



GLASS INSULATORS FOR 10–1150 kV OVERHEAD LINES AND SUBSTATIONS

Products catalogue
2022



GLOBAL INSULATOR GROUP



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Global Insulator Group (GIG) is an international industrial holding investing in production and development in the field of glass, porcelain, composite insulation and line fittings. The basic enterprises – Yuzhnouralsky Insulators and Fittings Plant, YuAIZ AO (Russia), United Porcelain Company LLC (Russia), Kazakh Insulators and Fittings Plant (Kazakhstan), GIG-IRM Glass Insulators (India).

Suspension disc-type glass insulators – 13 million units per year. Suspension string toughened glass insulators for HVTL and substations for the voltage range of 35–1150 kV for AC systems and up to 800 kV for DC lines as well.

Porcelain insulators – 2.4 million units per year. Porcelain insulators for HVTL for the voltage range of 0.4–20 kV and for 0.4–110 kV substations.

Composite insulators – 300 000 units per year. Line suspension insulators for voltage of 10–110 kV, pin insulators for traction lines, line post insulators, post insulators for substations and hardware-controlled insulators for up to 110 kV.

High-voltage transmission and distribution line fittings – 4 000 ton per year, for 35–1150 kV HVTL.

More than 300 companies from Russia, the CIS countries and from more than 100 countries of Europe, America, Africa, Middle East, Asian-Pacific region are the constant consumers of the holding's products. The wide geography of deliveries provides manufacturing of the insulation units for different environmental conditions.

The new constructive designs are based on the 60-year-old operating experience in the field of insulation at the important high-voltage objects in harsh environmental conditions. Thanks to constant cooperation of **GIG** technical centre with the TL service departments there were developed the products with special requirements: Super-FOG glass insulators, glass insulators with a waterproof (composite) coating, insulators for DC lines, pin glass-porcelain insulators, seamless composite insulators for HVTL and substations up to 500 kV, line fittings for tight and high-temperature conductors.

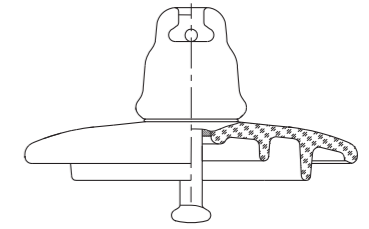
The products of **Global Insulator Group** comply with the quality management systems of ISO 9001, 14001, and 18001. The products are subjected to testing in the factory laboratories and international independent test centers to confirm the customer's requirements and national standards.

Technical support of the **GIG** clients is carried out by the technical consulting service "GIG-Operation division".

Glass part profiles of toughened glass insulators

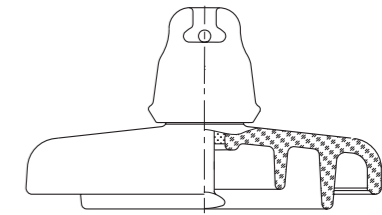
Standard profile

Design of insulating part has small ribs. Insulators of standard profile perform well in areas of mild contaminations. Creepage distance is over the mandatory requirements of international standards.



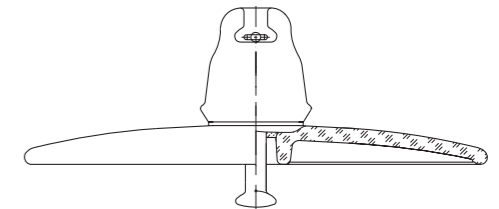
Fog type profile

Design of insulating part has strongly extended ribs which protect from flowing contaminations and dry depositions. The distance between ribs prevents from partial discharge between adjacent ribs under severe contamination. Such insulators perform well in areas with industrial pollution, heavy rainfall and coastal areas.



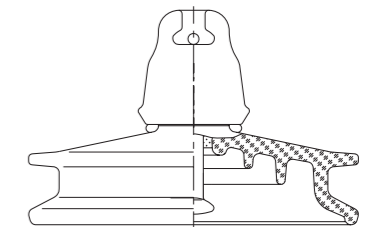
Open profile

Design of insulating part with open profile is marked by absence of under-ribs and extended diameter of disk. Open profile reduces pollutant accumulation on the surface. This design is effective in desert areas with wind and sandstorms and also can solve ice-bridging problems.



