

# Terms and Definitions Related to Support Surfaces

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Support surfaces remain an integral component of pressure injury prevention and treatment. Recent research and new technologies created a need for revision of past terms and definitions related to support surfaces. These terms and definitions have been developed to provide a common language that refers to basic physical concepts, design features and performance characteristics related to a full body support surface. Thus, the purpose of this document is to provide a glossary of terms and definitions that are specific to the language used within the Support Surface Standards Initiative (S3I) and serve as a lexicon to facilitate and provide clarity of understanding regarding performance evaluation and the standardized testing protocols.

Based on the work of the S3I of the National Pressure Injury Advisory Panel (NPIAP), new terms and definitions were added, clinically non-relevant terms were removed, and all were compiled into an alphabetical list to facilitate ease of use. This document undergoes periodic review and revision. Table 1 provides the reader with a framework to better understand the current clinical language related to support surfaces. The definition of a full body support surface used in this document is: “A head to foot device (i.e. mattress) or system (e.g. mattress and mattress overlay combination) which is designed for pressure redistribution and may or may not be designed for microclimate management, shear management, and/or other therapeutic functions.”

Table 1: Framework for current clinical language / defined terms related to support surfaces.

General Terms	Support Surface Category	Component/ Material (not all inclusive)	Performance Characteristics	Design Features (not all inclusive)	Engineering Terms
<ul style="list-style-type: none"> <li>• Bariatric Patient Full Body Support Surface</li> <li>• Basic/Standard Hospital Mattress</li> <li>• Bottoming out</li> <li>• Full Body Support Surface</li> <li>• Life Expectancy</li> <li>• Mattress</li> <li>• Offloading</li> <li>• Overlay</li> <li>• Safe Working Load</li> <li>• Support Surface</li> <li>• Therapeutic Working Load</li> </ul>	<ul style="list-style-type: none"> <li>• Active Support Surface</li> <li>• Reactive Support surface</li> </ul>	<ul style="list-style-type: none"> <li>• Air</li> <li>• Cell / Bladder</li> <li>• Foam</li> <li>• Gel</li> </ul>	<ul style="list-style-type: none"> <li>• Envelopment</li> <li>• Immersion</li> <li>• Microclimate</li> <li>• Pressure Redistribution</li> </ul>	<ul style="list-style-type: none"> <li>• Alternating Pressure</li> <li>• Air Fluidized</li> <li>• Constant / Continuous Low Pressure</li> <li>• Convertible / Adaptable</li> <li>• Hybrid</li> <li>• Integrated Bed System</li> <li>• Lateral Rotation</li> <li>• Low Air Loss</li> <li>• Multi-zoned Surface</li> <li>• Non-powered</li> <li>• Powered</li> <li>• Pulsation</li> <li>• Turn Assist</li> <li>• Zone</li> </ul>	<ul style="list-style-type: none"> <li>• Coefficient of Friction</li> <li>• Fatigue</li> <li>• Force</li> <li>• Friction (Frictional Force)</li> <li>• Indenter</li> <li>• Mechanical Load</li> <li>• Pressure</li> <li>• Shear</li> <li>• Shear Strain</li> <li>• Shear Stress</li> <li>• Test Mannequin – Full Body</li> </ul>

