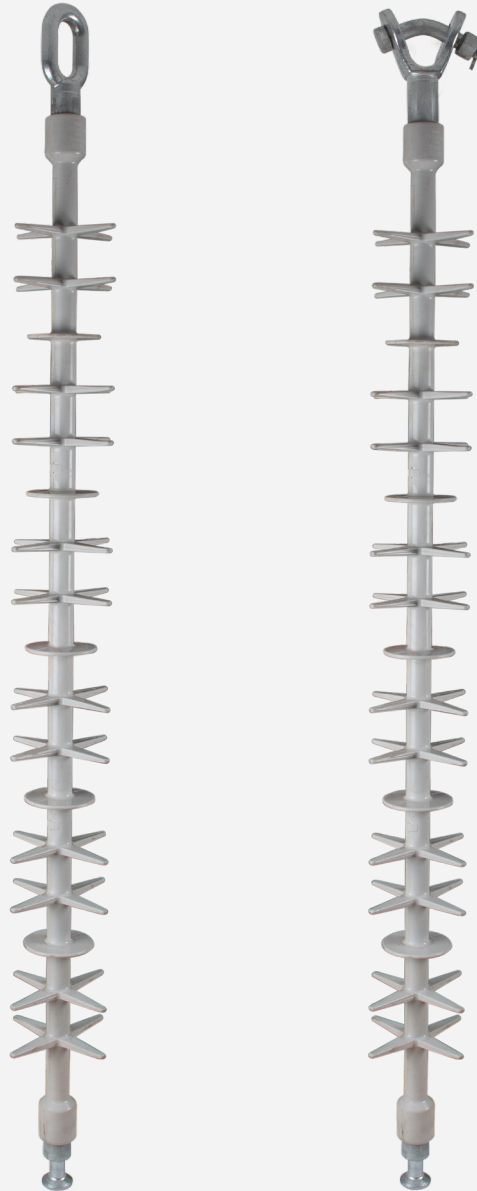


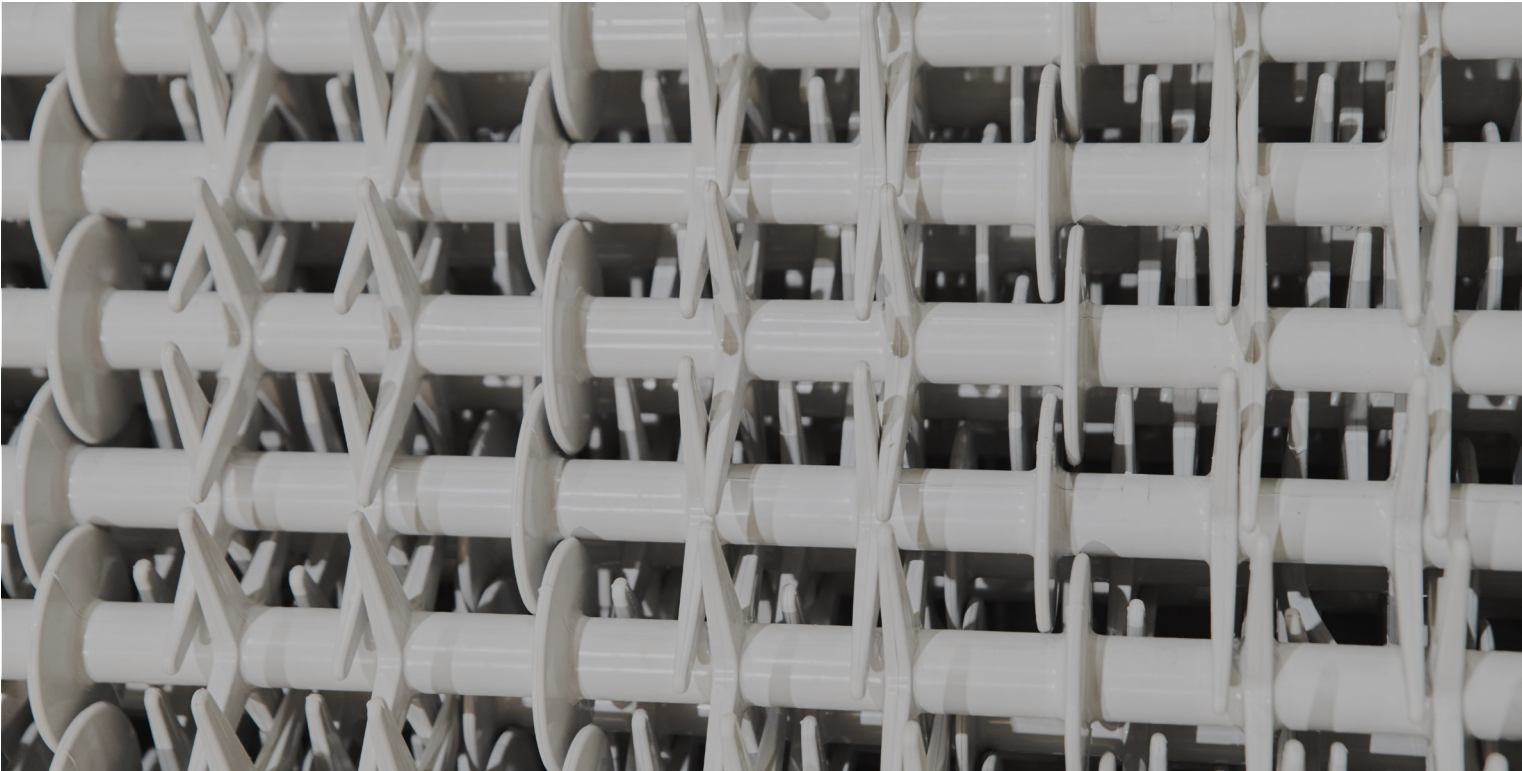


Insulators

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Polymeric bird protection insulators

The new polymeric bird protection insulators designed by Inael Electrical Systems are approved by the main electrical companies in the world.

These insulators are specially designed for the rigid attachment of conductors to the supports of medium voltage power lines. They are characterized by their great resistance to bending and their long creepage distance, pollution level III according to IEC 60 815, which makes them ideal for places with high pollution or requests for significant stress.

The insulators are equipped with hardware manufactured by stamping and hot-dip galvanized. The new polymeric bird protection insulators are the ideal solution to one of the biggest problems we encounter today, the electrocution of birds.

On the other hand, it is worth highlighting the exceptional hydrophobic capacity to prevent the accumulation of moisture and therefore the guarantee of an adequate response in environments with water or snow.

Polymeric strains or suspension insulators

Generalities:

We show you in this catalogue, different models of composite insulators:

