

SMD - Surface Mount Devices

Coilformers and Components



This catalogue contains information on all Surface Mount Coilformers and Components available from NORWE

Miniature electronic components, surface mountable, are used in ever increasing numbers in many areas of electronics. The requirements are: smallest dimensions, high temperature rating and fast solderability.

We supply coilformers in high quality thermoplastics, exactly to meet your production requirements and product specification.

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 SMD-series coilformers, we recommend irradiated 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 SMD-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.

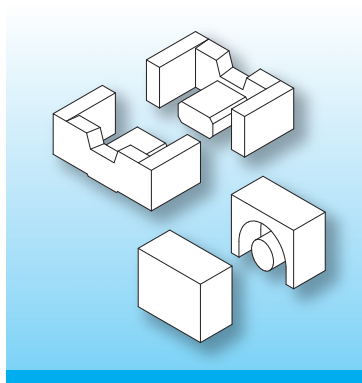
Our extensive range of modular tooling allows almost unlimited constructional changes to meet customers specification, often by simple changes of tool inserts.

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



**EE, EFD, ER, EP, EPX, RM, P (PC)
Ferrite Cores**

The tables below show the dimensions and the magnetic characteristics per set of the ferrite cores for the coilformers shown in this catalogue. The data can be used as an orientation in the design of application specific converters. Specific details on the ferrite cores and materials should be available from the catalogues of the ferrite manufacturers.



l_e - effective length
 A_e - effective area
 A_{min} - core cross section
 V_e - effective volume

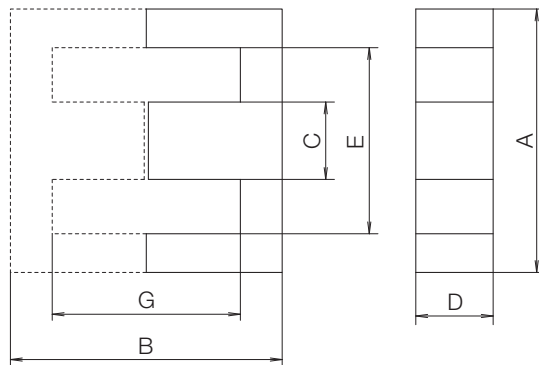
Dimensions in mm/inch.

Magnetic Characteristics/per set Type:	l_e mm / inch	A_e mm ² / inch ²	A_{min} mm ² / inch ²	V_e mm ³ / inch ³
EF 5	12.70 / 0.500	2.50 / 0.004	—	31.40 / 0.002
EF 6.3	12.20 / 0.480	3.30 / 0.005	2.60 / 0.004	40.30 / 0.002
EF 8	18.40 / 0.724	5.40 / 0.008	5.40 / 0.008	100.00 / 0.006
EF 8.8	15.50 / 0.610	5.00 / 0.008	3.60 / 0.006	78.00 / 0.005
EF 10	22.90 / 0.902	8.40 / 0.013	8.10 / 0.013	192.00 / 0.012
EF 12.6	29.60 / 1.165	12.40 / 0.019	12.20 / 0.019	367.00 / 0.022
EF 16	37.60 / 1.480	20.10 / 0.031	19.40 / 0.030	750.00 / 0.046
EFD 10	23.10 / 0.909	7.20 / 0.011	6.50 / 0.010	166.00 / 0.010
EFD 12	28.50 / 1.122	11.40 / 0.018	10.70 / 0.017	325.00 / 0.020
EFD 15/8/5	34.00 / 1.339	15.00 / 0.023	12.20 / 0.019	510.00 / 0.031
EFD 20	47.00 / 1.850	31.00 / 0.048	31.00 / 0.048	1460.00 / 0.089
EFD 25	57.00 / 2.244	58.00 / 0.090	57.00 / 0.088	3310.00 / 0.202
EFD 30	68.00 / 2.677	69.00 / 0.107	69.00 / 0.107	4690.00 / 0.286
ER 9.5/5	14.20 / 0.559	8.47 / 0.013	8.55 / 0.013	120.00 / 0.007
ER 11/5	14.00 / 0.551	12.70 / 0.020	12.60 / 0.020	174.00 / 0.011
ER 14.5/6	19.00 / 0.748	17.60 / 0.027	16.60 / 0.026	333.00 / 0.020
EP 5	9.73 / 0.383	3.09 / 0.005	2.34 / 0.004	30.00 / 0.002
EP 7	15.70 / 0.618	10.30 / 0.016	8.50 / 0.013	162.00 / 0.010
EPX 7	15.60 / 0.614	17.70 / 0.027	13.90 / 0.022	276.00 / 0.017
EPX 9	15.60 / 0.614	17.70 / 0.027	13.90 / 0.022	276.00 / 0.017
EP 10	19.20 / 0.756	11.30 / 0.018	8.50 / 0.013	217.00 / 0.013
EPX 10	21.70 / 0.854	15.90 / 0.025	13.20 / 0.020	345.00 / 0.021
EP 13	24.20 / 0.953	19.50 / 0.030	14.90 / 0.023	472.00 / 0.029
RM 4 LP	17.30 / 0.681	14.50 / 0.022	11.30 / 0.018	251.00 / 0.051
RM 4	21.00 / 0.827	11.00 / 0.017	11.30 / 0.018	232.00 / 0.014
RM 5 LP	17.50 / 0.689	24.50 / 0.038	18.00 / 0.028	430.00 / 0.026
RM 5	20.80 / 0.819	20.80 / 0.032	15.00 / 0.023	430.00 / 0.026
RM 6 LP	21.80 / 0.858	37.50 / 0.058	31.20 / 0.048	820.00 / 0.050
RM 6	26.90 / 1.059	31.30 / 0.049	31.00 / 0.048	840.00 / 0.051
P 4.6 x 4.1	7.60 / 0.299	2.80 / 0.004	—	21.30 / 0.001
P 5.8 x 3.3	7.90 / 0.311	4.70 / 0.007	3.66 / 0.006	37.00 / 0.002
P 7 x 4	10.00 / 0.394	7.00 / 0.011	5.57 / 0.009	70.00 / 0.004
P 9 x 5	12.20 / 0.480	9.80 / 0.015	7.29 / 0.011	120.00 / 0.007
P 9 x 7	14.60 / 0.575	10.00 / 0.016	—	140.00 / 0.009