Term	Definition
<b>ACTIVE SUPPORT SURFACE</b>	A powered support surface with the capability to change its pressure redistribution properties independent of applied load.
<b>AIR</b>	A gas with minimal resistance to flow. It can act as a support medium to assist in pressure redistribution and/or be circulated to assist in dissipating heat and moisture vapor.
<b>AIR FLUIDIZED</b>	A design feature of a support surface that utilizes air flow through a medium (e.g., beads) producing a fluid like state. Intent is to provide pressure redistribution, microclimate and shear management.
<b>ALTERNATING PRESSURE</b>	A design feature of a support surface that utilizes cyclic changes in loading and unloading as characterized by frequency, duration, amplitude, and rate of change parameters. It provides active pressure redistribution.
<b>BARIATRIC PATIENT FULL BODY SUPPORT SURFACE</b>	A head to foot device (i.e., mattress) or system (e.g., mattress and mattress overlay combination) that accommodates the weight and body habitus of the bariatric patient for clinical practice (i.e., turning and repositioning). It is designed for pressure redistribution and may or may not be designed for microclimate management, shear management, and/or other therapeutic functions.
<b>BASIC/STANDARD HOSPITAL MATTRESS</b>	There is no basic/standard mattress used consistently in healthcare facilities at this time. This term is used primarily in research trials as a control in support surface studies. The term “ <b>standard hospital mattress</b> ” should not be used without a full description of defined support surface properties.
<b>BOTTOMING OUT</b>	The state of support surface deformation beyond critical immersion whereby effective pressure redistribution is lost.
<b>CELL/BLADDER</b>	A component of a support surface that is a means of encapsulating a support medium (e.g. air, gel, foam).
<b>COEFFICIENT OF FRICTION</b>	A ratio between the parallel force that is needed to start or maintain motion between two objects in contact with each other and the perpendicular force holding them together.
<b>CONSTANT/CONTINUOUS LOW PRESSURE</b>	See Reactive Support Surface
<b>CONVERTIBLE / ADAPTABLE</b>	Support surface that can be used with or without power. Power will alter the support surface properties and/or features.
<b>ENVELOPMENT</b>	The ability of a support surface to conform (fit or mold) around the body.
<b>FATIGUE</b>	The reduced capacity of a surface or its components to perform as specified. This change may be the result of intended or unintended use and/or prolonged exposure to chemical, thermal, or physical forces.
<b>FOAM</b>	A cellular matrix which may be used in the construction of a support surface. Different types of foam provide different performance characteristics.
<b>FORCE</b>	A push or pull vector with magnitude (quantity) and direction (e.g., perpendicular, parallel) that is capable of maintaining or altering the position of a body.
<b>FRICTION (FRICTIONAL FORCE)</b>	The resistance to motion in a parallel direction relative to the common boundary of two surfaces.
<b>FULL BODY SUPPORT SURFACE</b>	A head to foot device (i.e. mattress) or system (e.g. mattress and mattress overlay combination) which is designed for pressure redistribution and may or may not be designed for microclimate management, shear management, and/or other therapeutic functions.
<b>GEL</b>	A semisolid system consisting of a network of solid aggregates, colloidal dispersions or polymers which may exhibit elastic properties. Gels can range from hard to soft.
<b>HIGH SPECIFICATION FOAM SUPPORT SURFACE / MATTRESS</b>	<b>Deprecated Term.</b>
<b>HYBRID</b>	A support surface that combines two or more support mediums such as air, gel, foam, and others.
<b>IMMERSION</b>	Penetration (sinking) into a support surface, measured by depth.
<b>INDENTER</b>	An apparatus that is used to apply forces to deform a support surface to determine performance characteristics.
<b>INTEGRATED BED SYSTEM</b>	A bed frame and support surface that are combined into a single unit whereby the surface is unable to function without the bed frame.
<b>LATERAL ROTATION</b>	A feature of a support surface that provides rotation about a longitudinal axis as characterized by degree of patient turn, duration, and frequency.

<b>Term</b>	<b>Definition</b>
<b>LIFE EXPECTANCY</b>	The period of time during which a product, or component, is able to effectively fulfill its intended use as defined by the manufacturer.
<b>LOW AIR LOSS</b>	A support surface construction providing pressure redistribution utilizing constant airflow through bladder(s) with an intentional escape of air. Low air loss is not a performance characteristic of heat and moisture removal. LAL is frequently a misused term for microclimate management. See microclimate management.
<b>MATTRESS</b>	A generic term for a full body support surface designed to be placed directly on an existing bed frame. Not necessarily designed for clinical applications.
<b>MECHANICAL LOAD</b>	Force distribution acting on a surface.
<b>MICROCLIMATE</b>	The temperature and humidity/moisture in a specified location at the body interface.
<b>MICROCLIMATE MANAGEMENT</b>	The impact of a support surface on the temperature and humidity/moisture in a specified location at the body interface.
<b>MULTI-ZONED SURFACE</b>	A feature of a full body support surface in which different segments can have unique therapeutic capabilities.
<b>NON-POWERED</b>	A category of support surfaces not requiring or using sources of electrical energy for operation.
<b>OVERLAY</b>	A supplementary support surface designed to be placed directly on, and used in conjunction with, a primary/base support surface.
<b>POWERED</b>	A category of support surfaces requiring or using sources of electrical energy for operation.
<b>PRESSURE</b>	The force per unit area exerted perpendicular to the plane of interest.
<b>PRESSURE REDISTRIBUTION</b> Deprecated Terms: <b>PRESSURE REDUCTION</b> <b>PRESSURE RELIEF</b>	The ability of a support surface to distribute load over the contact areas of the human body.
<b>PULSATION</b>	A feature of a support surface that provides repeating higher and lower pressure resulting in cyclic changes in stiffness in the surface typically with shorter duration inflation/deflation, higher frequency and lower amplitude than alternating pressure.
<b>REACTIVE SUPPORT SURFACE</b>	A powered or non-powered support surface with the capability to change its pressure redistribution properties only in response to the applied load.
<b>SAFE WORKING LOAD</b>	Maximum external mechanical load (sum of the occupant and accessory equipment) as recommended in the manufacturers' instructions for use.
<b>SHEAR</b>	An umbrella term. See shear strain and shear stress.
<b>SHEAR STRAIN</b>	Distortion or deformation of tissue as a result of shear stress.
<b>SHEAR STRESS</b>	The force per unit area exerted parallel to the perpendicular plane of interest.
<b>SUPPORT SURFACE</b>	A device or system which is designed for pressure redistribution and may or may not be designed for microclimate management, shear management, and/or other therapeutic functions. Support surfaces include but are not limited to mattresses, integrated bed systems, overlays, and cushions.
<b>TEST MANNEQUIN – FULL BODY</b>	A physical analog of the human body used during testing.
<b>THERAPEUTIC WORKING LOAD (WEIGHT RANGE)</b>	The rated load range at which the features of a support surface are functioning according to its intended use.
<b>TURN ASSIST</b>	A design feature that assists in lateral turning of the patient for routine care.
<b>ZONE</b>	A defined area of a support surface that can have its own function or feature.