

# VANISPERSE® AT

## The powerful organic additive for lead-acid batteries

Borregaard LignoTech produces various grades of lignin-based products which are key sustainable additives for the lead-acid battery industry. With a global presence and multi-plant locations, Borregaard can ensure reliable supply of consistent quality products to customers worldwide.

**Vanisperse AT** is an organic battery additive developed to significantly increase cold high rate discharge performance and high temperature life while simultaneously increasing NAM utilisation and reducing water loss in lead-acid batteries.

**Vanisperse AT** possesses qualities aimed at enabling batteries to perform above expectations.

In commercially manufactured SLI batteries, tested at an independent battery laboratory **Vanisperse AT** demonstrated:

- Improved cold crank - assurance that CCA ratings will be met consistently
- Improved battery life - particularly under high temperature service conditions
- Decreased water loss - contributing to increased battery life
- Improved NAM utilisation – leading to material cost reduction

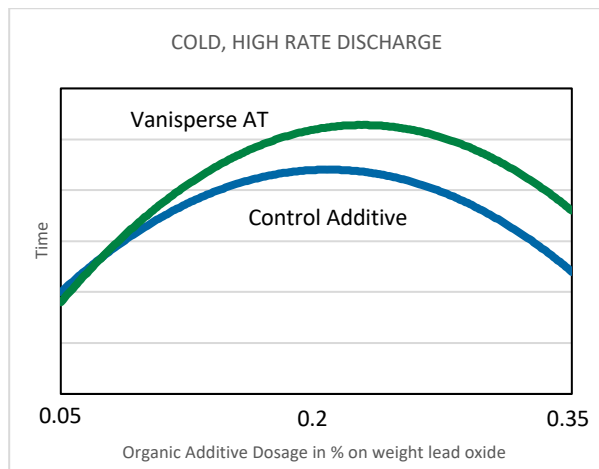


Figure 1: Cold and High rate discharge at -18°C



### Commercial battery trials

Two commercial battery trials were run to validate the performance of **Vanisperse AT**. The trials were conducted under controlled conditions with batteries that were not customised in any way, other than the reduction of NAM by 8% for specific testing meant to evaluate the effect of such reduction. The Control batteries for all tests were formulated with **Vanisperse A**. The highlights of the results are presented in Figure 2. **Vanisperse AT** was shown to enable an 8% to 38% increase in SAE J240 life at 41°C, and a 17% to 32% increase in SAE J2801 life at 75°C.

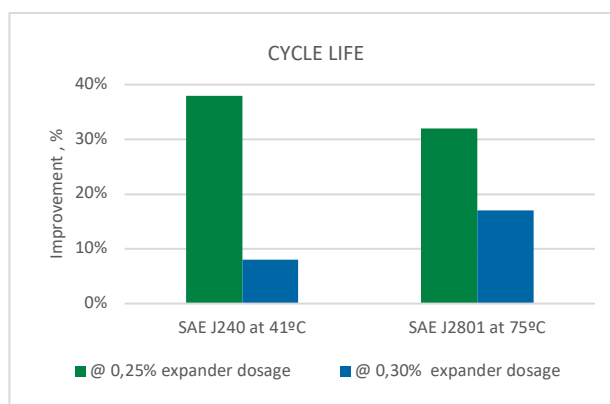


Figure 2: Cycle Life relative to industry standard Vanisperse A with nominal NAM content.

In the SAE Group 65 study, the results of which are shown in Table 1, the Vanisperse AT test groups with 8% less NAM comfortably exceeded the 30 second discharge limit. Overall, the mean **Vanisperse AT** discharge times were 20% longer than the control.

**Vanisperse® AT** batteries were found to perform better at 0.25% than at 0.30% dosage for groups with reduced NAM content. In this battery design, the savings in NAM cost would be approximately \$0.75 per battery.

Life tests demonstrated a 21% to 28% reduction in water loss in SAE J240 at 41°C and a 31% to 34% reduction in water loss in SAE J2801 at 75°C, see Figure 3.

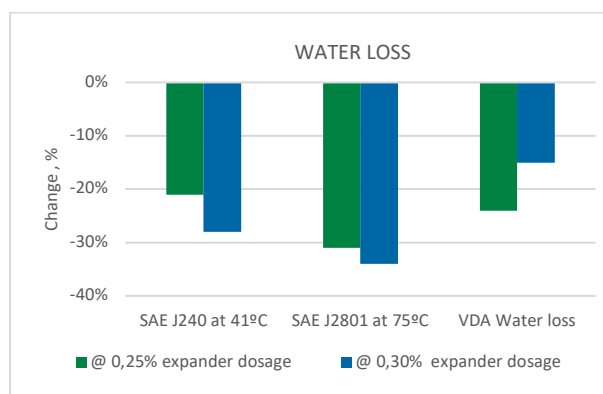


Figure 3: Relative Water Loss relative to industry standard Vanisperse A with nominal NAM content.

GROUP 65 BATTERIES: SAE CCA 650 A A @-180C, TIME TO 7.2 V, SECONDS					
NAM Content	Dosage	min required (seconds)	Control with Vanisperse A	Vanisperse AT	Improvement
Nominal	0.25%	30	60	66	10%
	0.30%		62	68	10%
8% Reduction	0.25%		39	52	32%
	0.30%		44	48	8%

Table 1: SAE CCA650AA test with Group 65 Batteries

Logo  
(please respect margins)

[www.vanisperse.com](http://www.vanisperse.com)

---

[www.vanisperse.com](http://www.vanisperse.com)

Page 3 of 3

Contact: [www.borregaard.com](http://www.borregaard.com)  
Borregaard AS  
Hjalmar Wessels Vei 10,  
1721 Sarpsborg

Product name: Vanisperse DCA

Revision No.:  
Revision Date: 14.01.20

**Use of Information disclaimer:** *The information given here is based on our best knowledge and we believe it to be true and accurate. However, Borregaard AS, Norway does not warrant or guarantee in any manner whatsoever, express or implied, including the warranty of merchant-ability or fitness for the end user the accuracy, completeness, reliability or suitability of the information and procedures listed herein and will not be responsible for any loss or damage including, without limitation, indirect or consequential loss or damage resulting from their use. Any reliance you place on such information is therefore strictly at your own risk.*

**Choice of Law:** *Construction of the disclaimers above and resolution of disputes thereof are governed by the laws of the Kingdom of Norway.*