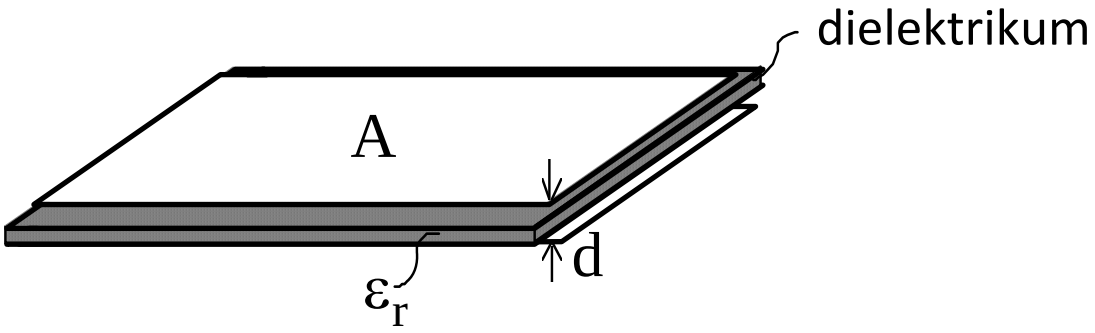
Capacitors

Use of capacitors in vehicles

- DC-filter
- AC-filter
- Snubber
- EMI
- Transient protection/decoupling
- Reactive power compensation

Capacitor designing parameters



$$C = \varepsilon_r \cdot \varepsilon_0 \frac{A}{d}$$

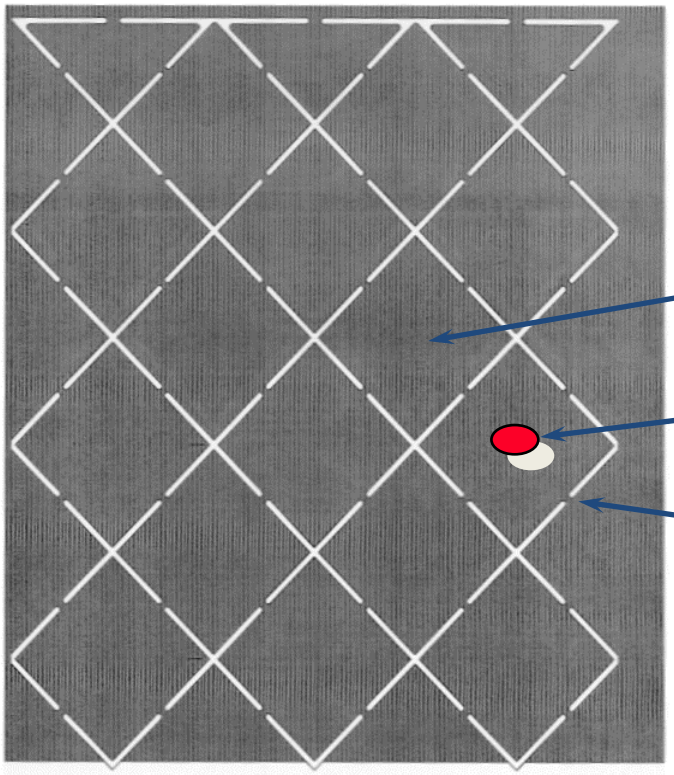
Dielectricum

Luft	1
Vatten	80
Glas	10
Impregnerat papper	3,5–6
Pertinax	3,5–4,5
Polyester	3,3
Polykarbonat	2,8
Polypropylen	2,2
Polystyren	2,6
Glimmer	4–8
Aluminiumoxid Al_2O_3	7
Tantaloxid Ta_2O_5	11
Keramik klass 1	5–450
Keramik klass 2	200–15000
Keramik klass 3	10000–50000
Keramik NP0	60
Keramik X7R	1500
Keramik Z5U	5000

Electrical fields

- **Air Breakdown, AC 3 kV/mm**
- **AC Capacitors 80 kV/mm**
- **DC Capacitors 200kV/mm**

