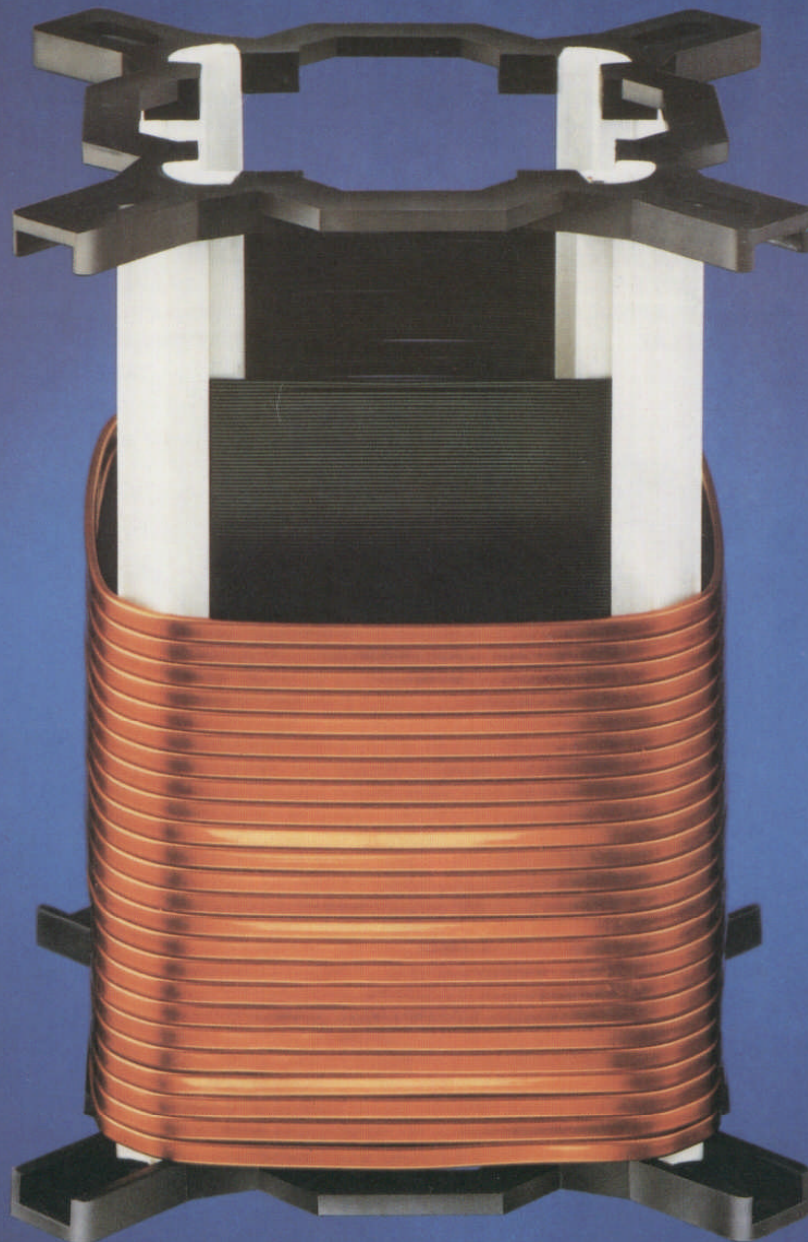


MEFFERT

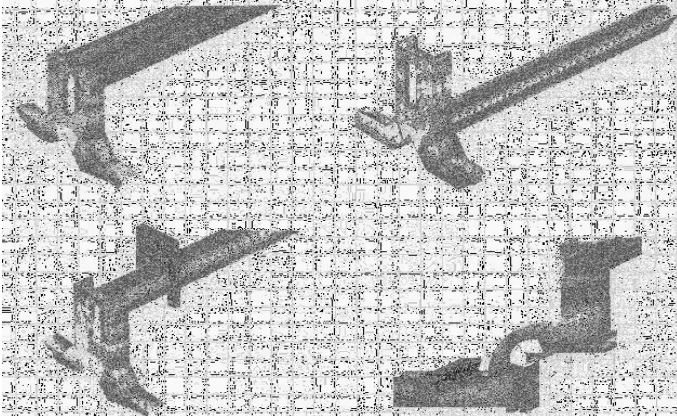
ELEKTRO-ISOLIERTECHNIK

A Modular Coil winding System.