External shed profile

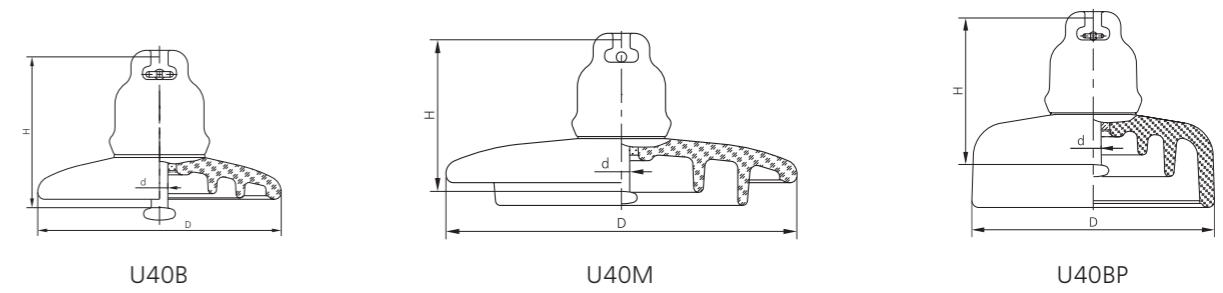
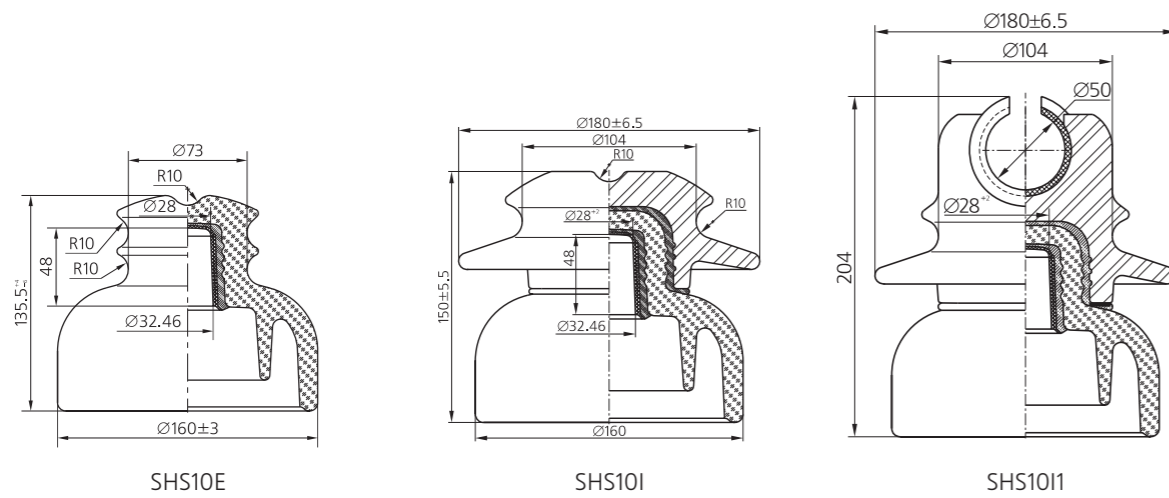
Design of insulating part has two external ribs. As a result of ribs arranged on the side face, the surface of insulator is self-cleaned by strong wind. Insulators perform well in areas with industrial pollution and salty soil.



HV glass and glass-ceramic pin insulators
class of mechanical load: 12.5 kN

HV glass suspension insulators
class of mechanical load: 40 kN

Ball and socket type



Profile	Standard profile		Fog type profile	
	IEC 60305	U40B	U40M	U40BP
Reference designation	Non-standard			
Minimum mechanical failing load	kN	40	40	40
Minimum mechanical residual strength	kN	32	32	32
Diameter of the insulating part, D	mm	175	255	175
Spacing, H	mm	100/110	100/110	110
Nominal creepage distance	mm	190	320	300
Ball and socket coupling, d (IEC 60120)	mm	11	11	11
Puncture voltage in insulating medium	kV	110	110	110
50 Hz withstand voltage (dry)	kV	55	70	60
50 Hz withstand voltage (wet)	kV	33	40	34
Dry lightning impulse withstand voltage 1.2/50 +/-	kV	70/70	100/100	85/85
Radio interference voltage at 0.5 MHz	dB	34	60	60
	kV	10	20	20
	dB	86	86	86
	kV	25	25	25
Weight	kg	1.7	3.0	2.5

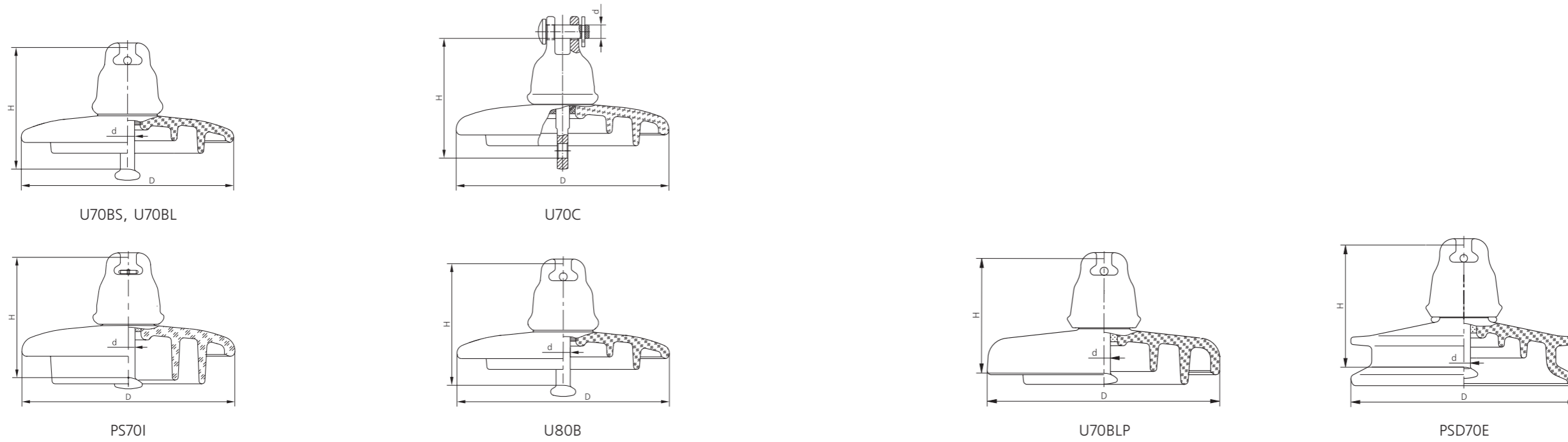
All technical requirements and testing are in accordance with IEC standards.

