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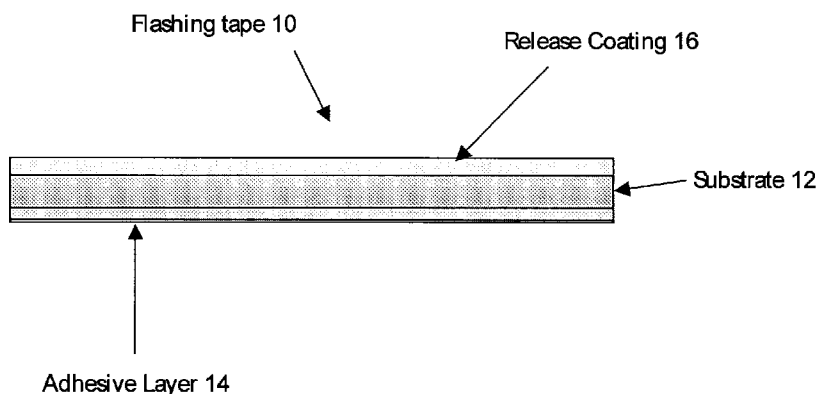


Fig 1- General Product Configuration

(57) **Abstract:** Disclosed is a method of installing a flashing tape onto a building surface proximate to an opening in a building structure. The method includes: providing a roll of flexible flashing tape, wherein the flexible flashing tape comprises a flexible substrate with an adhesive layer on one surface of the flexible substrate, wherein the adhesive layer has sufficiently low adhesion such that the flashing tape may be easily unrolled without the need for a release liner and may be removably adhered to the building surface; unrolling a portion of the flexible flashing tape and positioning it onto the building surface such that the adhesive layer contacts the building surface and removably adheres the flashing tape to the building surface until the flashing tape can be permanently fastened thereto; and permanently fastening the flashing tape to the building surface with mechanical fasteners.

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**Temporarily Adhered Mechanically Attached
Weather Barrier Material**

Field of the Invention

The present invention relates to weather barrier materials, particularly flashing tapes, having pressure-sensitive adhesive surfaces for aiding in their installation. In particular, the present invention relates to a method of installing a flashing tape onto a building surface proximate to an opening in a building structure.

Background of the Invention

It is known in the construction industry to use weather barrier materials to provide protection from water intrusion. The commonly known materials are felt and roofing underlayments for roof, weather resistive barriers, also known as house wraps for the sheathing and door and window flashings in the rough openings in the building structures. These materials are available either/or both as self-adhered comprising a thick adhesive for permanent adhesion or mechanically affixed with aid of mechanical fasteners like staples and nails.

In certain applications or environments, mechanically fastened materials are preferred over self-adhered due to cost or compatibility issues. These mechanically attached materials are attached to the substrate by the use of fasteners such as nails or staples. This requires holding one end of the material with one hand while fastening it with a fastening tool with the other hand. Such an installation method requires a number of steps, is tedious and slow, and can be difficult to obtain a high quality installation, particularly when long lengths of material are being installed. To obtain a high quality installation, a skilled experienced installer is generally required.

Therefore, there is a need in the industry to have a simplified installation method that requires relatively little skill to produce a high quality installation. Moreover, there is a need to improve the speed of installation as well.

Summary of the Invention

The present invention is directed to a method of installing a weather barrier sheet, such as a flashing tape, onto a building surface (typically an exterior surface) of a building structure. Where the weather barrier sheet is a flashing tape, the building surface will typically be proximate to an opening (e.g., a door or window opening) in a building structure. The method includes: providing a roll of flexible weather barrier sheet (e.g., flashing tape), wherein the flexible weather barrier sheet (e.g., flashing tape) comprises a flexible substrate with an adhesive layer on one surface of the flexible substrate, wherein the adhesive layer has sufficiently low adhesion such that the weather barrier sheet (e.g., flashing tape) may be easily unrolled without the need for a removable release liner and may be removably adhered to the building surface; unrolling a portion of the flexible weather barrier sheet (e.g., flashing tape) and positioning it onto the building surface such that the adhesive layer contacts the building surface and removably adheres the weather barrier sheet (e.g., flashing tape) to the building surface until it can be permanently fastened thereto; and permanently fastening the weather barrier sheet (e.g., flashing tape) to the building surface with mechanical fasteners.

Since the adhesive layer is removably adherent to the building surface, the flexible weather barrier sheet advantageously may be repositioned, as necessary, onto the building surface prior to permanently fastening it. Generally, the flexible weather barrier sheet may be cut to an appropriate length either before or after positioning it onto the building surface.

