



## Technology Brief — Getac Salt Fog Anti-Corrosion Technology

# Enabling a Long-Lasting Service Life with Getac’s Salt Fog Anti-Corrosion Technology

## Salt Fog Corrosion Effects and Test Conditions

Salt is one of the most corrosive chemical compounds in the world, and can be found in the air, in the ground, and in oceans, lakes and rivers. Most materials on Earth, metal in particular, will become corroded by salt when exposed to open air for extended periods of time. This is especially true in coastal regions, where the effects of corrosion are worst. As a result, most “rugged” PCs are in fact very susceptible to salt fog corrosion, especially products with magnesium alloy cases.

Salt fog testing for military products generally follows procedures described in MIL-STD-810G 509.4 Salt Fog, with a vapor spray salt solution of 5% salt water introduced in a test chamber to create a salt fog environment. Testing usually includes 48 hours of exposure followed by another 48 hours of drying time. However, two successive cycles of 24-hour exposure / 24-hour drying should prove to be a more challenging scenario for this particular test. The latter test method was therefore selected to analyze the corrosion resistance of Getac’s rugged products.

In order to prevent salt fog corrosion damage, the design of a rugged PC must address corrosion in two key areas: 1) **magnesium alloy surface treatment**, and 2) **mechanical design**.

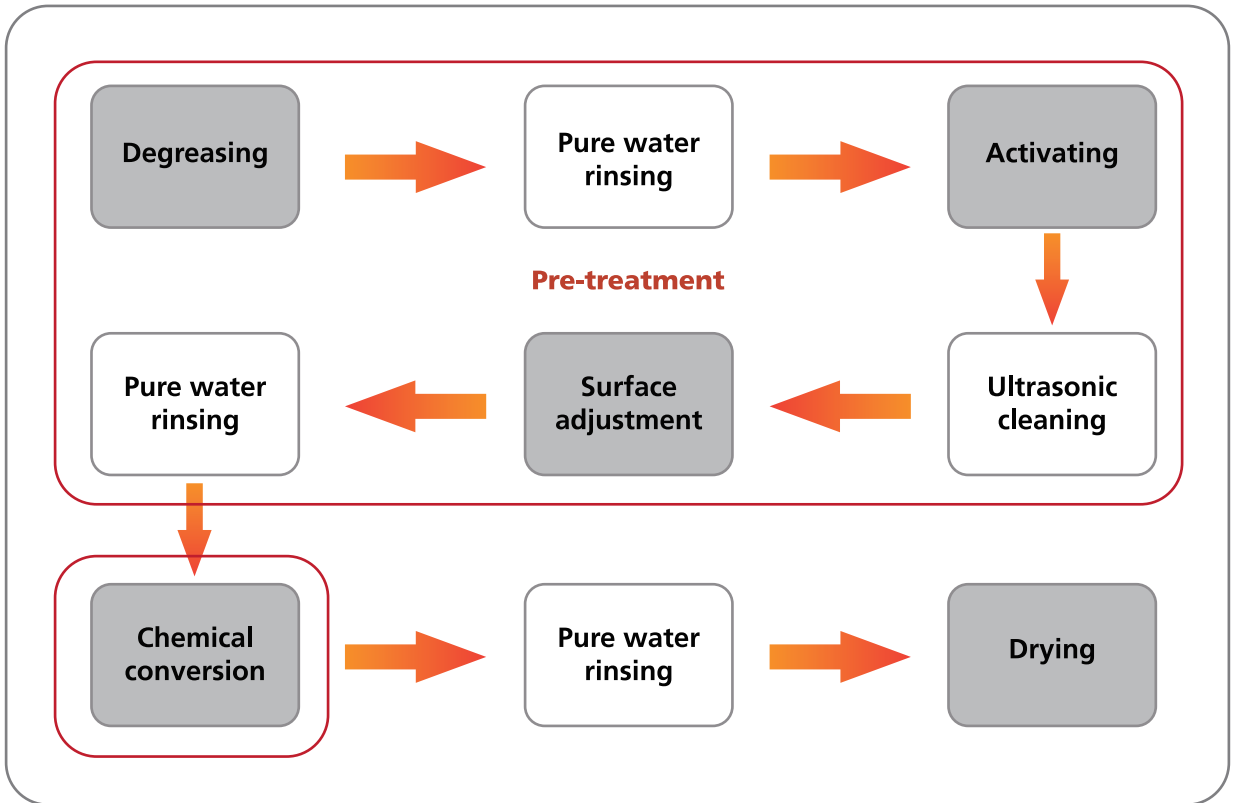
Magnesium surface treatments include chemical conversion and painting. Getac’s magnesium factory has created a chemical conversion treatment system (MGCC) (Figure 1) that includes a special pre-treatment to clean and prep die-cast magnesium surfaces before the chemical conversion process is applied. Our current

chemical conversion treatment is not limited to plain phosphate, it also contains calcium phosphate, vanadate and other salts. We proceeded with Part C of the MIL-STD-810G Salt Fog Test (24hr exposure / 24hr drying for 2 cycles) with chemical conversion coating without addition of paint, and only reported 1% corrosion area following the test (RN6-ASTM D610 compliant). This compares favorably to normal chemical coatings that are only able to attain a 24-hour RN6 level.



