

Prolong Operation Time of VRLA Batteries by Using High Performance Valve Technology



**18 ASIAN BATTERY
CONFERENCE & EXHIBITION**
Sep- 2-5 2025

Abertax® Technologies Ltd.
KD MERZ

ABERTAX BOOTH H37

Prolong Operation Time of VRLA Batteries by Using High Performance Valve Technology



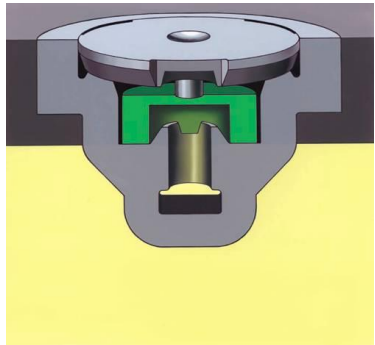
Presentation agenda

- Construction, Advantages Features
- Test results ,Lab and Field
- **OPzV cells** (waterloss)
- **CD valve**
 - Contructions
 - VW test TL-82506:2012
- Summary Advantages
- Valve Range

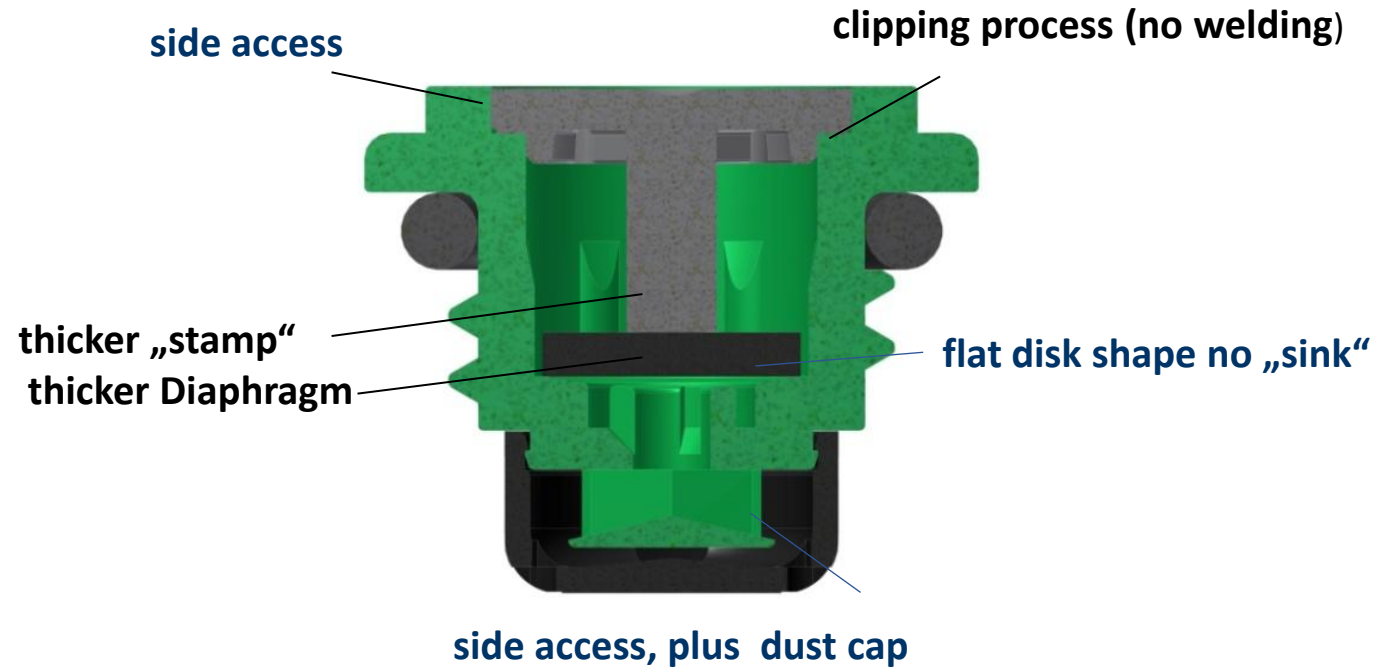


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VALVE DESIGN



Standard



ABERTAX



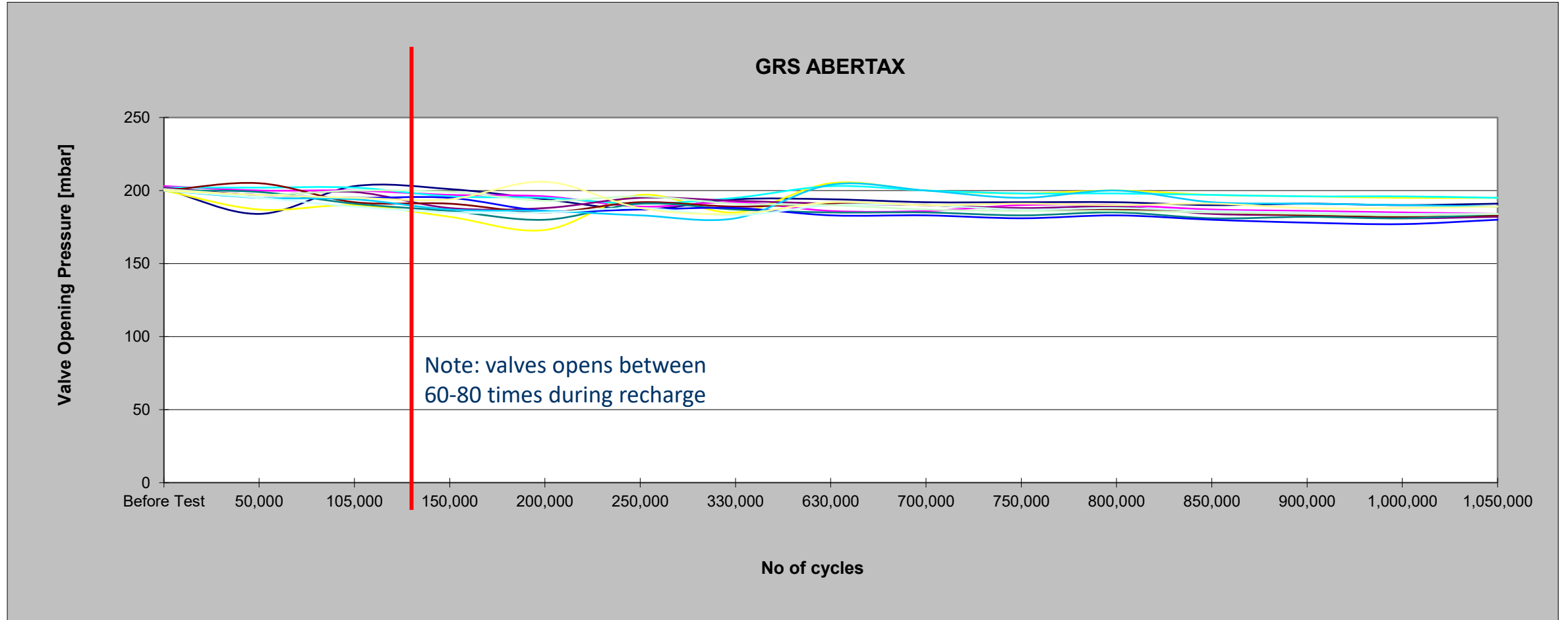


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FEATURES - cycle life

8 Valves (180 – 200 mbar) on a test bench

Test pressure range max 220 mbar – min 150 mbar

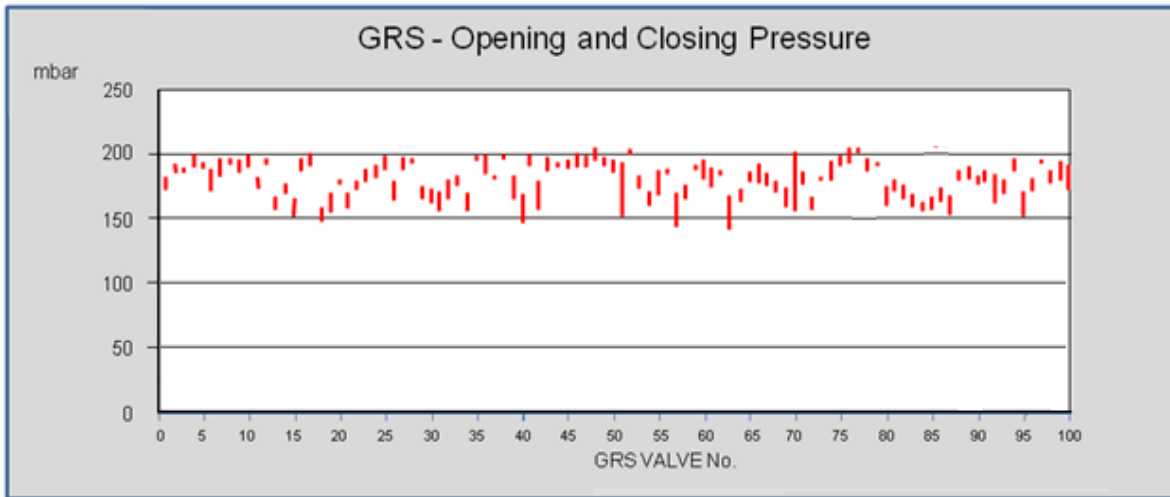


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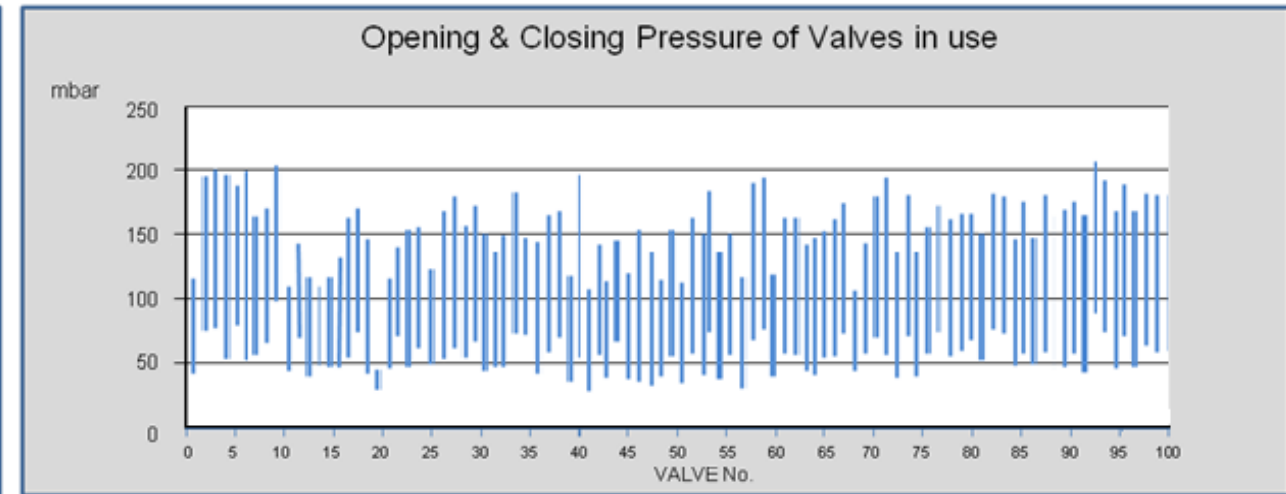


FEATURES - Opening and Closing Pressure

100 valves from production tested for open and closing pressure
Each single line = one single valve