Type	A	B	C	D	E	G
EE 5	5.25 ±0.10 0.207 ±0.004	5.30 -0.10 0.209 -0.004	1.40 -0.10 0.055 -0.004	2.00 -0.10 0.079 -0.004	3.80 +0.20 0.150 +0.008	4.00 +0.20 0.157 +0.008
EE 6.3*	6.30 -0.25 0.248 -0.010	5.80 -0.20 0.228 -0.008	1.40 -0.10 0.055 -0.004	2.00 -0.10 0.079 -0.004	3.60 +0.20 0.142 +0.008	3.70 +0.20 0.146 +0.008
EE 8	8.00 ±0.15 0.315 ±0.006	8.10 -0.20 0.319 -0.008	2.40 -0.10 0.094 -0.004	2.40 -0.10 0.094 -0.004	5.60 +0.20 0.220 +0.008	5.60 +0.20 0.220 +0.008
EE 8.8	9.00 ±0.25 0.354 ±0.010	8.20 -0.40 0.329 -0.016	1.90 ±0.12 0.075 ±0.005	2.00 -0.20 0.079 -0.008	5.20 ±0.13 0.205 ±0.005	4.06 +0.50 0.160 +0.020
EE 10	10.00 ±0.20 0.394 ±0.008	10.00 -0.24 0.394 -0.009	3.00 -0.12 0.118 -0.005	3.00 -0.12 0.118 -0.005	7.00 +0.30 0.276 +0.012	7.00 +0.24 0.276 +0.009
EE 12.6	12.60 ±0.40 0.496 ±0.016	13.00 -0.40 0.512 -0.016	3.70 -0.30 0.146 -0.012	3.70 -0.30 0.146 -0.012	8.90 +0.60 0.350 +0.024	9.00 +0.60 0.354 +0.024
EE 16	16.10 ±0.60 0.634 ±0.024	8.20 -0.30 0.323 -0.012	4.70 -0.30 0.185 -0.012	4.70 -0.40 0.185 -0.016	11.30 +0.60 0.445 +0.024	11.40 +0.80 0.449 +0.031

* EE 6.3 suitable for coilformer EE 5.