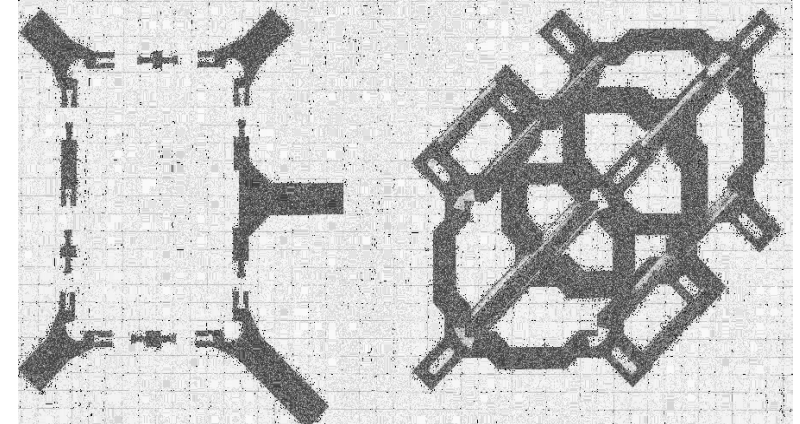
The System at a glance

All Areas of electrical and electronic technology are exploding with new developments. But design and construction of lower voltage dry transformers has shown little progress in the last years. This has changed dramatically with the introduction of our new Coil Cage System to the European market. This system cuts costs and considerably simplifies the construction of dry transformers in the range of 5 KVA to 100 KVA.



Advantage of the Coil Cage System

- good heatdissipation through chimneyeffect
- high heatresistantace
- usable for all sizes
- low stockcosts



Shape and design

The Coil Cage System uses a self supporting cage structure. This permits the manufacture of vented transformers with spacer elements between primary and secondary coils, eliminating all fixturing. Since core, spaces elements, and coils are all held in place by the rigid cage structure, the manual operation of coil winding is drastically simplified. Highly heat resistant pultrusion-molded fiberglass profiles, which can be produced in any desired length, are used as vertical support for core and windings. Horizontal end frames rigidly hold the vertical support elements in place and give the coilbody its shape and rigidity.

The cross section of the vertical elements is standardized to simplify inventory. The endframes on the other hand can be produced in any desired size and shape thus making possible any size and shape of bobbin. End frames are produced either as monolithic frames or as modular units consisting of standardized rigid corner pieces connected by spacer elements of varying lengths, again with simple inventory in mind. The siderail guides in the end frames are continuous, allowing construction of transformers with multiple coil layers.

Conclusion

The Coil Cage System offers the transformer design engineer a truly unique system of easily adaptable components, giving him complete flexibility in optimizing design and construction of dry transformers in the range between 5 KVA and 100 KVA. The modular concept combined with the low cost of elements makes the system just as useful for small series or even single units as for large series.

The creation of air spaces through use of vertical spacer elements in combination with cutouts in the end frames improves heat dissipation substantially and allows either an increase in current density or a reduction in copper consumption of up to 30% as compared to more traditional compactly wound transformers.

Where spacer elements are now in use, production managers welcome the great simplification of assembly using the end frames. This substantially reduces labor costs as well as requirements.

Accessories

To further simplify the manufacturing process we recommend the use of our polyester-shrink-tape to stabilize the transformer coils. The ends are connected by simply knotting, glueing, or soldering. Heating transformer and tape to the desired temperature lets the tape shrink and thus creates a substantial tensile force in the tape, resulting in high mechanical stability of the unit. Properly impregnated this tape will withstand temperatures of up to 220°C.

