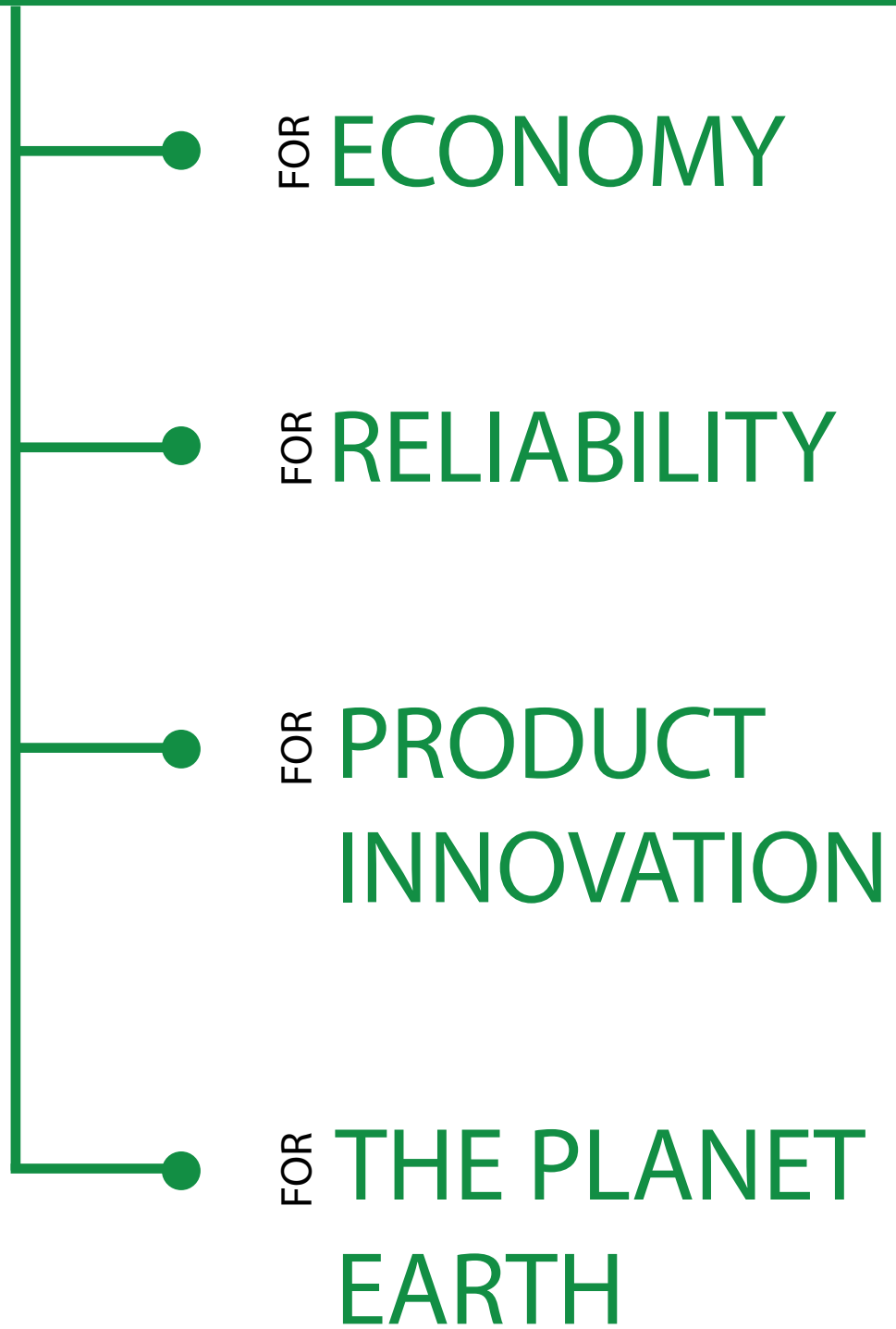


# MONMOUTH RUBBER & PLASTICS



# BONDAFLEX

Controlled Particle Size Composites Of Recycled Cellular Rubber And Plastic Materials:



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# TEAM MONMOUTH GLOBAL



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**To Our Friends and Customers Worldwide:**



*Monmouth Rubber supplies products and solves problems for customers on a global scale. While there are other companies that supply products similar to ours, none have a people team more devoted than ours. When it comes to the quality of our people and the extra effort they give when servicing customer needs, Monmouth excels. Please feel free to contact any of our team and I assure you they will put forth a special effort to make your business experience a productive and satisfying one.*

*All the best,*

**John M. Bonforte, Jr.**  
**President**

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## Monmouth's Mission Statement

To become and remain, through continual improvement, the highest quality, producer of cellular rubber and plastic buns in the world.