ABERTAX: pressure range within **50 mbar**

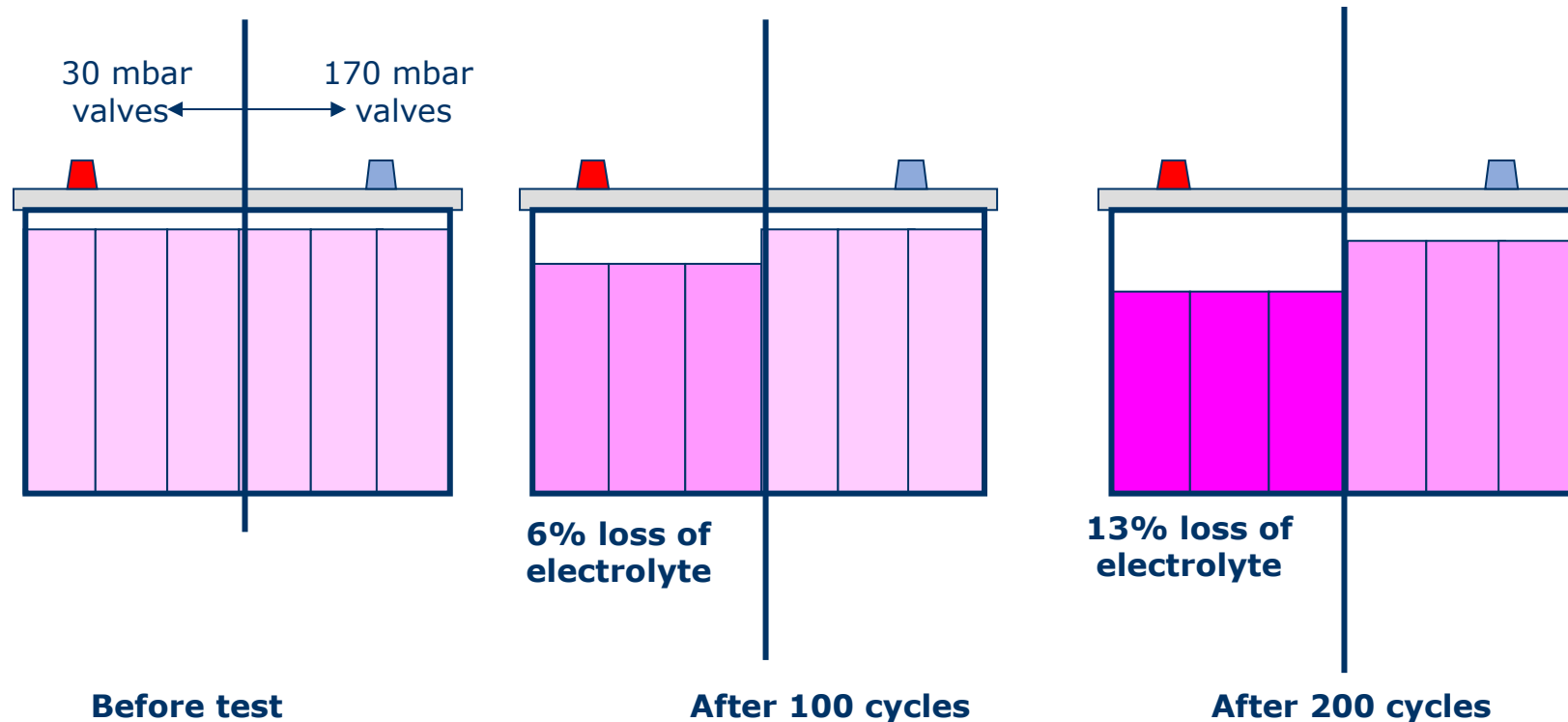


others : (considered as one of the best in field)
pressure range within **150 mbar**

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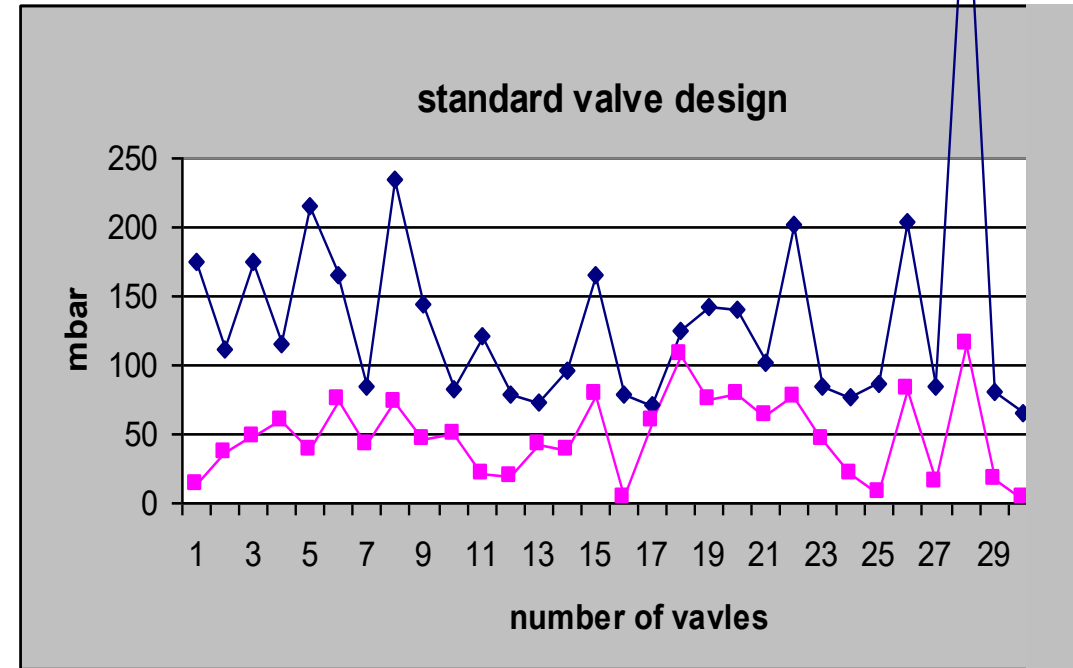
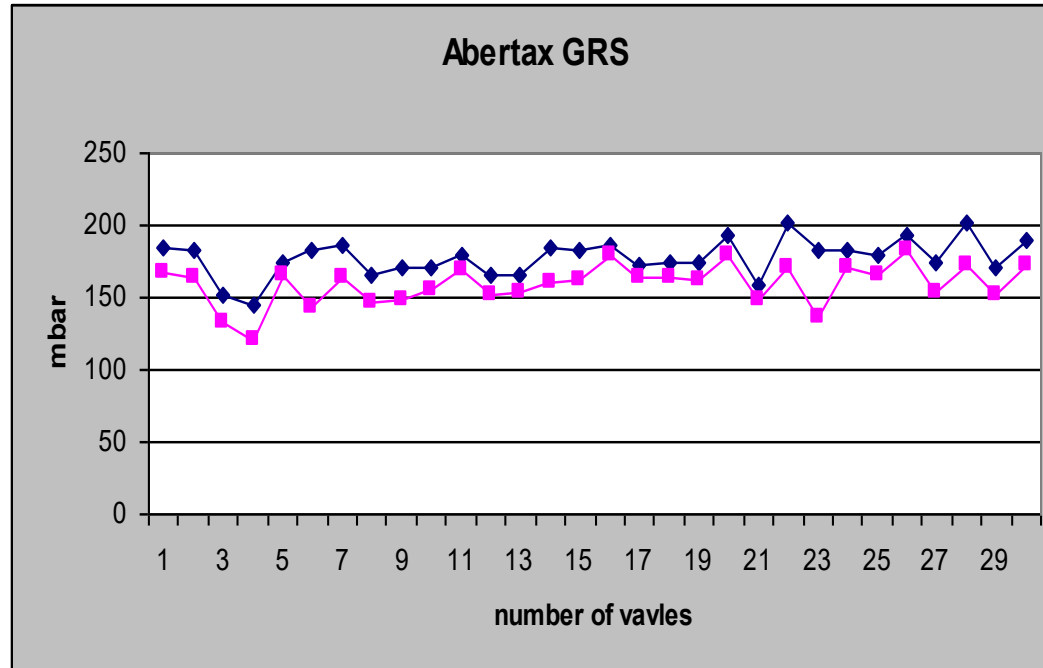
Waterloss at different valve pressure