Segmented metallisation

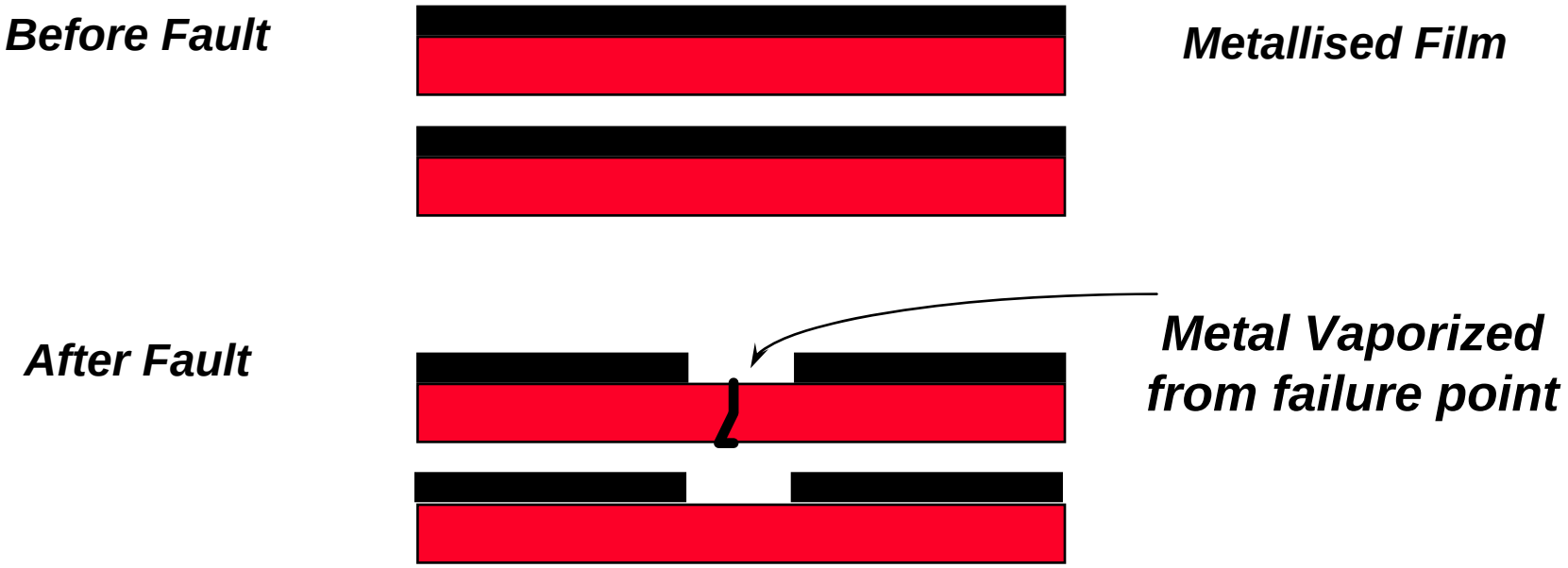


Segment

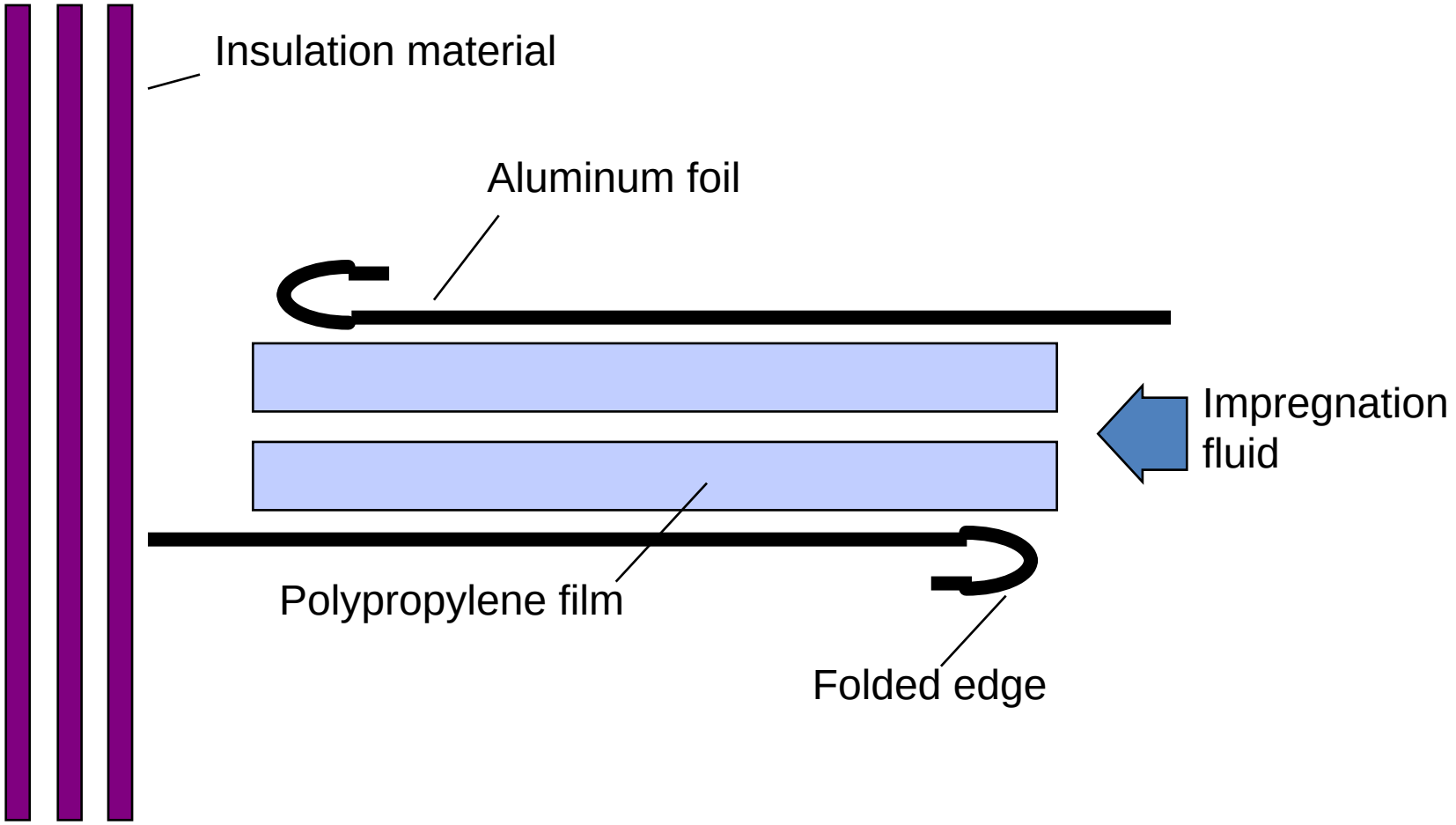
Clearing point

Breaks act as Internal Fuse

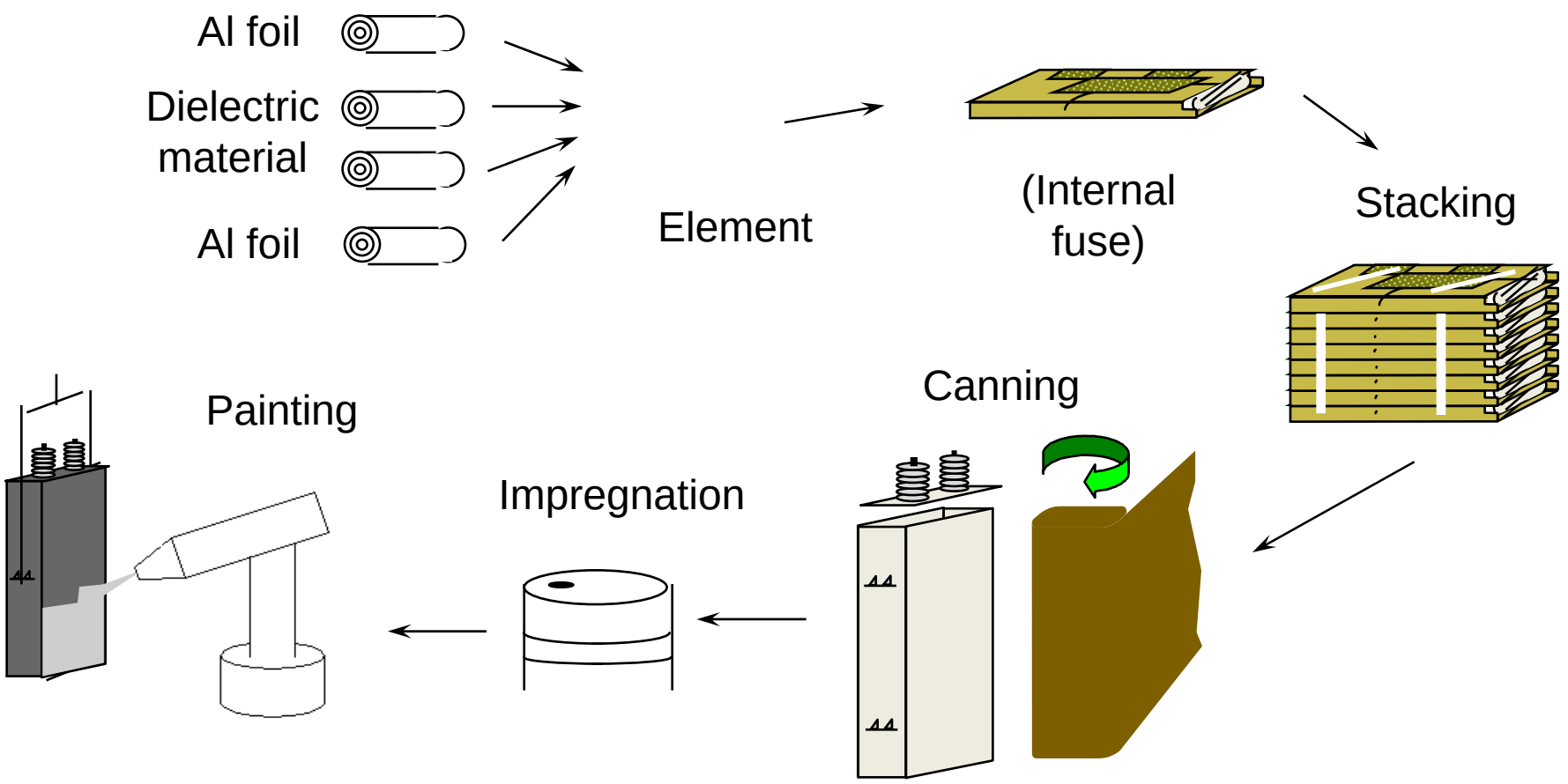
Metallised Film Dielectric



Film/Foil Capacitor



Capacitor construction