- **A.** Insulators uses in strain and suspension chain till 132 kV, which can incorporate in both ends, anyone of the fittings indicate in the table 1.
- **B.** Pin insulator till 36 kV.

Composite insulators reference standards

UNE EN 61109 CEI 61109

External test over polymeric insulators :

In Internationally recognized laboratories, we have carried out all the design and the type test established in the reference standards, with satisfactory result. INAEL has a test index for all them; this index is at our client’s disposal. And can be used in requesting those protocols that our clients may consider necessary to obtain.



Test capacity in our INAEL’s laboratories

INAEL laboratories could carry out the nest test over composite insulators:

Design Test:

- Torsion test
- Failing load test.
- Interfaces test.
- Core load-time test.
- Core materials test.

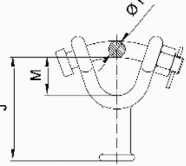
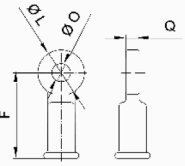
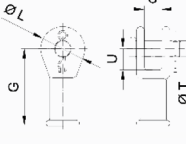
Type Test:

- Mechanical tensile load-time test.
- Dielectric test.

Ensayos de tipo. Características:

- Composite insulators, epoxy with fibreglass core and silicone housing.
- Core epoxy fibreglass E.C.R. (Electric and Chemically Resistant).