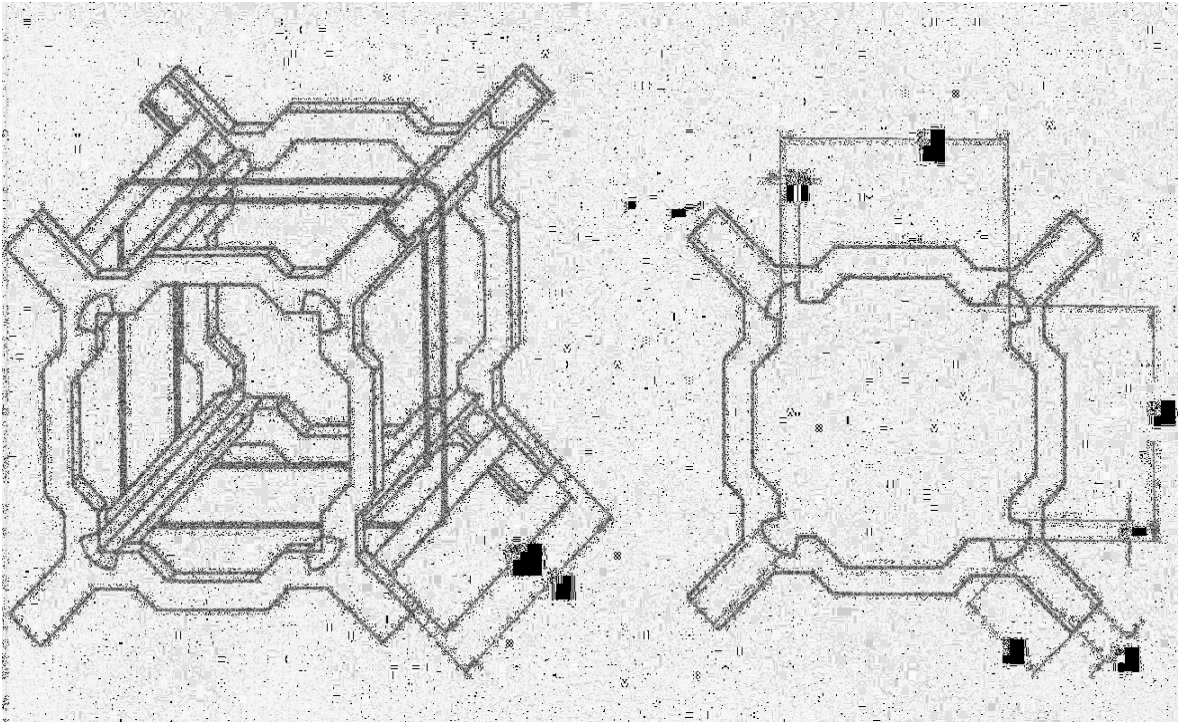
material: **Polyamid (PA-6)**
frames / cornerpieces / connectors / extensions

Technical Data	Unit	Iso-CI F (155°C)	Testmethod
mechanical properties			
Strain at break	%	3,5 / 5,0	DIN EN ISO 527
Stress at breakdown	Mpa	170 / 110	DIN EN ISO 527
E-Module (tensile)	Mpa	9.000 / 5.500	DIN EN ISO 527
Flexural strenght	Mpa	240 / 175	DIN EN ISO 178
E-Modul (flexural)	Mpa	8.000	DIN EN ISO 178
Charpy-impact strenght (23°C)	kJ / m ²	50,0 / 60,0	DIN 53453
Charpy-notched impact strenght (23°C)	kJ / m ²	11 / 18	DIN 53453
physical properties			
Density	g / cm ³	1,36	ISO 1183
Moistureabsorption	%	2,0	DIN 53714
Waterabsorption	%	6,5	DIN 53495
thermal properties			
Trackingindex	°C	220	DIN EN ISO 3146
Temperature of deflection under load HDT A (1,8Mpa)	°C	205	DIN EN ISO 75
Vicat softening temperature VST B/50	° C	210	DIN EN ISO 306
electrical properties			
Trackingindex (Lsg. A)	CTI	500	IEC 112
Surface resistant	Ω	1E14 / 1E12	IEC 93
Volume resistivity	Ω / cm	1E15 / 1E12	IEC 93
Insulationclass	°C	F (155°C)	
Burning behavior UL 94 (1,6 ; 3,2 mm)	class	HB	UL 94

Above datas are taken from the actual documents of the manufactures
(Datas without any guarantee – Alterations are subject to change)

technical data

frames

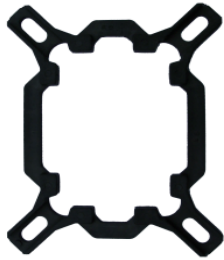


All measurements in mm:

