

The invention relates to thermo-adhesive products for use in the textile industry. They consist of a backing fabric coated with thermo-adhesive polymers.

Reinforcing fabrics for use as adhesive facing for cloth to improve its stiffness or increase its strength fall into this category.

Backing fabrics for thermo-adhesives may be of various types, woven, knitted or non-woven. The properties required of reinforcing fabrics are determined by the various stages of manufacture and their ultimate use.

Once made, the backing fabric is coated with the thermo-adhesive substance. At present, this coating process is most often done by means of an engraving roller which applies the coating in a dot pattern. The thermo-adhesive polymers, initially in the form of powder or paste, are heated to a temperature of 80°, which causes them to melt and adhere to the backing. In another method, coating is applied by the transfer method. In this case, the thermo-adhesive polymer is deposited by an engraving roller in a dotted pattern on a mat that has been treated to render it non-adhesive; these dots are then transferred to the backing fabric at a lower temperature.

The thermo-adhesive textile product obtained from the first stage is then stored at ambient temperature. At this stage the different layers of the product in contact with each other should not stick to each other. This means that the thermo-adhesive textile product should not be "self-adhesive". As a result the textile product used should not be sticky at ambient temperature.

The thermo-adhesive textile product is then used by manufacturers, who apply it to garments, bonding the reinforcing fabric to the garment by means of presses

operated at temperatures of between 120 and 180° and at pressures ranging between several decibars and several bars for relatively short periods of 10 to 30 seconds. During this stage, the polymers of the thermo-adhesive textile product must return to the adhesive state. However, they should not have too low a viscosity during this operation, otherwise the polymers will penetrate the textile backing or the garment itself, causing puckering or permeation, making the products almost unusable.

Finally, the finished garments and in particular fabrics strengthened with facing must withstand the rigours of various usages and in particular washing. The bonding obtained in the previous stage must therefore be capable of standing up to very difficult conditions.

Numerous attempts have been made to develop products that will satisfy the various demands resulting from all the stages mentioned above.

One suggestion has been to produce an adhesive made up of two or several layers of polymers with different physical characteristics. By careful selection on the basis of the viscosity and melting temperature of these various layers, it was hoped that permeation and puckering could be avoided. However, this technique has been found to be very difficult to implement.

The process of applying the thermo-adhesive material to the textile substrate by the transfer method as mentioned above does avoid excessive penetration of the textile substrate by the adhesive material.

It has also been suggested that a thermo-adhesive polymer be deposited on the textile substrate and be made thermosetting by placing it in contact with a cross-linking agent at a later stage.

Document DE-A-1 956 605 proposes a thermo-bonding

interfacing comprising a textile structure coated on one of its surfaces with a polymer material or a mixture of polymers that are essentially not cross-linked at the time of application but which soften at a point ranging
5 between 50°C and 200°C, wherein a proportion of these, at least 10% by weight, is converted in less than five minutes at a temperature ranging between 120°C and 200°C to a cross-linked insoluble plastic material...; document FR-A-2 132 469 relates to reinforcing for
10 garments and a method of manufacturing it.

With this manufacturing method, the surface of a textile backing is coated with a hardening mass made up of a plasticised or thermosetting substance, which hardens to varying degrees depending on the degree of
15 stiffness required.

The coating and cross-linking are intended to modify only the stiffness of the product.

Document FR-A-2 348 955 relates to a process for coating a substrate with a mixture of an epoxy resin and
20 a hardener. The product obtained by this method is a coated fabric whose properties are stable and not likely to be altered subsequently by any physical or chemical reaction. These products are not thermo-adhesive, cross-linking occurs immediately and is completed during
25 application.

Document DE-A-2 313 021 describes thermo-adhesive compounds that can be polymerised.

Document US-A-419 618 relates to the manufacture of a thermo-adhesive strip.

30 The aim of the present invention, therefore, is to produce a thermo-adhesive textile product for use as a reinforcing fabric, which may be bonded without puckering or permeation and that is resistant to wear and, in particular, to garment cleaning agents.

35 In order to resolve this problem, the invention

proposes a thermo-adhesive product of the type comprising a backing fabric and a layer of thermo-adhesive applied to its surface, characterised in that the thermo-adhesive layer comprises polymers that cross-link under the effect of an external agent.

The invention will be more clearly understood from the following description.

Surprisingly, it is possible to make a thermo-adhesive product from a layer of thermo-adhesive, thermoplastic polymers, that cross-link under the effect of an external agent, such as an increase in their temperature or irradiation by radiating energy such as ultra-violet radiation, applied to a textile backing. These polymers are thermoplastic in behaviour as long as they are subjected to temperatures below a critical temperature, known as the transformation temperature. Below this temperature, they may therefore change from the paste state at ambient temperature to a liquid state at around 90°C.

When subjected to a temperature higher than 120 to 130°, for example, the cross-linking reaction is triggered, rendering these polymers thermosetting.

The thermo-adhesive product of the invention is obtained by a conventional coating process in a dot pattern using a photoengraving roller. The pasty product forming the thermo-adhesive layer is heated to a temperature of around 80° and then deposited on the textile backing. This is moistened as a result, which ensures adhesion of the coating.

After cooling, the thermo-adhesive product is not tacky. This means that it is not adhesive at this temperature and can therefore be stored without problem.

When used as an interfacing, by clothing manufacturers in the case of garment interfacing, the thermo-adhesive product is heated to a temperature

ranging between 120 and 150°. As the temperature rises, two phenomena occur: the first is a decrease in the viscosity of the thermo-adhesive layer because of the thermoplastic properties of the polymers and the second
5 cross-linking of these same polymers. These two phenomena generate opposite effects on the viscosity of the thermo-adhesive layer. Hence, the viscosity decreases sharply initially and then increases again

The choice of reaction speeds determined by the
10 nature of the components and the possible presence of a cross-linking catalyst allow adjustment of the minimum viscosity of the adhesive layer and the time during which this low viscosity exists.

It is therefore possible to form a thermo-adhesive
15 layer which provides sufficient moistening of the substrate to which it is to be applied without causing either distortion or complete penetration during this bonding stage.

Cross-linking of the products is by an external
20 agent, which may be either an increase in temperature or the effect of irradiating energy such as ultra-violet.

Various families of polymers may be used to form the thermo-adhesive layer in accordance with the invention. They may, for example, have a base of
25 urethane acrylate, modified ethylene vinyl acetate or possibly vinyl copolymers.

The textile backing may be of any type, for example knitted, woven or non-woven, and the substrates to which the thermo-adhesive product of the invention is applied
30 may also be of various types: textile, synthetic material or metal.

Claims

1. Thermo-adhesive textile fabric comprising a backing fabric and a thermo-adhesive coating deposited in a dot pattern on its surface, characterised in that the thermo-adhesive coating comprises non-cross-linked thermoplastic thermo-adhesive polymers, that may be cross-linked with each other by increasing their temperature or applying radiation.
2. Thermo-adhesive textile fabric in accordance with claim 1, characterised in that the thermo-adhesive coating also comprises a catalyst.
3. Thermo-adhesive textile fabric in accordance with one of claims 1 and 2, characterised in that the cross-linkable thermoplastic thermo-adhesive polymers of the adhesive coating have a urethane acrylate base.
4. Thermo-adhesive textile fabric in accordance with one of claims 1 and 2, characterised in that the cross-linkable thermoplastic thermo-adhesive polymers have a modified ethylene vinyl acetate base.
5. Thermo-adhesive textile fabric in accordance with one of claims 1 and 2, characterised in that the cross-linkable thermoplastic thermo-adhesive polymers have a vinyl copolymer base.

