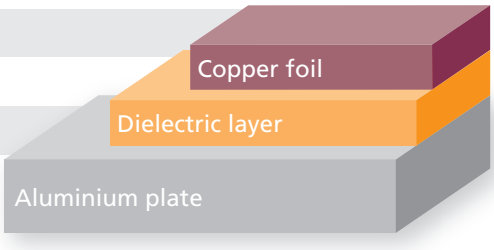
IMS –
INSULATED METALLIC SUBSTRATES

The fields of application are extremely varied and the materials are mainly used in the following areas:

- Power transformation (DC/AC)
- Automotive and audio technology, engine control and power transformation
- Switches and solid state relays (SSR)
- Motor drives
- LED technology

IMS – TYPICAL STRUCTURE:

Thickness aluminium:	0.5 mm - 3 mm
Thickness dielectric:	75 µm - 150 µm
Copper thicknesses:	18 µm - 410 µm
Thermal conductivity:	0.4 - 3.0 W/mK – higher upon request



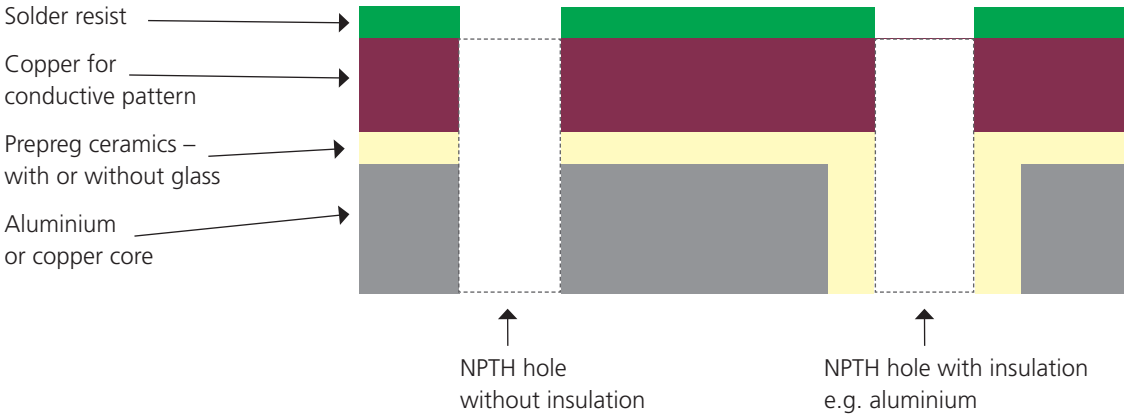
To create IMS materials, the copper foil is laminated onto a metal core (e.g. aluminium or copper) via prepreg, whereas the metal core is a component of the circuit board. The circuit board can then be structured on the face bearing the copper foil.

For technical details regarding thermal conductivity, cycle test etc. please refer to the separate data sheet „Properties and Functions of IMS Materials" as well as to the IMS Factsheet.

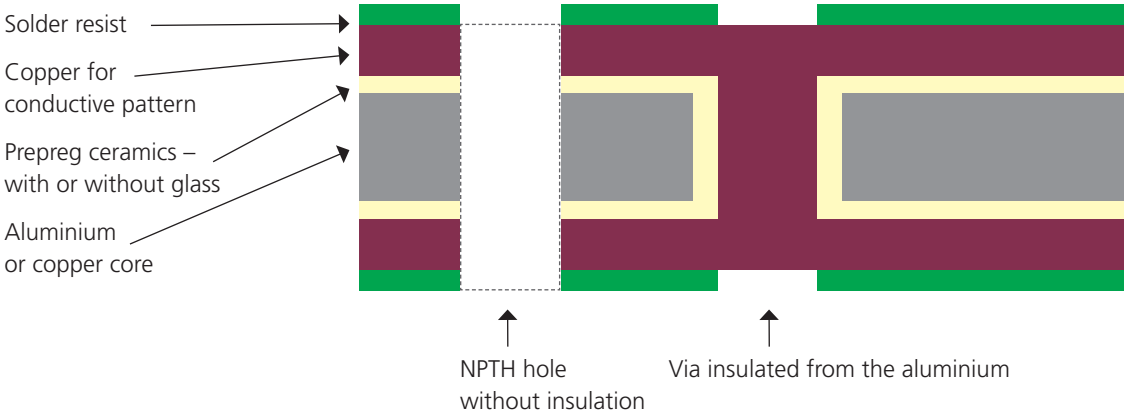
Depending on the respective fields of application, there are various designs. The choice of the material depends on the location and the layout. An optimum layout can lead to massively reduced costs for materials.