- Rubber Silicone free of EPDM.
- Ant vandalism insulators.
- Water repellent insulators.
- Insulators highly ecologic in their use
- System of sheds inclined with two different diameters, with wide protected Creepage distance.
- Weight 40% lower than the equivalent ceramic or glass insulators..
- Finished in sky grey colour S1502G according to UNE 48103 (RAL 7035) that does not produce visual impact
- Under order they can be supply in blue colour (RAL 5012)
- Total interchangeability with previus models (RAL5012).
- Intercambiabilidad total con modelos de vidrio.
- Aisladores compuestos por núcleo de fibra de vidrio con resina epoxi y envolvente de silicona.

Tabla 1			
Hardware type			
Mark	Y	P	H

* Under order we can supply insulators with hardware of size 11, with falling load of 40 kN.

Failing Load	Dimensions mm															
	C	D	E	F	G	Ø1	J	ØK	ØL	M	N	O	Q	S	ØT	F
40 kN	57	68,5	72	73,5	73,5	12	84	12	45	30	40	18	13	18	16	21,5
70 kN	68	75,6	79	85	78,5	16	88	16	43	30	50	17,5	13	18	16	21,5
	88						100			40				20		
120 kN	89	100	100	107	20	20	124	18	50	40	50	21	16	22	20	27

Our insulators can equip any of the fittings shown in the above table in any of their ends.

All the fittings are manufactured by hot forge and hot dip galvanized.

On each fitting are permanent embossed the next characteristics data of the insulator.

- Type.
- Specified mechanical load.
- Pollution level.
- Rated voltage.
- Year and month of manufacture.
- INAEL's brand.

