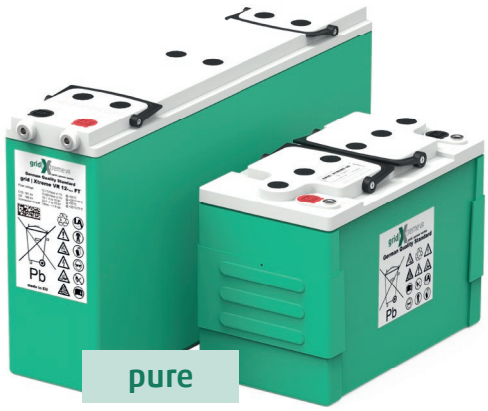
HOPPECKE
POWER FROM INNOVATION

grid | Xtreme VR

MAXIMUM PERFORMANCE WITH GOOD CYCLABILITY



The HOPPECKE grid | Xtreme VR pure lead battery can also be used in applications with frequent charging and discharging cycles and display its specific advantages. The potential of this technology is to maximize the number of electrodes installed, also known as thin plate technology. The resulting increase in the electrochemical reaction surface for a given volume allows the use of active masses, which are generally reserved for cycle-resistant and long-life batteries. grid | Xtreme VR batteries are therefore not only extremely powerful, but also characterized by a long cycle life.

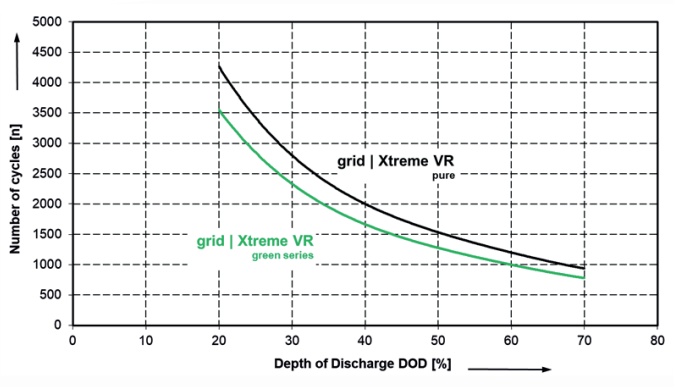
The charging and discharging processes that occur permanently in cyclic applications and the associated transformation of the active masses usually lead to electrolyte stratification in AGM batteries and also place maximum stress on the battery housing material due to volume change.

A reduced performance of the battery system with aging and the impairment of the electrochemical behavior of the outer cells affected by the deformation of the battery vessel are the consequences. grid | Xtreme VR pure lead batteries were therefore equipped with the ESS technology (**E**nhanced **S**tability **S**tandard) operationally proven at HOPPECKE.

The risk of electrolyte stratification in cyclic applications and the associated reduction in discharge performance and cycle life could thus be safely counteracted.

Furthermore, the patented and innovative Safeguard-Tec for Top Terminal variants (optionally available) offers optimum dimensional stability over the entire service life of the battery. Inhomogeneities in the cell compound of a battery block, which can occur particularly under cyclic load and/or at elevated ambient temperatures and impair performance, are eliminated. This increases the reliability of the entire battery system and also leads to a longer cycle life.

Service life in cycles and Depth of Discharge



Performance features for cyclic applications:

Performance features		grid | Xtreme VR (pure)	grid | Xtreme VR (green series)	Customer benefits
Design		Top- and Frontterminal	Top- and Frontterminal	High flexibility and compact installation
Temperature range		-40°C up to 55°C	-35°C up to 50°C	Suitable for high temperature applications
Shelf life @ 20°C		up to 24 months	up to 24 months	Easy storage
Design Life	20°C	15 years	15 years	---
	30°C	10 years	8 years	Lower TCO's
Charging current		5 – 40 A/100Ah (fast charging capability)	5 – 40 A/100Ah (fast charging capability)	Fast charging capability
Float charge voltage		2.285 Vpc (+/-0.5%)	2.285 Vpc (+/-0.5%)	---
Boost charge voltage		2.40 Vpc	2.40 Vpc	
Cycle ability	30% DOD	2800	2330	
	50% DOD	1500	1300	
	70% DOD	940	780	
Max. depth of discharge in cyclic applications		70% DOD	70% DOD	---
Energy density (E10 – 1.80 Vpc, 20°C)		≥ 95 Wh/ltr.	≥ 93 Wh/ltr.	Low space requirement
Power density (P10min – 1.60 Vpc, 20°C)		≥ 220 W/ltr.	≥ 215 W/ltr	Low space requirement
Safeguard-Tec		Optional for TT batteries	Optional for TT batteries	High dimensional stability throughout battery life and improvement of electrical performance, especially under elevated temperature and cyclic load conditions.*
Fully automated, digitized manufacturing processes		Yes	Yes	More flexibility and common parts due to parallel connection (up to 10 strings at 48V)
Flammability class acc. UL 94		V0	V0	More safety due to higher fire classification
Measuring point for impedance measurements		Available	Available	Simple and precise condition determination after installation and regular maintenance

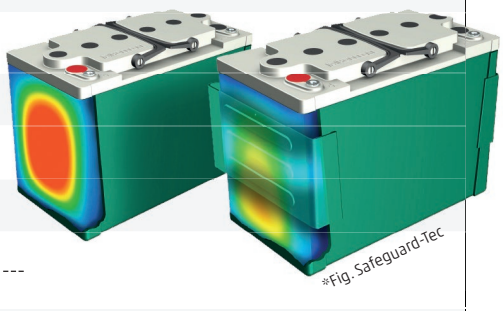


*Fig. Safeguard-Tec

All of our cells and batteries should be installed, commissioned and operated in accordance with:

- HOPPECKE Operational Manual / Recommendations / Instructions
- International Standard IEC 62485-2 Safety requirements for secondary batteries and battery installations
- Regional / National / Local Standards for the Environment

Optimal environmental compatibility - closed material cycle in certified recycling system

HOPPECKE Baterie Polska Sp. z o.o.
ul.Logistyczna 10
63-006 Śródka
Poland
Fon: +48 61 64 65 000
Fax: +48 61 64 65 001
E-Mail: sbo@hoppecke.pl

HOPPECKE Batterien GmbH & Co. KG
Bontkirchener Straße 1
59929 Brilon
Germany
Fon: +49 (0) 2963 61-374
Fax: +49 (0) 2963 61-270
reservepower@hoppecke.com

grid Xtreme VR

green series

06.2022