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TEMPERATURE INDICATOR

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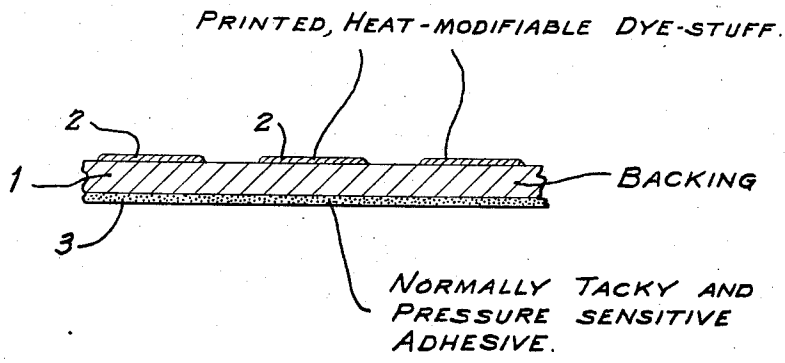

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TEMPERATURE INDICATOR

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This invention relates to a pressure-sensitive adhesive tape, and, more particularly, relates to a pressure-sensitive adhesive tape having particular utility in the packaging of surgical materials.

In normal operation of hospitals, clinics and the like, various products, such as gowns, sheets, drapes, etc., which are required during surgery or other aseptic procedures are not generally considered disposable. Such materials are employed once and then laundered or otherwise prepared for subsequent use. Prior to such use, however, it is essential that such materials be sterilized. Due to the volume of materials involved, it is, of course, necessary to store these materials for use as desired. There has been developed a procedure where such materials, after laundering and the like, are packaged in units ready for subsequent use, and the package then sterilized and stored. As may be apparent, there is a potential danger in such a procedure. There is a prospect of unsterilized packages becoming mixed with sterilized packages in storage for use as desired.

To prevent unsterilized products from being used by the physician requiring sterile materials, there have been developed various types of sterility indicators which are attached to or incorporated into the package so that, upon inspection or opening of the package, it is apparent that the contents thereof have or have not been sterilized. Such materials generally comprise a carrier such as a piece of cardboard or the like to which is applied a coating of a material which indicates that the card has been exposed to conditions which are normally considered to result in sterilization of the contents of the package.

It is apparent that such indicators have inherent disadvantages. In the case of indicators which are designed for attachment to the package, there is the problem of preventing dislodgment of the indicating device during handling of the package. In the case of those designed for incorporation into the package, there is the disadvantage that the sterility of the package is not indicated until it is opened, and, if not sterile, the package must be discarded for the purpose intended, with the inherent delay necessary in replacing the package. In both types, there is the disadvantage that there is required the additional operation of affixing the intended device to the package to be sterilized, or incorporating it into the package and then wrapping the materials.

In accordance with this invention, these problems are eliminated and, additionally, in one operation, it is possible to form and seal the package of materials to be sterilized and provide the package with a positive indicator of sterility. This bi-functional operation can be accomplished by use of the product of this invention which comprises a normally tacky and pressure-sensitive adhesive tape of a particular construction which has incorporated in its structure a material which will undergo a decided color change upon exposure to conditions necessary for sterilization.

Accordingly it is an object of this invention to provide a normally tacky and pressure-sensitive adhesive tape having a structure and composition which can withstand environment conditions insuring sterilization.

It is also an object of this invention to provide pressure-sensitive adhesive tapes having these characteristics and the further characteristic of containing in its structure visible means of identifying the fact that the adhesive tape and the product to which it is attached have been subjected to sterilization conditions.

It is a further and more specific object of this invention to provide a normally tacky and pressure-sensitive adhesive tape having an adhesive formulation particularly adapted for exposure to elevated temperatures, in which tape is incorporated a material which will exhibit a visible color at normal atmospheric conditions and will permanently change color upon exposure to a sterilizing environment.

These and other objects of the invention will become apparent when consideration is given to the following detailed description of the sterilization indicating, pressure-sensitive adhesive tape of this invention.

The figure of the drawing represents an end view of a preferred form of the invention.

In accordance with this invention, a sterility indicating normally tacky and pressure-sensitive adhesive tape is formed comprising laminae including a flexible backing, a lamina, visible when viewing the back surface of the tape, containing a heat-modifiable dyestuff which changes color, visible to the human eye, upon exposure to elevated temperatures employed in sterilization and a normally tacky and pressure-sensitive adhesive coated on one surface of the backing, which, in the preferred embodiment of the invention, contains a curing agent for the adhesive composition which is activated by elevated temperatures to render the adhesive resistant to softening at the elevated temperature to which the tape is subjected. The use of such a normally tacky and pressure-sensitive adhesive tape enables in one operation the sealing of packages of materials to be subsequently subjected to sterilization, and the incorporation into such the package structure of a positive identification of packages which have been subjected to sterilization.

