

Dri-Remediation™

Industrial Wetness Prevention
& Remediation Formulas

*Earth's Natural Materials for Immediate and
Effective Control & Elimination of Moisture*

*TECHNICAL BULLETIN #1
TECHNOLOGY*





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The Problem with Water

Water damage describes a large number of possible losses caused by water intruding where it will enable attack of a material or structure by destructive processes such as staining, rotting of wood, growth, rusting of steel, de-laminating of materials such as plywood, growth of microbes and many others.

The damage may be imperceptibly slow and minor such as water spots that could eventually mar a surface, or it may be instantaneous and catastrophic such as flooding. However fast it occurs, water damage is a very major contributor to loss of property.

Water damage can originate by different sources such as: a broken dishwasher hose, washing machine overflow, dishwasher leakage, broken pipes, clogged toilet, leaking roof, and moisture behind walls, foundation cracks, plumbing leaks, and bad weather (snow, rain, floods).



If your building has water damage due to

- flooding,
- sewage back-up from flooding in the area,
- plumbing or roof leaks,
- damp basement or crawl space,
- overflows from sinks or bathtub, or
- high humidity: steam cooking, dryer vents, humidifiers,

mildew, mold, fungus, algae and/or bacteria will develop within 24-48 hours of water exposure. Even worse, mold will continue to grow until steps are taken to eliminate the source of moisture, and effectively deal with the mold, algae or bacteria problem.



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Current Situation

The methods for drying an area that has been damaged by water have not changed significantly in the past few decades. The methods currently in common use include:

Cold air blowing: This approach involves the use of industrial fans to move the air out of the area and take the moisture in the space with it. Due to the fact that this process depends on the relative humidity and the air's ability to contain water, it usually takes inordinate long periods to dry an area. With this method, any mold or algae forming colonies are spread throughout the area and contaminate the personnel in the area.



Hot Air Blowing: Similar to the cold air process with the exception the air flow is heated to an elevated temperature and thus carries more water out of the area. This heat can cause damage to materials in the area and has all the drawbacks of the cold air method.

Silica Gel: This chemical drying agent has been used for years on small areas and is usually contained in some form of container or bag. Silica gel is a granular, vitreous, porous form of silicon dioxide made synthetically from sodium silicate. As a desiccant it has a strong affinity for water molecules but is limited to 2-4X in water pickup.

Extended or synthetic starch molecules: While these materials have a high affinity for water, they form a paste of plastic like film which makes removal difficult. They may pick up to 500x their own weight in water.

Sodium polyacrylate: A synthetic polymer widely used in consumer products like diapers. It has the ability to absorb as much as 200 to 300 times its mass in water. The resulting gel is difficult to remove and the material swells to fill all available space making it sticky and odiferous as the un-removed material dries.

Clays and Bentonite: These unique clays will generally swell to double its own dry volume when it comes in contact with moisture and when completely hydrated it has the capabilities to swell up to 18 times its own dry volume. It cannot be applied to vertical surfaces and usually forms a paste material which is difficult to remove.



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Dri-Remediation™ Products

Dri-Remediation™ products are unique when compared to the current product offerings. These products chemically bond (adsorb) the water as well as draw water to the material (absorb). The materials absorb and adsorb up to 50,000x their weight in water and can regenerate to their original state when left to dry. Hence they can be left in place or do not need as stringent a cleanup process. The material can be knocked down off of vertical surfaces and all material can be vacuumed up using industrial vacuums. Most of all, the Dri-Remediation™ material is rapid drying and quick to remove water and permitting return of the area to normal use faster.

Dri-Remediation™ Technology

We call our product line “Dri-Remediation™” to speak to its function, composition and mode of action.

Dri-Remediation™ is comprised of a proprietary blend of naturally derived nanomaterials. The power of natural nanotechnology comes not from the chemistry but from the high surface area and the natural physical properties of the materials themselves. Dri-Remediation™ is composed of natural and modified natural scoriaceous material found in the environment.