Profile	Pin profile			
	Non-standard	SHS10E	SHS10I	SHS10I1
Reference designation				
Minimum mechanical failing load (bending)	kN	12.5	12.5	12.5
Nominal creepage distance	mm	290	350	350
Puncture voltage in insulating medium	kV	130	130	130
50 Hz withstand voltage (dry)	kV	68	68	68
50 Hz withstand voltage (wet)	kV	42	45	45
Impulse withstand voltage 1.2/50 +/-	kV	105	80	80
Weight	kg	2.0	3.5	3.8

HV glass suspension insulators
class of mechanical load: 70, 80 kN

U70BS-G, U70BL-G, U70BLP-G, PSD70E-G with RTV coating

Ball and socket type
Tongue-ball type



Profile		Standard profile		Standard profile		Fog type profile	External shed profile
Reference designation	IEC 60305	U70BS/U70BL		U70C		U70BLP	
	BS EN 60305				U80B		
	Non-standard			PS70I*			PSD70E
Minimum mechanical failing load	kN	70	70	70	80	70	70
Minimum mechanical residual strength	kN	56	56	56	64	56	56
Diameter of the insulating part, D	mm	255	255	255	255	280	270
Spacing, H	mm	127/146	146	146	140	146	127/146
Nominal creepage distance	mm	320	407	320	320	445	411
Ball and socket coupling, d (IEC 60120)	mm	16A	16A	16C	16	16A	16A
Puncture voltage in insulating medium	kV	130	130	130	130	130	130
50 Hz withstand voltage (dry)	kV	70	72	70	70	82	75
50 Hz withstand voltage (wet)	kV	40	42	40	40	50	45
Dry lightning impulse withstand voltage 1.2/50 +/-	kV	105/105	110/110	105/105	105/105	125/125	110/110
Radio interference voltage at 0.5 MHz	dB	60	60	60	60	60	60
	kV	20	20	20	20	20	20
	dB	86	86	86	86	86	86
	kV	25	30	25	25	30	25
Weight	kg	3.6	4.3	3.8	3.8	5.66	4.6

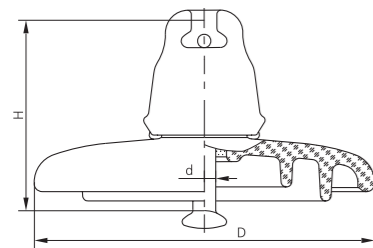
All technical requirements and testing are in accordance with IEC, BS standards.

* According to IEC 60305 insulator of PS70I type corresponds to insulator of U70BL type and can be applied instead of insulator of U70BL type.

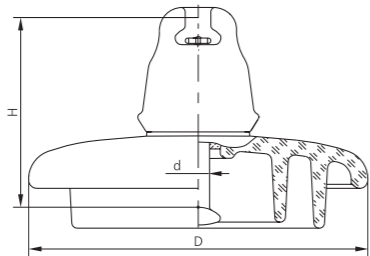
HV glass suspension insulators
class of mechanical load: 100, 120 kN

Ball and socket type

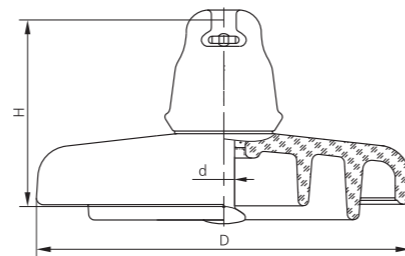
U120B-G, U120BP-G, PSV120D-G, U120AD-G with RTV coating