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All dimensions in mm/inch

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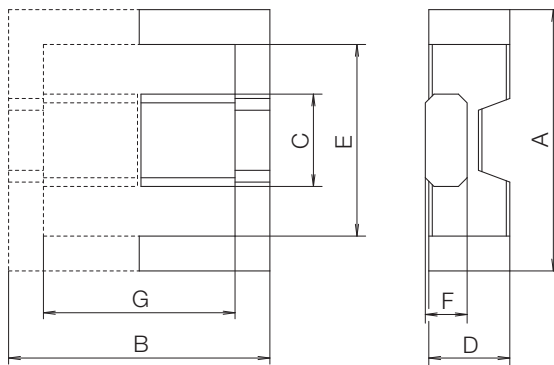
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Type	A	B	C	D	E	F	G
EFD 10/5/3	10.50 ±0.30 0.413 ±0.012	10.40 ±0.20 0.409 ±0.008	4.55 ±0.15 0.179 ±0.006	2.70 ±0.10 0.106 ±0.004	7.65 ±0.25 0.301 ±0.010	1.45 ±0.05 0.057 ±0.002	7.50 ±0.30 0.295 ±0.012
EFD 12/6/3	12.50 ±0.30 0.492 ±0.012	12.40 ±0.20 0.488 ±0.008	5.40 ±0.15 0.213 ±0.006	3.50 ±0.10 0.138 ±0.004	9.00 ±0.25 0.354 ±0.010	2.00 ±0.10 0.079 ±0.004	9.10 ±0.30 0.358 ±0.012
EFD 15/8/5	15.00 ±0.40 0.591 ±0.016	15.00 ±0.30 0.591 ±0.012	5.30 ±0.15 0.209 ±0.006	4.65 ±0.15 0.183 ±0.004	11.00 ±0.35 0.433 ±0.014	2.40 ±0.10 0.094 ±0.004	11.00 ±0.40 0.433 ±0.016
EFD 20/10/7	20.00 ±0.55 0.787 ±0.022	20.00 ±0.30 0.787 ±0.012	8.90 ±0.20 0.350 ±0.008	6.65 ±0.15 0.262 ±0.006	15.40 ±0.50 0.606 ±0.020	3.60 ±0.15 0.142 ±0.006	15.40 ±0.50 0.606 ±0.020
EFD 25/13/9	25.00 ±0.65 0.984 ±0.026	25.00 ±0.30 0.984 ±0.012	11.40 ±0.20 0.449 ±0.008	9.10 ±0.20 0.358 ±0.008	18.70 ±0.60 0.736 ±0.024	5.20 ±0.15 0.205 ±0.006	18.60 ±0.50 0.732 ±0.020
EFD 30/15/9	30.00 ±0.80 1.181 ±0.031	30.00 ±0.30 1.181 ±0.012	14.60 ±0.25 0.575 ±0.010	9.10 ±0.20 0.358 ±0.008	22.40 ±0.75 0.882 ±0.030	4.90 ±0.15 0.193 ±0.006	22.40 ±0.60 0.882 ±0.024



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All dimensions in mm/inch

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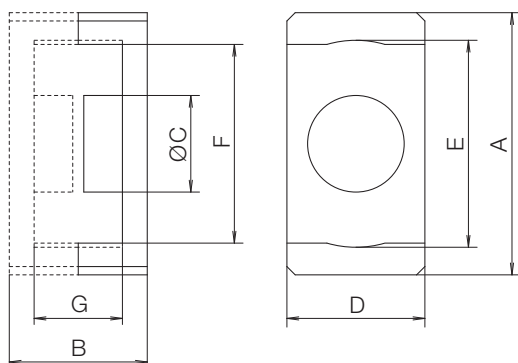
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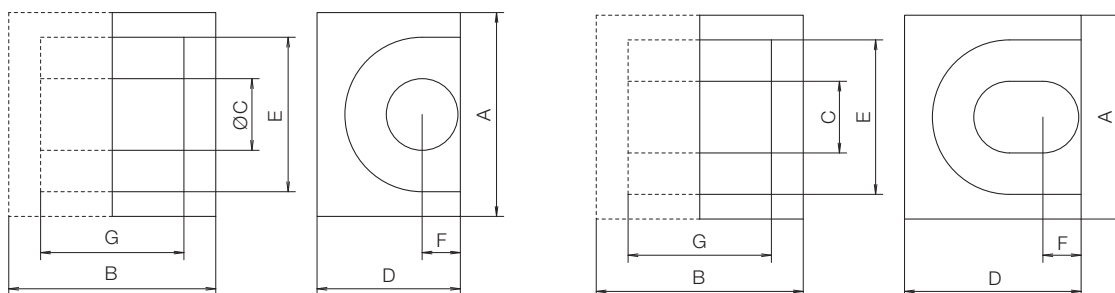
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Type	A	B	C	D	E	F	G
ER 9.5/5	9.55 -0.40 0.376 -0.016	5.05 -0.30 0.199 -0.012	3.55 -0.20 0.140 -0.008	5.00 -0.20 0.197 -0.008	7.50 +0.25 0.295 +0.010	7.20 ±0.20 0.283 ±0.008	3.20 +0.30 0.126 +0.012
ER 11/5	11.00 -0.35 0.433 -0.014	5.05 -0.30 0.199 -0.012	4.25 -0.25 0.167 -0.010	6.00 -0.20 0.236 -0.008	8.70 +0.30 0.343 +0.012	8.10 ±0.20 0.319 ±0.008	3.00 +0.30 0.118 +0.012
ER 14.5/6	14.50 ±0.20 0.571 ±0.008	5.90 ±0.10 0.232 ±0.004	4.70 ±0.10 0.185 ±0.004	6.70 ±0.10 0.236 ±0.004	11.80 ±0.20 0.465 ±0.008	11.80 ±0.20 0.465 ±0.008	3.30 ±0.20 0.130 ±0.008