D = core-broad
E = infinite slab

	A	B	C	D	E	F	W	H
UI 180 a	13	32	7	62	63	7	164	180
UI 180 b	13	32	7	62	78	7	164	180
UI 180 c	13	32	7	62	93	7	164	180
UI 210 a	13	32	7	72	73	7	194	210
UI 210	13	32	7	72	88	7	194	210
UI 210 b	13	32	7	72	103	7	194	210
UI 210 c	13	32	7	72	133	7	194	210
UI 240 a	13	32	7	82	83	7	224	240
UI 240 b	13	32	7	82	110	7	224	240
UI 240 c	13	32	7	82	140	7	224	240

frames



Type type	Maße (mm) measures(mm)
UI 180 a	62 x 63
UI 180 b	62 x 78
UI 180 c	62 x 93
UI 210 a	72 x 73
UI 210	72 x 88
UI 210 b	72 x 103
UI 210 c	72 x 133
UI 240 a	82 x 83
UI 240 b	82 x 110
UI 240 c	82 x 140

cornerpieces



Type type	Länge (mm) length(mm)
8	10
9	17
0	23
I	35
II	50
II	70
IV	90

connectors



Type type	Länge (mm) length(mm)
0	20
2	22
4	24
5	25
6	26
8	28
10	30
32	52
57	72

extensions



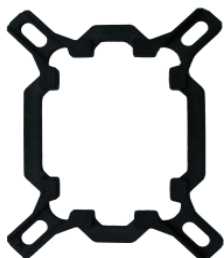
Type type	Länge (mm) length(mm)
15	15
20	20
30	30
40	40
50	50
100	100

material: Rynite 530 L
frames / cornerpieces / connectors / extensions
cornerprofile / dogbones

Technical Data	Unit	Iso-CI H (180°C)	Testmethod
mechanical properties			
Strain at break	%	2,0	DIN EN ISO 527
Stress at breakdown	Mpa	135	DIN EN ISO 527
E-Module (tensile)	Mpa	11.500	DIN EN ISO 527
Flexural strenght	Mpa	175	DIN EN ISO 178
E-Modul (flexural)	Mpa	9.700	DIN EN ISO 178
Charpy-impact strenght (23°C)	kJ / m ²	40,0	DIN 53453
Charpy-notched impact strenght (23°C)	kJ / m ²	8,5	DIN 53453
physical properties			
Density	g / cm ³	1,675	ISO 1183
Moistureabsorption	%	0,17	DIN 53714
Waterabsorption	%	0,77	DIN 53495
thermal properties			
Trackingindex	°C	252	DIN EN ISO 3146
Temperature of deflection under load HDT A (1,8Mpa)	°C	243	DIN EN ISO 75
Vicat softening temperature VST B/50	° C	218	DIN EN ISO 306
electrical properties			
Trackingindex (Lsg. A)	CTI	250	IEC 112
Surface resistant	Ω	1E14	IEC 93
Volume resistivity	Ω / cm	1E15	IEC 93
Insulationclass	°C	H (180°C)	
Burning behavior UL 94 (1,6 ; 3,2 mm)	class	V-0	UL 94

Above datas are taken from the actual documents of the manufactures
(Datas without any guarantee – Alterations are subject to change)

frames



Type type	Maße (mm) measures(mm)
UI 180 a	62 x 63
UI 180 b	62 x 78
UI 180 c	62 x 93
UI 210 a	72 x 73
UI 210 b	72 x 103
UI 210 c	72 x 133
UI 240 a	82 x 83
UI 240 b	82 x 110
UI 240 c	82 x 140

cornerpieces



Type type	Länge (mm) length(mm)
0	22
1	35
2	44
3	55
4	70
5	90

connectors



Type type	Länge (mm) length(mm)
0	20
2	22
4	24
5	25
6	26
8	28
10	30

extencions



Type type	Länge (mm) length(mm)
15	15
20	20
30	30
40	40
50	50
100	100

cornerprofiles
Length up to 530 mm

7 x 7
9 x 9

dogbones
Length up to 524 mm

8 x 13
10 x 13
13 x 16

**Dogbones
Cornerprofiles**

Distanceprofil for the production of transformers
constructionprofile

Quality

Glassfibre reinforced polyesetrprofiles are produced endless in the pultrusions-
process. The glassstandart is approx. 50-60%. The deliveryprogramm has got
a lot of profiles for different usages. Round-, half-round, rectangular-, rods-,
L-, U-, C-, hatprofiles and dogbones and special profiles which can be done
to customer needs.

