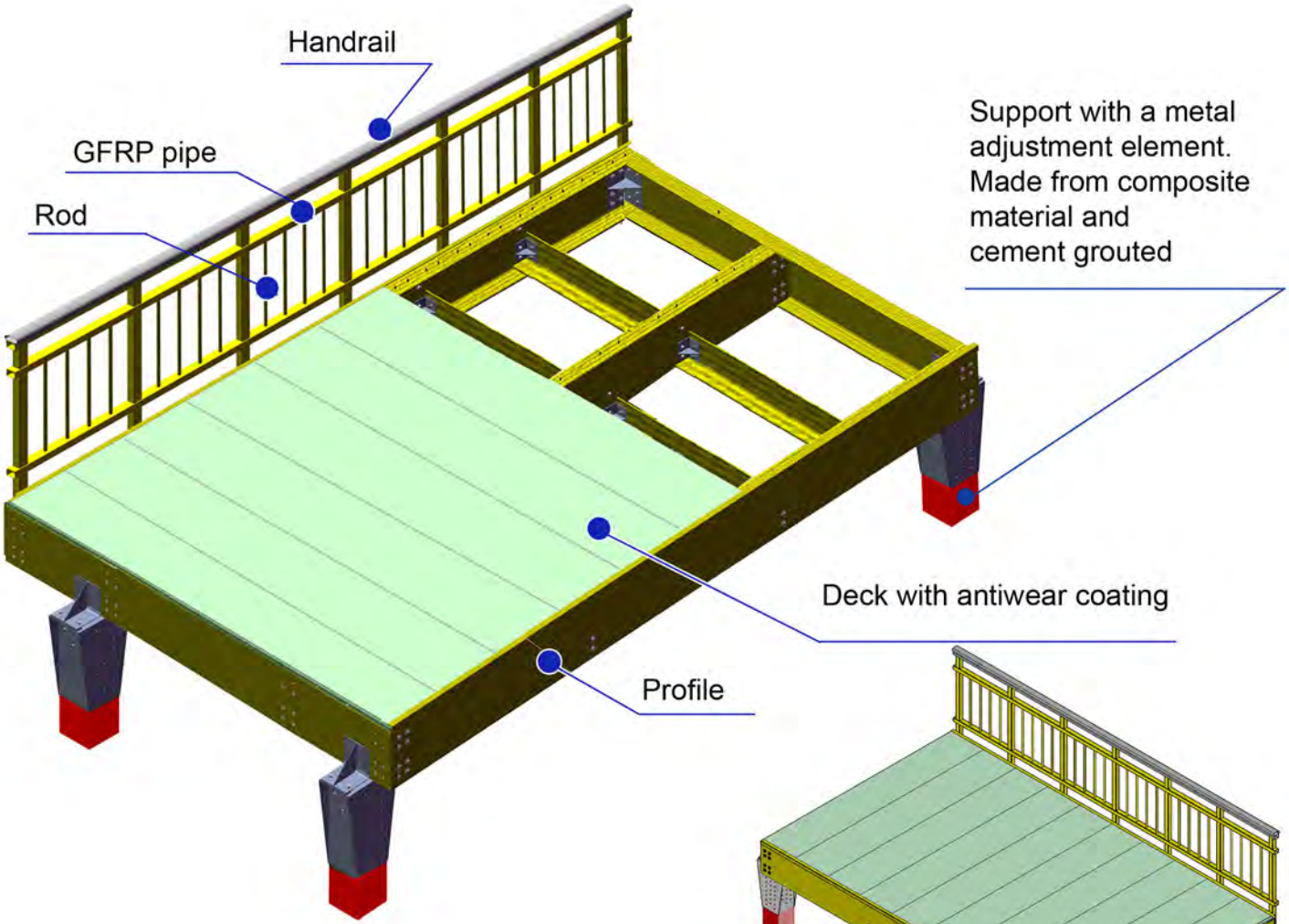
Supports (plastic and metal)

	Traditional materials	Composites
Weight 1 m2	800 kg	60 kg
Control range, mm	-	± 200
Repair frequency	5 years	10 years
Life cycle	20 years	75 years

As building material fiberglass plastic has numerous advantages:

1. *- corrosion resistance,*
2. *- low specific weight together with high strength,*
3. *- minimum service and long life cycle,*
4. *- easy assembly,*
5. *- considerable reduction of the erection works, time and quantity of interruption periods during production;*
6. *- opportunity to control position of the deck in the vertical and horizontal directions during maintenance.*

The platform consists of separate composite modules joined together.



РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ

НА ПОЛЕЗНУЮ МОДЕЛЬ

№ 87713

ПЛАТФОРМА

Патентообладатель(ли): *Общество с ограниченной ответственностью "Научно-технологический испытательный центр "АпАТэК-Дубна" (RU)*

Автор(ы): *см. на обороте*

Заявка № 2009116060

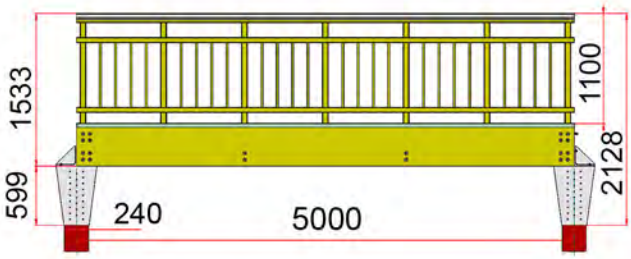
Приоритет полезной модели **29 апреля 2009 г.**

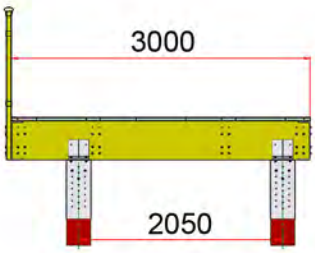
Зарегистрировано в Государственном реестре полезных моделей Российской Федерации **20 октября 2009 г.**

Срок действия патента истекает **29 апреля 2019 г.**

Руководитель Федеральной службы по интеллектуальной собственности, патентам и товарным знакам

Б.П. Симонов





Patent for the utility model № 87713 “PLATFORM”

Noise barrier

made of composite materials

РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ

НА ПОЛЕЗНУЮ МОДЕЛЬ

№ 81501

ШУМОЗАЩИТНЫЙ ЭКРАН

Патентообладатель(ли): Общество с ограниченной ответственностью "Научно-технологический испытательный центр" АпАТэК-Дубна" (RU)

Автор(ы): см. на обороте

Заявка № 2008125230

Приоритет полезной модели: 24 июня 2008 г.

Зарегистрировано в Государственном реестре полезных моделей Российской Федерации 20 марта 2009 г.