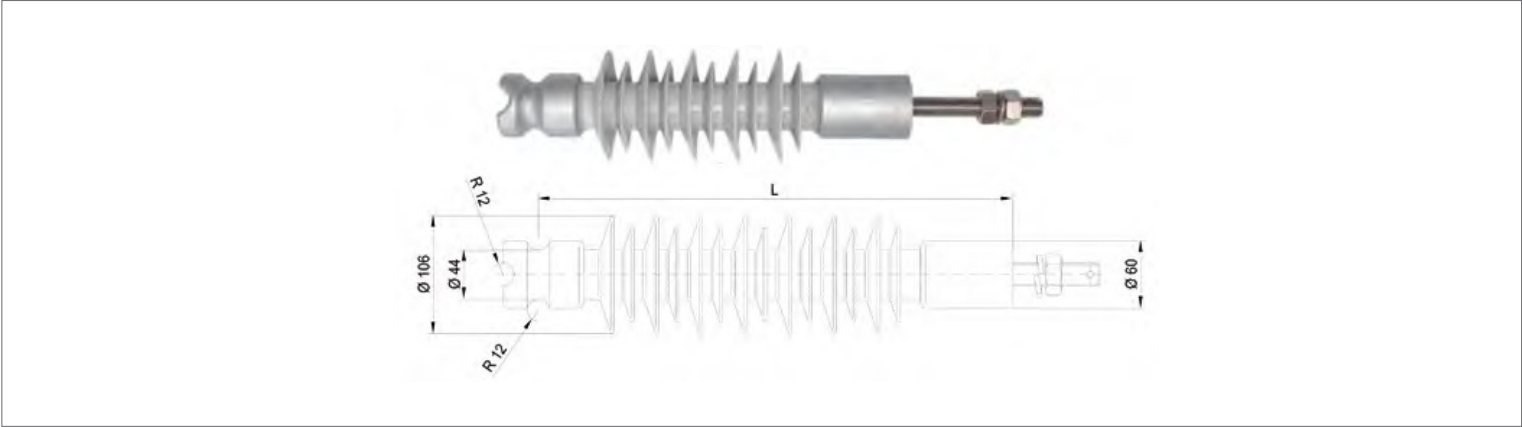
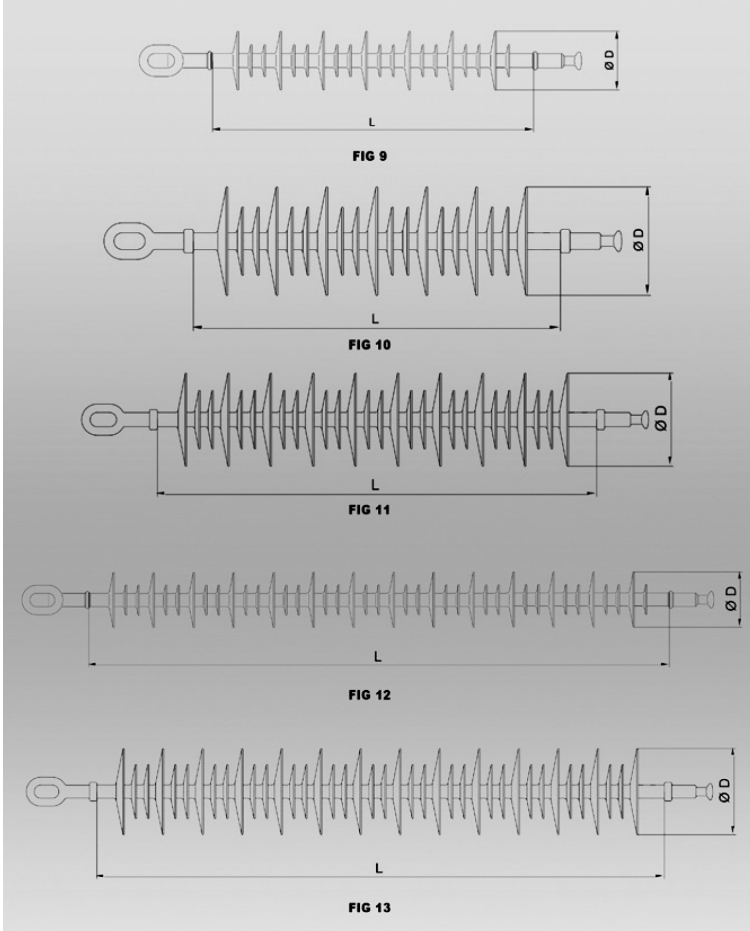
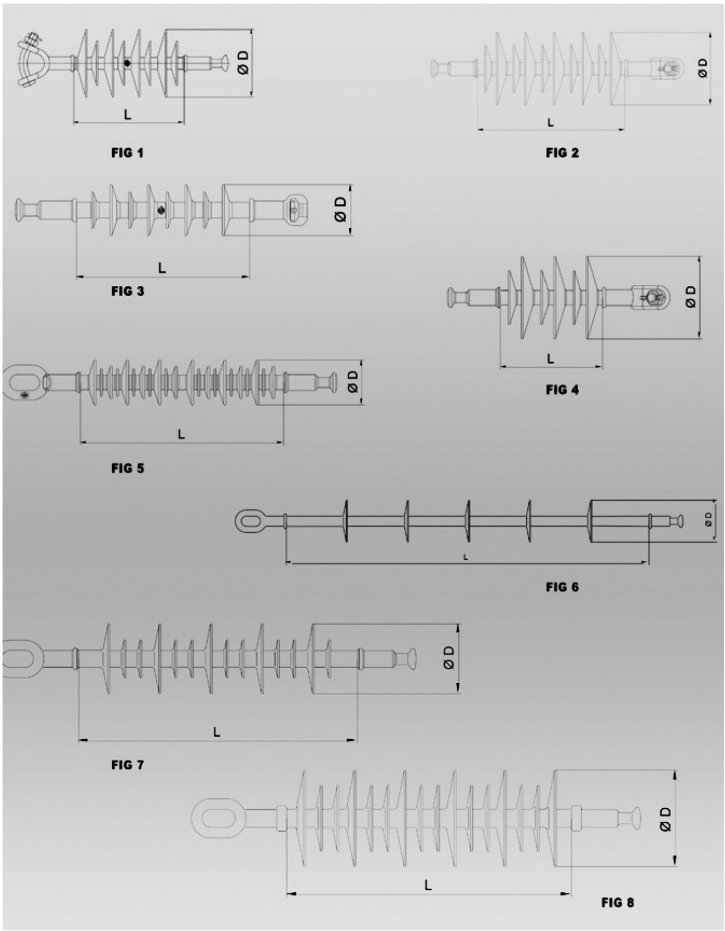