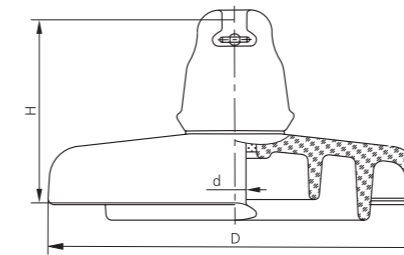
U100BS, U100BL, U120B



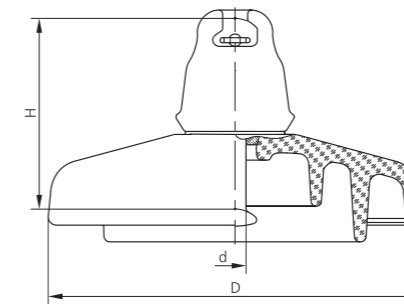
PS120V



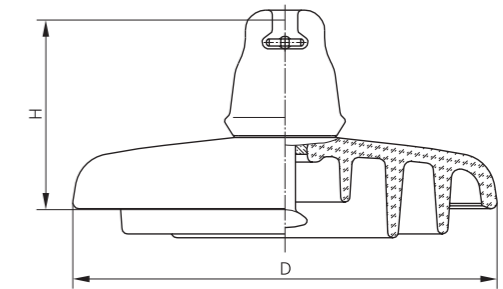
U100BLP



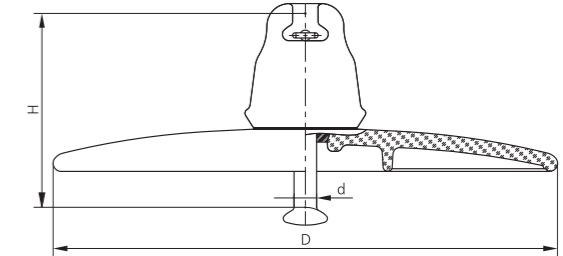
U120BP



PSV120D



U120BP1



U120AD

Profile	Standard profile		Standard profile	Fog type profile			Open profile
	IEC 60305	U100BS/U100BL		U120B	U100BLP	U120BP	
Reference designation	Non-standard			PS120V*			
Minimum mechanical failing load	kN	100	120	120	100	120	120
Minimum mechanical residual strength	kN	80	96	96	80	96	96
Diameter of the insulating part, D	mm	255	255	255	280	280	380
Spacing, H	mm	127/146	127/146	146	146	127/146	146
Nominal creepage distance	mm	320	320	407	445	445	468
Ball and socket coupling, d (IEC 60120)	mm	16A	16A	16A	16A	16A	16
Puncture voltage in insulating medium	kV	130	130	130	130	130	130
50 Hz withstand voltage (dry)	kV	70	70	72	82	82	82
50 Hz withstand voltage (wet)	kV	40	40	42	50	50	50
Dry lightning impulse withstand voltage 1.2/50 +/-	kV	110/110	110/110	110/110	125/125	125/125	125/125
Radio interference voltage at 0.5 MHz	dB	60	60	60	34	60	60
	kV	20	20	20	10	20	20
	dB	86	86	86	86	86	86
	kV	30	30	30	30	30	30
Weight	kg	3.9	3.9	4.6	5.66	5.56	5.75

All technical requirements and testing are in accordance with IEC standards.

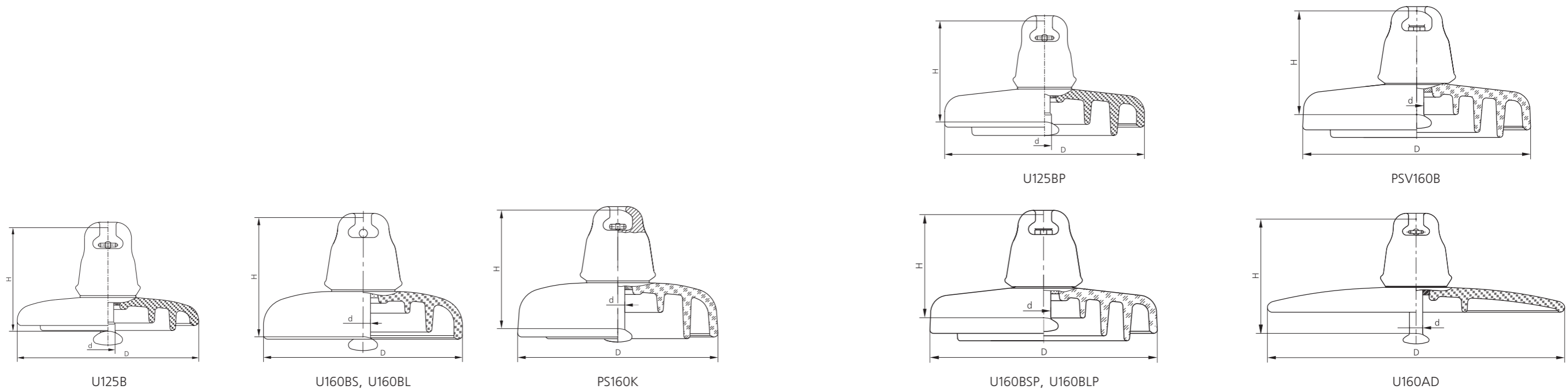
* According to IEC 60305 insulator of PS120V type corresponds to insulator of U120B type and can be applied instead of insulator of U120B type.

** According to IEC 60305 insulator of PSV120D type corresponds to insulator of U120BP type and can be applied instead of insulator of U120BP type.

HV glass suspension insulators
class of mechanical load: 125, 160 kN

Ball and socket type

U160BS-G, U160BL-G, PS160K-G, U160BSP-G, U160BLP-G, U160AD-G with RTV coating



Profile	Standard profile		Standard profile		Fog type profile		Open profile	
	IEC 60305	BS EN 60305	U160BS/U160BL	PS160K*	U125BP	U160BSP/U160BLP	PSV160B**	U160AD
Reference designation	Non-standard	U125B						
Minimum mechanical failing load	kN	125	160	160	125	160	160	160
Minimum mechanical residual strength	kN	100	128	128	100	128	128	128
Diameter of the insulating part, D	mm	255	280	280	280	320	320	420
Spacing, H	mm	146	146/170	170	146	146/170	146/170	146/170
Nominal creepage distance	mm	320	385	460	445	545	545	400
Ball and socket coupling, d (IEC 60120)	mm	20	20	20	20	20	20	20
Puncture voltage in insulating medium	kV	130	130	130	130	130	130	130
50 Hz withstand voltage (dry)	kV	70	75	75	82	90	90	60
50 Hz withstand voltage (wet)	kV	40	45	45	50	55	55	50
Dry lightning impulse withstand voltage 1.2/50 +/-	kV	110/110	110/110	115/115	125/125	140/140	140/140	95/95
Radio interference voltage at 0.5 MHz	dB	34	60	34	34	60	60	60
	kV	10	20	10	10	20	25	20
	dB	86	86	86	86	86	86	86
Weight	kV	30	35	35	25	35	40	40
	kg	4.1	6.13	7.4	5.86	8.28	8.28	7.43

All technical requirements and testing are in accordance with IEC, BS standards.