**John M. Bonforte, Sr.**  
**General Manager / Technical Director**

**ASK JOHN**

"Ask John" is Monmouth's global technical support service. It is **free** and brings real value to your company. It allows Monmouth's customers and visitors to have a 24/7 Technical Library & Test Lab, absolutely **free**. Have a technical question or problem, just E-mail, [johnsr@monmouthrubber.com](mailto:johnsr@monmouthrubber.com), or call 1-732-229-3444 Ext 12 and "Ask John".

# Key Elements of a Successful Recycling Business

Monmouth Rubber and Plastics Corp. has been a manufacturer of closed cell rubber & plastic materials for over 40 years.

Monmouth's proprietary Bondaflex process is an integral part of our manufacturing process.

OVER 98% OF ALL WASTE GENERATED BY MONMOUTH RUBBER IS RECYCLED.

A successful recycling program that serves customers' needs on a long-term basis requires at least four key elements. The elements are symbiotic and ultimately determine the longterm success of a recycled operation.

Over the past 40 years, a multitude of companies have entered and subsequently exited the recycling of cellular rubber and plastic materials. The primary reason for their exit is due to deficiencies in one or more of the four key elements and/or the symbiotic processes.

Monmouth has successfully implemented the four key elements and has satisfied customer needs for over 20 years with its proprietary Bondaflex process.

## 1 A RELIABLE AND CONSISTENT STREAM OF RECYCLABLE MATERIAL

Monmouth's Strengths: Monmouth generates a significant portion of the materials used in the Bondaflex process. A steady supply of materials is augmented by relationships with generators of scrap that go back 20+ years. Monmouth is the only supplier of recycled cellular materials that is vertically integrated back to the manufacture of prime cellular materials. As a result, Monmouth is able to manufacture material for its Bondaflex process to augment the supply stream when necessary by using its polymer manufacturing department.

## 2 STATE-OF-THE-ART RECYCLING EQUIPMENT THAT IS ENERGY EFFICIENT

Monmouth's Strengths: Monmouth has state-of-the-art equipment for size reduction, size sorting, mixing and curing of our Bondaflex product line. All key machines in the recycled process have backup alternatives to ensure that machine downtime does not affect material supply to our customers. Bondaflex is highly eco-efficient which means that significantly less energy and raw material are needed to produce our Bondaflex products as opposed to the equivalent prime material products.



### **MACHINERY TO PROPERLY SKIVE THE RECYCLED BUNS TO THICKNESS SPECIFIED BY CUSTOMER REQUIREMENTS**

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### **IN-DEPTH QUALITY CONTROL SUPPORT OF BONDAFLEX PRODUCTS**

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### **OUR STRENGTHS BENEFIT OUR CUSTOMERS IN THE FOLLOWING WAYS:**



**ECONOMY**

**RELIABILITY**

**PRODUCT INNOVATION**

**COMPREHENSIVE PRODUCT TESTING AND SUPPORT**

**PLANET EARTH**

**ECONOMY**

## **Every Penny You Save Is A Potential Source Of New Business**

In applications requiring high density (mass), Bondaflex has proven to be the most economical path to a high mass product at a low cost. In applications requiring low creep (the ability of a material to retain its thickness under severe weight) Bondaflex out performs most other materials. Monmouth's vertically integrated manufacturing process assures its customers of the most cost effective means of distribution.

RELIABILITY

## Bondaflex – A Recycled Product You Can Depend On

Bondaflex has stood the test of time for over 20 years. It continues to be used in Corp of Engineer projects such as dams, levees, and water treatment facilities, industrial gaskets, and the list goes on. In a recycled product, reliability is needed not only in the performance of the product but also in the reliability and performance of the manufacturing source of the material to guarantee that the product will be there when you need it and in the form that you need it. When it comes to reliability and performance, for the past 20 years, Bondaflex has continually outperformed all competitors.

