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NORWE®

Components for Power Conversion EC-Series

This catalogue contains information on our product range of the EC-Series

EC-coilformers are mostly used for power conversion applications in switched-mode power supplies, dc-dc converters and transductors. We can supply coilformers made in high quality plastics (thermoplasts), matching your production requirements.

Accessories, such as EC-clips and Safety-Class Spacers, are also included in this catalogue.

All dimensions in mm/inch. The permissible deviations according to DIN 16901 apply as tolerances.

Wherever high-temperature soldering processes are used in connection with EC-series coil-formers, we recommend irradiation cross-linked plastics. This ensures that the mechanical properties – in particular those of gfr-polyamides – are maintained and breakages are reduced. For this reason NORWE offers all plastic components of the EC-series in irradiated cross-linked materials.

In the short term, the cross-linked materials can be exposed to very high temperatures. Apart from improved aspects in production there may be interesting cost advantages, and a discussion with us could be useful.

Should you need further assistance, be it technical or to assist when placing your order, we look forward to hearing from you.

Fully tagged or pinned coilformers are – in small quantities – usually available from stock. We can also quote for coilformers with pins or tags fitted to your requirements. All lead-times are relatively short.

Our extensive range of modular tooling allows almost unlimited constructional changes to meet customers specification, often by simple changes of tool inserts.

In addition the modular tooling system allows extremely short tooling times and can be very cost effective.

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All dimensions in mm/inch

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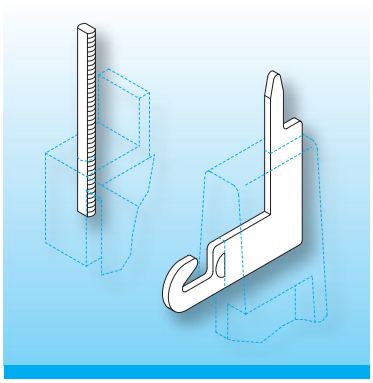
Survey of Solder-pins

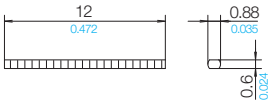
The survey below contains the standard solder-pins matched to the coilformers of the EC-series and informs you about the exact dimensions of the solder-pins. The material used is tin bronze, tinned. Further shapes and types are included in our catalogue “Stamped and Pressed Components for Electronic Applications”.
In addition we also supply individual solder-pins and solder-tags to customers specification – please contact us.



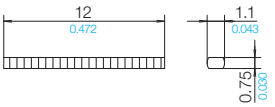
Survey of Solder-tags

The solder-tags below are the standard types matched to the coilformers of the EC-series.
The survey contains the exact dimensions of the solder-tags.
The material used is brass, tinned.

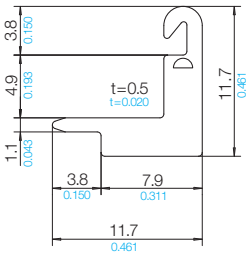
Special materials/designs on request, dimensions in mm/inch.



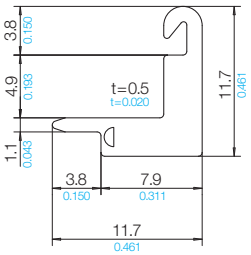
Solder-pin: z812/ua
73298-212



Solder-pin: z112/ua
73322-212



Solder-tag: ech/wd
75403-261



Solder-tag: ecv/wd
75401-261

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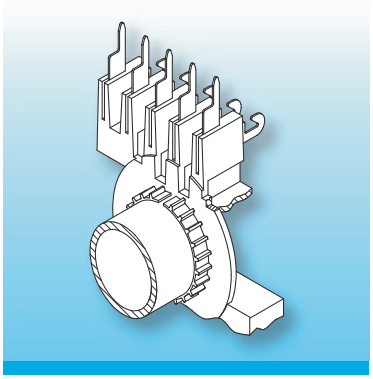
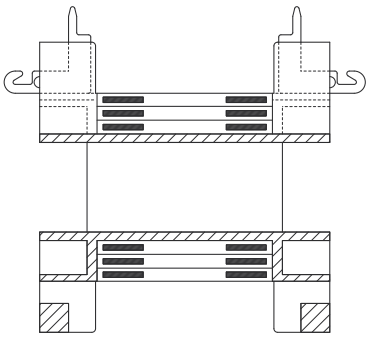
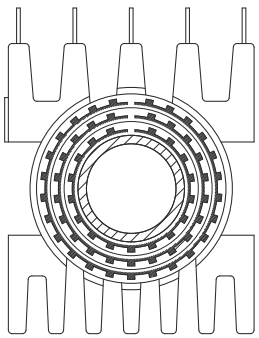
Safety Class with Spacers DR
Clearance and creepage dimensions for safety-insulated components may vary from country to country. Accordingly, test voltages of 2500/ 4000/7500 V between primary and secondary and to the core require creepages and clearances from 4 to 12 mm (0.157 to 0.472 inch).