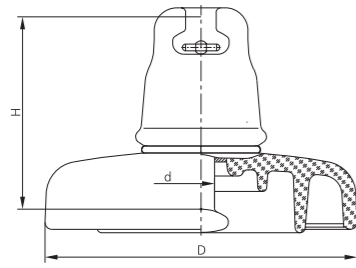
* According to IEC 60305 insulator of PS160K type corresponds to insulator of U160BL type and can be applied instead of insulator of U160BL type.

** According to IEC 60305 insulator of PSV160B type corresponds to insulator of U160BLP type and can be applied instead of insulator of U160BLP type.

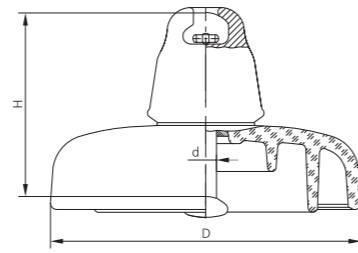
HV glass suspension insulators
class of mechanical load: 190, 210, 240 kN

Ball and socket type

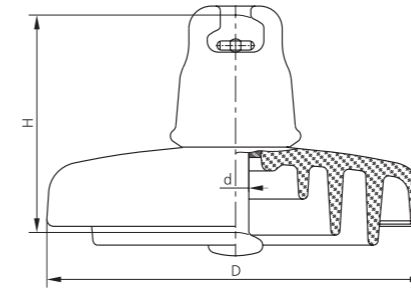
U210B-G, U210BP-G, U210AD-G with RTV coating



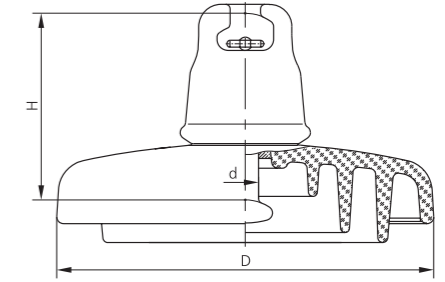
U190B



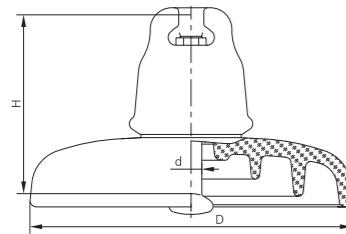
PS210D



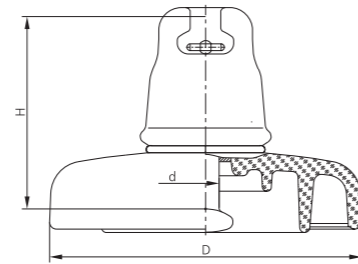
U190BP



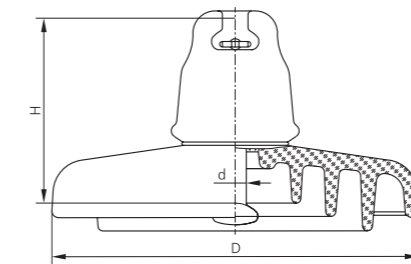
U240BSP, U240BLP



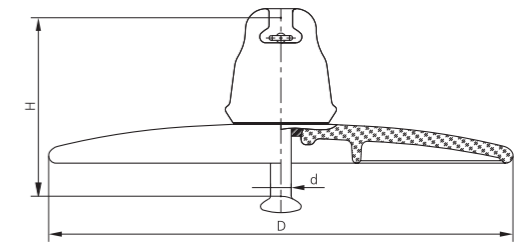
U210B



U240B



U210BP



U210AD

Profile	Standard profile		Standard profile		Fog type profile		Open profile	
	IEC 60305	U210B	PS210D*	U240B	U210BP	U240BSP/U240BLP	U210AD	
Reference designation	Non-standard	U190B						
Minimum mechanical failing load	kN	190	210	210	240	190	210	240
Minimum mechanical residual strength	kN	152	168	168	192	152	168	192
Diameter of the insulating part, D	mm	280	290	280	280	340	330	340
Spacing, H	mm	190	170/195	170	170/192	196	170/195	170/195
Nominal creepage distance	mm	428	380	460	428	617	555	617
Ball and socket coupling, d (IEC 60120)	mm	24	20	20	24	24	20	24
Puncture voltage in insulating medium	kV	130	130	130	130	130	130	130
50 Hz withstand voltage (dry)	kV	70	72	75	70	100	90	100
50 Hz withstand voltage (wet)	kV	45	45	45	45	60	55	60
Dry lightning impulse withstand voltage 1.2/50 +/-	kV	110/110	110/110	115/115	110/110	150/150	140/140	150/150
Radio interference voltage at 0.5 MHz	dB	60	60	60	60	34	60	34
	kV	20	20	20	20	10	20	10
	dB	86	86	86	86	52	86	86
	kV	40	40	40	40	30	35	35
Weight	kg	7.9	7.5	8.0	7.9	10.6	9.45	11.0