### Salt Fog Testing Machine

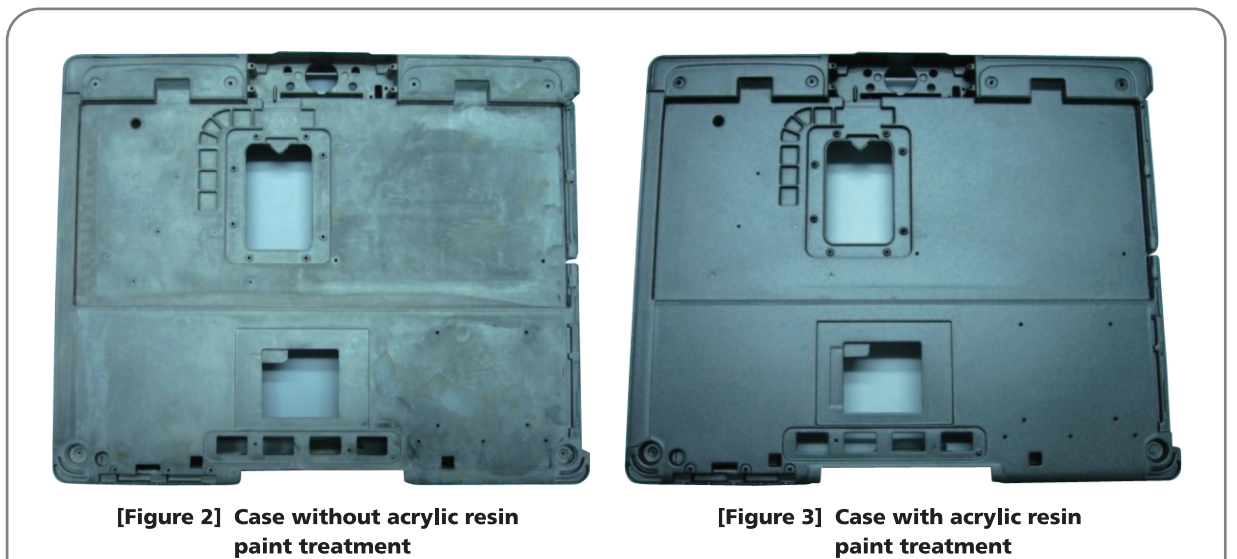
*Surface treatment for magnesium alloy is a critical component in the prevention of salt fog corrosion. Getac’s exclusive magnesium alloy surface treatment exceeds anti-corrosion levels of common surface treatments found in today’s market place.*



[Figure 1] Getac Magnesium Chemical Conversion (MGCC) Treatment System

## The addition of paint specially-formulated for magnesium alloy produces military-grade corrosion protection

After applying Getac’s special acrylic resin paint, MGCC treated magnesium parts revealed no evidence of corrosion when tested. The painting process requires hi-temp baking, and consists of four layers: two primers & two top coats. This paint is specifically formulated for magnesium parts that have undergone MGCC treatment, and allows these parts to be completely resistant to salt fog corrosion test conditions specified in the MIL-STD-810G standard.



[Figure 2] Case without acrylic resin paint treatment

[Figure 3] Case with acrylic resin paint treatment

*Magnesium components that undergo chemical conversion treatment only exhibit slight signs of corrosion, and fully conform to military salt fog standards with an extra paint treatment specifically designed for magnesium alloy.*

## Getac's outstanding mechanical design transcends IP65 water-resistance levels and features industry-leading drainage technology