The expression "heat modifiable dyestuff" is intended to include those compounds and compositions known to undergo a chemical change resulting in a change from the color exhibited at normal room temperatures to a different or modified color upon exposure to elevated temperatures, particularly temperatures above those normally employed in sterilization, that is, those above approximately 210° F. The color change may be from one color to a second color, or from colorless to colored, or from colored to colorless, or a change in color property as from reflective to non-reflective, luminous to non-luminous, etc., so long as, upon exposure to the conditions of temperature and time normally employed in sterilization, there is a distinct and visible change in the color of the dyestuff and hence, the appearance of the tape. Such heat modified dyestuffs may take various forms. They may be, for example, organic dyes or dye intermediates or derivatives. Exemplary of organic dyes with such heat modifiable characteristics are an azo dye such as Calco Oil Yellow 7463, Color Index #19; an anthraquinone dye, such as Calco Oil Blue N.S.; an acid dye, such as Iosol Yellow, National Aniline. They may also be dyes which are not stable when exposed to heat and either change in color or, more commonly, become colorless under these conditions. Such materials include Methyl Violet Conc., Color Index #680, which changes from a blue-purple to colorless upon heating and Victoria

Pure Blue BO which changes from blue to colorless upon heating. The materials may also comprise leuco bases which are generally colorless and are transformed into the dye corresponding to the leuco base upon heating. Exemplary of such a material is a system comprising the leuco base of Thionine Blue (Color Index #926) and sodium potassium chromate which turns from a colorless material to a blue dye.

It is also possible to employ as the heat-modifiable dyestuff a metallic salt system which yields change in color upon application of heat. For example, it is satisfactory for this invention to employ a system comprising lead oxide and sulphur, which changes from yellow to black upon application of heat and moisture. Conventional indicators which are sensitive to change in pH and change color thereupon may be employed, in conjunction with a material generating a suitable alkaline, alkaline medium or acid upon exposure to moisture, or heat and moisture may be employed as heat-modifiable dyestuff of this invention. Such material as phenolphthalein and litmus color in conjunction with a compound generating mediums of alkalinity and acidity respectively when exposed to moisture will give an indication that the tape has been exposed to steam sterilization conditions.

The heat-modifiable dyestuff may also comprise a system of compounds which are activated upon heating to produce a colored material visible to the human eye. Such a system may take the form, for example, of a diazonium compound, a conventional color coupler and a material which is activated upon heating to produce the medium required for the coupling reaction. In such a system, for example, a diazonium derivative of a para phenylene diamine may be employed together with an alkyl substituted phenol coupling compound, and the heat-activatible material may comprise a compound such as urea which upon heating and in the presence of moisture will generate the alkaline medium necessary for the coupling reaction. Similarly, a dye intermediate may be employed in conjunction with a zinc salt whereby upon heating the zinc will react with the intermediate to form the corresponding dye. Additionally, dyestuffs which change in color upon exposure to an oxidizing or reducing agent may be employed in conjunction with such an agent which is functionally activated upon exposure to heat.

The pressure-sensitive adhesive tape formed in accordance with this invention may take various forms. If desired, the backing employed in the tape may comprise a fibrous web such as a woven fabric or a paper. The cloth may be sized in a suitable manner with conventional materials for such purposes as, for example, a filled rubber latex. The paper web is normally treated in a conventional manner to unify the web and strengthen the backing against splitting or delamination when subjected to the forces caused by adhesion of adjacent plies of the tape roll. Such unification may be accomplished by incorporating the web a fiber bonding extensible material by impregnation of the web with conventional materials for such purposes as, for example, a solution or dispersion of a plasticized proteinaceous mixture (e.g., glue-glycerine), or a suitable polymer or mixture of suitable polymers, or by deposition of suitable materials of such a nature on the fibers prior to the formation of the sheet by the technique known as beater impregnation. The impregnation of the web may be done in normal conventional manners, as by forming a solution of conventional rubber-resinous impregnant materials in a suitable solvent as, for example, an impregnant formed by dissolving a mixture of broken down rubber and a compatible resin such as rosin in a suitable solvent such as toluene and saturating the paper web therewith. For similar results, but to avoid the use of organic solvents with their known disadvantages, the impregnation may be performed with an aqueous system and impregnants comprising rubber lattices such as disclosed in the patent to Engel et al., No. 2,592,550, may be incorporated in the sheet at either the dry end or the wet

