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ADVANCED HOOK ADHESION ENGINEERED FOR HYGIENE FLEXIBILITY AND COST EFFICIENCY

Abstract
Hook adhesive will be used between nonwoven layer and hook material It should have high shear resistance performance at 38°C body temperature. Formulation is assumed to be rubber based or polyolefin based in the market. HYFIX 1919 hot-melt adhesive based on synthetic rubber was brought to market maturity following an extensive series of tests. The HYFIX 1919 Hook Adhesive offers higher shear strength to hook material, enabling coat weight reduction for various nonwoven surfaces. This enables disposable hygiene manufacturers to access to a HYFIX 1919 adhesive solution for on-line application to assemble the fasting system of baby & adult diapers, while gaining flexibility in tape material selection and enabling cost savings.

1. Introduction
Hot melt adhesives are widely used for various commercial and industiral application such as product assembly and hygiene. Such hot melt adhesives are applied to a substrate while in its molten state and cooled harden the adhesive layer. One of the baby diaper part is fastening tape hook which is a mechanical closure system made of a hook tape and a loop frontal tape as landing zone. When used for diapers, strips of the laminate material are affixed to the front waistband region of the diapers. The hook-and-loop loop closure is made complete with closure bands that are attached to the diapers on the side and have hook-and-loop hooks on their free end. Hook-and-loop closures can be opened and closed multiple times without any detrimental effect on their functionality. Pressure-sensitive adhesive compositions and an improved refastenable tape closure system comprising a release tape and a fastening tape wherein the fastening tape has a balance of properties such that the tape exhibits a maximum in the peel force between peel rates of 100 mm/minute and 400 mm/minute when peeled from a polyolefin substrate as found in disposable diaper back sheets are disclosed. The adhesive of the fastening tape comprises a specific range of compositions including an elastomeric component based on an A-B-A block co polymer wherein the A blocks are derived from styrene or alphamethylstyrene and the B blocks are derived from isoprene, butadiene, or hydrogenated versions of these or an (AB) block copolymer of the same type of composition in another geometry such as a tapered block copolymer or a radial block copolymer, a solid tackifier resin, and an end block reinforcing resin.

2. Experimental
Suitable elastomers are, in particular, those of high tear strength and high elasticity. SBS-based rubber, as well as the second SBS or SIS-based rubber, reinforcing resin group, oil, and antioxidant were formulated into a hot-melt adhesive designed for Hook application. The particular ingredients used in the formulation are not explained due to registered considerations, but all ingredients are carefully chosen to meet hygiene compliance standards. Adhesive formulations, which can be applied at temperatures below 170 °C, can be prepared using rubbers and solvent oil in stainless- steel reactor with rotor rotating at a speed 175 rpm. While resin was added to mixture at low temperature for blocking thermal degradation. After 200 gr compounding, ıf the results are suitable for PSA application, the hot melt adhesive will be planned to pass 80 kg pilot production. When 80 kg pilot production was done, primarily, the adhesive used to adhere nonwoven with hook surface and another substrate elastic attachment at Pilot Coater Plant. Nonwoven materials are often made using a variety of techniques, including spun bonding, melt bonding, etc. Nonwoven materials are often manufactured by randomly placing fibers or rovings in a random pattern and are then thermally bonded using inherent bonding characteristics of the fibers or by bonding the fibers using resin materials applied to the fibers. The required level of cohesion and temperature resistance for such permanent assemblies (or laminates) is usually quantified by a ‘‘shear & SAFT’’ tests. It is preferred that hot melt construction adhesives provide strong shear strength, particularly at low coating weight such as 20 to 40 grams per square meter.

3. Results
Whole results were repeated 6 times to reproducibility and reliability of the results. It has been designated that 1919 gives good results even at low application grammage such as 20 and 30 gsm where the biggest difference is in shear and saft results. Moreover, aging results are the most important parameters for understanding adhesive performance and HF 1919 has shown supreme performance after 50 ˚C degree and two weeks conditions.

4. Conclusion

Indeed, the disposable nonwoven hygiene products, such as diapers, are sold all over the world even in countries wherein the daily temperature is high (for example higher than 40°C). The disposable nonwoven hygiene products face high temperature in those countries but also during transport and/or storage. HYFIX 1919 hot melt adhesive compositions based on rubber provide laminate with good maintenance of the cohesion performances after ageing at temperatures higher than 50°C. However, HYFIX 1919 adhesive compositions with stable cohesion performance both at initial and over time at high temperature. Finally, with the patented Innofix technology, an 11% energy consumption advantage is achieved in the first hour at 140 degrees compared to a product using a competing packaging technology.