Срок действия патента истекает 24 июня 2018 г.

Руководитель Федеральной службы по интеллектуальной собственности, патентам и товарным знакам

Б.П. Симонов

Patent 81501

- - Deformation resistance
- - Convenience and lower service costs
- - Stone kick resistance
- - Stability of dimensions
- - Deterioration and corrosion resistance
- - Fire safety
- - The screen is prepared for the "antigraffiti" coatings

Comparison: Noise barrier made of traditional materials – composite noise screens produced by "ApATeCh"

№	Characteristics	Noise barrier made of traditional materials	Composite noise screens produced by "ApATeCh"
1	Section pace/step	2...4 m	up 7.5 m
2	Material and construction	Three-layer construction made of the aluminium profile with a filler, or acrylic glass	Two-chamber pultrusion hollow sections
3	Type of the foundation	Strip foundation	Point foundation
4	Screen efficiency "Noise reduction"	4 dBA	13....15 dBA
5	Assembling	Load-lifting equipment	Hand assembling with reduction of assembling time in 1.5 times
6	Mobility	No assembly-disassembly opportunity with the consequent application	Not less than 10 assembly-disassemblies with the retention factor of details 95%
7	Service and repairs of the structure (washing, painting, graffiti-protection, replacement of damaged details)	Ageing due to influence of stones and caustic dust on the metal coverings and water absorption of the filler	- absence of corrosion - simplified repairs by replacement of separate profiles - graffiti protection
8	Life cycle	10...25 years	50 years

COMPOSITE SEA WALL PROTECTION SYSTEMS

РОССИЙСКАЯ ФЕДЕРАЦИЯ

USEFUL MODEL PATENT

№ 84401

SEA WALL

Patent holder(s): ***Limited liability company Science and technology testing center "ApATeCh-Dubna" (RU)***

Author(s): ***see on the reverse side***

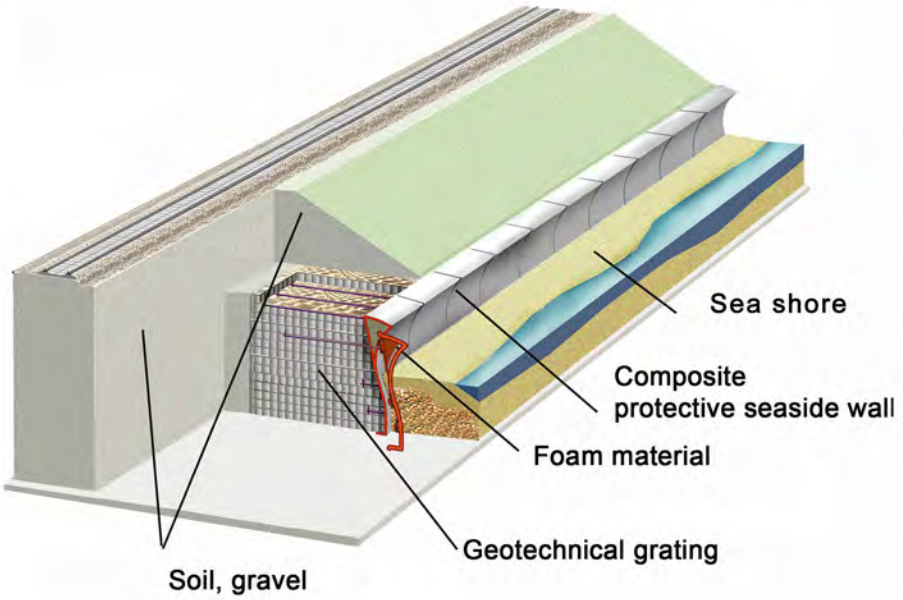
Application No **2009103666**
Priority of useful model ***05 February 2009***
Registered in the State Register of useful models of the Russian Federation on ***July 10, 2009***
Patent expiry date **05 February 2019**

Head of the Federal Intellectual Property, Patent and Trademark Service

Simonov B.P.

Composite sea walls

Protective seaside wall:



- -Protection of the Black sea shore from an 8-degree storm
- -Dumping/filling of the second railway track
- -1.5-time reduction of costs and time of adjustment
- -Increase of a life cycle in more than 2 times
- -Test maintenance of the composite seaside wall under the sea climate and sandy-pebble erosion
- -Monitoring of the wall behavior with the help of sensors installed into the material