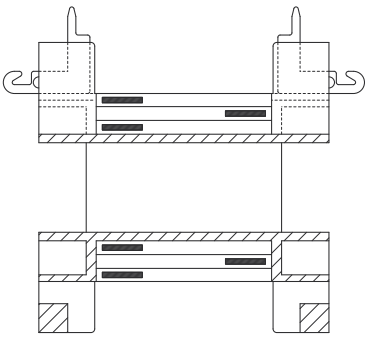
Spacers DR are advantageous for these applications. Examples are shown in the drawings below. Insulating tape between separate windings (across the total width including spacers) is required to achieve creepage and clearance dimensions.

With spacers DR on both sides of the winding creepage and clearance distances of 8 or 12 mm (0.315 or 0.472 inch) can be achieved.





With spacers DR only on one or the other side of the winding creepage and clearance distances of 4 or 6 mm (0.157 or 0.236 inch) can be achieved.



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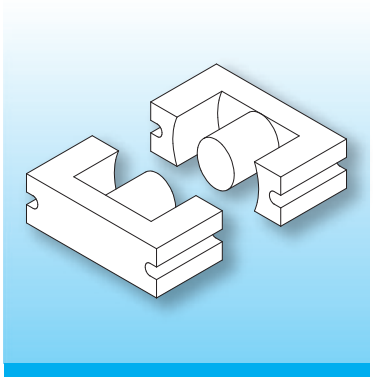
EC-Ferrite Cores

The tables below show the magnetic data for the cores shown in this catalogue and their dimensions. The data can be used as an orientation in the design of specific converters.



Specific details on the ferrite cores and materials should be available from the catalogues of the ferrite manufacturers.

l/A - Magnetic Core Factor
l_e - Effective magnetic length
A_e - Effective cross-section
A_{min} - Cross-section
V_e - Effective magnetic volume

Ferrite Core	l/A	l_e	A_e	A_{min}	V_e
	mm^{-1}/$inch^{-1}$	mm/inch	mm^2/$inch^2$	mm^2/$inch^2$	mm^3/$inch^3$
EC 35	0.918	77.4	84.3	66.0	6530
	0.036	3.047	0.131	0.102	0.398
EC 41	0.735	89.3	121.0	100.0	10800
	0.029	3.516	0.188	0.155	0.659
EC 52	0.580	105.0	180.0	134.0	18800
	0.023	4.134	0.279	0.208	1.147
EC 70	0.514	144.0	279.0	201.0	40100
	0.020	5.669	0.432	0.312	2.447
EC 90	0.353	221.0	626.0	570.0	138270
	0.014	8.701	0.970	0.884	8.438
EC 120	0.330	255.0	772.0	707.0	196490
	0.013	10.039	1.197	1.096	11.991

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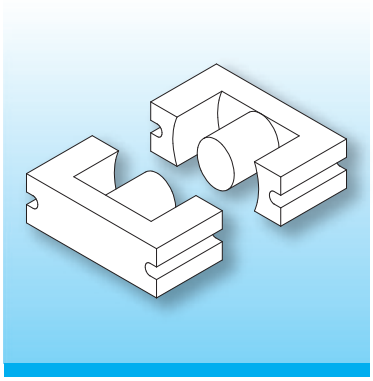
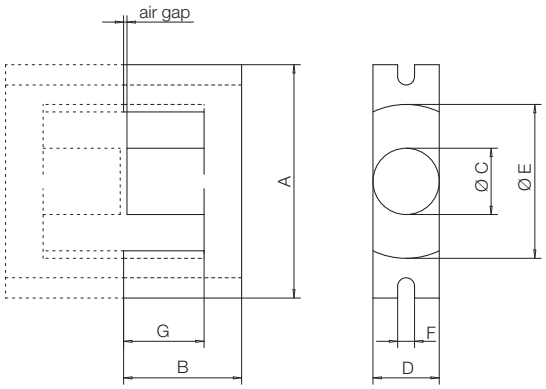


Specific details on the ferrite cores and materials should be available from the catalogues of the ferrite manufacturers.

