DRY CELL AND STORAGE BATTERY JOINT STOCK COMPANY
PINACO
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VILAS 573

TEST REPORT

1. NAME OF SAMPLE: Lead acid starter battery
2. Manufacturer & address: Dry Cell and Storage Battery Joint Stock Company (PINACO)
   321 Tran Hung Dao st., Dist. 1, Ho Chi Minh City, VIETNAM
3. Lab testing: Own lab
4. Trademark: JP
5. Type / model:

   N120 12V 120Ah

   Period of test: Day of starting test: 12 Jan 2020; Day of ending test: 15 Feb 2020
6. Test items: 03
7. Remarks:

   Throughout this report a comma is used as the decimal separator.

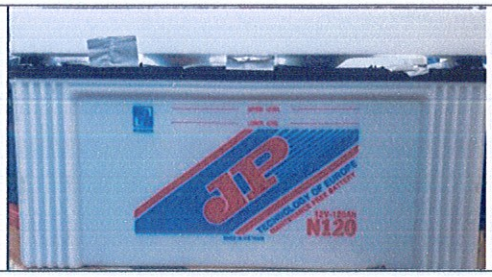
Type	Items
N120	5 h rate capacity test $C_{5,e,}$,Reserve capacity (RC) check $C_{r,e,}$ Cranking performance test – Cold cranking ampere (CCA) test, Charge acceptance test, Dimensions of batteries.

8. Testing according to JIS D 5301: 2006
9. Test conclusion :

The tested items are 5 h rate capacity test $C_{5,e,}$,Reserve capacity (RC) check $C_{r,e,}$ Cranking performance test – Cold cranking ampere (CCA) test, Charge acceptance test, Dimensions of batteries.

The results of the tested items comply with the relevant requirements of the standards.

- Photos & marking:

N120			

- Testing and requirement:

JIS D 5301: 2006			
Cl.	Requirement – Test	Result	Verdict

	Testing and requirements		
9.5.1	**Dimensions:**		
	The external dimension show in table External dimension mm Type: N120 (115F 51); Overall height (max): 257; Container height: 206÷213; width: 177÷182; length: 500÷505	External dimension mm Type: N120; Overall height (max): 255; Container height: 209; width: 180; length: 502	p
	Dimensions of the positive terminals		p
	Type: N120; ϕ: (mm): 19.2 ÷19.5; h: (mm): 17 ÷ 20	ϕ: (mm): 19,36; h: (mm): 17,70	p
	Dimensions of the negative terminal		p
	Type: N120; ϕ: (mm): 17.6 ÷17.9; h: (mm): 17 ÷ 20	ϕ: (mm): 17,70; h: (mm): 17,62	p
9.5.2.	**Capacity test**		
a	Reserve capacity (RC) check $C_{r,e}$		**P**
	The battery shall be placed in a water bath at a temperature of 25°C±2°C. The water surface shall be 15 mm to 25mm below the upper surface of the battery. The distance between batteries and also the distance to the wall of the bath shall be at least 25mm. After the completion of charging according to 9.4.2 and between 1h to 5h lapse, confirm that the temperature of the electrolyte of either cell in the		

	cente position is 25 °c ÷2 °c.Then The battery shall be discharged with the current of 25A ± 1% until the terminal voltage falls to 10,50V±0,05V. The duration t (h) of the discharge shall be recorded Record the electrolyte temperature T°c at the end of discharging, and calculate the effective reserve capacity $C_{r,e}$ by the following formula: $C_{r,e}$=t [1-0,009(T-25)] (min)		
	$C_{r,e} \geq C_{r,n}$	**N120:** $C_{r,n}$ =180 min, $C_{r,e}$ = 257 min	p
9.5.2. b	5 h rate capacity test $C_{5,e}$		**P**
	The battery shall be placed in a water bath at a temperature of 25°C±2°C. The water surface shall be 15 mm to 25mm below the upper surface of the battery. The distance between batteries and also the distance to the wall of the bath shall be at least 25mm. After the completion of charging according to 9.4.2 and approximately 1h lapse, confirm that the temperature of the electrolyte of either cell in the cente position is 25 °c ÷2 °c.Then The battery shall be discharged with the current of 5 h rate current I5 until the terminal voltage falls to 10,50V±0,05V. The duration t (h) of the discharge shall be recorded Calculate the 5 h rate capacity $C_{5,e}$ by the following formula: $C_{5,e}$=I_5 x t (Ah)		
	$C_{5,e} \geq 0.95\ C_{5,n}$	**N120:** $C_{5,n}$ =96 Ah, $C_{5,e}$ = 106	P
9.5.3	**Cranking performance test**		
a	**Cold cranking ampere (CCA) test**		**P**
	After the completion of charging according to 9.4.2 and approximately between 1h to 5h lapse, the battery		

	shal be place in a cooling chamber at a temperature of –18°c ± 1°c for a minimum of 24h or under the temperature of the electrolyte of either cell in the centre position has reached – 18°c ± 1 °c. The battery shall then be discharged within 2 min after the cooling with nominal cold cranking current I_{cc} for 30 s as show in table 1 and table 2. This discharging current shall be kept constant to within I_{cc} ± 0.5% wile discharging. The terminal voltage 30 s from the start of diacharging shall be recorded. After the cold cranking ampere test, the battery is left for 20s ±1 s. The duration t (s) of discharging is recorded the battery is discharged with the discharge current of $0.6I_{cc}$ until the voltage falls to 6V. This discharging current shall be kept constant to within 0.6 I_{cc} ± 0.5% while discharging.		
	$U_{10s} \geq 7,5V$ $U_{30s} \geq 7,2V$ $t_{6V} \geq 40$ (optional)	**N120:** U_{10s} = 7,78V, U_{30s} = 7,65V;	P
9.5.4	**Charge acceptance test .**		**P**
a.	**Charge acceptance test 1.**		
	The battery shall be placed in a water bath at a temperature of 25°C±2°C. Then the battery shall be discharged with 5 h rate current I_5 for 2.5h. The battery shall be cooled at a temperature of 0°C±1 °C for a minimum of 20h or until the temperature of one of the middle cells has reached 0°C±1 °C. At this temperature of 0°C, the battery shall be charged at a constant voltage of 14,40V ± 0,10V. After 10min, the charging current I_{ca} shall be recorded	N120: I_o = 12 A;	
	$I_{ca2} \geq I_o$	N120: I_{ca} = 17.8 A	P

12	**Marking of the polarity of terminals**		P
	Batteries shall carry the marking of polarity, at least of the positive terminal		P
12.1	The marking of positive polarity shall take the form of the symbol "+" either on the upper surface of the positive terminal or on the lid adjacent to the positive terminal.		P
12.2	If the negative polarity is also marked, the marking shall take the form of the symbol "-" either on the upper surface of the negative terminal or on the lid adjacent to the negative terminal.		P

SIGNATURE	**DONGNAI STORAGE BATTERY ENTERPRISE** **MANAGER** CHI NHÁNH CÔNG TY CỔ PHẦN PIN ẮC QUY MIỀN NAM XÍ NGHIỆP ẮC QUY ĐỒNG NAI Nguyễn Văn Toàn