Type	A	B	C	D	E	F	G
EP 5	6.15 -0.30 0.242 -0.012	5.70 -0.20 0.224 -0.008	1.80 -0.15 0.071 -0.006	3.90 -0.25 0.154 -0.010	4.30 +0.25 0.169 +0.010	0.90 ±0.10 0.035 ±0.004	3.80 +0.40 0.150 +0.016
EP 7	9.40 -0.40 0.370 -0.016	7.50 -0.20 0.295 -0.008	3.40 -0.20 0.134 -0.008	6.50 -0.30 0.226 -0.012	7.20 +0.40 0.284 +0.016	1.70 ±0.10 0.067 ±0.004	5.00 +0.40 0.197 +0.016
EPX 7	9.40 -0.40 0.370 -0.016	7.50 -0.20 0.295 -0.008	3.40 -0.20 0.134 -0.008	9.00 -0.40 0.354 -0.016	7.20 +0.40 0.284 +0.016	1.70 ±0.10 0.067 ±0.004	4.60 +0.40 0.181 +0.016
EPX 9	9.40 -0.40 0.370 -0.016	7.50 -0.20 0.295 -0.008	3.40 -0.20 0.134 -0.008	9.00 -0.40 0.354 -0.016	7.20 +0.40 0.284 +0.016	1.70 ±0.10 0.067 ±0.004	4.60 +0.40 0.181 +0.016
EP 10	11.80 -0.60 0.465 -0.024	10.40 -0.20 0.409 -0.008	3.45 -0.30 0.136 -0.012	7.85 -0.40 0.309 -0.016	9.20 +0.40 0.362 +0.016	1.85 ±0.10 0.073 ±0.004	7.20 +0.40 0.283 +0.016
EPX 10	11.80 -0.60 0.465 -0.024	10.40 -0.20 0.409 -0.008	3.45 -0.30 0.136 -0.012	7.85 -0.40 0.309 -0.016	9.20 +0.40 0.362 +0.016	1.80 ±0.10 0.071 ±0.004	7.20 +0.40 0.283 +0.016
EP 13	12.80 -0.60 0.504 -0.024	13.00 -0.30 0.512 -0.012	4.50 -0.30 0.177 -0.012	9.00 -0.40 0.354 -0.016	9.70 +0.60 0.382 +0.024	2.40 ±0.10 0.094 ±0.004	9.00 +0.40 0.354 +0.016