PRODUCT INNOVATION

## Monmouth Will Develop a Bondaflex Product to Satisfy Your Customer's Needs

Recycling a waste stream material is only the beginning. The recycled product must then fulfill a customer's needs. For over 20 years Bondaflex has delivered the innovative firsts that allow fabricators to satisfy the needs of their customers. Through our proprietary Bondaflex process, proprietary machines, product testing, and shock attenuation laboratory, Bondaflex is positioned to continue to offer innovative solutions to customer problems in the 21st century.

COMPREHENSIVE PRODUCT TESTING & SUPPORT

## Our Laboratory Is Your Laboratory

Monmouth Rubber has a complete product testing laboratory on site. As part of our quality control and customer support, some of the tests we perform in our laboratory are:

- Compression Deflection
- Tensile
- Compression Set
- Elongation
- Creep
- UL Burn

- Tear Die C
- Water Absorption
- Fluid Immersion
- Shock Attenuation
- Oven Aging
- Low Temperature Flex

Our product testing and development laboratory has proven to be a valuable asset to our customers. It continues to bring real value to their company and their selling efforts. Our customers realize value, not only in a consistent and quality product, but in the technical support required to develop new products for their customers.

FOR THE  
PLANET EARTH

## Bondaflex Saves Over 20 Million Pounds Of The Earth's Resources.

For the past 20 years, the Bondaflex process has eliminated the need for over 20 million pounds of organic industrial production in the form of oil and natural gas, as well as a multitude of chemicals used in the rubber industry.

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### GLOBAL WARMING

With its Bondaflex process Monmouth has been doing its part to lower greenhouse gases for over 20 years. Industry has continued to increase its participation as responsible environmental stewards of the earth's environment. Government regulations and industrial requirements will continue to drive new and improved ways of recycling the waste stream on the planet. Monmouth's commitment to continuous improvement of the environmental impact that industry has on the planet is second to none. Monmouth's Bondaflex process is eco-efficient.

### "0" EMISSIONS FOR OUR PLANET – THE MONMOUTH GUARANTEE

Monmouth guarantees that it will accept back at its Long Branch facility, 100% of the material that it supplies. This includes skids, banding wire, stretch wrap, as well as the cellular and solid material that Monmouth makes and sells.

# SPECIFY BONDAFLEX

## FOR THE LIFE OF YOUR PRODUCT

## FOR THE LIFE OF YOUR PLANET

The unique physical properties of Bondaflex make it the material of choice for many applications in the following areas:

**Acoustics**  
**Shock Absorption & Attenuation**  
**Creep**  
**Compression Set**

## ACOUSTICS

SOUND DEADENING &  
SOUND ABSORPTION

Vibration is a key element in the generation of noise. Lowering or eliminating vibration reduces noise levels. In addition to minimizing vibration, Bondaflex absorbs any residual sound once the vibration level meets the design criteria. Sound waves are absorbed into the honeycomb interstices of Bondaflex and then reduced further by the mix of high and medium density closed cell clusters. This 1, 2 process of first absorbing the sound and then deadening the sound is one of the unique physical properties of Bondaflex.

Over a 20 year period Monmouth's noise mitigation research has resulted in the proprietary ratio of controlled particle size, particle density, and particle size distribution to optimize the performance of sound absorption and vibration dampening. Monmouth is equipped to work with a customer's specific acoustical requirements to tailor a Bondaflex product that performs at the highest possible level while offering the lowest possible cost.

SQUEAK AND RATTLE

Squeak is a friction-induced noise caused by relative motion resulting from a slipstick phenomenon between interfacing surfaces. The elastic deformation of the contact surfaces stores energy that is released when the static friction exceeds the kinetic friction, producing the audible squeak noise.

Rattle is an impact-induced phenomenon that occurs when there is a relative motion between components with a short loss of contact. It is generally caused by loose or overly flexible elements under forced excitation. Impacts are caused when surfaces close to each other move perpendicular to each other due to insufficient attachments or insufficient structural strength forcing repeated separation and reestablishment of contact.

Bondaflex often is the material of choice to solve both squeak and rattle points in a product of new design as well as an existing product that needs design modification.

