VINPOWER DIGITAL™
The Future of Digital Storage

WHAT MAKES THE M-DISC™ ROCK-LIKE?

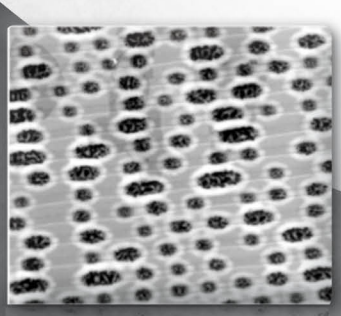
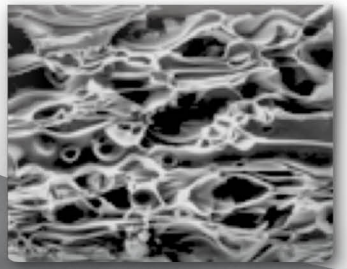
Rock-Like?

The phrase "rock-like" is used to describe the M-DISC™ data layer, yet the disc is obviously not made of rock. So why is this description appropriate? Is this more than a clever marketing ploy? The answer is yes, much more. The M-DISC™ data layer has several properties comparable to those of common rocks. The composition of the data layer, its morphology, and the changes it undergoes during the data-writing process all present intriguing parallels to rock.


Rocks are composed of inorganic materials that are typically oxides of metals and metalloids. Common compounds found in rocks include silicon dioxide, aluminum oxide, alumino-silicates, etc. Many more-complex compounds are also common, including elements such as carbon, nitrogen, potassium, calcium, iron and other metals, etc. All of these compounds are solid from well below room temperature to upwards of a thousand degrees Celsius in most cases, and they are all chemically stable against oxidation, the effects of water, and other corrosive or aggressive chemical environments.


The Inorganic Data Layer

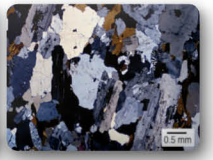
The M-DISC™ data layer has many of the same characteristics. It is composed entirely of inorganic materials and compounds including metals and metalloids. It contains several of the materials and compounds common to rocks including silicon dioxide and carbon. It is a solid from room temperature to upwards of 500°C, and it is stable in the presence of oxygen, nitrogen, water, and other deleterious chemicals that may be found in ordinary storage environments.

Data Layer Physical Structure

The M-DISC™ morphology, or physical structure, also has characteristics analogous to common rocks. It includes multiple layers of dissimilar materials, like common sedimentary and some igneous rocks. The comparison even makes sense on the microscopic scale, where the written M-DISC™ can be described as an aggregate of ordered, polycrystalline regions and amorphous or glassy regions. The etched "pits" in the M-DISC™ that hold the digital data are also like the void structures that can be found in many igneous rocks such as pumice or scoria.

Etching Data in Stone

Finally, the inorganic M-DISC™ data layer materials undergo physical change during the write process in the same way that rock materials change under the influence of heat and other geologic processes. When the data layer is irradiated by a focused laser, the intense heat thus generated causes the innermost layers to melt and to move away from the laser spot, creating a hole in the data layer as previously described. The materials found in rocks would react in a similar way to an intense heat source, melting, flowing or ablating away, in contrast with the organic dyes used in typical DVD-recordable discs, which would merely decompose under the same thermal conditions. Furthermore, when the melted portions of the M-DISC™ data layer cool after writing, the material surrounding the written voids forms a polycrystalline structure that is again reminiscent of the microcrystalline structure of many common rocks.

Permanent by Design

In summary, a comparison of the M-DISC™ data layer to natural stone is valid on many points. This is not by accident. The intent of the scientists and engineers who developed the M-DISC™ was to develop the modern, digital equivalent of engraving data, literally, in stone. The characteristics and features that enable a rock to survive for tens of thousands of years without a change were the inspiration behind the product. It isn't by chance that the M-DISC™ data layer is similar to a rock — **it's by design!**

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