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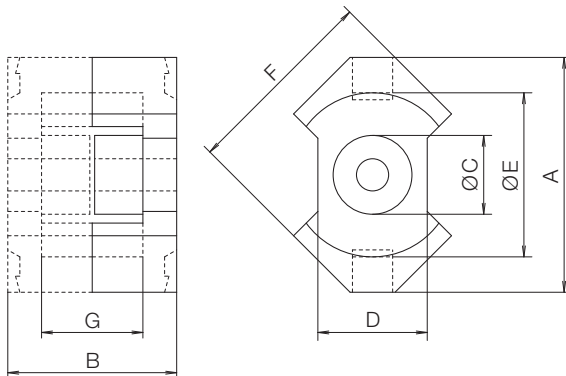
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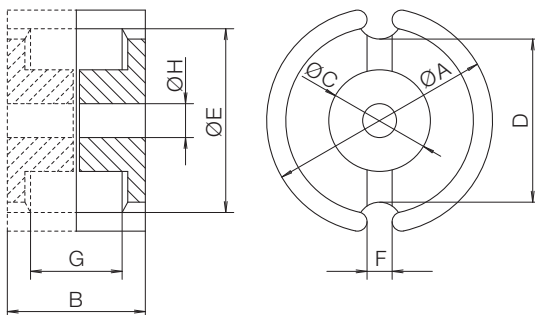
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Type	A	B	C	D	E	F	G
RM 4 LP	11.00 -0.40 0.433 -0.016	7.80 -0.20 0.307 -0.008	3.90 -0.20 0.154 -0.008	4.60 -0.20 0.181 -0.008	8.00 +0.30 0.315 +0.012	9.80 -0.40 0.386 -0.016	4.30 +0.40 0.169 -0.016
RM 4	11.00 -0.40 0.433 -0.016	10.50 -0.20 0.413 -0.008	3.90 -0.20 0.154 -0.008	4.60 -0.20 0.181 -0.008	8.00 +0.30 0.315 +0.012	9.80 -0.40 0.386 -0.016	7.00 +0.40 0.276 -0.016
RM 5 LP	14.60 -0.60 0.575 -0.024	7.80 -0.20 0.307 -0.008	4.90 -0.20 0.193 -0.008	6.80 -0.40 0.268 -0.016	10.20 +0.40 0.402 +0.016	12.30 -0.50 0.484 -0.020	3.60 +0.40 0.142 -0.016
RM 5	14.60 -0.60 0.575 -0.024	10.50 -0.20 0.413 -0.008	4.90 -0.20 0.193 -0.008	6.80 -0.40 0.268 -0.016	10.20 +0.40 0.402 +0.016	12.30 -0.50 0.484 -0.020	6.30 +0.40 0.248 -0.016
RM 6 LP	17.90 -0.60 0.705 -0.024	9.00 -0.20 0.354 -0.008	6.40 -0.20 0.252 -0.008	8.20 -0.40 0.323 -0.016	12.40 +0.50 0.488 -0.020	14.70 -0.60 0.579 -0.024	4.50 +0.40 0.177 -0.016
RM 6	17.90 -0.60 0.705 -0.024	12.50 -0.20 0.492 -0.008	6.40 -0.20 0.252 -0.008	8.20 -0.40 0.323 -0.016	12.40 +0.50 0.488 -0.020	14.70 -0.60 0.579 -0.024	8.00 +0.40 0.315 -0.016



Type	A	B	C	D	E	F	G	H
P 4.6 x 3.1	4.60 -0.20 0.181 -0.008	3.10 -0.10 0.122 -0.004	2.00 -0.10 0.079 -0.004	—	3.50 +0.15 0.138 +0.006	1.10 +0.60 0.043 +0.024	2.10 +0.20 0.082 +0.008	—
P 5.8 x 3.3	5.80 -0.25 0.228 -0.010	3.40 -0.40 0.134 -0.016	2.50 -0.15 0.098 -0.006	—	4.50 +0.20 0.177 +0.008	1.50 +0.10 0.060 +0.004	2.20 +0.20 0.087 +0.008	0.95 +0.10 0.037 +0.004
P 7 x 4	7.35 -0.25 0.289 -0.010	4.20 -0.10 0.165 -0.004	3.00 -0.10 0.118 -0.004	5.45 -0.40 0.215 -0.016	5.80 +0.20 0.228 +0.008	1.70 +0.20 0.067 +0.008	2.80 +0.20 0.110 +0.008	1.40 +0.05 0.055 +0.002
P 9 x 5	9.30 -0.30 0.366 -0.012	5.40 -0.20 0.213 -0.008	3.90 -0.20 0.154 -0.008	5.80 -0.30 0.228 -0.012	7.50 +0.25 0.295 +0.010	2.10 +0.30 0.083 +0.012	3.60 +0.30 0.142 +0.012	2.00 +0.10 0.079 +0.004
P 9 x 7	9.30 -0.30 0.366 -0.012	6.60 -0.20 0.260 -0.008	3.90 -0.20 0.154 -0.008	7.40 -0.40 0.291 -0.016	7.50 +0.20 0.295 +0.010	1.90 +0.50 0.075 +0.020	4.80 +0.30 0.189 +0.012	2.00 +0.10 0.079 +0.004



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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
010	eg7	PA66 Polyamide 66	Ultramid A3EG7 BASF AG	E 41871	HB (1.50)
039	A3X2G5 sv.	PA66 Polyamide 66	Ultramid A3X2G5, cross-linked BASF AG	–	V-0 (0.81)
096	TE 250 F6	PA46 Polyamide 46	Stanyl TE250F6 DSM	E 47960	V-0 (0.35)
132	torA504	PPS Polyphenylensulfid	A504X90 natur Torelina Toray Industries Inc	E 41797	V-0 (0.28)
181	A3X2G10	PA66 Polyamide 66	Ultramid A3X2G10 BASF AG	E 41871	V-0 (1.70)
243	Zen. 6130L black	LCP Liquid Crystal Polymer	Zenite 6130L, black DuPont	E 41938	V-0 (0.38)

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Irradiation Cross-Linking of SMD Coilformers and SMD Accessories

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 SMD-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 peaks 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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