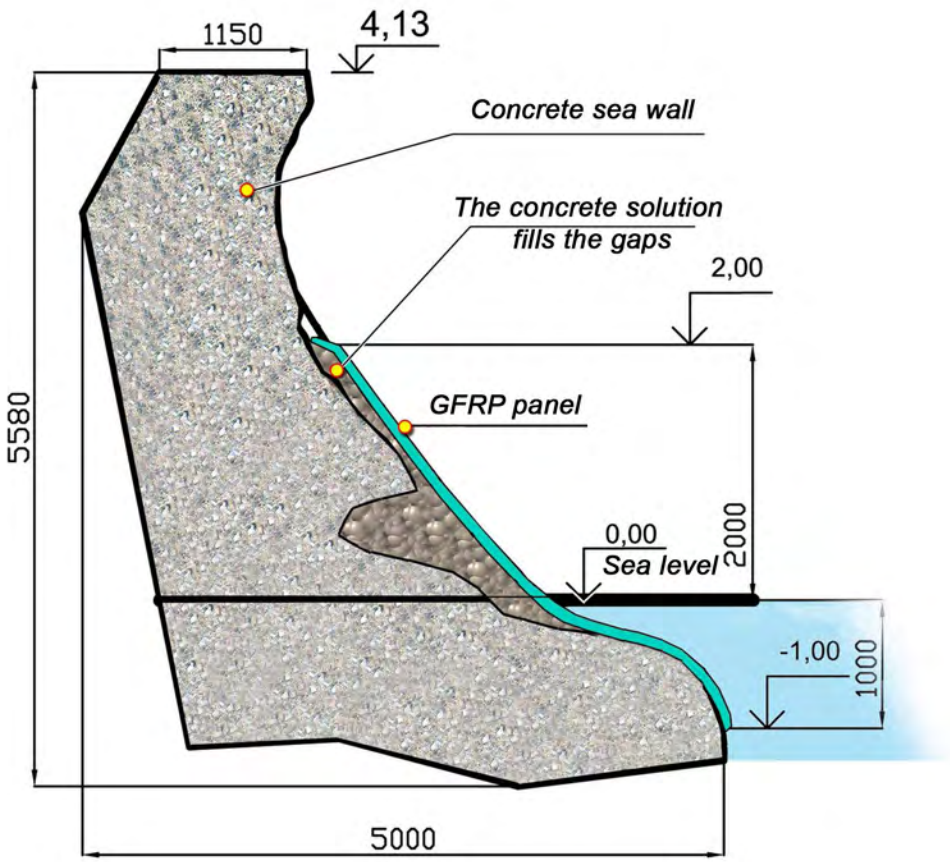
Old view

Composite sea wall at the Black Sea

Installation of sea wall panels

"APATECH" EXPERIENCE: REPAIR OF CONCRETE SEA WALL IN 2009

REPAIR CONCEPT

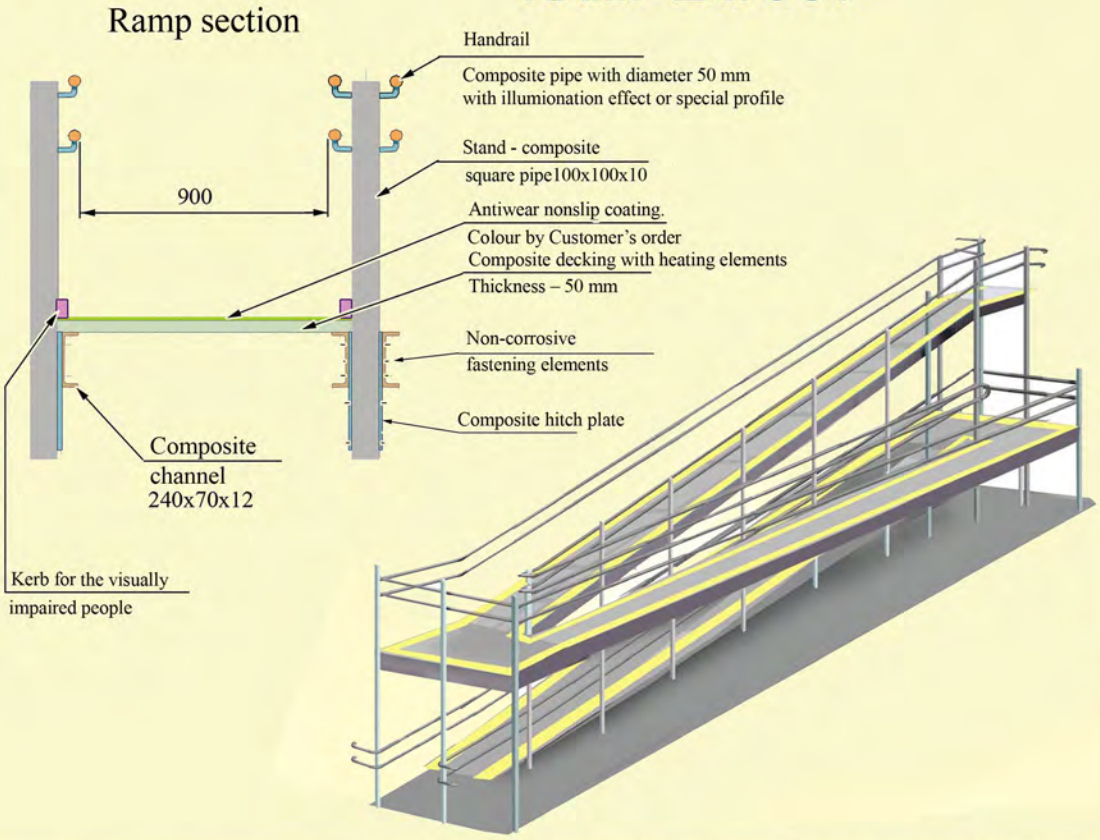


INSTALLATION OF SEA WALL SHELLS

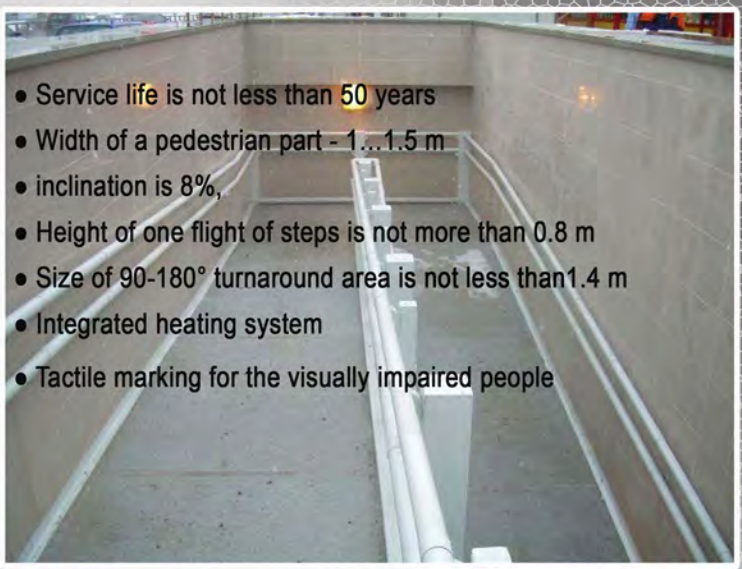
RESTORED SEA WALL SECTION

RAMPS FOR THE PHYSICALLY CHALLENGED PEOPLE

RAMP LAYOUT

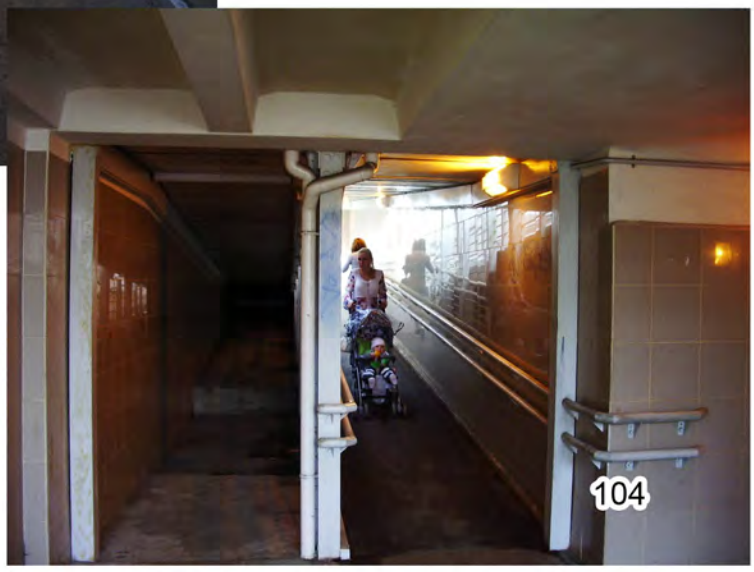


Patent 75680

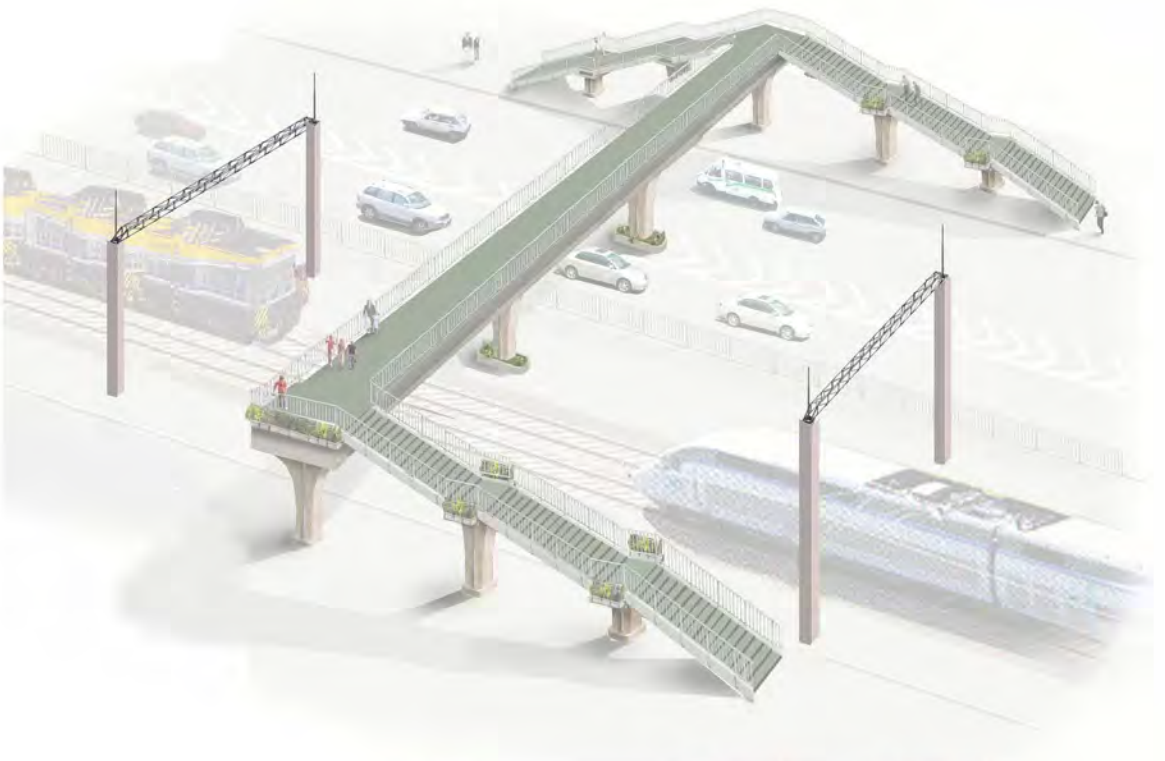


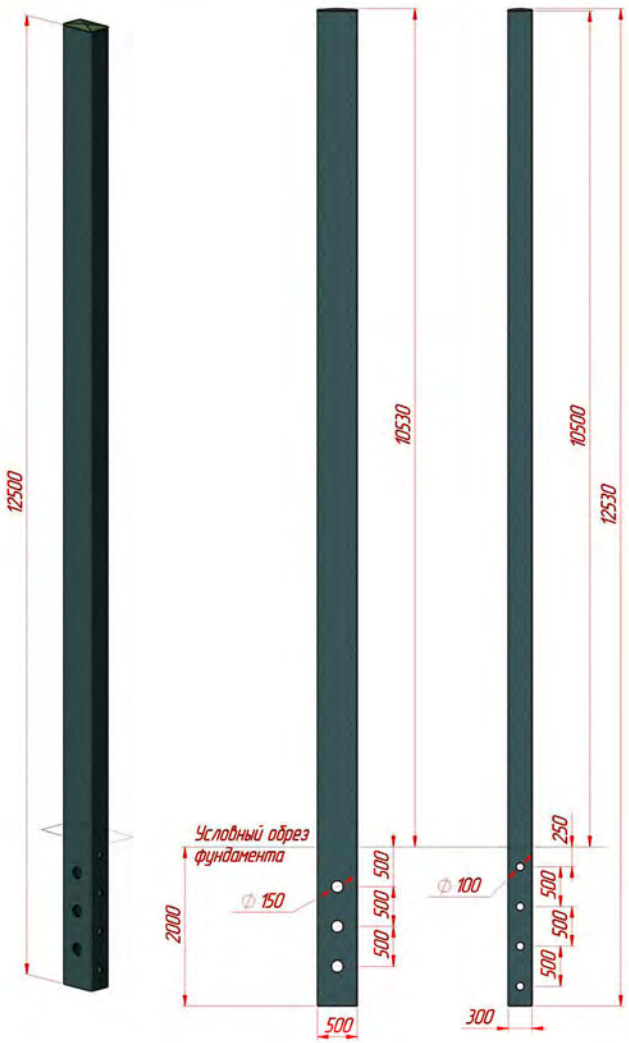
"Apatech" ramp with heating system
in the Moscow underground

RAMP
FOR THE PHYSICALLY CHALLENGED PEOPLE NEAR THE MOSCOW UNDERGROUND STATION



SUPPORTS AND RIGID CROSS-BEAMS OF THE CONTACT SYSTEM