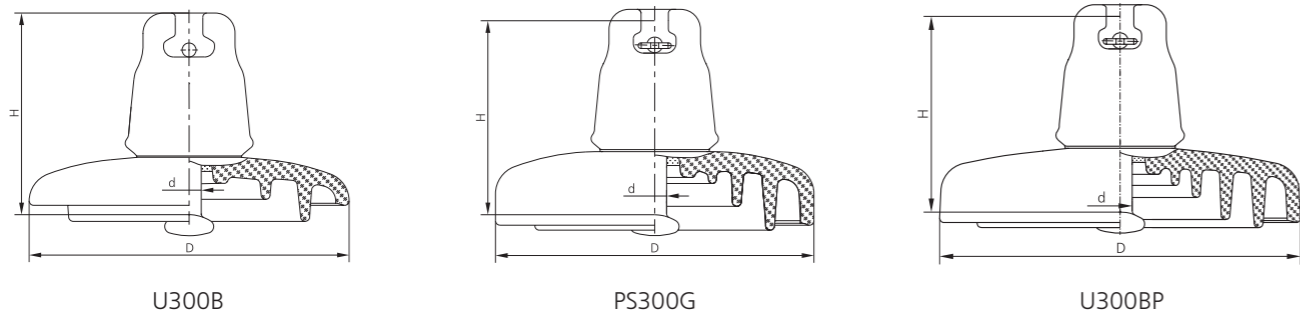
All technical requirements and testing are in accordance with IEC standards.

* According to IEC 60305 insulator of PS210D type corresponds to insulator of U210B type and can be applied instead of insulator of U210B type.

HV glass suspension insulators
class of mechanical load: 300 kN

Ball and socket type

U300BP-G with RTV coating



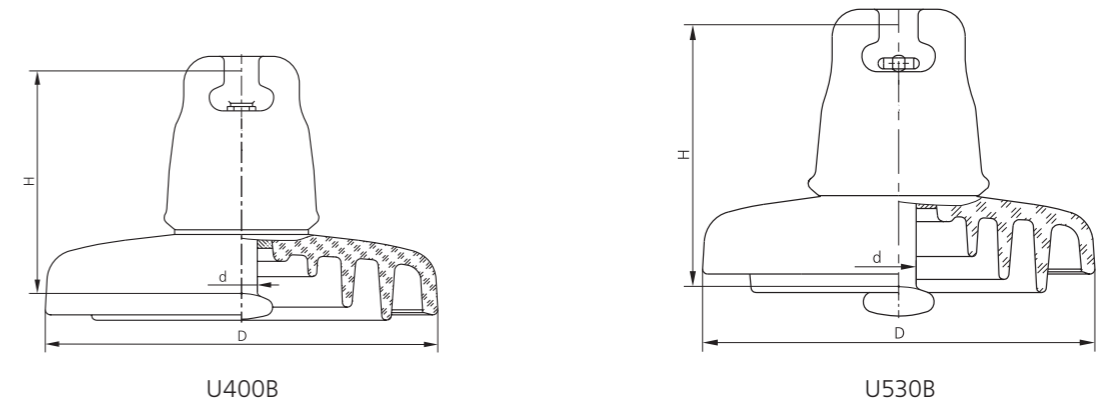
Profile	Standard profile		Fog type profile	
	IEC 60305	U300B	U300B	U300BP
Reference designation	IEC 60305 Non-standard		PS300G*	
Minimum mechanical failing load	kN	300	300	300
Minimum mechanical residual strength	kN	240	240	240
Diameter of the insulating part, D	mm	320	320	360
Spacing, H	mm	195	195	195/196
Nominal creepage distance	mm	390	485	617
Ball and socket coupling, d (IEC 60120)	mm	24	24	24
Puncture voltage in insulating medium	kV	130	130	130
50 Hz withstand voltage (dry)	kV	82	82	100
50 Hz withstand voltage (wet)	kV	50	50	60
Dry lightning impulse withstand voltage 1.2/50 +/-	kV	130/130	130/130	155/155
Radio interference voltage at 0.5 MHz	dB	60	60	60
	kV	20	20	20
	dB	86	86	86
	kV	40	40	40
Weight	kg	10.0	11.5	13.3

All technical requirements and testing are in accordance with IEC standards.

* According to IEC 60305 insulator of PS300G type corresponds to insulator of U300B type and can be applied instead of insulator of U300B type.

HV glass suspension insulators
class of mechanical load: 400, 530 kN

Ball and socket type

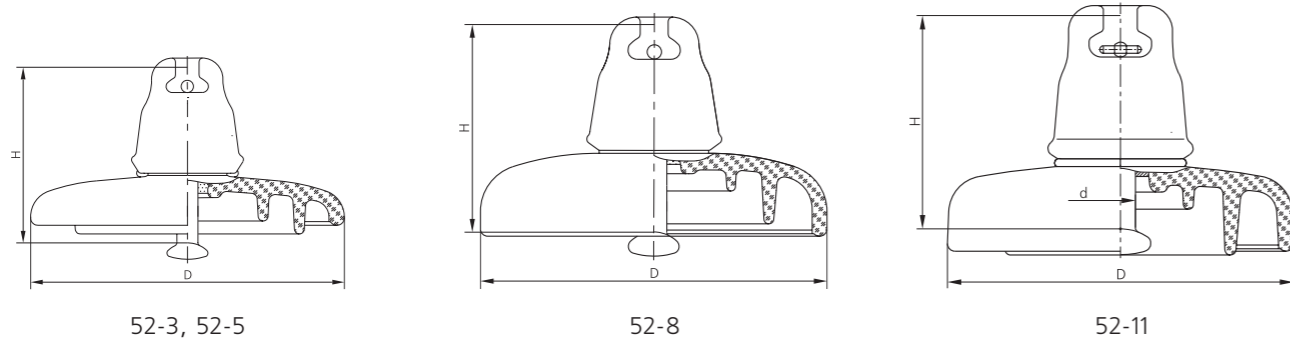


Profile	Standard profile		
	IEC 60305	U400B	U530B
Reference designation	IEC 60305		
Minimum mechanical failing load	kN	400	530
Minimum mechanical residual strength	kN	320	424
Diameter of the insulating part, D	mm	360	360
Spacing, H	mm	205	240
Nominal creepage distance	mm	550	600
Ball and socket coupling, d (IEC 60120)	mm	28	32
Puncture voltage in insulating medium	kV	130	130
50 Hz withstand voltage (dry)	kV	90	100
50 Hz withstand voltage (wet)	kV	55	60
Dry lightning impulse withstand voltage 1.2/50 +/-	kV	140/140	155/155
Radio interference voltage at 0.5 MHz	dB	60	60
	kV	20	20
	dB	86	86
	kV	40	40
Weight	kg	16.2	20.5