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FIELD TEST - after 6 months heavy duty operation



— opening pressure
— closing pressure

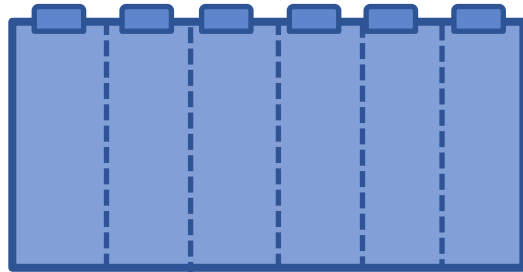
6 months operation in electric boat at higher temperature (up to 50°C), frequent deep-discharge and overcharge



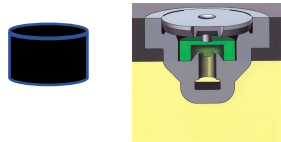
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Test procedure to investigate the impact on cycle life at various VRLA battery qualities:

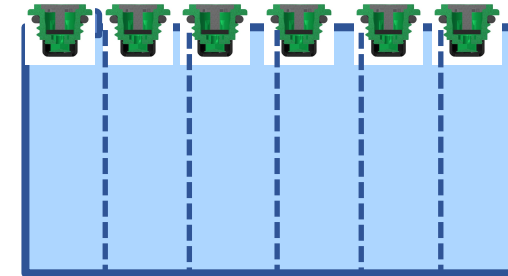
- VRLA Batteries (GEL/AGM) where received from the market in different qualities (cycle life), all > 40 Ah
- On 2 (out of 4 batteries) the standard valve where replaced with the ABERTAX valve
- All batteries on cycling test: 80% DOD IUI recharge



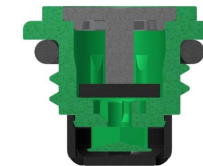
Standard valve
rubber hut, bunsen, or
membrane



Low cycling batteries: 150 -200
Medium cycling batteries: 200-350
High cycle life batteries: > 400