Composite ballastless bridge slab and sleeper

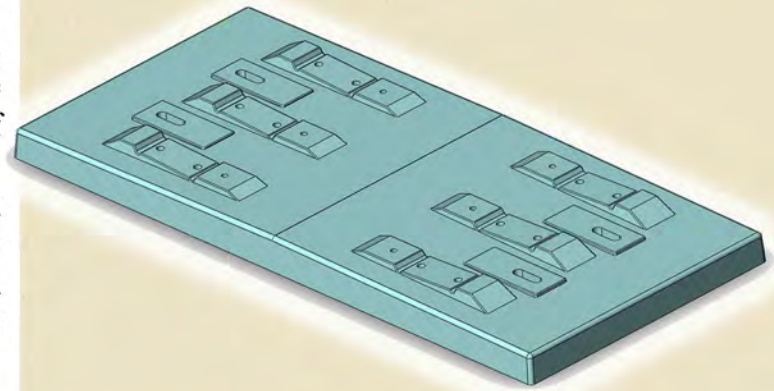
Under the order of Russian Railways Co. as of 18th of February, 2008 №316р "On design and construction of manufactured structures made of composite materials" "ApATeCh" together with the Research Institute of bridges developed new advanced technology for structures and production technologies of composite ballastless bridge deck (BBD) slab and sleepers for application in metal spans of railway bridges considering actual and future maintenance conditions such as increase in traffic density and speed, loads on axes which guarantee standard period of service life at the considerable reduction of maintenance costs.