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## Some Helpful Engineering Principles Of Sound

- 1** Sound is a series of alternating compression and refraction waves traveling outward from a vibrating object through a gas, liquid or solid.
- 2** Sound cannot exist without matter.
- 3** Sound waves result from the movement of molecules.
- 4** Intensity is expressed in units called decibels.
- 5** When sound strikes an object, it makes it vibrate.
- 6** If the object naturally vibrates with the same frequency as the sound, it will vibrate more strongly, this is known as resonance.
- 7** Sound waves like light waves are reflected from surfaces separating media of different properties (such as air to metal) and refracted (that is bent from the original direction of propagation) in crossing such surfaces obliquely.
- 8** Sound waves can bend around corners.
- 9** Moist air carries sound faster than dry air.
- 10** Reverberation time is the time a sound impulse in a closed area takes to be reduced to one millionth of its intensity.
- 11** Liquids transmit sound better than air.
- 12** Sound travels through water more than 4 times faster than in air.
- 13** In wood, its speed is 10 times greater than in air.
- 14** In rigid materials, about 15 times greater.
- 15** Iron, stone, wood, etc., transmit sounds better than liquids.
- 16** Poorest transmitters of sound are flexible materials, i.e. cellular rubber, etc.

# SHOCK ABSORPTION & ATTENUATION

Effective shock absorption and attenuation has as one of its key elements the ability of an elastomeric material to absorb energy from the impact medium and return (whiplash) the minimum amount of energy returned to the impact medium. Further, the ability for the elastomeric material to continue to absorb and dissipate the impact energy over multiple cycles and extended periods of time, determines the functional effectiveness of the shock absorption material.

There is a relationship between compression deflection and the level of energy imparted on the material from the impact medium. A simple example is the dropping of an egg from two feet in height. The shock attenuation material should have a thickness capable of absorbing the full geometric impact of the egg but soft enough to cushion the egg so that it does not crack on impact. If the same size egg were made of lead and dropped from the same height, a thicker and firmer material would be needed to absorb and attenuate the resulting shock.

Bondaflex, a composite material, can be custom formulated for particle size, particle size density, and thickness to obtain the most cost effective shock absorbing performance. Monmouth has a fully equipped shock attenuation test lab to test for "G" Force, HICs, speed of impact, and height of impact on site. This testing ability allows Monmouth to deliver a custom designed Bondaflex product with reliable and repeatable shock absorption qualities.

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## CREEP (Deformation)

Creep is a key factor in designing packaging, component support, as well as many other applications where a consistent and reliable spacial distance must be maintained based on a given force over an extended period of time. In materials science, creep is the tendency of a material to move or to deform permanently to relieve stresses. Material deformation occurs as a result of long term exposure to levels of stress that are below the yield or ultimate strength of a material. Depending on the magnitude of the applied stress and its duration, the deformation may become so large that a component can no longer perform its function.

For example, an application where an elastomeric spacer material of 1" thickness that is used to support a total weight of 50 lbs. depends on the elastomeric material maintaining at least .95" of the original 1" thickness in order for the 50 lb. compression to function properly. The creep (compression) of the 1" elastomeric material down to .95" and to compress no further over a specified period of time is said to have a creep factor of 5%. The creep factor of an elastomeric material is critical to product performance not only in its ability to maintain spacial integrity but it has a direct effect on vibration, shock attenuation, and noise mitigation.

Bondaflex, with its high mass, unique particle size geometry and distribution, exhibits exceptionally low creep. This results in the Bondaflex component supporting a given weight with a predictable amount of deflection that does not increase over an extended quantifiable period of time.

Bondaflex can be custom formulated for a customer's application with low creep, low cost, and the minimum amount of mass to function for the application.

Monmouth has available creep and deflection curves over a broad range to show the design engineer how Bondaflex will perform in a time-stress model.

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## COMPRESSION SET

Bondaflex exhibits very low compression set. Under ASTM-D-1056, the specimen is compressed 50% of its original thickness for 22 hours. The load is released from the specimen and after a 24 hour recovery period at room temperature, the percent of set is calculated. Under ASTM-D-1056, the percent of set is calculated based on the percent of percent compressed. In other words, if a 1" thick specimen after the 24 hour recovery period recovers to 3/4" thick, the compression set would be expressed as 50%. (1/4" as a percent of 1/2" equals 50%).