Dimensions of strains or suspension insulators

Type	Rated voltage KV max.	Creepage distance Min mm	Distance arc mm.	l - 10 mm	ØD mm	Torsion daN x m	Withsand voltages		Aprox weight KV	Uds./ Box	Fig
							12/50Hz KV.	50Hz 1 min KV			
Specified mechanical load / 40 KN											
CS40**15P	15 / 17,5	680	225	155	125	6	95	38	1,20	12	1
CS40**15P	30 / 36	1200	350	310	130	6	215	95	1,56	12	2
Specified mechanical load / 70 KN											
CS70**15P	15 / 17,5	680	225	150	125	6	95	38	1,40	12	1
CS70**20	20 / 24	520	240	230	75	6	165	75	1,03	12	3
CS70**20P	20 / 24	903	284	224	138	6	165	75	1,18	12	4
CS70**30	30 / 36	900	355	340	75	6	230	110	1,35	12	5
CS70**30 AV	30 / 36	1350	1000	1000	70	6	170	70	2,50	12	6
CS70**30P	30 / 36	1200	350	310	130	6	215	95	1,76	12	2
CS70**45	45 /52	1065	450	450	110	6	300	120	1,53	12	7
CS70**45P	45 / 52	1745	500	450	175	6	325	140	2,35	12	8
CS70**66	66 / 72	154	640	630	110	6	380	165	3,20	60	9
CS70**66P	66 / 72	2480	690	630	175	6	380	165	3,90	60	10
		2450	650	654							
		2600	730	700							
Specified mechanical load / 120 KN											
CS120**45P	45 / 52	2140	600	557	175	9	325	170	2,65	60	8
CS120**66P	66 / 72	2450	690	650	175	9	380	165	4,20	60	10
		2420	650	570							
		2600	730	700							
CS120**110P	110 / 123	3520	890	824	175	9	450	320	5,00	60	11
CS120**132	132 /145	2930	1145	1120	110	9	675	320	4,65	60	12
		2960	1190	1165							
CS120**132P	132 / 154	4740	1245	1195	175	9	675	320	6,40	60	13
		4710	1194	1165							

In order to determine the correct reference, replace ** by the designation of upper and inferior fittings (see the table 1 in page 6)

The insulators whit a P, at end of type, are manufactured to be installed in places with a high pollution (level IV according to IEC 60815), due to their especial system of big diameter shed, which guarantee a big protected creepage distance.



Type	Rated voltage/ max.	Minimum creepage distance	Protected creepage distance	L mm	Specified mechanical load	Withstand voltages		Aprox Weight kg.	Units / box ud.
						1,2 / 50 µs Bll. KV	50Hz bajo lluvia		
ARPI 08 CRP20	20 - 24	635	269	351	8	150	63	3,5	3,5
ARPI 06 CRP30	30 - 36	930	377	437	6	200	100	4,5	3

Figures of strains or suspension insulators

These insulators are specially designed for the subjection in rigid way of the wires, to the electrical supports of medium voltage.

They are characterized by their great resistance to the flexion and for their great creepage distance, level of contamination III according to IEC 60 815, what makes them suitable for places of high pollution or for applications of important efforts.

In their base they go equipped of a fitting in hot dip galvanized with a pin of stainless steel, of M-20 with a longitude of 120mm. with their corresponding nuts and stainless washers. We can manufacture other options under order. In the head of the insulator a fitting of special design has been mounted to hold in vertical, horizontal or inclined position the electric wires through preformed bars. These fittings are hot dip galvanized and all their edges are rounded to avoid the close contact with the wires or possible partial discharges.



Inael Electrical Systems, S.A.
C/ Río Jarama, 7, 45007 Toledo,
Spain

+34 925 233 511
+34 925 231 095
inael@inael.com