This technology can be applied for both, single- and double-sided PCBs.

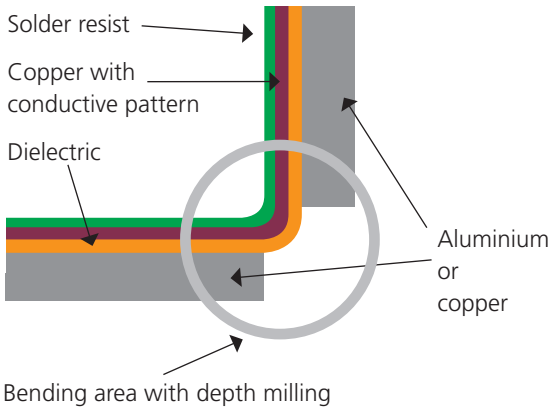
LAYOUT EXAMPLE FOR A SINGLE-SIDED IMS PCB WITH AND WITHOUT INSULATED HOLES TO THE ALUMINIUM / COPPER:



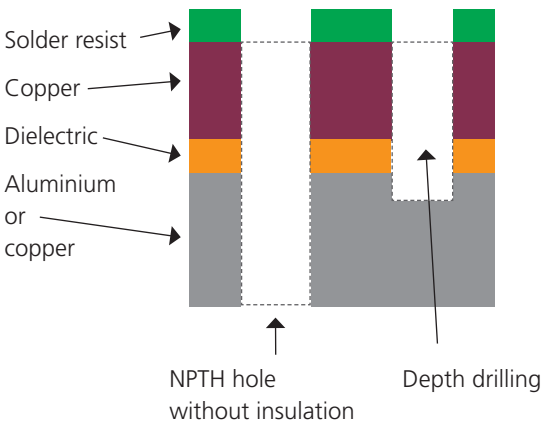
LAYOUT EXAMPLE FOR A DOUBLE-SIDED IMS PCB WITH VIA / PLATED THROUGH HOLE:



LAYOUT EXAMPLE FOR A BENT IMS SWITCH:



LAYOUT EXAMPLE FOR DEPTH MILLING:



PCB DESIGN AND SELECTION OF MATERIALS:
(PLEASE CONTACT US IN CASE OF DIFFERENT SPECIFICATIONS)

Metal cores:	see IMS Factsheet
Dielectric (insulation thickness):	see IMS Factsheet
Copper thicknesses:	see IMS Factsheet
Dielectric strength:	see IMS Factsheet
Drill holes optimum:	in aluminium > 0.90 mm
Drill holes insulated from aluminium:	are drilled 1 mm larger than the final diameter in order to achieve a good insulation
Conductor path structures:	150 µm breadth and spacing these values depend on the basic copper that is employed
Solder resist:	white, black, green, blue, red – other colours on request
Surface finish options:	HAL lead-free / leaded chem. Sn Entek chem. Ni / Au (extremely complex), thus very expensive
Contouring:	scoring milling (radius > 0.8 mm preferable) depth milling
Special prints:	carbon annotation prints stripping lacquers

LAYOUT / SOLDERING PROCESS:

The reliability of the soldering points as well as the optimal positioning and self-centring of the components substantially depends on the design of the solder pad, which additionally contributes to a good heat reduction.

In the soldering process, fast heat-up or cooling should be avoided, as these factors may result in soldering defects or inordinate thermoelectric emfs (material / soldering points).