Ballastless bridge deck (BBD) and composite sleepers in comparison with the BBD slab made of reinforced concrete and wood crossbeams have higher durability and produceability. The latter is conditioned by relatively light weight of a bridge camber. For the deck with wood crossbeams constructional depth is provided by cutting each sleeper, and this requires high skills from a carpenter. In case of BBD this task is solved by adjusting the height of supporting elements.

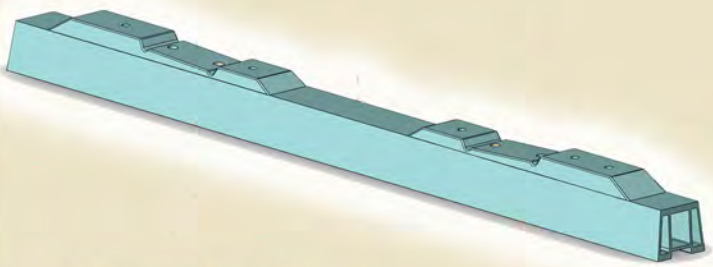
ApATeCh designers made calculations and research and confirmed that a new structure of composite BBD slab and sleeper will have higher durability, whereas a sleeper made from wood is to be replaced every 5 years on the average.

Since the end of 1980-s ballastless bridge deck slabs came to be widely used both for renovation of old and construction of new railway bridges. However, during the following 5 years mass defects both in BBD and spans with them have emerged.

The most common defects are the following:



Composite ballastless bridge deck slab



Composite sleeper

DEFECTS OF BBD SLABS MADE FROM REINFORCED CONCRETE

longitudinal and и
diagonal cracks in the slabs

Slackening of tension or breaking of pins and as a result, damage of joints.

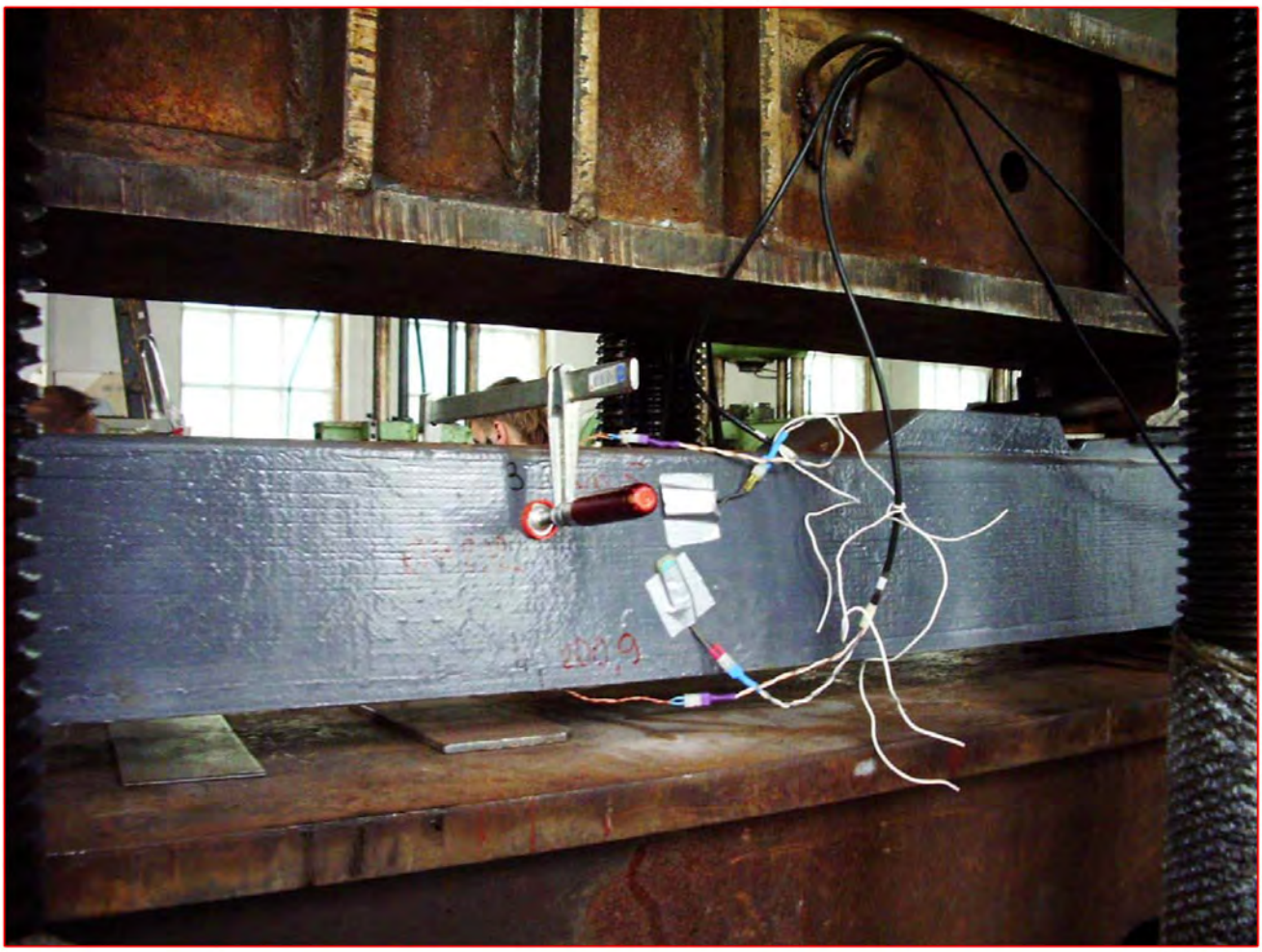
Spalling and destruction of the reinforced cement-sand layer
Rot damage and destrruction of a layer of plates.