Under ASTM-D-1667 and ASTM-D-3575, the amount of compression set is calculated as a percent of original thickness. Therefore, the same 1/4" as a percent of 1" would be a compression set of 25%.

The compression set for Bondaflex is reported under the more severe compression set test of ASTM-D-1056.

The relatively high mass, controlled particle size, and unique honeycomb interstices of Bondaflex allows the design engineer many of the physicals of a closed cell product with the low compression set of an open cell product. In many cases, Monmouth can tailor a Bondaflex product to meet the most demanding compression set requirements.

The above information is a brief overview of Acoustics, Shock Absorption & Attenuation, Creep, and Compression Set. Monmouth has in its technical library a wealth of empirical information and engineering studies that are available as part of its customer service and technical support.

# GLOSSARY

# OF ENVIRONMENTAL

# TERMS

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The use of these terms and definitions varies largely from one author to another. The list below relies on definitions used by internationally recognized organizations (e.g. ISO, SCC, SETAC), environmental agencies (e.g. Environmental Protection Agency of the USA) or research reports of large groups of scientists and projects etc.

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## **Abiotic Resources**

Resources which are considered abiotic and therefore not renewable. Zinc ore and crude oil are examples of abiotic resources.

## **Biotic Resources**

Resources which are considered biotic and therefore renewable. The rainforests and tigers are examples of biotic resources.

## **By-Product**

A useful and marketable product or service that is not the primary product or service being produced. See also co-product.

## **Close-loop Recycling**

A recycling system in which a product made from one type of material is recycled into a different type of product (e.g. used newspapers into toilet paper). The product receiving recycled material itself may or may not be recycled. See also open-loop recycling.

## **Co-Product**

A marketable by-product from a process that can technically not be avoided. This includes materials that may be traditionally defined as waste such as industrial scrap that is subsequently used as a raw material in a different manufacturing process.

## **Continuous Improvement**

The process of enhancing an environmental management system to achieve improvements in overall environmental performance in line with an organization's environmental policy.

## **Damage**

A deterioration in the quality of the environment not directly attributable to depletion or pollution.

# GLOSSARY

# ENVIRONMENTAL

# TERMS

continued...

**Depletion**

The result of the extraction of abiotic resources (non-renewable) from the environment or the extraction of biotic resources (renewable) faster than they can be renewed.

**Downcycling**

See recycling.

**Eco-Efficiency**

The relationship between economic output (product, service, activity) and environmental impact added caused by production, consumption and disposal.

**Emission**

One or more substances released to the water, air or soil in the natural environment. See also environmental release, pollution and environmental intervention.

**Environment**

Surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelations. This definition extends the view from a company focus to the global system.

**Environmental Aspects**

Elements of an organization's activities, products or services which can interact with the environment (ISO 14004). A significant environmental aspect is an environmental aspect which has or can have a significant environmental impact. See also environmental interventions, environmental problem.

**Environmental Effect**

Any direct or indirect impingement of activities, products and services of an organization upon the environment, whether adverse or beneficial. An environmental effect is the consequence of an environmental intervention in an environmental system. See also environmental impact, environmental problem.

**Environmental Effects Evaluation**

A documented evaluation of the environmental significance of the effect of an organization's activities, products and services (existing and planned) upon the environment.

# GLOSSARY

# ENVIRONMENTAL

# TERMS

continued...

**Environmental Effects Register**

A list of significant environmental effects, known or suspected, of an organization's activities, products and services upon the environment. Also see environmental inventory.

**Environmental Impact**

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services. An environmental impact addresses an environmental problem. Also see environmental effect.

**Environmental Intervention**

Exchange between the economy and the environment including resource extraction, emissions to the air, water, or soil, and aspects of land use. If resource extraction is excluded, the term used in this case is environmental release. See also emission and pollution.

**Environmental Inventory**

An environmental inventory identifies and quantifies - where appropriate - all environmental aspects of an organization's activities, products and services. Also see environmental effects register.

**Environmental Management**

Those aspects of an overall management function (including planning) that determine and lead to implementation of an environmental policy. See also environmental management system.

**Environmental Management Audit**

A systematic evaluation to determine whether an environmental management system and environmental performance comply with planned arrangements, and whether a system is implemented effectively, and is suitable to fulfill an organization's environmental policy.

**Environmental Management Program**

A description of the means of achieving environmental objectives and targets.