All technical requirements and testing are in accordance with IEC standards.

HV glass suspension insulators ANSI Standard

Ball and socket type



Profile		Standard profile			
Reference designation	ANSI C 29.2	52-3	52-5	52-8	52-11
Minimum mechanical failing load	lbs (kN)	20.000 (100)	30.000 (136)	40.000 (180)	50.000 (222)
Minimum mechanical residual strength	lbs (kN)	13.400 (60)	18.000 (81.6)	24.000 (108)	30.000 (133)
Impact strength	in·lbs (N·m)	400 (45)	400 (45)	400 (45)	400 (45)
Diameter of the insulating part, D	in (mm)	10 (255)	10 (255)	11 (280)	11 (280)
Spacing, H	in (mm)	5 ³ / ₄ (146)	5 ³ / ₄ (146)	5 ³ / ₄ (146)	6 ¹ / ₈ (156)
Nominal creepage distance	in (mm)	12 ⁵ / ₈ (320)	12 ⁵ / ₈ (320)	15 ¹ / ₆ (385)	16 ³ / ₄ (428)
Ball and socket coupling	—	type B	type J	type K	type K
Puncture voltage	kV	130	130	130	130
Flashover power frequency voltage (dry)	kV	80	80	80	80
Flashover power frequency voltage (wet)	kV	50	50	50	50
Dry lightning impulse withstand voltage 1.2/50 +/-	kV	125/130	125/130	125/130	140/140
Radio interference voltage at 1 MHz	dB	34	34	34	34
	kV	10	10	10	10
Weight	lb (kg)	8.8 (4.0)	9.2 (4.2)	13.6 (6.18)	17.4 (7.9)

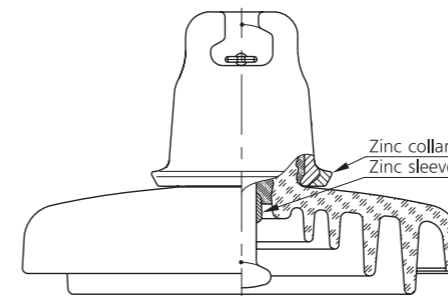
Insulators meet ANSI C 29.1, ANSI C 29.2 requirements.

Glass insulators for DC lines

An unidirectional flow of direct electric current result in specific electric stresses which require special insulating materials and design of insulators to resist corrosion of metal parts, pollution accumulation on insulator surface and other cases related to application of insulator on OHV DC lines.

Corrosion caused by direct current requires protecting metal end fittings. To prevent this, a sleeve made of pure zinc is cast directly on to the pin. Thus, zinc sleeve acting as a sacrificial electrode protects the pin against galvanic action. Adapted design of glass part has low ion conductivity due to special glass chemistry.

GIG offers insulators for DC application with mechanical load 160, 210, 300 kN.



Reduced radio interference insulators

The reduced radio interference insulators are modified standard insulators designed to preserve both the geometry and design, as well as their technical characteristics, however, unlike the standard ones, the former feature the level of radio interference reduced by 8 to 10% and the reduced corona discharge losses.

The use of the reduced radio interference insulators on power lines will reduce the corona power loss. The decreased corona discharge losses, in turn, result in the decreased air ionization around the insulators and the overhead line accessories and, consequently, in the decreased likelihood of the insulator string flashover. The use of these types of insulators at power grid facilities will improve the reliability of overhead line operation.

Insulators with silicone coating

Nowadays GIG set up manufacturing all glass insulators with silicone coating that allows dealing with challenges in areas with high level of pollution by improving reliability of transmission line operation. Silicone coating gives polymeric properties to glass insulators while maintaining the advantages of toughed glass.

As a result coated insulators have the following advantages:

- Silicone coating has high hydrophobic properties thus contaminations are greatly reduced on the glass surface. Discharge characteristics are increased by 1.5 and more times under severe contamination conditions.
- Costs for line operation are reduced as there is no need to wash insulators.
- Radio interference level is reduced.
- Insulators resist to vandalism (shooting).



Packet with crates



Each packet with crates includes several wooden crates placed on the pallet.
 For packing manufacture the "screw-ringed" nails, which have ring grooves on the stem that create the additional friction force and the nails keep the nailed timber more fixedly.
 The pallet packer wraps round the packet with insulators by stretchtape in a few layers to strengthen it for transport to the consumer.

Lath packet



Universal package (UP)



Sea package (SP)



Wooden crate



The pallet packer wraps round the packet with insulators by stretchtape in a few layers to strengthen it for transport to the consumer.

