ThermoTape: High Adhesion Medical Tape with Switchable Ahesion for Injury-Free Release

ThermoTape is a temperature sensitive photo-release tape that adheres to human skin to reduce the risk of medical-adhesive-related skin injuries.

What is the Problem?

Medical adhesive tapes are an integral part of healthcare delivery and are used in all care settings to cover and secure to the skin wound dressings or critical medical devices such as intravenous (IV) lines. Medical tapes consist of pressure-sensitive adhesive (PSA) applied to a plastic or fabric backing that functions as a carrier for the adhesive, providing structural and protective properties. The combination of different backings and adhesives determines the characteristics of the tape, including levels of adhesion and water resistance, and informs nurses' decisions in the selection of the appropriate tape for a patient in a specific situation. Without means of safe removal, these stronger adhesives are difficult to painlessly remove from the skin and may cause medical-adhesive-related skin injuries (MARSI), including skin tears and an increased risk of infection. Lower-adhesion medical tapes may be applied to avoid MARSI, leading to device dislodgement and further medical complications. There is a need for a high adhesion tape that can transition to a low adhesion tape upon removal.

What is the Solution?

The solution, ThermoTape, is a high-adhesion medical tape designed for low skin trauma upon release. A temperature sensitive copolymer was developed and combined with a selected pressure-sensitive adhesive (PSA) material. By warming the skin-attached tape for 30 seconds, a significant loss in adhesion is achieved. Heat is directly applied to the tape with a heat pack or other source. This tape can be manufactured with a variety of methods that are compatible with roll-to-roll processes.

What is the Competitive Advantage?

While high-adhesion medical tapes are effective and easy to apply, the adhesion of these tapes can increase over time, leading to a painful and time-consuming removal process that may ultimately result in tape-induced injuries. Lower-adhesion medical tapes increase the risk of critical device dislodgement and is classified as a medical error. ThermoTape is the first temperature-sensitive tape that functions in the human skin temperature range. In vitro testing has demonstrated retention of high adhesion at normal skin temperature (35 °C), and 67.5%

Technology ID

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Category

Device/Other

Selection of Available Technologies

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reduction in peel force adhesion when raised to 45 °C both in vitro and in vivo. A recent clinical trial showed statistically significant results for pain reduction when heat was used for removal. ThermoTape can potentially significantly reduce the risk of MARSI while simultaneously providing the high adhesion required for secure attachment of medical devices during hospital care.

Patent Information:

WO2022056165A1

References

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