end of the paper machine or thereafter in the dry sheet. With a prssure-sensitive adhesive tape containing such fibrous backings, the dyestuff may be incorporated into the composition employed to impregnate the web or may be incorporated into conventional coatings applied to the back surface of such backings. Such a coating may comprise a back-sizing coating of a lacquer or the like, or a coating of a release agent for the adhesive. In any of these lamina, the dye is visible upon inspection of the back surface of the tape.

The tape may also be formed with a backing of the conventional polymeric film materials employed in the formation of normally tacky and pressure-sensitive adhesive tapes, for example, cellophane, cellulose acetate, polyethylene, polyesters, vinyl chloride, etc. When such polymeric films are employed in the transparent form, it is possible to incorporate the sterility indicating dye into a lamina of the tape underlying the backing. Such lamina may include the adhesive itself, a conventional primer coating such as that described in the patent to Morris No. 2,424,996, or a lamina intermediate the backing and adhesive and priming coatings. Such intermediate lamina can take the form of a reinforcing element for the polymeric film, such as a thin rope paper or Troya tissue as disclosed in the patent to Kellgren No. 2,444,830, or numerous strands of reinforcing filaments applied longitudinally of the tape for reinforcement thereof as, for example, threads of glass, cotton, nylon, rayon, acetate, etc. With such reinforcing elements the heat modifiable dyestuff may be applied to this lamina before incorporation into the tape structure. Alternatively, the dyestuff may be incorporated into the adhesive employed to laminate such reinforcing elements to the transparent film backing, or any other coating visible through the film backing.

The normally tacky and pressure-sensitive adhesive may be coated on any of the thus formed backing elements in conventional manners. The adhesive mass itself may be any of the normally tacky and pressure-sensitive adhesive masses well known to the industry. Such adhesive masses are based upon elastomeric polymers such as natural rubber, and various synthetic rubbers, such as copolymers and interpolymers of butadiene and styrene or acrylonitrile preferably containing at least 40% butadiene and at least 10% of the monomer copolymerized therewith, vinyl ethers, polychloroprene, acrylate elastomers, polyisobutylene, butyl rubber, reclaim rubber and mixtures of such materials. The adhesive mass may be especially compounded, copolymerized, or interpolymerized to have the desired degree of adhesiveness in the absence of additional tackifiers. Or, preferably any of the conventional resins adapted to render the adhesive tacky and pressure-sensitive at normal temperatures may be used, such as rosin, hydrogenated rosin, dehydrogenated rosin, the glycols and glycerides of any of these resinous materials, polyterpenes, and polyalkyl styrenes. The tackifying resins are present in the composition in amount sufficient to render the adhesive tacky and pressure-sensitive at normal temperatures, usually approximately 25 to 125 parts by weight per 100 parts of elastomeric polymer. The adhesive mass may be free of an inert filler or may contain inert filler such as zinc oxide, magnesium carbonate, calcium carbonate, lead oxide, clay, titanium dioxide and hydrated alumina. Other ingredients such as antioxidants or heat stabilizers, dyes or pigments may be present or absent.

Preferably the adhesive formulation employed in the formation of pressure-sensitive adhesive tapes in accordance with this invention contains a heat-activatible curing agent which is adapted to, and is present in amount sufficient to, render the adhesive composition resistant to softening at elevated temperatures. Such heat-activatible curing agents can comprise conventional vulcanizing agents for such elastomeric polymers, as, for example, the thiuram polysulfides such as Tuads and

Tetrone A or may comprise heat-advancing rubber reactive resins, such as the oil-soluble phenolic-aldehyde resins preferably formed from para alkyl substituted phenols. Such heat-activatible curing agents are employed in amount sufficient to render the adhesive resistant to softening upon exposure to elevated temperatures due to the mechanism of the curing agent hardening the adhesive composition to balance the effect of heat upon an otherwise thermoplastic composition. Preferably the vulcanizing type curing agents are employed in amount about ½ to 5 parts per 100 parts of elastomer, and the resinous type curing agents are employed in amount up to approximately 30 parts per 100 parts of elastomer, all by weight.