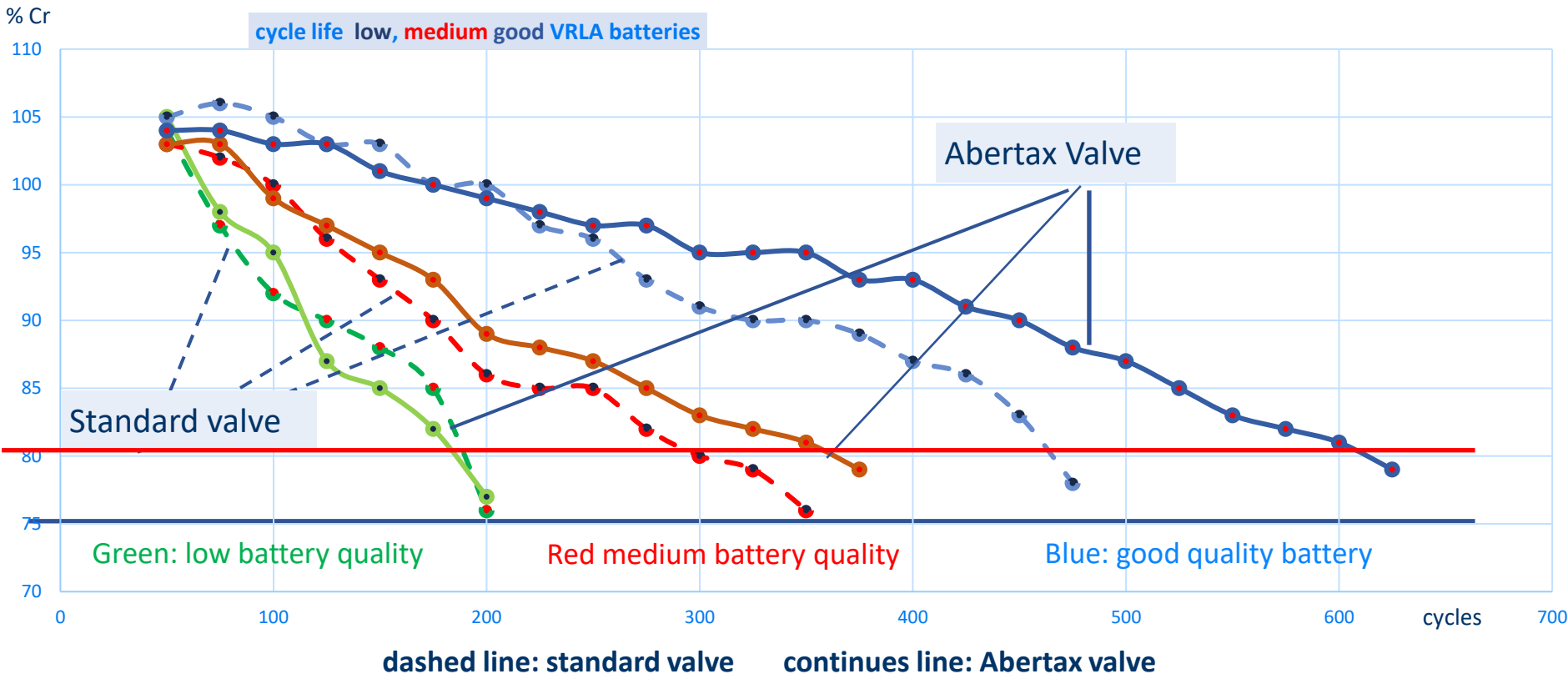


Abertax vavle

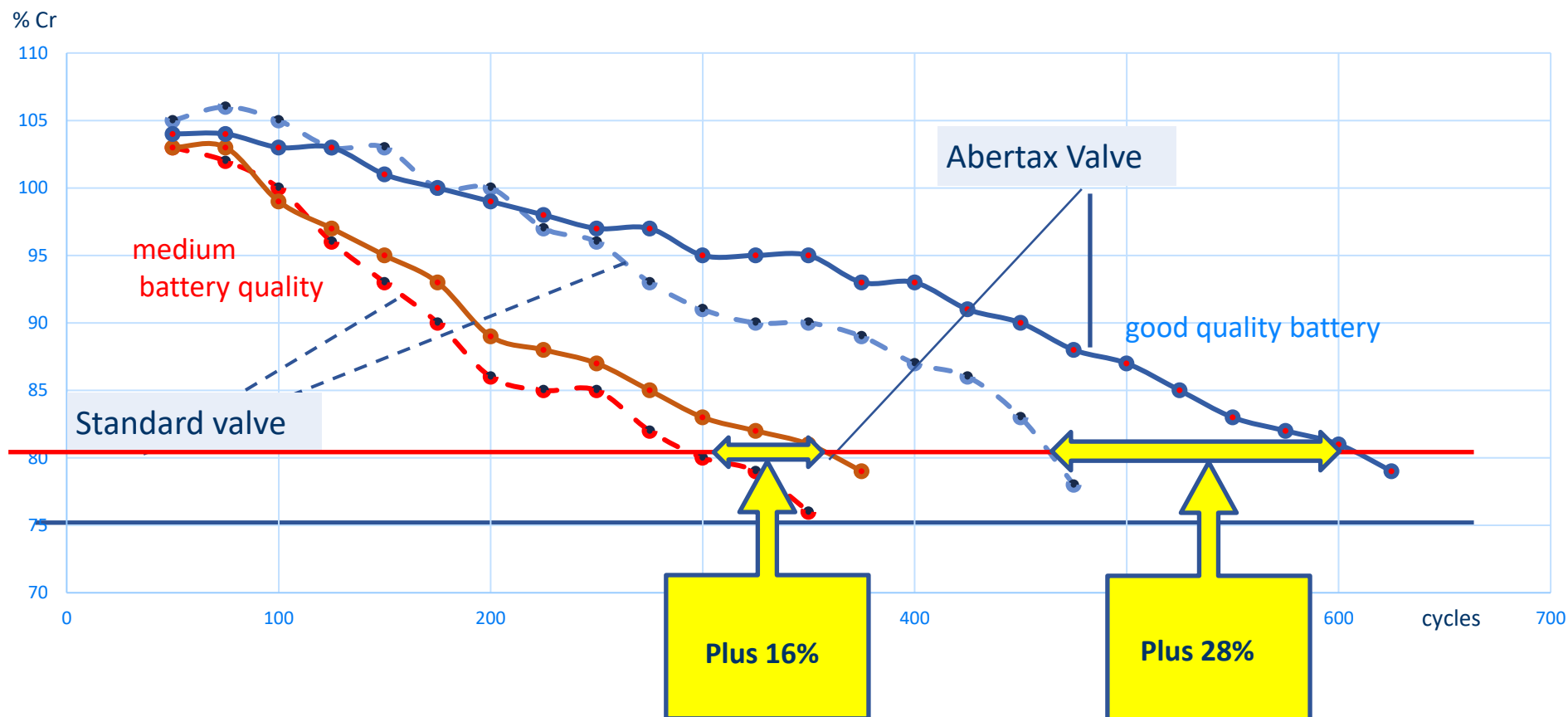




Impact of safety valve on cyclelife for VRLA batteries of different qualities (cycles)



Impact of safety valve on cyclelife for VRLA batteries of different qualities (cycles)

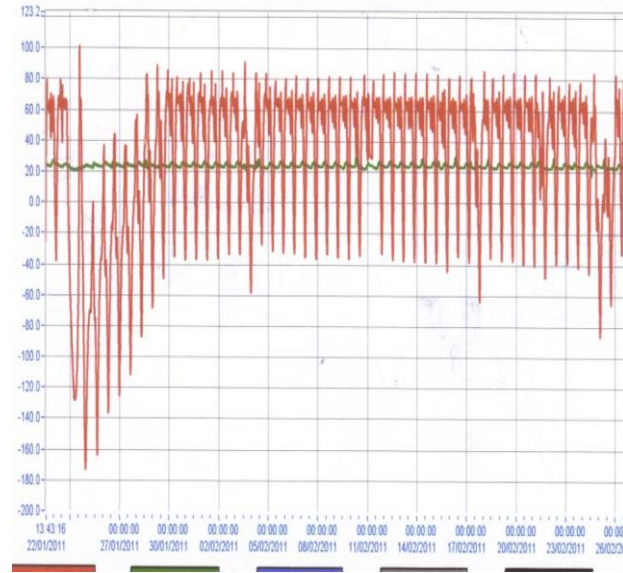


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Importance of selection of ideal valve pressure