In contrast to prior art use of adhesives for permanent adhesion to the building surface as well as aid in the performance of the building material, the adhesive used on the weather barrier sheets of the present invention is present only to provide an aid in the installation, thus permitting the product to be installed by a less skilled installer and increase the speed of installation.

Further advantages and benefits of the invention are disclosed hereinafter.

Brief Description of Drawings

Fig. 1 is a schematic diagram of a flashing tape in accordance with one embodiment of the present invention.

Fig. 2 is a schematic diagram of a flashing tape in accordance with another embodiment of the present invention.

Detailed Description of Exemplary Embodiments

As shown in Fig. 1, a flashing tape 10 of the present invention comprises an adhesive layer 14 coated onto a flexible carrier substrate 12. A third layer of non-removable release coating 16 is optional if one desires to further reduce the adhesion of the tape to itself, thus reducing the force necessary to unroll the tape. The term "coated" or "coating" with respect to the adhesive layer is intended to cover all types of coating applications in which a layer of one material is applied or attached to a layer of another material, including brushing, rolling, roller coating, spraying, dipping, laminating, extruding, coextruding, etc. This term is not intended to exclude one or more optional intermediate layers between the adhesive layer and the substrate layer since it is only critical that the adhesive layer is at the outermost external surface of the flashing tape so that, upon application, the adhesive layer contacts the building surface. Flashing tapes typically have a width of about 4 in. to about 12 in. and are generally sold in rolls of various lengths (e.g., 25 to 300 feet).

The flexible substrate 12 may optionally be coated with a non-removable release coating, which differs from conventional removable release liners, to aid in the release of the carrier sheet from itself. The flexible substrate 12 may be any material suitable for use as a weather barrier sheet, preferably a flashing tape. Typically such a material will be substantially impervious to moisture. For example, the material may be woven or non-woven cloth, mesh or paper made from natural or synthetic fibers and can be coated with a material to improve its ability to be impervious to water such as a polyvinyl chloride polymer or an elastomer like EPDM rubber. The woven or non-woven cloth can also be uncoated and substantially impervious to water like Gore-Tex.RTM. or non-woven polyethylene. The material can also be polymeric film including, for example, polyolefins, polyamides and other polymers. The polymeric films may also be metallized or non-metallized. Also, foils may be used. The substrate 12 advantageously may also be vapor impermeable and generally stable in the presence of ultra-violet light (UV). Furthermore, the material may optionally be creped, wrinkled or stretchable before adhesive is applied so that the material is elongatable.

Generally, the substrate 12 is provided in a thickness that is sufficient to prevent moisture from penetrating the flashing tape to the underlying building surface that one is trying to protect. Typically, the determination of sufficient substrate thickness is dependent, at least in part, on the application, the environment, and materials in which the substrate is to be used. Preferably, the thickness of the substrate layer is about 0.03 to 5 mm and more preferably between about 0.1 to 1 mm.

The adhesive layer 14 can comprise one or more adhesive materials suitable for adhesion to the surface of building materials (e.g., wood, composite wood panels, OSB, masonry, aluminum, vinyl, steel, drywall, and vapor barrier). The adhesive layer 14 can be formed from any type or combination of adhesives. Exemplary adhesive materials may comprise rubber modified

bitumen or synthetic adhesives, as known in the art, having a thickness of 0.25-5 mils (0.006-0.13 mm), and more preferably 0.5-2.0 mils (0.013-0.05 mm). In addition to rubber modified bitumen, exemplary adhesives include butyl rubber, polyisobutylene, acrylic, vinyl ether, styrene-isoprene-styrene (SIS), styrene-butadiene-styrene (SBS), styrene-ethylene-butylene-styrene (SEBS), ethylene-propylene-diene monomer, and combinations thereof. No particular adhesive is preferred as long as the adhesive properties, or the amount and topography employed, make it a temporary repositionable adhesive, that is the flashing tape must be easily removed and reapplied as necessary to achieve the proper placement. Preferably, the adhesive layer has sufficiently low adhesion such that the flashing tape may be easily unrolled without the need for a removable release liner and may be removably adhered to the building surface. The ultimate attachment of the adhesively coated article is still performed by mechanical fasteners.