As may be seen from the foregoing, various mechanisms may be employed to obtain the color which is visible to the human eye as required by this invention. Obviously, in the selection of the mechanism, reasonable care is exercised to avoid the use of a material or system which would be deleterious to the structure or components of the pressure-sensitive adhesive tape. For example, it is known that some heavy metal salts have an adverse effect upon a normally tacky and pressure-sensitive adhesive. If the lamina containing a coloring composition containing such a metal salt is immediately adjacent the adhesive, either as formed or when rolled for conventional packaging, an adverse effect upon the characteristics of the tape would be obtained. For constructions where the coloring materials are adjacent the adhesive, heat modified dyestuffs which do not exhibit an adverse effect upon the adhesive such as the aforementioned azo, anthraquinone and acid dyes are preferably employed. If a laminated tape construction is employed, it may not be essential to avoid materials which have an adverse effect upon the adhesive, since such materials may be incorporated into the tape in a position where they have no opportunity to contact the adhesive.

The following are examples of normally tacky and pressure-sensitive adhesive tapes formed in accordance with this invention and having the characteristic of changing color upon exposure to a sterilizing environment of elevated temperatures. Unless otherwise indicated all proportions given are in parts by weight.

Example I

A highly porous absorbent paper having a weight of the order of thirty pounds per ream of four hundred and eighty sheets, twenty-four by thirty-six inches in size, preferably uncalendered and unsized but having rugosities such as are obtained by crimping or embossing, was saturated by passing it through an impregnant bath containing an aqueous dispersion having forty percent solids and of the following composition:

	Parts
Copolymer of 60 percent butadiene and 40 percent acrylonitrile	65
Copolymer of 50 percent butadiene and 50 percent styrene	20
Copolymer of 10 percent butadiene and 90 percent styrene	14.5
Titanium dioxide pigment	15
Antioxidant (heptylated diphenyl amine)	0.5

The paper was saturated to contain impregnant solids to the extent of one hundred percent of its original weight. The sheet was dried, for instance, in a festoon. When substantially dried the sheet was coated on one major surface with a backsizing composition comprising a plasticized nitrocellulose lacquer containing approximately 0.5 grams of oil-soluble azo dye comprising Calco Oil Yellow 7463 (Color Index #19) per 150 grams of lacquer solids, which imparted a bright yellow color to the back surface of the tape. The backsize was applied in amount about 0.25 ounces per square yard coated and

the sheet thereafter dried. The sized sheet was then coated on the reverse side with about 2.5 ounces per square yard of an adhesive comprising:

	Parts
Pale crepe rubber	40.0
Hydrogenated rosin glyceride (M.P. 84° C.)	25.0
Oil soluble phenol-aldehyde resin (M.P. 85° C.)	12.0
Filler (calcium carbonate, ZnO)	25.0
Antioxidant (e.g. diamyl hydroquinone)	2.0

and the sheet again dried.

The tape was then employed to seal a paper wrapped package of surgical drapes and the package then introduced into a conventional dry heat sterilizer and exposed to 350° F. for about 5 minutes. Upon removal from the sterilizer the yellow color of the backing had disappeared and the color of the tape was that of the impregnated backing, i.e., a whitish tan. The sterilizing environment had no detrimental effect upon the adhesiveness of the adhesive, and, in fact, the presence of the phenolic resin had caused the adhesive to cure and become more cohesive than before exposure.

Example II

A paper-backed pressure-sensitive adhesive tape was formed by the same procedure as that outlined for the tape of Example I, with the exception that no heat-modifiable dyestuff was included in the backsize coating for the paper web. The thus formed tape was then printed on the backsized surface with a design of light yellow stripes of a composition comprising a plasticized nitrocellulosed lacquer containing about 1% by weight of the lacquer solids of a mixture of lead oxide and sulphur. The tape was then employed to seal a paper-wrapped package of materials to be sterilized and the package introduced to a steam sterilizer (i.e. autoclave) and exposed to steam at a temperature of about 250° F. for 15 minutes. Before sterilization, the stripes on the tape were barely discernible, but after exposure to the sterilizing conditions the stripes assumed a pronounced black color and were clearly visible.