Package with boxes (PB)

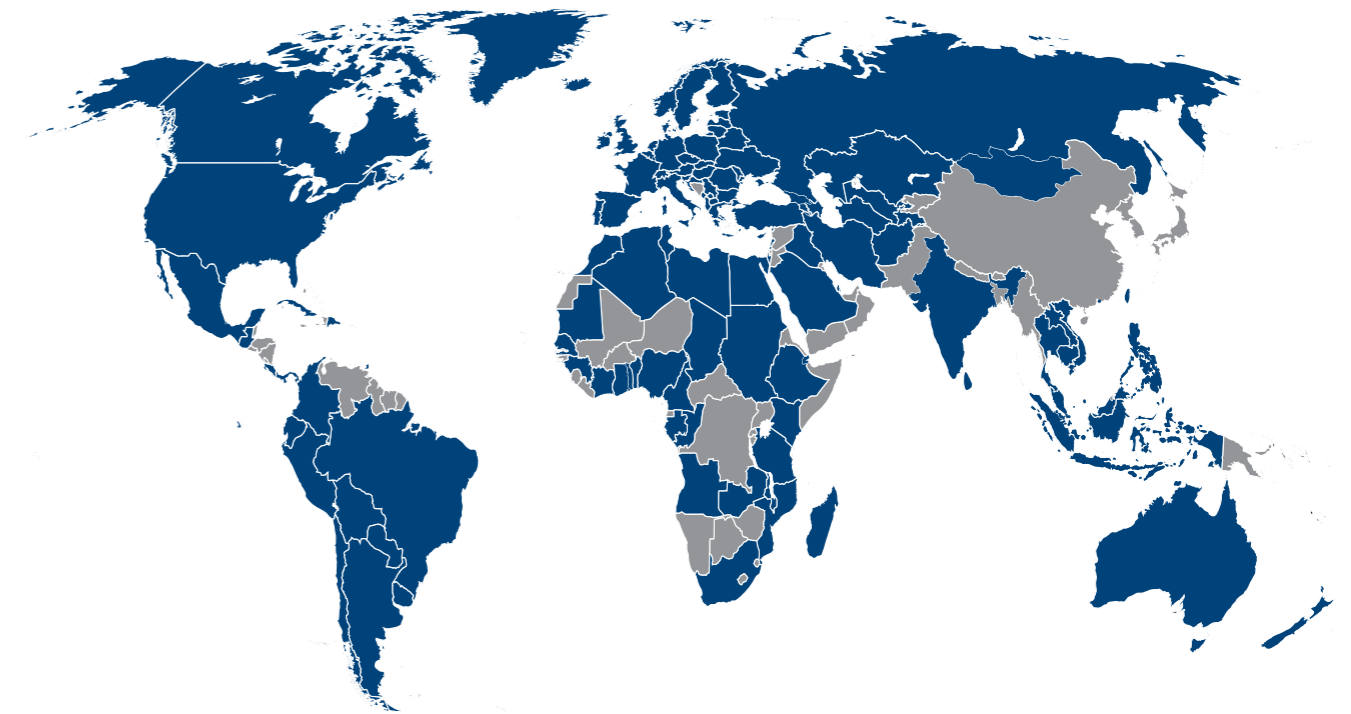


Slatted crates



Easy to disassemble (box does not require special tools for opening; simply untwist the wires and the box opens). The design is such that during the transportation empty boxes can be laid flatwise taking up minimum space in the truck.

Wooden cylindrical crate (WCC)



- | | | | | |
|---------------|--------------------|-------------|------------------------|----------------|
| Afghanistan | Colombia | Indonesia | Norway | Turkey |
| Albania | Congo | Iran | Panama | United Kingdom |
| Algeria | Costa Rica | Iraq | Paraguay | Uruguay |
| Angola | Cote d'Ivoire | Ireland | Peru | USA |
| Argentina | Croatia | Israel | Philippines | Vietnam |
| Australia | Cuba | Italy | Poland | Zambia |
| Austria | Cyprus | Kosovo | Portugal | |
| Belgium | Czech Republic | Kenya | Qatar | |
| Benin | Denmark | Lao PDR | Romania | |
| Bolivia | Djibouti | Latvia | Russia | |
| Brazil | Dominican Republic | Lebanon | Saudi Arabia | |
| Bulgaria | Ecuador | Libya | Senegal | |
| Cambodia | Egypt | Lithuania | Serbia | |
| Cameroon | Estonia | Luxembourg | Singapore | |
| Canada | Ethiopia | Macedonia | Slovakia | |
| Chad | Finland | Madagascar | Slovenia | |
| Chile | France | Malawi | South African Republic | |
| CIS Countries | Gabon | Malaysia | Spain | |
| Abkhazia | Georgia | Malta | Sri Lanka | |
| Armenia | Germany | Mauritania | Sudan | |
| Azerbaijan | Ghana | Mexico | Sweden | |
| Belarus | Greece | Mongolia | Switzerland | |
| Kazakhstan | Guatemala | Montenegro | Taiwan | |
| Moldova | Guinea | Morocco | Tanzania | |
| Tajikistan | Hong Kong | Mozambique | Thailand | |
| Turkmenistan | Hungary | Netherlands | Togo | |
| Ukraine | Iceland | New Zealand | Trinidad and Tobago | |
| Uzbekistan | India | Nigeria | Tunisia | |

The packing of insulators supplied by GIG is made of wood treated in accordance with the international standard ISPM-15. When the insulators are stored at the open storage ground, the wood may darken due to ultraviolet emission exposure or dust. The impact of these factors on the packaging material does not reduce its mechanical strength.

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