**Environmental Management Review**

A formal evaluation by management of the status and adequacy of systems and procedures in relation to environmental issues, policy and regulations as well as new objectives resulting from changing circumstances.

# GLOSSARY

# ENVIRONMENTAL

# TERMS

continued...

## **Environmental Management System**

The part of an overall management system which includes structure, planning activities, responsibilities, practices, procurements, processes and resources for developing, implementing, achieving, reviewing and maintaining an environmental policy.

## **Environmental Objectives**

The overall environmental goal, arising from an environmental policy, that an organization sets itself to achieve, and which is quantified where practical.

## **Environmental Performance**

Measurable results (see environmental performance indicators/index) of an environmental management system, related to the control of its environmental aspects. Assessment of environmental performance is based on environmental policy, environmental objectives and environmental targets.

## **Environmental Policy**

A statement by an organization of its intentions and principles in relation to its overall environmental performance. Environmental policy provides a framework for action and for the setting of its environmental objectives and target.

## **Environmental Strategy**

A plan of action intended to accomplish a specific environmental objective.

## **Open-loop Recycling**

A recycling system in which a particular mass of material (possible after upgrading) is remanufactured into the same product (e.g. glass bottles into glass bottles).

## **Pollution**

Residual discharges of emissions to the air or water following application of emission control devices (EPA 1993b). See also environmental release and environmental intervention.

## **Primary Product**

The product or service which is the strategic focus of an organization. See also by-product and co-product.

## **Prevention of Pollution**

The use of processes, practices, methods or products that avoid, reduce or control pollution. These may include recycling, treatment, process changes, control mechanisms, efficient use of resources and material substitution.

# GLOSSARY

# ENVIRONMENTAL

# TERMS

continued...

**Recycling**

The process of re-using material for the production of new goods or services on the same quality level. If the quality of the goods and services produced with recycled material is lower, then the process is known as downcycling. See also close-loop recycling and openloop recycling.

**Resources**

Materials found in the environment that can be extracted from the environment in an economic process. There are abiotic resources (non-renewable) and biotic resources (renewable).

**Reuse**

The additional use of a component, part, or product after it has been removed from a clearly defined service cycle. Reuse does not include reformation. However, cleaning, repair, or refurbishing may be done between uses.

**Solid Waste**

Solid products or materials disposed of in landfills, incinerated or composted. See waste.

**Valuation**

The process of weighting characterized environmental interventions against each other in a quantitative and/or qualitative way. This process results in an environmental performance index.

**Verification Activities**

All inspection, test and monitoring work related to environmental management.

**Waste**

An output with no marketable value that is discharged to the environment. Normally the term "waste" refers to solid or liquid materials.

# GLOSSARY

## OF ACOUSTICAL TERMS

### **ABSORPTION**

Absorption is a property of materials that reduces the amount of sound energy reflected. Thus, the introduction of an "absorbent" into the surfaces of a room will reduce the sound pressure level in that room by virtue of the fact that sound energy striking the room surfaces will not be totally reflected. It should be mentioned that this is an entirely different process from that of transmission loss through a material, which determines how much sound gets into the room via the walls, ceiling, and floor. The effect of absorption merely reduces the resultant sound level in the room produced by energy that has already entered the room.

### **ABSORPTION COEFFICIENT**

A measure of sound-absorbing ability of a surface. This coefficient is defined as the fraction of incident sound energy absorbed or otherwise not reflected by the surface. Unless otherwise specified, a diffuse sound field is assumed. The values of sound-absorption coefficient usually range from about 0.01 for marble slate to almost 1.0 for long absorbing wedges such as are used in anechoic chambers.

### **ACOUSTICS**

(1) The science of sound, including the generation, transmission, and effects of sound waves, both audible and inaudible. (2) The physical qualities of a room or other enclosure (such as size, shape, amount of noise) that determine the audibility and perception of speech and music

### **BROADBAND NOISE**

Noise with components over a wide range of frequencies.

### **CYLINDRICAL DIVERGENCE**

Cylindrical divergence is the condition of propagation of cylindrical waves that accounts for the regular decrease in intensity of a cylindrical wave at progressively greater distances from the source. Under this condition, the sound-pressure level decreases 3 decibels with each doubling of distance from the source. See also spherical divergence.

