



**AGM**

# **HYDRALOK™ ADVANCED DESICCANT**

A New Tool in the War on Moisture and Humidity

## **AGM CONTAINER CONTROLS**

Innovative Solutions for  
Environmental Control

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# HYDRALOK

## INTRODUCTION

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Moisture inside of modern military munitions housings can corrode or short circuit internal electronics, and fog optics systems, resulting in weapons failure during combat.

Unfortunately, the wide-ranging storage and deployment environments typical of military munitions serve to further compound moisture problems. Dew point levels fluctuate inside of munitions housings with varying temperatures and relative humidity (RH) to exacerbate condensation issues.

Moreover, the rough handling and sometimes improvised storage conditions in operational theaters of war can cause significant wear to these munitions, creating the potential for internal components to break or come apart.

AGM's HydraLok™ Advanced Desiccant provides a single solution to both moisture and durability concerns regarding advanced military munitions. A dense, shapeable, composite desiccant, HydraLok provides superior moisture adsorption through a wide range of temperatures and is strong enough for use as a structural design component.



# A NEW SOLUTION TO AN OLD PROBLEM

## PUT MOISTURE IN LOKDOWN

A common method for lowering RH inside of munitions enclosures, such as missile nose cones, is to place some amount of desiccant, such as silica gel, inside. The desiccant will adsorb water vapor from the air in the enclosure, protecting the electronics from corrosion and short circuiting.

To properly provide for the moisture demands of advanced military munitions a desiccant must provide both a high adsorption rate and maintain its capacity through a range of temperatures. AGM's HydraLok™ Advanced Desiccant more than meets these requirements.

### HYDRALOK™ ADVANCED DESICCANT ADSORPTION RATES

In a side by side comparison to HydraLok, traditional beaded 4A molecular sieve can adsorb approximately 2.5 grams of water per cubic inch. However, the beaded molecular sieve requires a bag or housing to hold the beads, as well as additional mounting hardware, which results in lost adsorption capacity.

Under the same conditions, HydraLok will adsorb 3 grams of water per cubic inch and requires no special bag, housing, or hardware. Rather, HydraLok can be used in a project as a structural component, or be directly epoxied or bolted to other components in an assembly. This significantly increases the adsorption power of HydraLok within the same space as traditional desiccants.

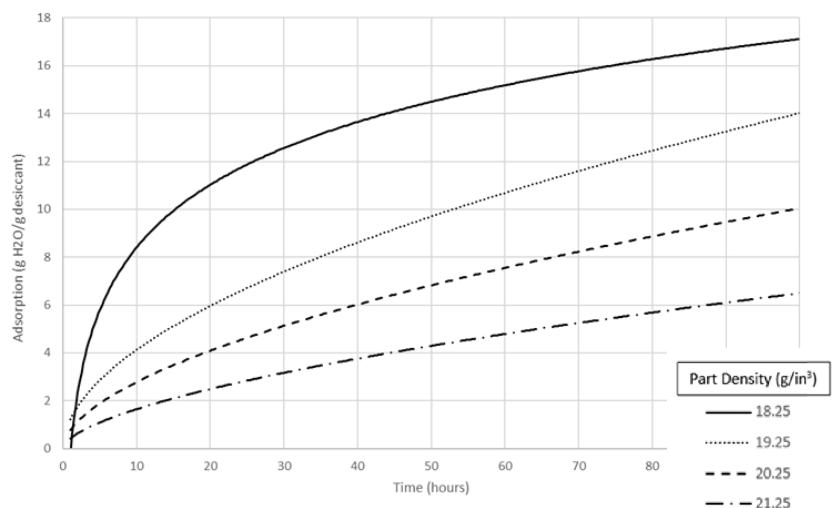
### HYDRALOK™ ADVANCED DESICCANT OPERATING TEMPERATURE RANGES

**Recommended Standard:**  
-54°C and 85°C (-65.2°F and 185°F)

**Maximum Serviceable:**  
150°C (302°F)



### PART DENSITY ADSORPTION ANALYSIS



# SUPERIOR DURABILITY

IN ANY SHAPE YOU NEED

If a specified desiccant cannot uphold necessary durability requirements, it can break or “leak,” sending debris throughout an enclosure and potentially damaging system components.

AGM’s HydraLok desiccant is a thermoplastic and desiccant composite material consisting of 4a molecular sieve and a polymer binder. These two materials are combined to imbue AGM’s HydraLok™ Advanced Desiccant with **three important attributes:**

01

## SUPERIOR DURABILITY

HydraLok™ Advanced Desiccant is significantly more durable in comparison to other desiccants. Through its unique manufacturing process, HydraLok may be machined as necessary for most projects, and maintains its rigidity up to 150°C.

02

## COMPLEX GEOMETRIES

The composition of HydraLok desiccant enables it to be shaped in the factory to many different form factors. This makes HydraLok ideal for projects with demanding space and shape constraints, or used as a structural component to help streamline designs.

03

## NON-DUSTING

In vibration tests, HydraLok desiccant has proven to exceed the Type II desiccant dusting requirements of MIL-D-3464E Section 3.10.2, which states “When tested as specified in 4.6.6, Type II desiccant shall produce not more than ½ milligram of dust, regardless of bag size.”

In compression tests of sample rods measuring 1 inch tall with 0.5 inch<sup>2</sup> cross sections, AGM’s HydraLok™ Advanced Desiccants performed as follows:

## COMPRESSIVE FORCE AT FAILURE (IBF)

Samples at -54°C	Samples at Room Temp	Samples at 85°C
1: 3151.94	4: 2269	7: 2488.61
2: 5078.17	5: 2161.96	8: 2442.04
3: 2523.39	6: 2291.71	9: 2193.65



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## CONCLUSION

The evolution of modern military munitions involves sophisticated electronics and optics equipment that is highly sensitive to the damaging effects of moisture, and yet must be constructed to withstand the rigors of long-term storage and operational theaters alike.

AGM's HydraLok™ Advanced Desiccant solutions are tailored to each unique application's size requirements and tuned to provide superior results.

LEARN MORE ABOUT AGM'S HYDRALOK™  
ADVANCED DESICCANT SOLUTIONS WITH A  
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