Foams – Glossary of Terms

Terms	Definitions
ADDITIVE	A material which does not take part in the chemical reaction but is included to alter the final product e.g. Fillers, pigments, flame retardants etc.
BLOWING AGENT	An additive to a foam mixture with the purpose of producing a “blown” foam through the production of a gas. The selected blowing agent also influences the insulation quality of the foam.
BLEND	A combination of two or more materials. E.g. The polyol in a foam system.
BUN	A portion of foam cut from a larger, usually continuous slabstock.
CASTING	The filling of essentially open moulds with liquid polyurethane.
CATALYST	An additive which accelerates the chemical reaction.
CELL	The individual cavities of a foam formed by the nucleation and growth of bubbles within the reacting mixture.
CELL STRUCTURE	Open Cells – Cells in a foam with no barrier in between. This allows gases and liquid to flow through the foam. Close Cells – Cells enclosed by a continuous membrane so there are no passageways for airflow.
CHAIN REACTION	Lengthening of the main chain of backbone of polymer molecules by end to end attachment.
COMPONENT	A separately metered stream of liquid which will be directly introduced into the mixing head.
CORE	The internal portion of a moulded foam which is free from a skin. This portion is usually used for checking the density of the foam.

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CREAM TIME	A measure of the beginning of the foam reaction. Usually characterized by a change in the liquids colour as it begins to rise.
CROSS LINKING	The formation of chemical links between the molecular chains.
CRUSHING	Usually a mechanical procedure to open the closed cells of a high resilience foam after de moulding.
CURE	A term which refers to the completeness of the chemical reaction.
CURING AGENT	A component that results in chemical activity between the components, with an increase in the rate of cure.
CYCLE TIME	A term most commonly used in situations where many items are being manufactured on an automatic or semi-automatic production line. It includes the time required for mould preparation, including release agent application, dispensing of components, reaction, cure and demould.
DEAD TIME	A foam which only slowly regains its original shape after deformation.
DEMOULD TIME	The time between dispensing the liquid components into the mould and removing the article being produced.
DENSITY	The weight per unit volume of the foam normally expressed in kg/m3. Core Density – Density at or near the centre of the foam Overall Density – Density of the foam including any moulded skin. Free Rise Density – Usually measured in kg/m3. It can be free rise or packed into a mould.
DEW POINT	The temperature at which a vapour begins to condense.
ELASTOMER	A flexible or semi-rigid rubber-like material not necessarily made from what is conventionally thought of as a rubber.
ELONGATION	The increase in length of a specimen at the instant before rupture occurs. Expressed as a present of original length.

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EXOTHERM	The heat released by the foam reaction. The heat can accelerate the foaming process.
FILLER	An unreactive material added to the polyurethane mixture. They usually solid materials such as glass and silica.
FLAME RETARDANT	A substance which is added to a polymer formulation to reduce or retard its tendency to burn.
FRIABLE	Refers to the crumbling or powdering of a foam when the surface is rubbed.
GEL TIME	The time when the foam has developed enough gel strength to be dimensionally stable.
HARDNESS	The surface property relating to the resistance of indentation.
HYDROLOSIS	The breakdown of polymers in the presence of water.
HYDROXYL GROUP	The combined oxygen and hydrogen radical (-OH) which forms the reactive group in polyols.
IMPACT RESISTANCE	Ability to withstand mechanical or physical blows without the loss of protective properties.
IMPINGEMENT	A technique of mixing through high velocity contact of the two streams.
ISOCYANATE	The family name of chemical compounds having one or more NCO groups attached to the main chain.
K VALUE	The heat transfer coefficient commonly used to compare the insulation values of different materials. The lower the K value, the better the insulator.

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MDI	An abbreviation for diphenylmethane diisocyanate.
MICROCELLULAR	An elastomer of cellular structure having a density between 1.3 and 1.2.
MIX TIME	Time in seconds a foam mixture has to be mixed before pouring into a mould.
MIL	One thousandth of an inch, 0.001 inch. A unit used to measure coating thickness.
MOULDED DENSITY	The density of a foam when expanded and cured in its final shape.
MOULDING	The process of producing a finished article from a closed mould.
NDI	Napthalene Di Isocyanate.
NCO	Nitrogen, Carbon, Oxygen. The chemical formula for an isocyanate group.
OPEN POUR	The dispensed foam mixture is placed in an open mould, allowing it to free-rise.
OVER PACKING	Purposely adding more material to the mould than is required to just fill it. This technique is used for increasing the density of the finished moulded part.
POLYISOCYANURATE (PIR)	A modified type of polyurethane foam which exhibits improved resistance to high temperatures.
POLYESTER	Polymeric compound, with the reactive hydroxyl groups containing ester linkages.

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POLYETHER	Polymeric compounds with reactive hydroxyl groups containing ether linkages.
POLYMER	A high molecular weight compound, natural or synthetic, whose chemical structure can be represented by a repeated small unit.
POLYOL	A chemical compound with more than one reactive hydroxyl group attached to the molecule.
POST CURE	The period of cure after the product has been removed from the mould. In some cases, accelerated curing at elevated temperatures is used.
POT LIFE	The length of time after mixing together of the two components during which the polymer remains sufficiently liquid to be processed.
PREPOLYMER	Poly Tetra Methylene Glycol.
PTMEG	Polymeric compounds with reactive hydroxyl groups containing ether linkages.
PU	Abbreviation of Polyurethane.
RELEASE AGENT	Applied to a mould to allow the foam to be demoulded easily.
RIM	Reaction Injection Moulding. A process of injecting a reacting mixture of polyurethane into a mould.
RISE TIME	The time when the freely rising foam stops growing.
SELF SKINNING	A foam mixture which forms a skinned surface on moulding.

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SKIN	The outer surface of a foam which occurs from the surface cooling more rapidly than the core. It is normally higher in density than the core.
SLABSTOCK	A polyurethane foam which is made into a continuous block.
SYSTEM	A rather ambiguous term used to describe almost any combination of mechanical parts or chemicals which have some relationship to each other. Often used to describe the supply of all chemical components needed to produce a polyurethane.
TACK FREE TIME	The time between the beginning of the foam pour and the point at which the outer skin of the foam loses its stickiness.
TDI	An abbreviation for Toluene Di Isocyanate.
THERMAL CONDUCTIVITY	The rate of heat transfer through a thickness of foam with a known area. The lower the value, the better the insulator. (see “k value”)
THERMOPLASTIC	A material which can be melted and solidified an indefinite number of times without permanent chemical change.
THERMOSET	A material which does not change on heating until it reaches the decomposition point.
THIXOTROPIC	Having the property of decreasing viscosity with increasing shear stress. A coating is thixotropic if it thins with stirring or pumping but thickens back up when movement decreases.
VENTING	The controlled release of gases (such as air) from a mould through holes, slots etc.
VISCOSITY	A measure of the thickness of a liquid. The lower the number the thinner the liquid.
VOLATILE ORGANIC COMPONENTS (VOC)	Organic materials which evaporate at normal temperatures and pressures, organic materials which have vapour pressure greater than 0.1 mmHg at one atmosphere.