A preferred configuration of the flashing tape 20 is shown in figure 2. The flexible substrate 22 comprises a woven mesh coated with continuous polyolefin based coating 26 with release characteristics. The bottom side of the woven mesh is optionally coated with polyolefin coating 28. The polyolefin coating is further coated with adhesive layer 24, preferably at a thickness of about 1 mil (0.025 mm). The preferred adhesive will adhere to the building surface with a force of less than 0.25 pli (pounds per linear inch), preferably 0.05 to 0.20 pli, most preferably less than 0.10 pli, and will permit the flashing tape to be repositionable. Repositionable adhesive requirements are well documented in the literature (e.g., Handbook of Pressure Sensitive Adhesive Technology, D. Satas, 1999, pp. 182-192). Typical repositionable adhesives are formulated to have a high storage modulus G' , typically in the range of about 10^5 dynes/cm². The back side release from the backing material is less than 100 grams/inch at all application temperatures, making sure the membrane unrolls from the core easily for application purposes.

The adhesive layer 14 or 24 may be a continuous layer over the entire surface of the flexible substrate, or it may be a discontinuous layer. If a discontinuous layer, the adhesive layer may be employed in any suitable topography and may form a pattern, for example a pattern selected from stripes, dots, blocks, triangles, diamonds, rectangles, ovals, circles, or a combination thereof. A discontinuous pattern is advantageous because it permits use of a stronger adhesive material, but wherein such adhesive material is deployed in a topographical pattern that provides relatively weak overall adhesion, thus allowing the weather barrier sheet to be repositionable.

In its broadest form, the concept of the present invention can be used for any mechanically attached weatherproofing sheet material like roofing underlayment, housewrap, flashing etc, but the preferred application is window and door flashing. Compared to the multistep, tedious and slow installation of a conventional mechanically attached flashing, which requires the installer to repeatedly position, hold and staple the flashing simultaneously, the present method, which utilizes a flashing with a slight adhesive for placement, allows the installer to first position the tape, then fasten it while it self-adheres to the structure. This greatly simplifies and speeds up the installation, thus allowing the installer to complete more door and window openings in a shorter period of time. The temporary adhesive works like a "third hand," aiding in the installation process and providing a smooth wrinkle free installation.

The present invention differs from the conventional self-adhered flashing or other commercially available window tapes by the fact that all other adhesive based tapes use the adhesive layer for permanent adhesion to the substrate. With the present invention, the adhesive is designed to have very limited adhesion to assist installation, while the flashing is permanently affixed to the structure by mechanical fasteners. Any suitable type of mechanical fastener may be used to

permanently affix the flashing to the building surface. Typical mechanical fasteners include staples, tacks and nails.

Table 1 illustrates some key differences between the flashing tapes of the present invention and those previously known.

Table 1: Adhesion Properties of Flashings

Property	Flashing of Present Invention	Mechanically Attached Flashing	Self-Adhered Flashing (AAMA 711)
Peel Adhesion to substrate	< 0.25 lbs/inch	0 lbs/inch	> 1.5 lbs/inch
Installation Method	Temporary Adhesive and Mechanical Fastener	Mechanical Fastener	Permanent Adhesive

What is claimed is:

1. A method of installing a weather barrier sheet onto a building surface of a building structure comprising:

providing a roll of flexible weather barrier sheet, wherein the flexible weather barrier sheet comprises a flexible substrate with an adhesive layer on one surface of the flexible substrate, wherein the adhesive layer has sufficiently low adhesion such that the weather barrier sheet may be easily unrolled without the need for a removable release liner and may be removably adhered to the building surface;

unrolling a portion of the flexible weather barrier sheet and positioning it onto the building surface such that the adhesive layer contacts the building surface and removably adheres the weather barrier sheet to the building surface until the weather barrier sheet can be permanently fastened thereto; and

permanently fastening the weather barrier sheet to the building surface with mechanical fasteners.
2. The method of claim 1 wherein the adhesive layer is a continuous layer over the entire surface of the flexible substrate.
3. The method of claim 1 wherein the adhesive layer is a discontinuous layer.
4. The method of claim 3 wherein the adhesive layer is in a pattern selected from stripes, dots, blocks, triangles, diamonds, rectangles, ovals, circles, or a combination thereof.
5. The method of claim 1 wherein the flexible weather barrier sheet is repositioned onto the building surface as necessary prior to permanently fastening it.
6. The method of claim 1 wherein the mechanical fasteners are selected from staples, tacks and nails.

7. The method of claim 1 wherein the flexible weather barrier sheet is cut to an appropriate length either before or after positioning it onto the building surface.

8. The method according to any preceding claim wherein the weather barrier sheet is a flashing tape and the building surface is proximate to an opening in a building structure.