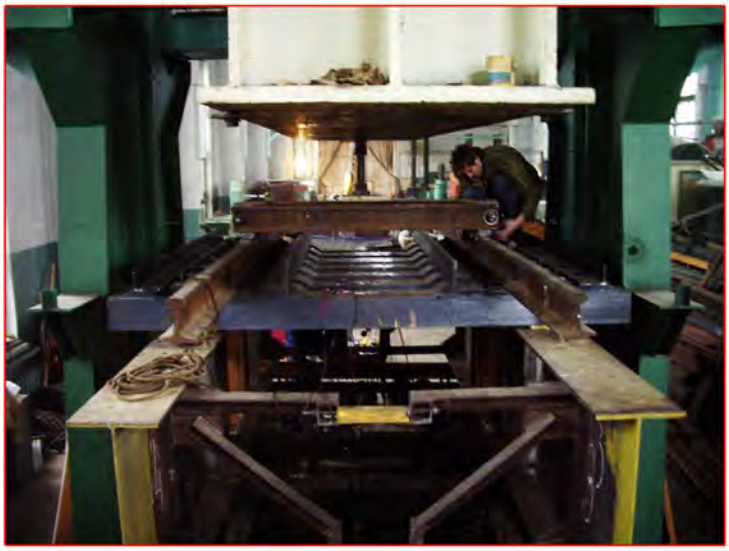
The listed phenomena do not cause the immediate outage of a span but their large quantity makes maintenance of the structure complicated and may lead to the emergency situation during load action and to rise in bridge maintenance costs.

Comparative technical and performance characteristics of structures made from traditional and composite materials

№	Name of a product and material	Service life, years	Weight, kg	Impact of hostile environment	Operating costs
1	Wooden bridge sleeper	5-8	130	Rotting Cracking Crumpling of material in the liner zone	Spike separated clamp-screw fastening. Tightening of clamps, driving in of spikes
2	BBD slab made of reinforced concrete	25-30	From 1800 to 2600	Longitudinal and и transverse cracks from water leaching of concrete, corrosion of reinforcements	Clamp-bolted fastening Tightening of clamps, insert bolts, studs Replacement of spring washers
3	Composite bridge sleeper	50	151	Resistance to hostile environment and precipitation	No threaded joints No fastening with elastic and screw-plug bonding
4	Composite BBD slab	50	777,5	Resistance to hostile environment and precipitation	No threaded joints No fastening with elastic and screw-plug bonding

Tests of the composite sleeper in the Research Institute of bridges and defectoscopy in St. Petersburg on July, 6 2009. Tests confirmed the high mechanical characteristics of a BBD structure and of a composite sleeper





Testing phase of the assembled composite sleepers lattice
on the simulated metal bridge span.

Federal agency of railway transport

НИИМ

Federal state unitary enterprise "Research Institute for bridges and nondestructive testing of Federal agency of railway transport"

Contract № 431
Stage 3

APPROVED
Director of NII mostov
V.V. Kondratov
"29" June 2009

ANALYSIS OF STRESS-STRAIN STATE OF BBD SLABS IN LABORATORY CONDITIONS ON THE BENCH

Topic:
DEVELOPMENT OF DESIGN STRUCTURAL SOLUTIONS OF THE COMPOSITE BALLASTLESS BRIDGE DECK ON THE METAL SPAN STRUCTURES O THE RAILWAY BRIDGES

Section:
"DEVELOPMENT OF THE COMPOSITE BALLASTLESS BRIDGE DECK STRUCTURES ON THE METAL SPAN STRUCTURES OF THE RAILWAY BRIDGES"

St. Petersburg, 2009

Federal agency of railway transport

НИИМ

Federal state unitary enterprise "Research Institute for bridges and nondestructive testing of Federal agency of railway transport"

Contract № 431
Stage 8

APPROVED
Director of NII mostov
V.V. Kondratov
"29" June 2009

ANALYSIS OF STRESS-STRAIN STATE OF BRIDGE SLEEPERSIN LABORATORY CONDITIONS ON THE BENCH

Topic:
DEVELOPMENT OF DESIGN STRUCTURAL SOLUTIONS OF THE COMPOSITE BALLASTLESS BRIDGE DECK ON THE METAL SPAN STRUCTURES O THE RAILWAY BRIDGES

Section:
"DEVELOPMENT OF THE COMPOSITE BRIDGE SLEEPERS ON THE METAL SPAN STRUCTURES OF THE RAILWAY BRIDGES"

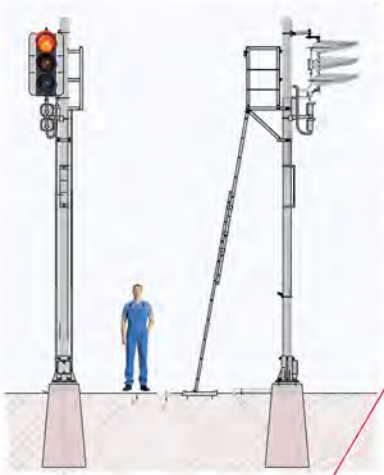
St. Petersburg, 2009

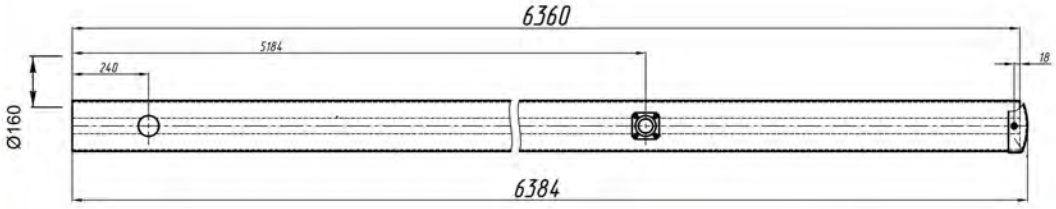
TRAFFIC LIGHTS POST

Weight - 26,5 kg

Codesign of ApAeCh and "ELTEZA" Co. subsdiary "AEMZ"

Aim of the work - to develop a structure and production technology for composite traffic lights posts designed for placing on them signal units of railway traffic lights.