All ingredients incorporated into our premier formulations are derived from earth’s resources and are Generally Regarded As Safe (GRAS) materials 100% safe to humans, animals, plants and the environment. Dri-Remediation™ uses exclusive nanotechnology blend that incorporates EPA registered ingredients that helps prevents the growth of mold, mildew, algae, bacteria and fungus on the coating surface.

Once applied, Dri-Remediation™ materials create a permanent, invisible barrier that inhibits the future growth of mold, mildew, fungus, algae and bacteria on the coating surface. Dri-Remediation™ materials are effective against the growth of odor causing bacteria, fungi (mold and mildew) and algae on the coating surface. Our exclusive Nano-Technology is Formaldehyde Free, Safe and Easy to Apply.

Dri-Remediation™ Products with Bind Fresh™ technology are proprietary formulations that use nanomaterials to quickly adsorb and encapsulate moisture. Dri-Remediation™ Products also capture and chemically bind microbe related odiferous compounds to securely lock them away. They also have residual insecticidal properties.



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Bind Fresh™ technology is unique in that the tiny nanostructures are self-assembling and tailor themselves upon assembly to the molecular structure of the moisture; microbes and other odiferous compounds present to chemically bond and entrap them. This entrapment occurs no matter the size or shape of the materials(s) or whether the materials(s) are present in solid, liquid or gaseous form.

PRODUCTS:

Dri-Remediation™ Powder (50069). This Powder is best used in areas with moisture or dampness visible in the area to be treated. The material may be used on all vertical or horizontal interior surfaces including wallboard, plastic, metal, plaster, stucco, concrete, wood and other surfaces.

Dri-Remediation™ HD Powder (50068). HD Powder is a heavy duty product best used in areas with high moisture or when standing water was recently present in the area to be treated. The material may be used on any vertical or horizontal interior or exterior surface including wallboard, plastic, metal, plaster, stucco, concrete, wood and other surfaces.

Dri-Remediation™ Granules (50072). Granules are used in areas with very high moisture or when water is visible in the area to be treated. The material may be used on all horizontal surfaces such as floor made of any material including tile, concrete, carpet, wood and other surfaces.

Dri-Remediation™ Carpet Powder (50071). Carpet Powder is designed for use in areas with light to moderate moisture or dampness visible in the carpet area to be treated. The material is designed to be used on all carpet surfaces. The formulation is non-staining and may be applied to any material.

Dri-Remediation™ Prevention Sachets (50070). Sachets are designed for use in new or remodel construction to prevent microbe growth and moisture build-up. The material is to be inserted into wall stud bays. This material is self-regenerative for the life of the product or structure.



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Our Technology

“Use of Nature’s Nanotechnology”

Dri-Remediation™ is composed of an admixture of natural and modified-natural material derived from the earth. Dri-Remediation™ dry powder is comprised of nano-constructs which spontaneously self-assemble to chemically bond to fungus, mold hyphae and spores, algae and/or bacteria. Dri-Remediation™ is derived from earth’s natural material which is highly hydroscopic. Although not used in Dri-Remediation™, the most universally known material of this type is lava which is a form of scoria from a geological perspective.

Scoriae are natural materials derived from earth’s rock, sand, dirt and dust. Scoriaceous material can be macroporous to mesoporous in porosity (porosity). Macroporous materials are large granular porous materials that can vary in particle diameter and/or mesh size.

Microporous material generally has pore sizes > 50 nm. Mesoporous materials have pore sizes from 2 to 50 nm. Both microporous and mesoporous structures are considered **nature’s natural nanotechnology**. Dri-Remediation™ uses both microporous and mesoporous size natural nanomaterials derived from the earth. Some natural material is modified by Dri-Remediation™ scientists for specific properties necessary for immediate and effective at inactivating microbes and/or their elimination. The natural nanomaterials in Dri-Remediation™, since they are derived from the earth, are environmentally friendly when returned to the earth.