Example III

A normally tacky and pressure-sensitive adhesive tape having a laminated structure was formed by initially coating a clear transparent film of cellulose acetate by a coating of a pressure-sensitive laminating adhesive comprising:

	Parts
Pale crepe rubber	1000
Hydrogenated rosin glyceride (M.P. 84° C.)	25.0
Polymer of unsaturated terpadiene (M.P. 115° C.)	25.0
Antioxidant (e.g. diamyl hydroquinone)	2.0

to which had been added approximately 10% by weight of adhesive solids of the oil-soluble anthraquinone dye Iosol Yellow, National Analine. A thin, porous, open-textured, flexible sheet of long fibered rope paper was laminated to the backing by means of the adhesive coating and a coating of the same normally tacky and pressure-sensitive adhesive as Example I coated thereon to form the finished tape. A paper-wrapped package of materials to be sterilized was then sealed with the tape and the package then introduced to a sterilizer and exposed to steam at 250° F. for 15 minutes. The high temperature steam atmosphere had caused the tape to change color from a vivid yellow, visible through the transparent back surface, to the color of the laminating adhesive mass, a light tan.

Example IV

A second laminated structured adhesive tape was formed by coating a clear transparent film of cellulose acetate with a thin film of the pressure-sensitive laminating adhesive employed in Example III, and laminat-

ing to the backing longitudinally extending strands of acetate yarns which have been previously sized with a toluene solution of about 8% solids content of 3 parts polyterpene resin (M.P. 115° C.) and 1 part pale crepe rubber and containing the oil-soluble anthraquinone dye, Calco Oil Blue N.S., in amount about 2% by weight of the solids of the solution. The thus formed laminated structure was then coated on the strand surface with a normally tacky and pressure-sensitive adhesive comprising:

	Parts
Pale crepe rubber	1000
Hydrogenated rosin glyceride (M.P. 84° C.)	25.0
Polymer of unsaturated terpadiene (M.P. 115° C.)	25.0
Antioxidant (e.g. diamyl hydroquinone)	2.0

and thereafter dried. A paper-wrapped package of materials to be sterilized was sealed with the thus formed tape and introduced to a sterilizer and exposed to steam at about 250° F. for 15 minutes. The tape changed from an original blue color, visible through the acetate backing, to a substantially white color, the color of the strands.

Example V

A highly porous paper, such as that employed in Example I, was impregnated with the same rubber latex dispersion indicated in that example, to which dispersion had been added approximately 10% by weight of dispersion solids of the oil-soluble azo dye, Calco Oil Yellow 7463 (Color Index #19). The thus impregnated backing was then coated on one side with a plasticized nitrocellulose backsize in amount about 0.25 ounce per square yard coated and dried, and then coated on the other side with the same normally tacky and pressure-sensitive adhesive employed in Example I and the sheet again dried. The thus formed tape was employed to seal a package of materials to be sterilized and exposed to steam at about 250° F. for 15 minutes. After exposure, the tape had changed from a vivid yellow color to the light tan.

From the foregoing it may be seen that various types of structure may be employed in the formation of a pressure-sensitive adhesive tape in accordance with this invention. Essentially the structure must contain a lamina visible when viewing the tape from the surface opposite the adhesive mass, i.e., its back surface, which lamina contains a heat modifiable dyestuff which change color upon exposure to the conditions of temperature and time necessary for sterilization. As illustrated, this lamina may comprise an impregnated web, a backsizing material or release coating applied to the backing, in those cases where the backing is opaque, or may comprise a lamina underlying a backing in those cases where the latter is transparent.

The preferred embodiment of this invention comprises a paper tape comprising a web of paper fibers unified with a rubber latex as, for example, a structure comparable to that disclosed in the aforementioned Engel et al. patent. A normally tacky and pressure-sensitive adhesive containing a heat-activatible curing agent of the type of a heat-advancing rubber reactive phenolic-aldehyde resin incorporated into the adhesive in amount sufficient to render the adhesive composition resistant to softening at elevated temperatures is coated on the web. The heat-modifiable dyestuff is incorporated into a backsizing composition preferably composed of a lacquer, and the dyestuff preferably comprises one of the aforementioned azo, anthraquinone, or acid dyes. Such dyes have a quite vivid color when applied to the tape and exhibit a marked change in color upon exposure to the conditions of time and temperature required to sterilize the package to which the tape is applied.

It will be appreciated that the heat-modifiable dyestuff may be incorporated into the tape structure as a continuous coating or impregnant of the desired lamina, or that the dyestuff may be placed in or on the tape in any desired design. Obviously the dyestuff may be incorporated into the tape structure by a printing operation and hence exhibit any desired indicia. If desired, it is possible to print the heat-modifiable dyestuff on the backing in the form of notice to the user that one particular color of the dyestuff indicates non-sterility and another indicates sterility.

Other modifications of this invention may become apparent to those skilled in the art. It is to be appreciated, however, that the examples and detailed description given are the statement of the best mode of operation of this invention and the invention is not to be considered limited other than by the appended claims.