Also available as
Selfextinguishing
UL 94V0

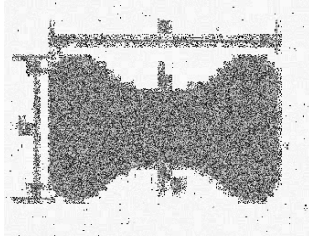
Glassfibre reinforced polyesterprofiles have got a lot of advantages compared
with metal, wood and thermoplastics. Polyesterprofiles do not age and is not
getting deformed either with high or low themperatures. Polyesterprofiles are
resistant against chemicals and standart solvent. The strengths/weight-
proportion is higher than wood, thermoplastics, steel or aluminium.
Polyesterprofiles combined the strengths of the stability of steel with the
insulating attribute of plastic.

Technical Data	Unit	Iso-CI H (180°C)	Testmethod
Mechanical Data			
Tensile Test			
Stress at breakdown at 20°C	Mpa	450	ISO 3268, Type II
150°C	Mpa	100	ISO 3268, Type II
Module of eleasticity at 20°C	Mpa	14100	ASTM D-790
150°C	Mpa	10000	
Deflection Test			
Transverse stress at break	Mpa	27	ISO 178
Modele of elasticity	Mpa	5600	
Machine direction stress at break	Mpa	700	
Module of elasticity	Mpa	29000	
Compression Test			
Stress at break	Mpa	300	
Module of elasticity	Mpa	3800	
Elektrical Data			
Power factor (50 Hz)		13×10^{-3}	VDE 0345
Dielektric constant		5,5	DIN 53483 (2)
Arc resistant	sek	100	
Dielelectrical strenght (transverse)	kV/mm	12	ASTM D-229
Dielelectrical strenght (longitudinal)	kV/mm	50	DIN 53483 (2)
Insulationclass	°C	180	ISO75 / SP
Surface resistance 23°C, 50% rf	Ω	$>2 \times 10^{14}$	DIN 53482
Volume resistivity 22°C, 60% rf	Ω/cm	$0,55 \times 10^{15}$	
Thermal conductivity	W/m°C	0,35	
Deliverylength	mm	3070/2500/2000	

These technical data correspond to mean and do not release the consumer from doing their own tests
Alteration are subject to change

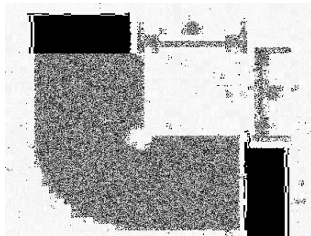
glasfibreereinforced polyesterprofile

Dogbone



Breite(b) width	Höhe(a) height
6,0	8,0
8,0	10,0
10,0	11,0
10,0	12,0
10,0	13,0
10,0	14,0
10,0	15,0
10,0	19,0
12,0	16,0
12,0	17,0
12,0	19,0
13,0	16,0
14,0	16,0
18,0	14,0
20,0	16,0
22,0	20,0
24,0	16,0

cornerprofiles



Type a x a type a x a	Höhe(H) height(H)	Radius R radius R
4,9 x 4,9	3,0	4,1
7,0 x 7,0	5,6	10,0
7,1 x 7,1	4,3	6,0
8,0 x 8,0	12,2	16,0
9,0 x 9,0	6,4	10,0
10,0 x 10,0	8,5	10,0
12,0 x 12,0	10,0	10,0
16,0 x 16,0	16,0	16,0

**Hutprofile, Viereckprofile, Winkelprofile, U-Profile, Hohlprofile,
Nutenverschlußstäbe(halbrund) und (trapez)**

**hatprofiles, rectangularprofiles, L-profiles, U-profiles. Hollowprofiles,
grooves rod (halfround) and (trapezoid)**

Es gibt eine Vielzahl von Werkzeugen für die oben genannten Profile.
Bitte fragen Sie bei uns an - wir beraten Sie gerne!

There are a lot of different productiontools for the above mentioned profiles available
Do not hesitate to ask us for further info - we will advise you!