Opening pressure of the valve 80 mbar



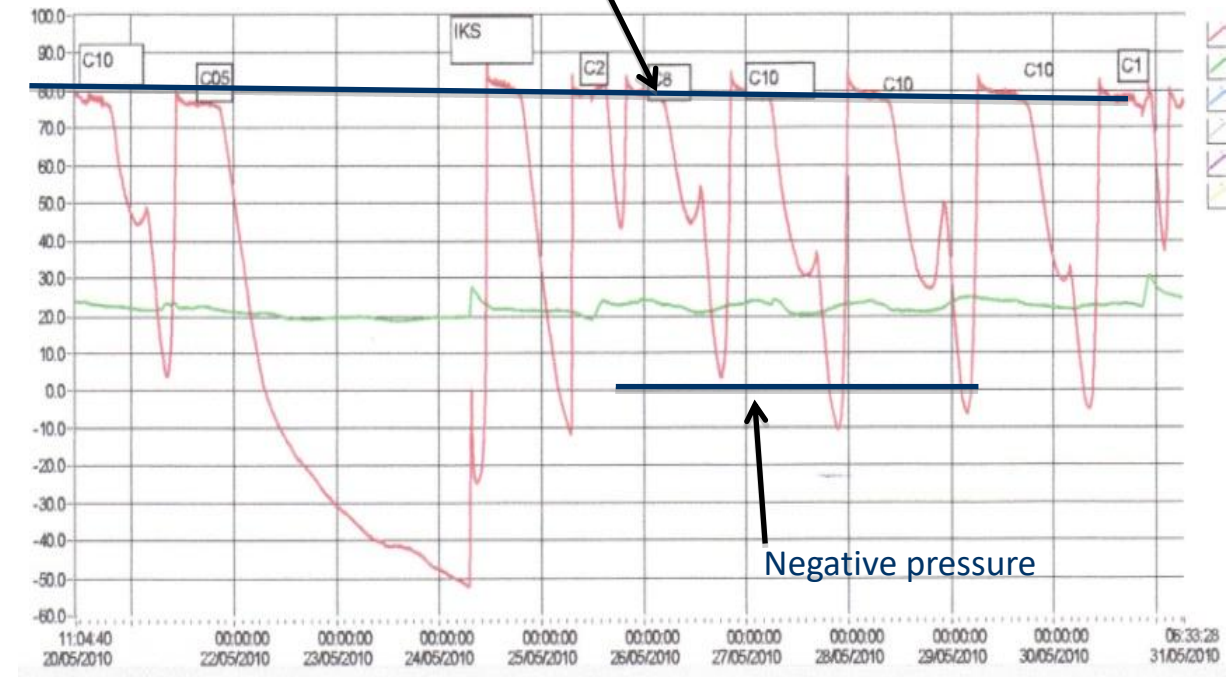
Cycling test of OPzV (GEL) cells with 80mbar valves for one month

- Valve is open during 50% of the recharging time
- Internal pressure occasionally negative

30 hours charge and discharge

12- 14 hours recharge time; 65 % of this time > 80 mbar

OPEN VALVES ! - GASSING !