### **CYCLES PER SECOND**

A measure of frequency numerically equivalent to Hertz.

### **DAMPING**

The dissipation of energy with time or distance. The term is generally applied to the attenuation of sound in a structure owing to the internal sound-dissipative properties of the structure or owing to the addition of sound-dissipative materials.

### **DECIBEL**

The decibel (abbreviated "dB") is a measure, on a logarithmic scale, of the magnitude of a particular quantity (such as sound pressure, sound power, intensity) with respect to a standard reference value (0.0002 microbars for sound pressure and 10<sup>-12</sup> watt for sound power).

# GLOSSARY

# ACOUSTICAL

# TERMS continued...

## **DOPPLER EFFECT (DOPPLER SHIFT)**

The apparent upward shift in frequency of a sound as a noise source approaches the listener (or vice versa), and the apparent downward shift when the noise source recedes. The classic example is the change in pitch of a railroad whistle as the locomotive approaches and passes by.

## **EFFECTIVE PERCEIVED NOISE LEVEL (EPNL)**

A physical measure designed to estimate the effective "noisiness" of a single noise event usually an aircraft fly-over; it is derived from instantaneous Perceived Noise Level (PNL) values by applying corrections for pure tones and for the duration of the noise.

## **FLOW RESISTANCE**

The flow resistance of a porous material is one of the most important quantities determining the sound absorbing characteristics of the material. Flow resistance is a ratio of the pressure differential across a sample of the porous material to the air velocity through it.

## **FREQUENCY**

The number of times per second that the sine-wave of sound repeats itself, or that the sine-wave of a vibrating object repeats itself. Now expressed in Hertz (Hz), formerly in cycles per second (cps).

## **HARMONIC**

A sinusoidal (pure-tone) component whose frequency is a whole-number multiple of the fundamental frequency of the wave. If a component has a frequency twice that of the fundamental it is called the second harmonic.

## **HERTZ**

Unit of measurement of frequency, numerically equal to cycles per second.

## **IMPACT**

(1) An impact is a single collision of one mass in motion with a second mass that may be either in motion or at rest. (2) Impact is a word used to express the extent or severity of an environmental problem; e.g., the number of persons exposed to a given noise environment.

## **LOUDNESS**

The judgment of intensity of a sound by a human being. Loudness depends primarily upon the sound pressure of the stimulus. Over much of the loudness range it takes about a threefold increase in sound pressure (approximately 10 dB) to produce a doubling of loudness.

## **LOUDNESS LEVEL**

The loudness level of a sound, in phone, is numerically equal to the median sound pressure level, in decibels, relative to 0.0002 microbar, of a free progressive wave of frequency 1000 Hz presented to listeners facing the source, which in a number of trials is judged by the listeners to be equally loud.

# GLOSSARY

## ACOUSTICAL TERMS

continued...

### **MACH NUMBER**

The ratio of a speed of a moving element to the speed of sound in the surrounding medium.

### **NOISE**

Any sound that is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying.

### **NOISE REDUCTION COEFFICIENT (NRC)**

A measure of the acoustical absorption performance of a material, calculated by averaging its sound absorption coefficients at 250, 500, 1000, and 2000 Hz, expressed to the nearest integral multiple of 0.05.

### **PITCH**

A listener's perception of the frequency of a pure tone; the higher the frequency, the higher the pitch.

### **REFRACTION**

The bending of a sound wave from its original path, either because it is passing from one medium to another or because (in air) of a temperature or wind gradient in the medium.

### **RESONANCE**

The relatively large amplitude of vibration produced when the frequency of some source of sound or vibration "matches" or synchronizes with the natural frequency of vibration of some object, component, or system.

### **REVERBERATION**

The persistence of sound in an enclosed space, as a resultant multiple reflections, after the sound source has stopped.

### **REVERBERATION TIME (RT)**

The reverberation time of a room is the time taken for the sound pressure level (or sound intensity) to decrease to one-millionth (60 dB) of its steady-state value when the source of sound energy is suddenly interrupted. It is a measure of the persistence of an impulsive sound in a room and of the amount of acoustical absorption present inside the room.

### **SHIELDING**

The attenuation of a sound by placing walls, buildings, or other barriers between a sound source and the receiver.

