Concorde Battery Corporation

2009 San Bernardino Road
West Covina, California, USA 91790

RG-624

24 VOLT 24 Ah, VALVE REGULATED, LEAD-ACID, AIRCRAFT BATTERY

DECLARATION OF DESIGN PERFORMANCE

TO THE REQUIREMENTS OF

RTCA DO-293A and IEC 60952-1

Applications: Engine Starting and Emergency Power
NOTE: Applications may not be a complete list of all applications for this battery type.

The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export-controlled information

Characteristic	RTCA DO-293A IEC 60952-1	Requirement/Performance	Test Report / Reference
Description	The RG-624 is a 24 volt, valve regulated lead acid battery designed for engine starting and emergency power. The battery assembly contains two MB12-22B monoblocks connected in series. Each MB12-22B consists of six 2 volt cells connected in series. The monoblocks are constructed of high impact polypropylene. The monoblocks are housed within a fuse-coated aluminum container and cover. The battery hold down is incorporated into the container housing. Two perforated vent areas are machined into the container for ventilation. The RG-624 is equipped with an MS3509 connector. The electrolyte is a sulfuric acid and water solution and is absorbed within the battery plates and separators. There is no free electrolyte. See Material Safety Data Sheet for hazardous material identification and precautions. The RG-624 is electrically identical to the RG-224, electrical testing conducted on the RG-224 is considered representative of the RG-624. Many environmental test results from the RG-224 are also considered representative of the RG-624 due to similarities in material and construction.		
Format	IEC 60952-2	Concorde Drawing No. RG-624	
Connector	IEC 60952-2	The RG-624 is fitted with a Type Q terminal conforming to MS-3509.	
Mass		23.6 kg Max (52 lbs)	
Charging method	IEC 60952-1, 4.3	Constant potential at 28.25 V	
Any auxiliary requirement:		None	
Ventilation	DO-293, 1.9 IEC 60952-2	Two perforated vent areas machined into the container for ventilation	
Flammability	IEC 60952-2	Fire Resistant	
Spillability		Non spill	
Electrical Performance			
Rated Capacity (C1)	DO-293, 2.2.2 IEC 60952-1, 5.1.1	24 Ah	
Capacity at –18°C	DO-293, 2.2.3 IEC 60952-1, 5.1.2	15 Ah when discharged at the C1 rate.	
Capacity at –30°C	DO-293, 2.2.4 IEC 60952-1, 5.1.3	10 Ah when discharged at the C1 rate.	
Capacity at +50°C	DO-293, 2.2.5 IEC 60952-1, 5.1.4	24 Ah when discharged at the C1 rate.	
Power Rating +23°C	DO-293, 2.2.6.1 IEC 60952-1, 5.2.1.1	Ipp = 1025 A Ipr = 650 A	
Power Rating -18°C	DO-293, 2.2.6.2 IEC 60952-1, 5.2.1.2	Ipp = 725 A Ipr = 500 A	
Power Rating -30°C	DO-293, 2.2.6.3 IEC 60952-1, 5.2.1.3	Ipp = 575 A Ipr = 400 A	

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Rapid Discharge Capacity at 23°C	DO-293, 2.3.1 IEC 60952-1, 5.3.1	13 Ah when discharged at 10 times the C1 rate to 10 volts.	
Rapid Discharge Capacity at -30°C	DO-293, 2.3.2 IEC 60952-1, 5.3.2	5 Ah when discharged at 10 times the C1 rate to 10 volts.	
Charge Retention	DO-293, 2.4 IEC 60952-1, 5.4	+23 C - Rating value for design = 90 %	
		+50 C - Rating value for design = 75 %	
Storage	DO-293, 2.5 IEC 60952-1, 5.5	DO-293 - 1 year storage life test in process	
Charge Stability	DO-293, 2.6 IEC 60952-1, 5.6, Class I	OK. Max battery temperature on charge = 51°C. Charge current fell during the charge period. Capacity at end of test > C1	
Short-circuit Current	DO-293, 2.7 IEC 60952-1, 5.7	Peak current = 1320.5 A Last recorded current = 6.24 A at end of test. Battery never became an open circuit and continued to deliver current throughout test. There was no debris, fragmentation or subsequent ignition of gasses within the battery.	
Charge Acceptance	DO-293, 2.8 IEC 60952-1, 5.8	+23 C = 100%	
		-18 C (battery with heaters only) N/A	
		-40 C (battery with heaters only) N/A	
Insulation Resistance	DO-293, 2.9.1 IEC 60952-1, 5.9.1	All samples successfully met the test requirements.	
Dielectric Strength	DO-293, 2.9.2 IEC 60952-1, 5.9.2	All samples successfully met the test requirements.	
Duty Cycle Performance	DO-293, 2.10 IEC 60952-1, 5.10	100 cycles successfully completed.	
Water Consumption Test	DO-293, 2.11 IEC 60952-1, 5.11	N/A	
Overcharge Endurance	DO-293, no requirement IEC 60952-1, 5.12	Not tested	
Cyclic Endurance	DO-293, 2.12 IEC 60952-1, 5.13	100 cycles successfully completed.	
Deep Discharge	DO-293, 2.13 IEC 60952-1, 5.14	The RG-624 successfully met the test requirements.	
Induced Destructive Overcharge	DO-293, 2.14 IEC 60952-1, 5.15	The RG-624 successfully met the test requirements.	
Electrical Emissions	DO-293, 2.15 IEC 60952-1, 5.16	N/A Battery contains no active electronics.	