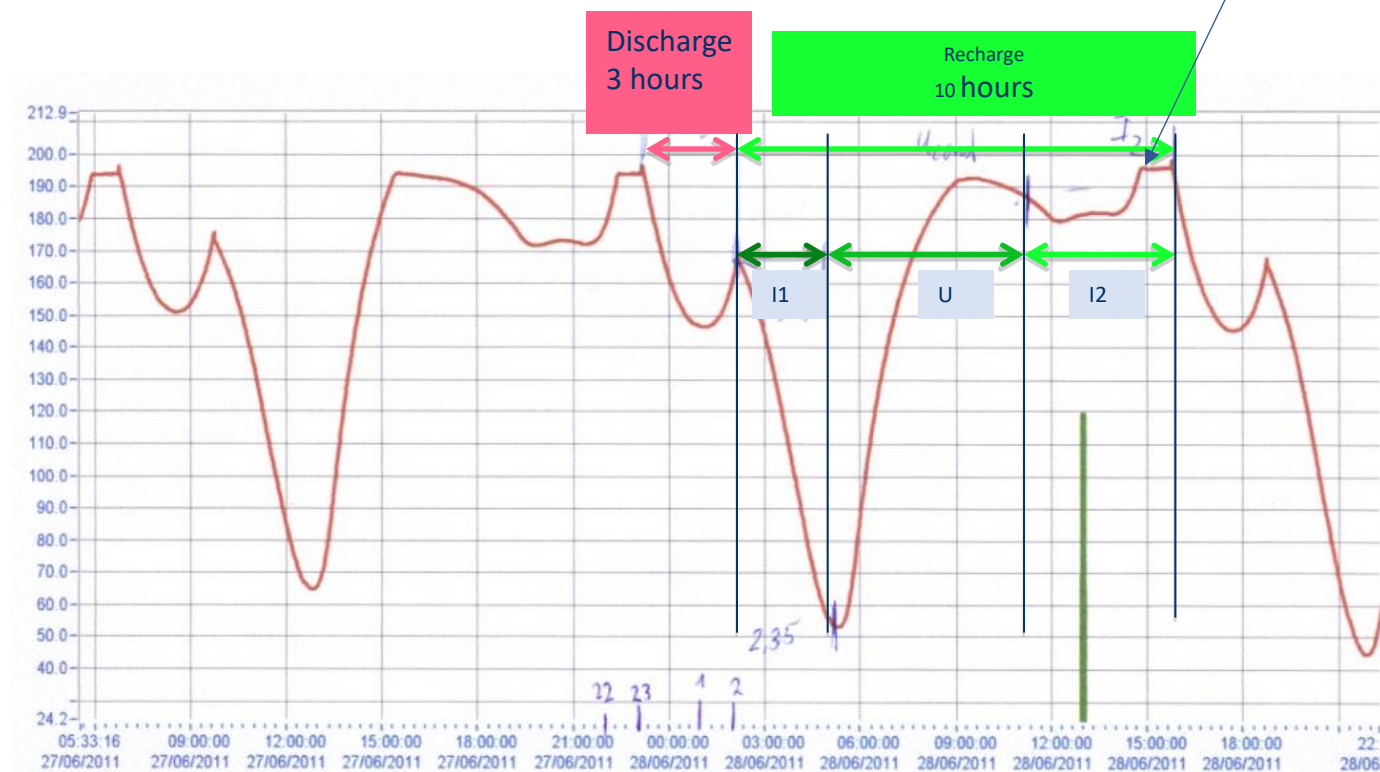
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Waterloss at different valve pressure