### **SONIC BOOM**

The pressure transient produced at an observing point by a vehicle that is moving past (or over) it faster than the speed of sound

### **SOUND ABSORPTION COEFFICIENT**

See absorption coefficient.

# GLOSSARY

## ACOUSTICAL TERMS

continued...

### **SOUND INSULATION**

(1) The use of structures and materials designed to reduce the transmission of sound from one room or area to another or from the exterior to the interior of a building. (2) The degree by which sound transmission is reduced by means of sound insulating structures and materials.

### **SOUND SHADOW**

The acoustical equivalent of a light shadow. A sound shadow is often partial because of diffraction effects.

### **SPEED (VELOCITY) OF SOUND IN AIR**

The speed of sound in air is 344 m/sec or 1128 ft/sec at 68°F.

### **SPHERICAL DIVERGENCE**

Spherical divergence is the condition of propagation of spherical waves that relates to the regular decrease in intensity of a spherical sound wave at progressively greater distances from the source. Under this condition the sound-pressure level decreases 6 decibels with each doubling of distance from the source. See also cylindrical divergence.

### **SPHERICAL WAVE**

A sound wave in which the surfaces of constant phase are concentric spheres. A small (point) source radiating into an open space produces a free sound field of spherical waves.

### **STEADY-STATE SOUNDS**

Sounds whose average characteristics remain constant in time. An example of a steady-state sound is an air conditioning unit.

### **STRUCTUREBORNE SOUNDS**

Sound that reaches the point of interest, over at least part of its path, by vibration of a solid structure.

### **ULTRASONIC**

Pertaining to sound frequencies above the audible sound spectrum (in general, higher than 20,000 Hz).

### **VIBRATION DAMPING**

See damping.

### **VIBRATION ISOLATOR**

A resilient support for Machinery and other equipment that might be a source of vibration, designed to reduce the amount of vibration transmitted to the building structure.

For a periodic wave (such as sound in air), the perpendicular distance between analogous points on any two successive waves. The wavelength of sound in air or in water is inversely proportional to the frequency of the sound. Thus, the lower the frequency, the longer the wavelength.

# BOND AFLEX

**Made in America**  
**Used Throughout the World**

**IMAGINE WHAT BOND AFLEX**  
**CAN DO FOR YOU!**

## OUR INVENTORY IS YOUR INVENTORY

Bondaflex buns ready for inventory. A minimum 2 months supply of inventory is normally maintained.

## STAY WITH A WINNER

Hoover Dam Bypass Project. Bondaflex has been used for over 20 years in many Corp of Engineer Projects throughout the world.

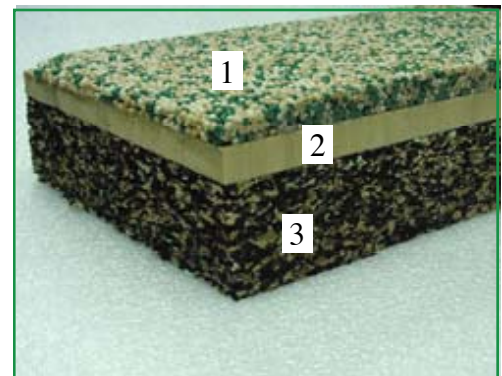


## SAFETY FIRST

Bondaflex is used where safety counts – For shock attenuation for subpadding in indoor & outdoor play areas.

Monmouth's commitment to innovation solves the most difficult shock attenuation challenges

- 1 – Top coat Pebble Wear surface
- 2 – Durafoam PVC/NBR shock padding
- 3- Bondaflex High Performance Shock Padding.



## SOLVING PROBLEMS FROM A TO Z

Many industrial and automotive applications use Bondaflex as an environmentally friendly solution for gasketing, sound absorption, and sealing against dust, air and water. Bondaflex, in many applications, is the ideal solution for squeak, rattle and vibration especially under severe conditions.



A state-of-the-art curing oven, designed & built by Monmouth employees. Just one example of a number of proprietary machines used in the Bondaflex process..

A state-of-the-Art F & K looper. One of 4 machines available to split Bondaflex to the most demanding thickness specifications.



SPECIFY **BOND AFLEX** FOR ECONOMY, RELIABILITY, PRODUCT INNOVATION, COMPREHENSIVE PRODUCT TESTING & SUPPORT, AND FOR **PLANET EARTH!**