What is claimed is:

1. A normally tacky and pressure-sensitive adhesive tape adapted for sealing packages to be subjected to sterilization composed of laminae including a flexible backing, a lamina visible when viewing the back surface of said tape containing a heat-modifiable dyestuff which changes in color visible to the human eye upon exposure to elevated temperatures employed in sterilization, and a normally tacky and pressure-sensitive adhesive coating on one major surface of said backing, said adhesive containing a heat-activatible curing agent for the adhesive composition adapted to, and present in amount sufficient to, render said adhesive composition resistant to softening at elevated temperatures, said adhesive coating remaining fixed to said backing to eliminate transfer of said coating to any material used therewith.

2. A normally tacky and pressure-sensitive adhesive tape in accordance with claim 1 wherein the heat-modifiable dystuff comprises an oil-soluble organic dye which exhibits a change in color visible to the human eye upon exposure of the dye to temperatures in excess of about 210° F.

3. A normally tacky and pressure-sensitive adhesive tape adapted for sealing packages to be subjected to sterilization comprising a porous fibrous web having incorporated therein a fiber bonding extensible material in amount sufficient to unify the web, a coating on one major surface of said unified web containing a heat-modifiable dyestuff which changes in color visible to the human eye upon exposure to elevated temperatures employed in sterilization, and a normally tacky and pressure-sensitive adhesive coating on the opposite surface of said unified web, said adhesive containing a heat-activatible curing agent for the adhesive composition adapted to, and present in amount sufficient to, render said adhesive composition resistant to softening at elevated temperatures, said adhesive coating remaining fixed to said backing to eliminate transfer of said coating to any material used therewith.

4. A normally tacky and pressure-sensitive adhesive tape adapted for sealing packages to be subjected to sterilization comprising a porous fibrous web having incorporated therein a fiber bonding extensible material in amount sufficient to unify the web, a coating on one major surface of said unified web containing a heat-modifiable dyestuff comprising an oil-soluble organic dye which exhibits a change in color visible to the human eye upon exposure of the dye to temperatures in excess of about 210° F., and a normally tacky and pressure-sensitive adhesive coating on the opposite surface of said fibrous web, said adhesive containing a heat-activatible curing agent for the adhesive composition adapted to, and present in amount sufficient to, render said adhesive composition resistant to softening at elevated temperatures, said adhesive coating remaining fixed to said backing to eliminate transfer of said coating to any material used therewith.

5. A normally tacky and pressure-sensitive adhesive tape adapted for sealing packages to be subjected to sterilization comprising a porous fibrous web having in-

corporated therein a fiber bonding extensible material in amount sufficient to unify the web, a reverse side coating on one major surface of said unified web containing a plasticized nitrocellulose lacquer and a heat-modifiable dyestuff which changes in color visible to the human eye upon exposure to elevated temperatures employed in sterilization and a normally tacky and pressure-sensitive adhesive coating on the opposite surface of said unified web, said adhesive containing a heat-activatible curing agent for the adhesive composition adapted to, and present in amount sufficient to, render said adhesive composition resistant to softening at elevated temperatures, said adhesive coating remaining fixed to said backing to eliminate transfer of said coating to any material used therewith.

6. A normally tacky and pressure-sensitive adhesive tape adapted for sealing packages to be subjected to steam sterilization comprising a flexible backing, a lamina visible when viewing the back surface of said tape containing a heat-modifiable dyestuff which changes in color visible to the human eye upon exposure to steam at elevated temperatures employed in sterilization, and a normally tacky and pressure-sensitive adhesive coating on one major surface of said backing, said adhesive containing a heat-activatible curing agent for the adhesive composition adapted to, and present in amount sufficient to, render said adhesive composition resistant to softening at

elevated temperatures, said adhesive coating remaining fixed to said backing to eliminate transfer of said coating to any material used therewith.

7. A normally tacky and pressure-sensitive tape in accordance with claim 1 wherein the heat-modifiable dyestuff comprises a metallic salt system.

8. A normally tacky and pressure-sensitive adhesive tape in accordance with claim 3 wherein the dyestuff comprises a metallic salt system.

9. A normally tacky and pressure-sensitive adhesive tape in accordance with claim 5 wherein the heat-modifiable dyestuff comprises a metallic salt system.

10. A normally tacky and pressure-sensitive adhesive tape in accordance with claim 6 wherein the heat-modifiable dyestuff comprises a metallic salt system.

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