One would ask, Why use nature’s nanotechnology? The reason is simple. Found naturally in the earth itself, these nanomaterials afford the means to deal with moisture and/or microbes with some very distinct advantages. Natural nanomaterial benefits derive from their small physical size (nano = 0.000000001 meters= 1 nm), which translates directly into an extremely large surface area. As will be explained later, 5 gm. of natural nanomaterial as used in Dri-Remediation™ has the surface area of 10 football fields, with 5×10^{20} reactive functional groups per 5 grams to chemically bond to moisture and microbes. This equates to over 10 functionally reactive bonding groups per square nm of surface area. This allows a small amount of material to have a significant action on moisture and/or microbes, an advantage never seen with conventional products. Dri-Remediation does not ABSORB water like a sponge but rather ADSORBS water and CHEMICALLY bonds to it. (By way of comparison, activated carbon, another scoriaceous material with pores (commonly used for odor



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prevention) has a surface area of only 1 football field per 5 gm. and it does not chemically bond water.)

Another unique advantage to some of nature's nanomaterials is their unique ability to spontaneously self-assemble. Nature's nanomaterials as used in Dri-Remediation™ come unassembled like a jigsaw puzzle. After contact with moisture, microbes and/or malodors the nanomaterials spontaneously self-assemble into a new 3-D network encasing and chemically bonding the material.

Dri-Remediation™ uses materials that are either naturally highly porous and hydroscopic or modified nanoparticulate. All materials are derived from scoria.

Dri-Remediation™ achieves excess water and mold elimination through the integration of 3 natural mechanisms of action: (1) absorption (as expected with any hydroscopic material); (2) adsorption (specific to the process of bonding and entrapment); and (3) as well as by natural bonding of water and mold by the high density of specific functional groups on amorphous unassembled nanoparticulate nanostructure subassemblies; these unassembled nanoparticulate structures undergo a natural process of spontaneous self-assembly upon contact with the material. This interaction results in a stabilized three dimensional cross-linked chemically bonded network.

Dri-Remediation™ uses the patent pending proprietary technology of Red Lion Scientifics, LLC.

Basic Properties of Dri-Remediation™

A total solution to the problem of moisture, microbe or malodor control comprises the following key elements most effectively found in Dri-Remediation™

Environmentally Friendly. The materials and method to be used for moisture, microbe or malodor elimination must be environmentally friendly in that they are not harmful to human or animal life or the environment.

Non polluting. Any materials used for moisture, microbe or malodor elimination must be non-polluting. This rules out any chemical or organic formulations that can have long term impacts on the environment.



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Non Toxic. The material used must be totally nontoxic for all animal and plant life. This also includes all microscopic and microbial species found in soil. By necessity this warrants that the materials used must be derived from inorganic sources, from the abundance of earth's natural resources.

GRAS. All materials used for moisture, microbe or malodor elimination must be Generally Regarded As Safe (GRAS). This means that chemists, physicists, and environmentalists at all levels of science and government all currently agree, without exception, that the materials used are generally regarded as safe and are currently classified as such.

Ultrahigh Efficiency. In order for a product to be effective at removal of moisture and microbe under the duration requirements and various levels of malodor products from accumulated material from microbe decay, it must exhibit efficiency in terms of microbe and malodor capture that meets and exceeds the requirement. This requirement is met through nanotechnology as described earlier.

Chemical Bonding. Only Dri-Remediation™ chemically bonds microbe upon contact. Others claim to bind but they do not chemically bond.

Green. In order to be truly "green" a material must be of the earth in its natural state or recyclable back to the earth not affecting its natural state. It is preferable to not require the breakdown of the material to return to its natural state.

Sustainable. In order for a material to be sustainable, it must be available on a continuous basis for generations to come. Although this term usually applies to organic based materials, it is also applicable to inorganic materials as well. For an inorganic (non-living) material, originally derived from the earth, to be sustainable it must upon return to the earth through recycling contribute back to it in an unaltered form to the total mass of inorganic material existing on the earth prior to its use. A sustainable inorganic material would fulfill those requirements and would not be destroyed, altered, or modified by its use. It would simply return to its original state and function in the biosphere as intended.

Product Application

No specific application requirements are necessary for using Dri-Remediation™ products. Each individual Product Data Sheet has instructions on application.