Ferrite Core	A	B	C	D	E	F	G
	mm/inch	mm/inch	mm/inch	mm/inch	mm/inch	mm/inch	mm/inch
EC 35	35.4 ±0.8 1.394 ±0.031	17.45 –0.3 0.687 –0.012	9.80 +0.6 0.386 +0.024	9.80 +0.6 0.386 +0.024	22.75 ±0.6 0.896 ±0.024	2.50 +0.5 0.098 +0.020	11.9 +0.7 0.469 +0.028
EC 41	40.6 ±1.0 1.598 ±0.039	19.65 –0.3 0.774 –0.012	11.90 –0.6 0.469 –0.024	11.90 –0.6 0.469 –0.024	27.05 ±0.8 1.065 ±0.031	3.00 +0.5 0.118 +0.020	13.5 +0.8 0.531 +0.031
EC 52	52.2 ±1.3 2.055 ±0.051	24.35 –0.3 0.959 –0.012	13.75 –0.7 0.541 –0.028	13.75 –0.7 0.541 –0.028	33.00 ±0.9 1.299 ±0.035	3.50 +0.5 0.138 +0.020	15.5 +0.8 0.610 +0.031
EC 70	70.0 ±1.7 2.756 ±0.067	34.65 –0.3 1.364 –0.012	16.80 –0.8 0.661 –0.031	16.80 –0.8 0.661 –0.031	44.50 ±1.2 1.752 ±0.047	4.50 +0.5 0.177 +0.020	22.3 +0.9 0.878 +0.035
EC 90	90.0 ±1.8 3.543 ±0.071	45.65 –0.3 1,797 –0.012	31.00 –2.0 1.220 –0.079	31.00 –2.0 1.220 –0.079	70.00 ±1.5 2.756 ±0.059	5.20 +0.6 0.205 +0.024	35.0 +1.0 1.378 +0.039
EC 120	120.0 ±2.0 4.724 ±0.079	51.15 –0.3 2.014 –0.012	31.00 –2.0 1.220 –0.079	31.00 –2.0 1.220 –0.079	95.00 ±1.7 3.740 ±0.067	5.20 +0.6 0.205 +0.024	35.0 +1.0 1,378 +0.039



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Thermoplastic Materials

The following survey contains supplementary information on the different thermoplastic-qualities.
The material quality orientates to the conventional use of the components. For technical reasons alternative materials cannot be used for all articles.
Consult our qualified specialists regarding your individual material requests – we will be pleased to check whether your material requirements can be realized.
Further information on the materials can also be obtained from our homepage (e.g. to call up the UL cards).

NORWE Mat.-Code	NORWE Mat.-Description	Chemical Symbol	Tradename Manufacturer	UL-File-No.	Flammability Rating acc. UL	RTI Elec acc. UL
024	p6g	PA66 Polyamide 66	PA66 30% GF black Compound	–	–	(+125° C)
039	A3X2G5 sv.	PA66 Polyamide 66	A3X2G5 cross-linked Ultramid BASF AG	–	–	(+120° C)
087	rtg nat.	PET Polyethylene Terephthalate	FR 530 L Rynite DuPont	E 41938	V-0 (0.35)	+155° C
106	A RV250 nat.	PA66 Polyamid 66	Radiflam A RV250 AF RADICINOVACIPS SPA	E116324	V-0 (0.75)	+115° C
186	SKYT.5220FR	PET Polyethylen-terephthalat	5220FR natur Skytra SK Chemicals Co. Ltd.	E 215991	V-0 (0.70)	+155° C

Explanations on the above survey of materials:

NORWE Mat.-Code . . . . . designates the number NORWE fixed for the material

NORWE Mat.-Description . . . . . names the NORWE-abbreviation for the material

Chemical Symbol . . . . . classifies the chemical product group of the material

Tradename . . . . . designates the product name or trade name fixed by the manufacturer

Manufacturer . . . . . name of manufacturer

UL-File-No. . . . . material quality tested and certified with respect to safety and flammability. The manufacturers of certified and approved products receive a so-called recognition card (yellow card) in which the product qualities are listed in detail. You find all relevant yellow cards – also called UL cards – for different material qualities on our homepage or you can obtain them from us.

Flammability Rating acc. UL . . . determines the flammability of thermoplastic materials based on burning tests in accordance with UL 94 considering the wall thickness of the material.

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Irradiation Cross-Linking of EC Components

NORWE cannot only look back on more than 40 years of experience in the development and production of coilformers but has in the meantime also gained almost 10 years of experience in irradiation cross-linking.

All components of the EC-series can on request be supplied in cross-linked material. A cross-linking enhancing material is added to the thermoplast granulates. After moulding the components are irradiated with Beta- or Gamma rays – depending on the penetration required.
The material loses its thermoplast characteristics (but it is not a thermoset) and withstands very high temperature peeks for short periods without any problems.

- Depending on the degree of cross-linking the coilformers and accessories withstand solder temperatures of 450–480° C for about 1–3 seconds. Irradiated cross-linked components easily tolerate the higher solder temperatures required due to the contact elements being changed to be leadfree.

- Unlike high temperature polymers – also cost-effective granulates are suitable for irradiation cross-linking. The characteristic features of the coilformers and accessories do not change due to the cross-linking.

- In contrast to high temperature polymers lower temperatures of material and mould during the production process are required and thus the tool elements are less stressed resulting in longevity.
The lower temperature profiles during the moulding process provide a lower wear and tear of the tool elements as well as a perceptible saving of energy costs.

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Individual special designs
- problem solutions orientated to industries' demands

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Current certifications
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- UL 746 D
- EN ISO 14001:2005
- AEOC

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