DC-capacitors, important parameters

- Voltage
- Capacitance
- Current
- Inductance
- Short circuit current
- Temperature
- Dimensions

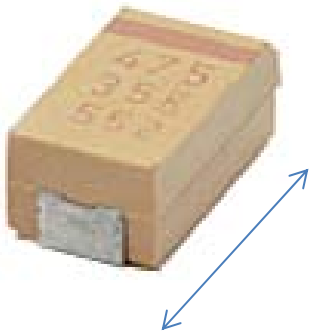
E-field impact on capacitor volume

$$C = \varepsilon_r \cdot \varepsilon_0 \cdot \frac{A}{d} \cdot \frac{d}{d} = \varepsilon_r \cdot \varepsilon_0 \cdot \frac{V}{d^2} \Rightarrow$$

$$V = \frac{C \cdot d^2}{\varepsilon_r \cdot \varepsilon_0} = \left\{ d = \frac{U}{E} \right\} = \frac{C \cdot U^2}{\varepsilon_r \cdot \varepsilon_0 \cdot E^2}$$

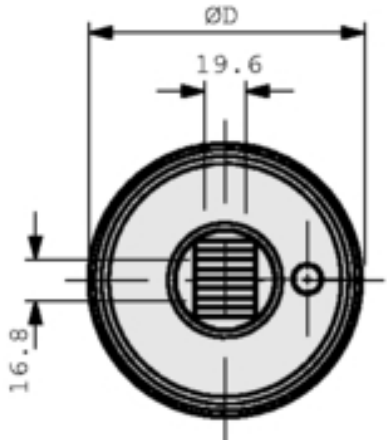
5-10 [mm]