Characteristic	RTCA DO-293A IEC 60952-1	Requirement/Performance	Test Report / Reference
Environmental Performance			
Vibration	DO-293, 3.1 IEC 60952-1, 6.1	Qualified to DO-293 and DO-160E, random vibration test per Curve C, section 8, 1 hour per axis.	
Acceleration	DO-293, no requirement IEC 60952-1, 6.2	Not tested	
Operational Shock	DO-293, 3.3.1 IEC 60952-1, 6.3, Class I	Qualified to DO-293 and DO-160E, Category B	
Crash Safety Shock	DO-293, 3.3.2 IEC 60952-1, 6.4	Qualified to DO-293 and DO-160E, Category B, impulse and sustained. Sustained per DO-160E Table 7-1, Aircraft type 5, Test type R, 20g's in each orientation.	
Explosion Containment	DO-293, 3.4 IEC 60952-1, 6.5	Qualified to DO-293 and DO-160E. The RG-624 successfully met the test requirements.	
Altitude	DO-293, 3.5 IEC 60952-1, 6.6	Tested and qualified to 20621m (67654 ft) in accordance with DO-293.	
Rapid Decompression	DO-293, 3.5.2 IEC 60952 no reqmt	Tested and qualified from 2300m (8000 ft) to 20621m (67654 ft) in accordance with DO-293.	
Temperature Shock	DO-293, 3.6 IEC 60952-1, 6.7	Tested from +85°C to -55°C in accordance with DO-293. The RG-624 successfully met the test requirement.	
Fungus Resistance	DO-293, 3.7 IEC 60952-1, 6.8	Qualified to DO-293 and DO-160E Category F. Test was performed on representative material samples. All samples successfully met the test requirement.	
Humidity	DO-293, 3.8 IEC 60952-1, 6.9	Qualified to DO-293 and DO-160E, Category B	

Characteristic	RTCA DO-293A IEC 60952-1	Requirement/Performance	Test Report / Reference
Fluid Contamination	DO-293, 3.9 IEC 60952-1, 6.10	Component test: Test was performed on representative material samples. All samples successfully met the test requirement. Fluids tested: Fuels. Aviation Jet A fuel Aviation piston engine fuel (100LL AVGAS) Hydraulic fluids Mineral based (MIL-H-5606) Non-mineral based synthetic (MIL-PRF-83282 and MIL-PRF-87257) Lubricating oils Mineral based (MIL-L-6081) Ester based synthetic (MIL-L-23699) Internal combustion engine SAE 15W40 Solvents and cleaning fluids Isopropyl alcohol (TT-I-735) Denatured alcohol De-icing fluid Ethylene Glycol Propylene Glycol AMS 1424 (SAE AEA Type I) AMS 1428 (SAE AEA Type VI) Insecticides - none Sullage - none Disinfectants (heavy duty phenolics) - none Coolant dielectric fluid - none Fire extinguishants - none	
Salt Spray	DO-293, 3.10 IEC 60952-1, 6.11	Qualified to DO-293 and DO-160E, Category S.	
Physical Integrity at High Temperature	DO-293, 3.11 IEC 60952-1, 6.12	The RG-624 successfully met the test requirements.	
Flammability	DO-293, no requirement IEC 60952-1, 6.13	Not tested. See Section 1	
Electrolyte Resistance	DO-293, 3.12 IEC 60952-1, 6.14	Component test: All components successfully met the test requirements.	
Thermal Sensors	DO-293, 3.13 IEC 60952-1, 6.15	N/A	
Component Qualification tests	DO-293, 3.14 IEC 60952-1, 6.16	Component test: All components successfully met the test requirements.	
Battery Airtightness	DO-293, no requirement IEC 60952-1, 6.17	N/A	

Characteristic	RTCA DO-293A IEC 60952-1	Requirement/Performance	Test Report / Reference
Cell Baffle	DO-293, no requirement IEC 60952-1, 6.18	N/A. Applies only to nickel-cadmium batteries only.	
Strength of Receptacle	DO-293, 3.15 IEC 60952-1, 6.19	OK	
Handle Strength	DO-293, 3.16 IEC 60952-1, 6.20	OK	

N/A = Not Applicable

Authentication:

Manufacturer. Concorde Battery Corporation

John B. Timmons, PE

Digitally signed by John B. Timmons, PE
DN: cn=John B. Timmons, PE, o=Concorde Battery Corporation, ou=Senior Vice President, email=jtimmons@concordebattery.com, c=US
Reason: I am approving this document
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Name of Signatory: John B. Timmons, PE

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