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**GB 1563379**

**GB 1486372**

**GB 1416449**

**GB 1314736**

**GB 1271233**

**GB 1191909**

**GB 0508035**

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(71) Applicants  
**TBA Industrial Products**

**Limited,**

**(Great Britain),**

**20 St Mary's Parsonage,**

**Manchester M3 2NL.**

(72) Inventors

**Michael John Knight,**

**David Stiles,**

**Terence Tonks.**

(74) Agent and/or Address for  
Service

**R.F. Hadfield,**

**D.D.E. Newman,**

**J.A. Crux,**

**20 St Mary's Parsonage,**

**Manchester M3 2NL.**

(54) **Printed circuit boards**

(57) Sheet material comprising fibres and an elastomeric binder is used as the substrate for printed circuits. The fibres are preferably vitreous fibres present in an amount from 20 to 70 wt % of the sheet.

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## SPECIFICATION

**Improvements in or relating to printed circuit boards**

5 This invention relates to metal clad laminates of the kind useful for making printed circuit boards. Such laminates comprise an insulating substrate sheet clad on one or both major faces with metal foil, 10 (normally copper). The latter is subsequently partly removed to create the outline of an electrical circuit, to which the necessary components and/or connections can be added.

15 The substrate is usually relatively inflexible. Various combinations of resin and fibrous reinforcement are well-known, ranging from paper reinforced phenolics to glass fibre reinforced fluorocarbon polymers. The latter are very expensive, although they are less brittle than other more commonly used 20 materials.

25 For some applications, there is a need for a greater than usual degree of flexibility coupled with high impact resistance. For example, copper clad polyester films are available for the production of printed circuits occupying more than one plane. However, their cost renders them unattractive for high volume, single plane applications and also they are too flexible for some purposes.

30 Our co-pending UK Patent Application No. 8107802 discloses a sheet material comprising from 10 to 35 wt% of a cured elastomeric binder and from 20 to 70% wt% of vitreous fibres and made by an "it" calendering process. Broadly similar sheet materials containing asbestos fibres have been made for many 35 years, of course. Both kinds of sheets are useful for the manufacture of gaskets and will be referred to in this specification as being "sheets of the aforesaid kind".

40 According to the present invention, a sheet of the aforesaid kind constitutes the substrate for a printed circuit board. It preferably has at least one of its two major faces at least partly clad with copper foil, although the substrate may be sold as a product in its own right.

45 It has been found that sheet materials of the aforesaid kind make a surprisingly good substrate for printed circuit board. Their composition confers excellent impact strength coupled with good flexibility and their electrical properties are perfectly adequate for most high volume applications. Indeed, their physical properties are such that the printed circuit boards can be incorporated directly into compression moulded products such as automotive instrument panels, thereby simplifying assembly.

55 Cladding with copper foil may be carried out by conventional adhesive lamination.

60 Processing into a finished circuit board for a particular end use may be carried out by all those methods commonly used, for example by applying a resist to those portions of the copper which are to remain, followed by etching away the untreated portions with ferric chloride.

## CLAIMS

1. A substrate for a printed circuit board, said substrate comprising a sheet of cured elastomeric binder and reinforcing fibres.
2. A substrate according to claim 1 wherein the elastomer component is present in an amount of from 10 to 35 wt% and the reinforcing fibres are vitreous fibres present in an amount of from 20 to 70 wt% of the sheet.
3. A substrate according to claim 1 or claim 2 wherein the sheet is made by a calendering process.
4. A printed circuit board comprising the substrate of any preceding claim clad on at least one major face with metal foil.

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