9. The method of claim 8 wherein the flashing tape has a width of about 4 in. to about 12 in.

10. The method of claim 1 wherein the adhesive layer has sufficiently low adhesion such that it will adhere to the building surface with a force of less than 0.25 pli (pounds per linear inch).

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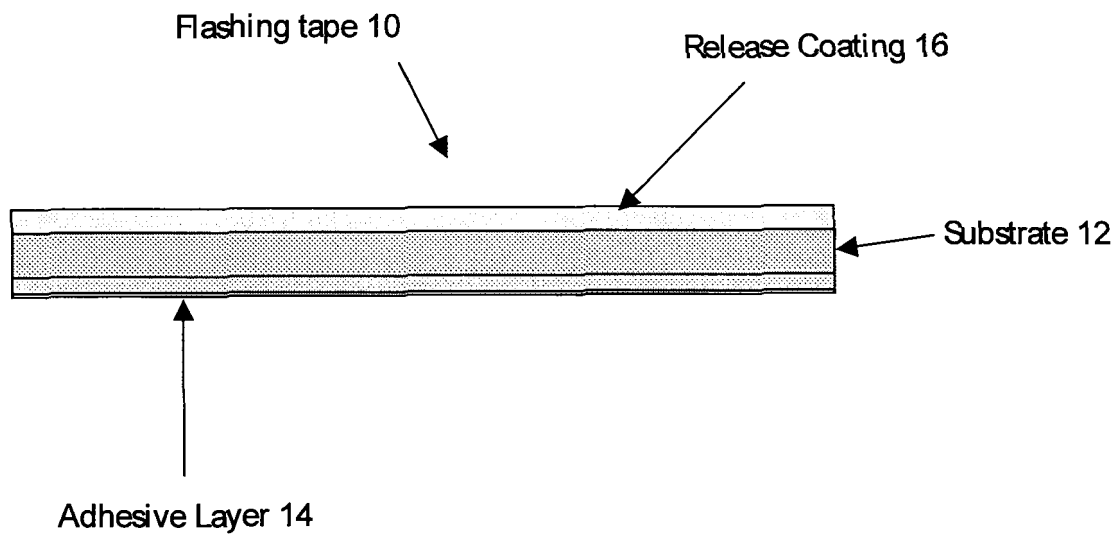


Fig 1- General Product Configuration

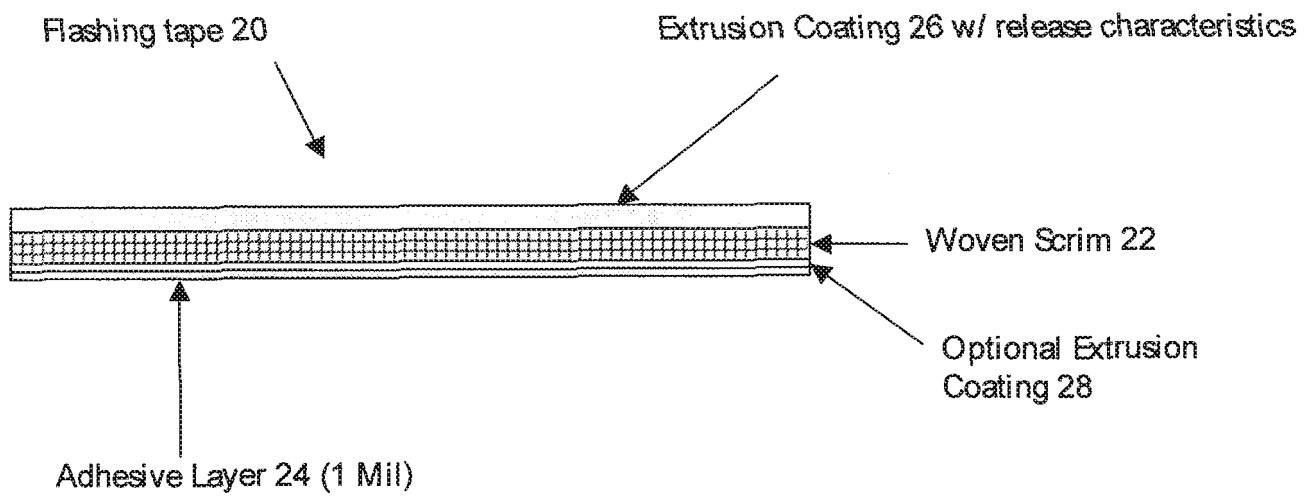
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Fig 2- Preferred Product Configuration