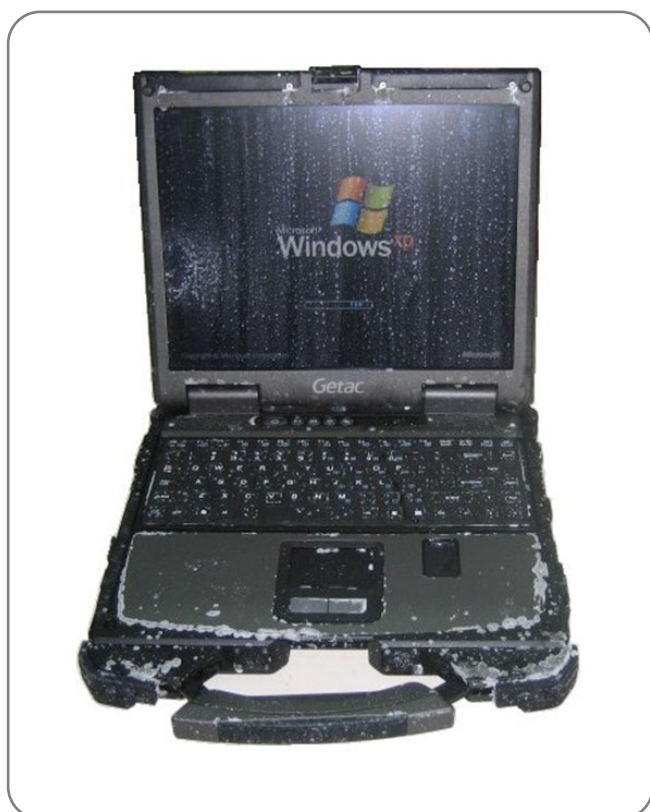
In terms of mechanical design, IP65 water-resistance level alone is not enough to successfully pass a salt fog test. The salt fog fallout rate is measured over 48 hours of exposure, hence superior water-resistant mechanisms are required to surpass IP65 levels and completely prevent salt water from penetrating into the system and causing system damage.

For keyboard drainage, cable in/out structures and microstructures throughout the entire machine are required to prevent salt deposits caused by standing salt water. This is effective in preventing structural damage from clogging or binding within the mechanical structure, and also helps avoid electrical malfunction due to corrosion.

The Getac B300 has successfully completed the MIL-STD-810G salt fog test and is proven to be fully operational under extremely demanding high salinity environments. With industry-leading mechanical design and superior corrosion-resistant treated parts, Getac is pleased to report that its rugged products are able to achieve exceptional levels of durability.

### Value to Customers

- Exceptional magnesium alloy surface treatment and specially-formulated coating for all magnesium components that enables long term operation under harsh, highly-corrosive salt fog environment.
- Innovative sealed port design prevents salt fog from entering the system and causing electronic component failure.
- Industry-leading microstructure drainage technology protects against corrosion-causing salt fog accumulation on internal components.



**[Figure 4] B300 After Removal from Test Chamber**

*The picture above shows the salt fog adhesion status of the Getac B300 after undergoing two successive cycles of 24 hours exposure and 24 hours of drying (MIL-STD-810G Salt Fog Test)*



**[Figure 5] Post-Salt Fog Test B300 After Water Wash**

*After extensive testing, the B300 exhibited no evidence of corrosion on its magnesium components after two successive 24hr exposure/24hr dry cycles MIL-STD-810G and a complete water wash procedure was conducted.*

# Getac

*Distributed by*  
**TERRITORIAL SUPPLIES, INC.**  
PO Box 474 \* Council, ID 83612  
800-221-7702 \* 208-253-0036  
208-253-0085 fax  
[www.territorialsupplies.com](http://www.territorialsupplies.com)

## Getac EUROPE

Germany  
TEL: +49 8928 890 488

Getac (UK) Ltd.  
Nedge Hill  
Telford TF3 3AH, UK  
TEL: +44 1952 207 231

## Getac NORTH AMERICA

Getac Inc.  
20762 Linear Lane,  
Lake Forest, CA 92630, USA  
TEL: +1 949 699 2888  
Toll Free: +1 866 GO GETAC  
(1 866 464 3822)

## Getac TAIWAN

Getac Technology Corporation  
5F, Building A, No. 209,  
Sec. 1, Nangang Rd.,  
Nangang Dist., Taipei City  
11568, Taiwan, R.O.C.  
TEL: +886 2 2785 7888

## SALES CONTACT

North America  
[Ruggedsales@getac.com](mailto:Ruggedsales@getac.com)

South America  
[SouthAmericasales@getac.com](mailto:SouthAmericasales@getac.com)

EMEA  
[EMEAsales@getac.com](mailto:EMEAsales@getac.com)

Asia Pacific  
[APACsales@getac.com](mailto:APACsales@getac.com)

## MARKETING CONTACT

Global  
[Globalmarketing@getac.com](mailto:Globalmarketing@getac.com)

North America  
[NorthAmericaMarketing@getac.com](mailto:NorthAmericaMarketing@getac.com)

South America  
[SouthAmericaMarketing@getac.com](mailto:SouthAmericaMarketing@getac.com)

EMEA  
[EMEAmarketing@getac.com](mailto:EMEAmarketing@getac.com)

Asia Pacific  
[APACmarketing@getac.com](mailto:APACmarketing@getac.com)

## SERVICE CONTACT

America Service Center  
[Support@getac.com](mailto:Support@getac.com)  
TEL: +1 866 EZ GETAC  
(1 866 394 3822)

Europe Service Center  
[UKsupport\\_getac@getac.com](mailto:UKsupport_getac@getac.com)  
TEL: +44 1952 207238

Asia Pacific Service Center  
[APACsupport\\_getac@getac.com](mailto:APACsupport_getac@getac.com)  
TEL: +86 512 57367777 ext.5740