Inner hole for cable entry Ø 45 mm

through-hole

Standardized hardware of the signal unit

Plug at the end of the post to protect from bad weather

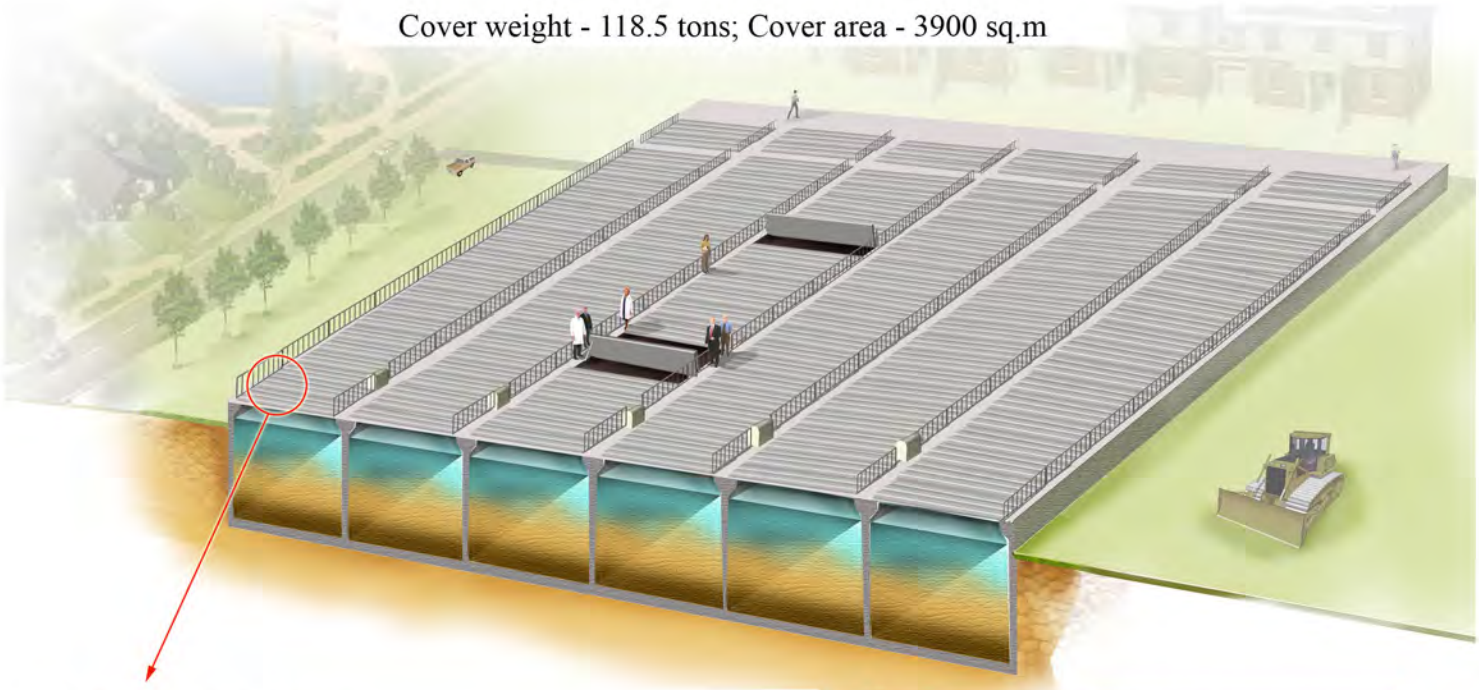
Comparative table of properties of traffic lights posts ApATeCh for the railway signal units made of metal and composite materials and supplied for the railways

Property	Metal	Composite material
Length, mm	6384	6384
Tube diameter, mm	140	160
Thickness of the wall, mm	4	5
Weight, kg	85,5	26,5
Density, kg/sm3	7,85	1,6 – 1,8
Tear (tensile) strength, N/mm (kgf/mm)	343 (35)	400 (41)
Yield strength, N/mm (kgf/mm)	216 (22)	

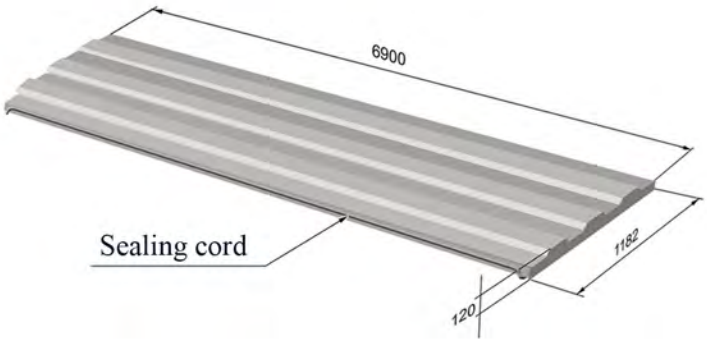
Calculation and design of a composite post were made for identical deformability under design load.

ApATeCh composite overlaps for primary settlers of waste disposal complex Bzugu.

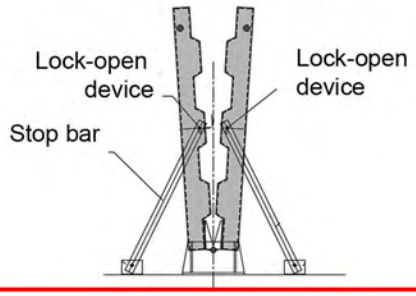
Cover weight - 118.5 tons; Cover area - 3900 sq.m