Opening pressure of the valve : 200 mbar

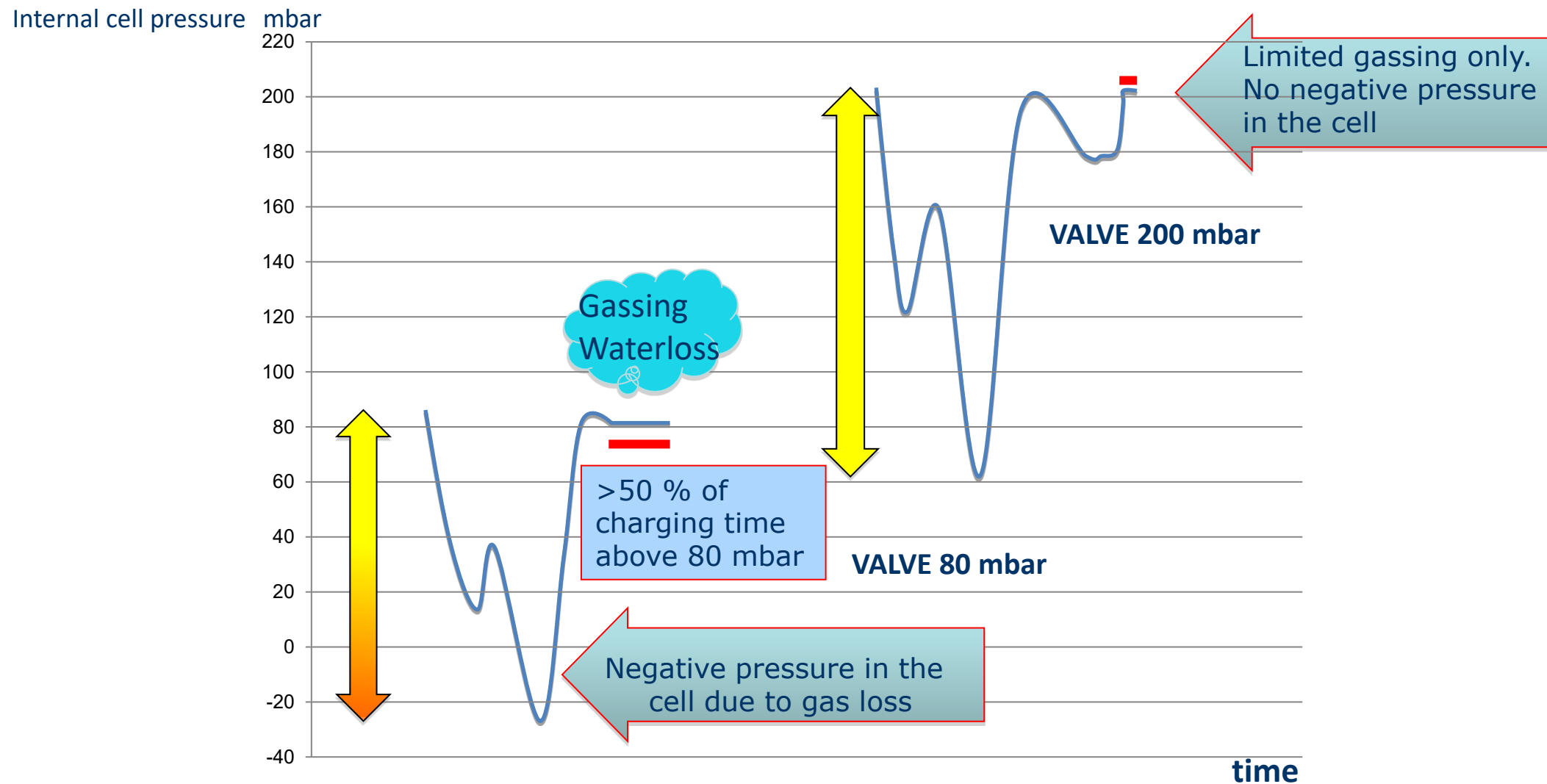
Only very low valve opening time



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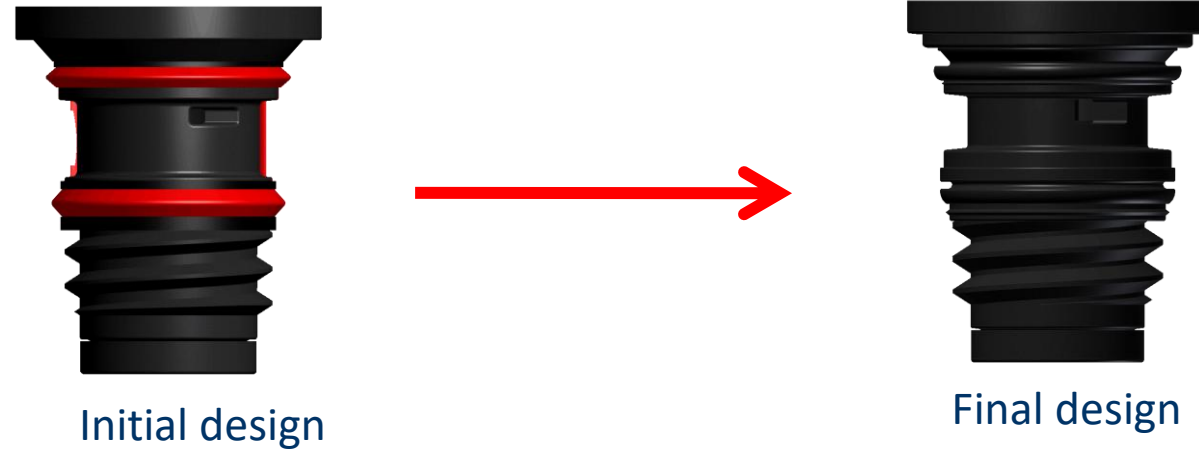
Waterloss at different valve pressure





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Special Valve (Central Degassing) for VR Automotive Batteries (AGM and GEL)



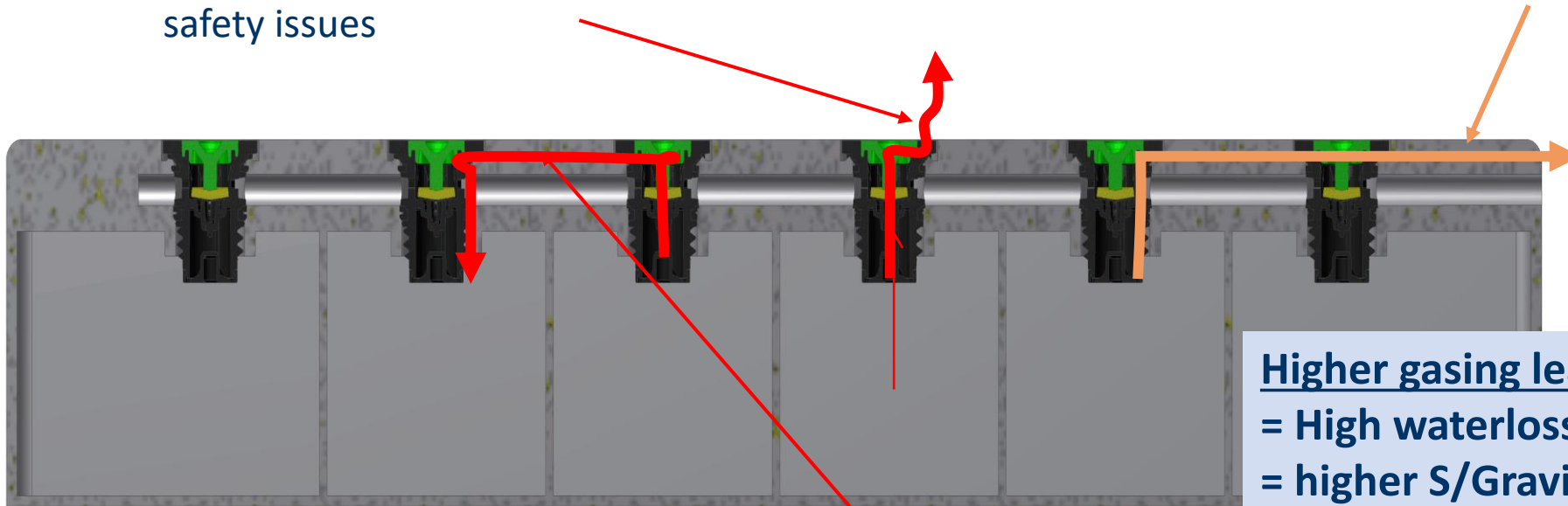
It took the Design and Engineering Departments 23 different intricate mould/material design changes to arrive at the final desired product to comply with VW Specifications (**VW-TL 82506:2012**).