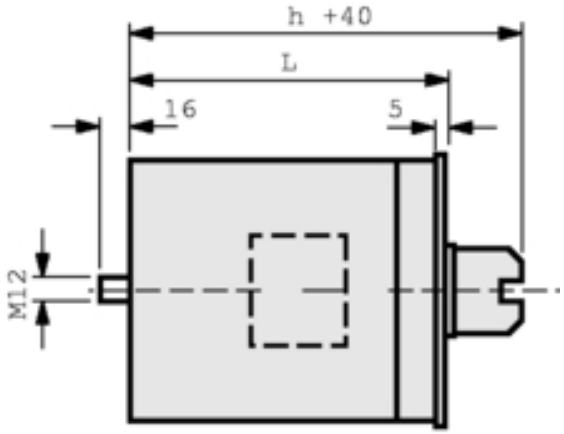
ELFA
Allt mellan antenn och jord



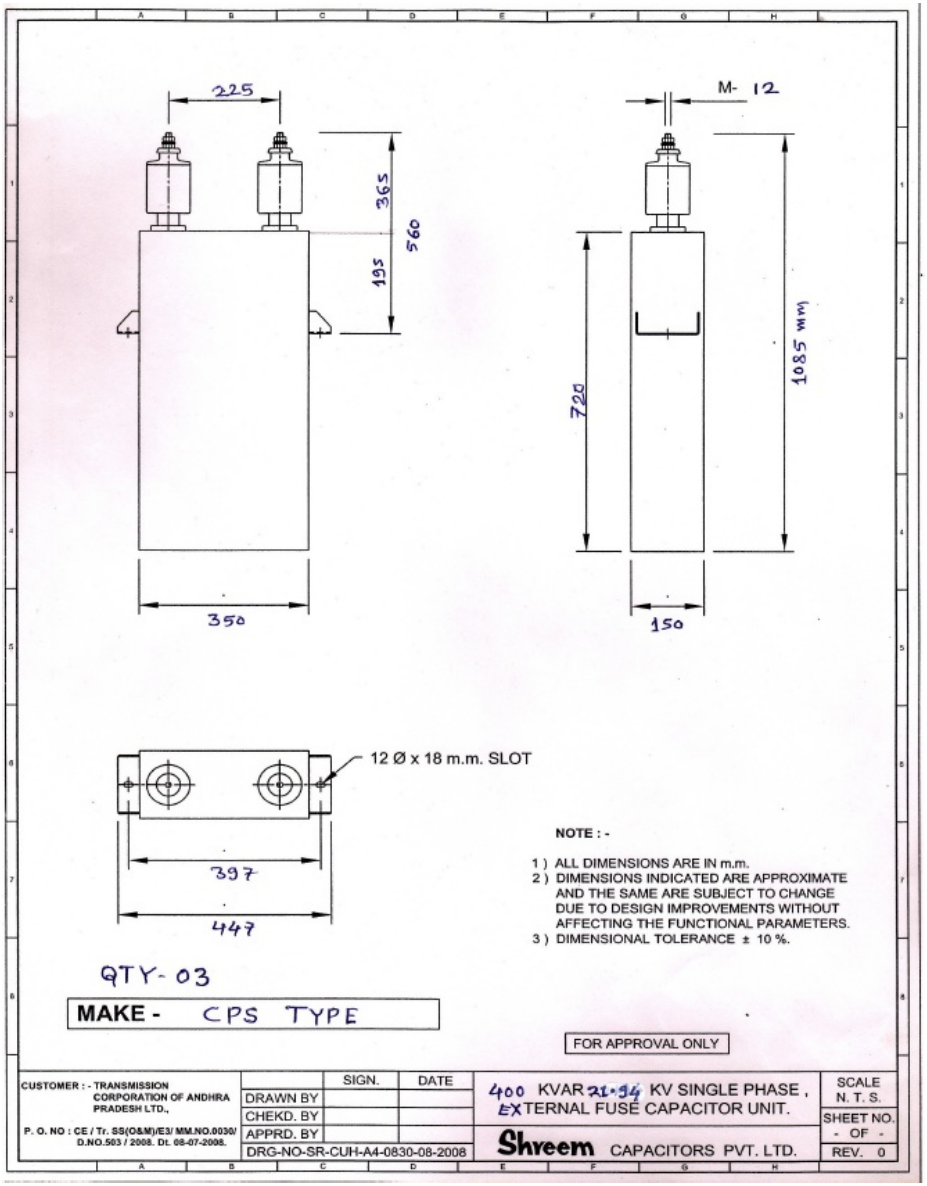
1 - 5 [cm]

ELFA
Allt mellan antenn och jord





1 - 5 [dm]


225
365
560
135
350
M- 12
720
1085 mm
150
12 Ø x 18 m.m. SLOT
397
447
NOTE : -
1) ALL DIMENSIONS ARE IN m.m.
2) DIMENSIONS INDICATED ARE APPROXIMATE AND THE SAME ARE SUBJECT TO CHANGE DUE TO DESIGN IMPROVEMENTS WITHOUT AFFECTING THE FUNCTIONAL PARAMETERS.
3) DIMENSIONAL TOLERANCE ± 10 %.
QTY- 03
MAKE - CPS TYPE
FOR APPROVAL ONLY
CUSTOMER : - TRANSMISSION CORPORATION OF ANDHRA PRADESH LTD.,
P. O. NO : CE / Tr. SS(O&M)/E3/ MM.NO.0030/ D.NO.503 / 2008. Dt. 08-07-2008.
SIGN.
DATE
DRAWN BY
CHEKD. BY
APPRD. BY
DRG-NO-SR-CUH-A4-0830-08-2008
400 KVAR 21-34 KV SINGLE PHASE , EXTERNAL FUSE CAPACITOR UNIT.
Shreem CAPACITORS PVT. LTD.
SCALE N. T. S.
SHEET NO. - OF -
REV. 0

0.5- 1 [m]

VAR compensation Capacitors
(siemens)

1-5 [m]

Leverantörer kondensatorer

•Vishay	DE	Film	(Roederstein)
•Montena	CH		(Condis)
•AVX	FR		(TPC, LCC)
•ABB Capacitors	SE, GB		
•Siemens	DE		
•Rifa	SE	Elektrolytic	
•BHC	GB		
•AVX	FR	Snubber, EMI	
•Arcotronics	IT		