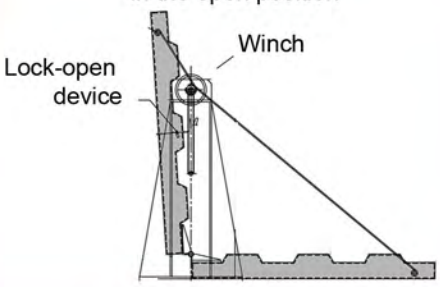
Three-layered panel



Fixation of the two panels in the open position

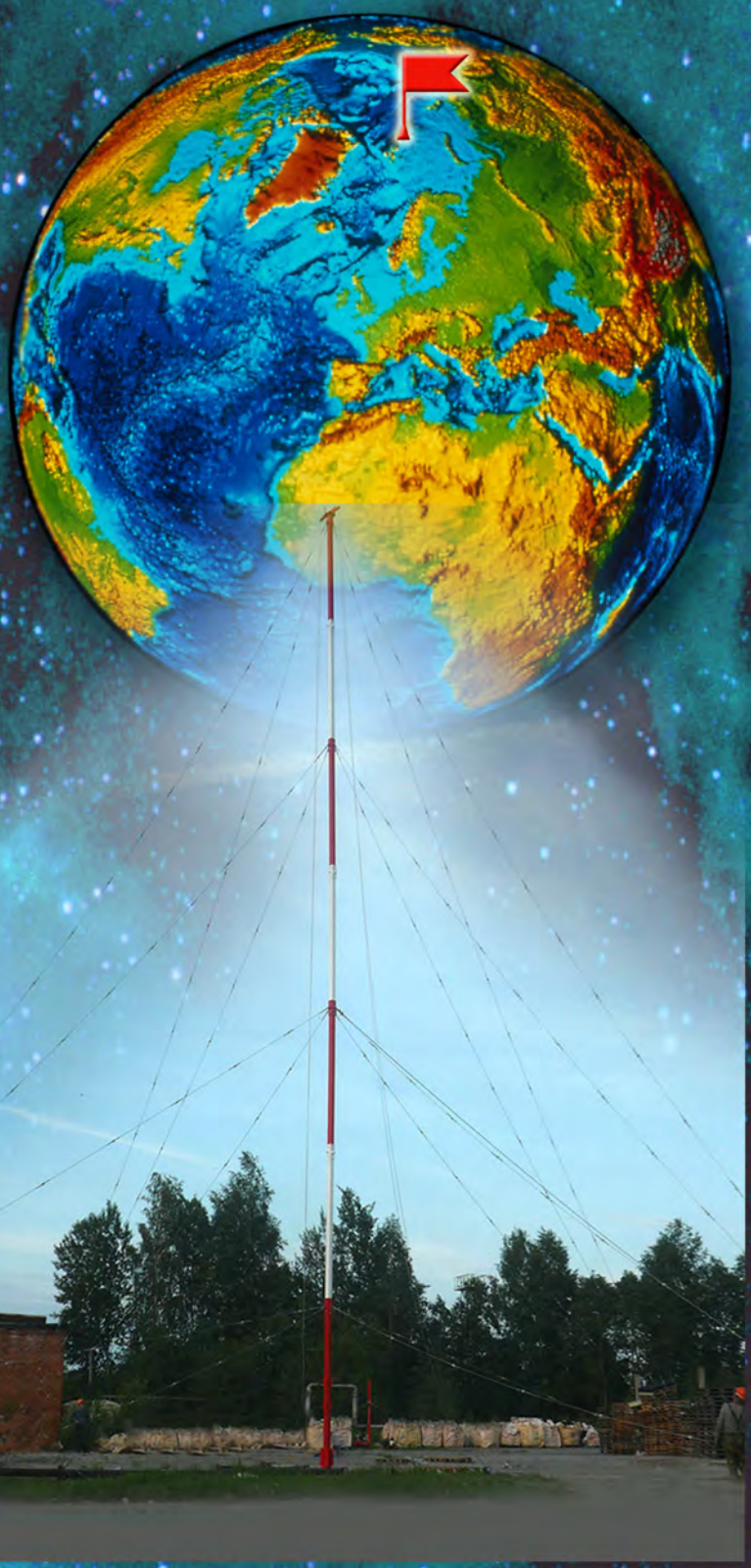


Fixation of a single panel in the open position



Panel manufacturing in the company workshop

Antenna-feeder systems



- Design
- Production
- Assembly
- Warranty and service maintenance of antenna-feeder systems of any complexity and high geometric accuracy with maximum possible application of composite materials.

Composite antenna-feeder systems provide:

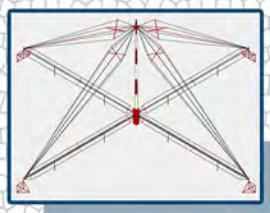
- ✓ operating capacity in a broad frequency band;
- ✓ simultaneous operation in several spaced bands;

- ✓ conservation of consistency of raditechnical properties in different operating conditions;

- ✓ improvement of radio-technical properties due to reduction of dielectric permeability (ε), dielectric loss tangent (tg δ), low level of radio wave reflection (≤1%) and homogeneity of dielectric properties of material.

Different purpose antenna-feeder systems with radiolucent dielectric composite materials and composite materials with specified physical properties (radio absorbing, conducting materials etc.).

Application of composite materials:



√ Structure weight reduction (by 1,5-3 times) while preserving strength properties compared to conventional metal structures and, as a result, improved performance and service life (25 years and more);

√ Possibility to assembly a structure of any geometric complexity without heavy equipment by a group of 3 - 5;

√ Assembly without arrangement of complex bases on any type of soil;

√ Assembly in hard-to-reach areas without impact on environment;

√ Composite materials are resistant to aerodynamic and thermal impacts, erosion due to rain, snow, dust and gas and ionizing radiation.

Lightweight Structures BV

JEC AWARD 2014

Body of the composite hopper car model 19-5167

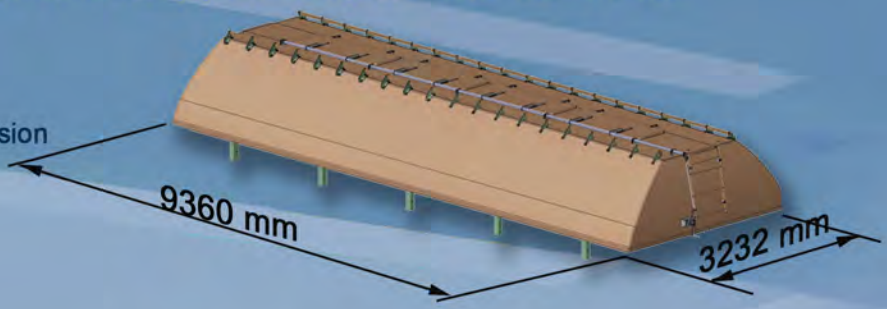
Concept hopper car

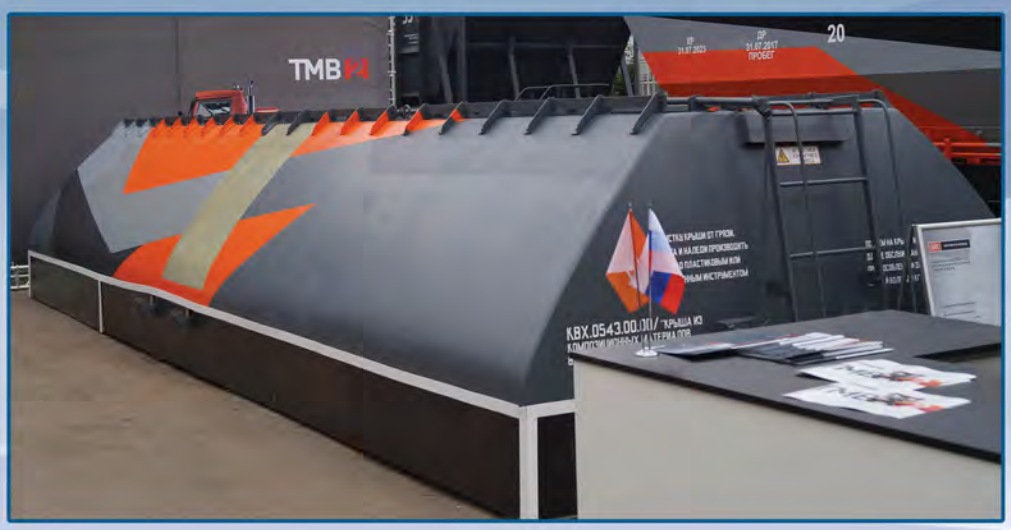
Material - GFRP. Technology - vacuum - infusion

Length - 13933 mm
Width - 3220 mm
The transported volume - 125 м3
Own weight - 7600 кg

Composite roof of a hopper car, model 19-5153

Material - GFRP.
Technology - vacuum - infusion
Length - 9360 mm
Width - 3232 mm
Own weight - 980 кg





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