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2. Poor sealing to top; gas (and electrolyte) can escape between valve and lid. safety issues

1. Normal gas flow; as it should be



Higher gasing leads to:

- = High waterloss
- = higher S/Gravity
- = Unbalanced charging
- = Cells drying out fast

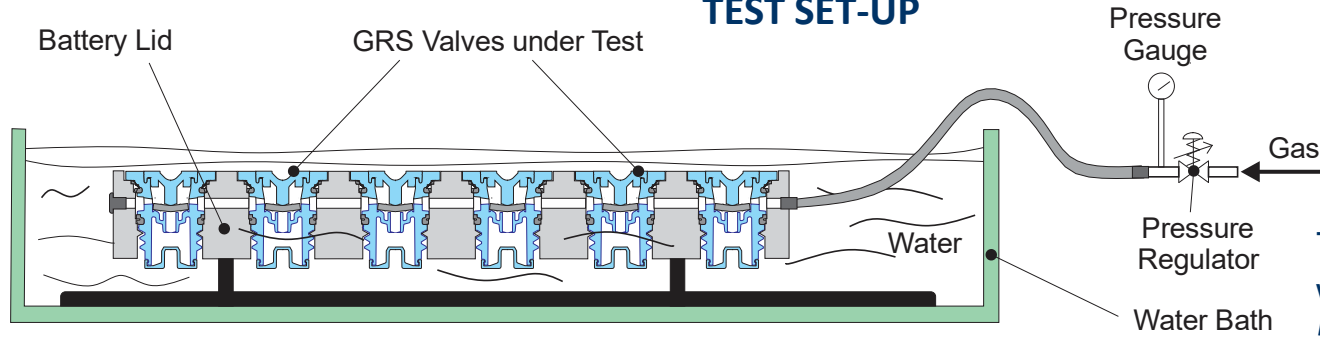
3. Poor sealing down to cells; gas can penetrate into other cells. This can lead to Performance and life-time issues.



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Meets VW temperature endurance test (90°C for 10 weeks as per VW-TL 82506:2012)

TEST SET-UP



For this Test, 18 ABERTAX GRS M8-CD Valves and 18 random-picked valves from the market were placed in respective Battery Lids (3 lids for Abertax valves and 3 lids for the random valves).

The set-up is shown on the left, with the assembled lids immersed in water. Gas at 200 mbar was fed through the Kamina lid channel for 5 minutes, and any gas leaks noticed near and around the valves.

RESULTS:

		ABERTAX GRS M18-CD Valves																	
week		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
2		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

		Random Valves from MARKET																	
week		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r
2		✓	✓	✓	✓	✗	✓	✗	✓	✓	✗	✓	✗	✓	✓	✓	✓	✗	✓
4		✓	✗	✓	✓	✗	✗	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓
6		✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
8		✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
10		✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

- ✓ No Leaks
- ✗ Leaks present

The lids were placed in an oven at 90°C, and left for 10 weeks. Checked for leaks, every week. Results are shown here every 2 weeks, for a better visual presentation.

ABERTAX Valves show no leaks even after 10 weeks, but several random valves show several leaks. In some cases, even after 1 or 2 weeks!

Such results were achievable by ABERTAX after 23 design/material changes were carried out to the Valve Design.



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Summary - Advantages

1. **Materials specially selected to withstand harsh battery acid environment, temperature and corrosive gases.**
2. **No air enters the battery cells even in the presence of negative pressure in cells.**
3. **Meets IATA requirements.**
4. **All Abertax GRS Valves are 100% individually function tested and guaranteed.**
5. **A further 8% pre-dispatch tests carried out on each and every batch.**
6. **No welding involved in the valve design – eliminating any possible distortion.**
7. **All individual parts produced in-house – providing strict and excellent quality control at all stages of production.**
8. **Acts as a fire-barrier to the inside of the cells.**
9. **Very close tolerances in opening and closing pressures.**

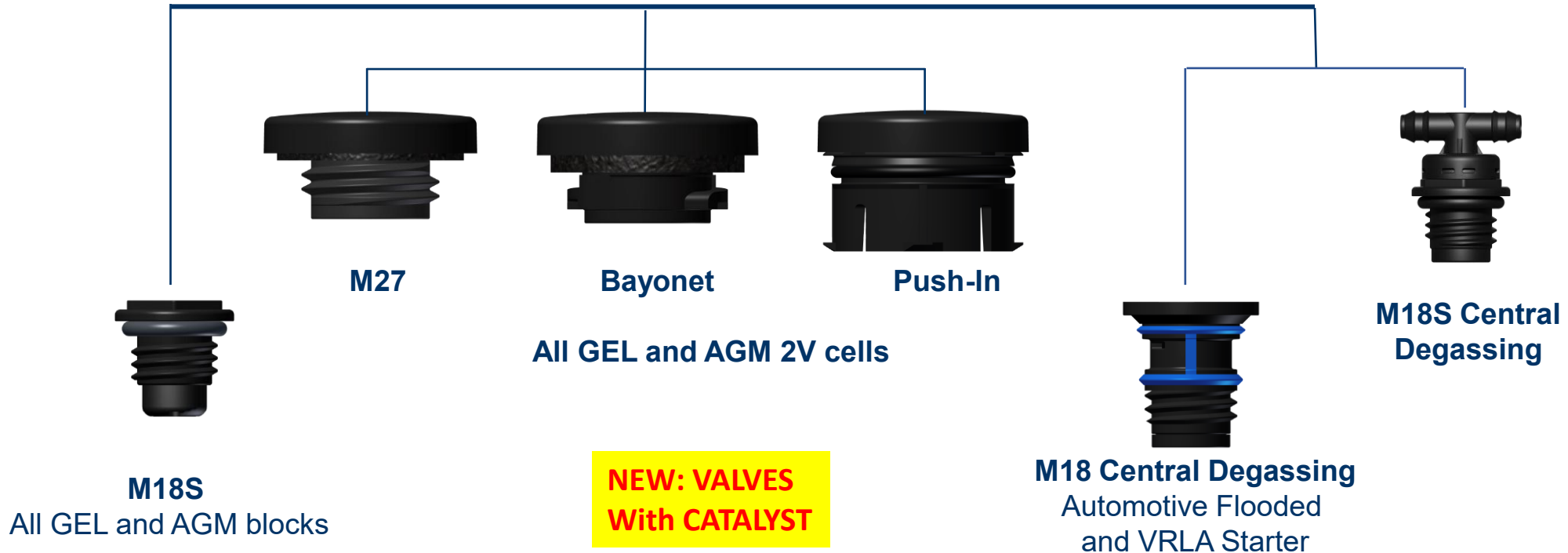


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Product Range

ABERTAX GRS

SAFETY VALVE FOR VRLA BATTERIES – patented



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Thank you

**For further informations
please see us at booth
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