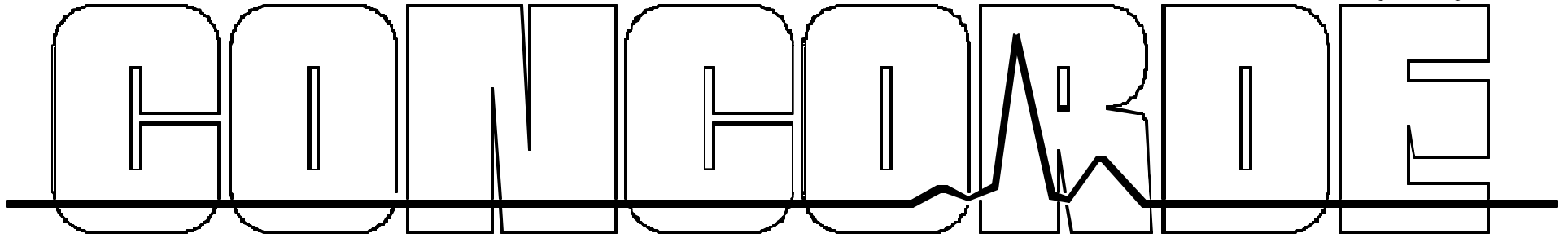


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Concorde Battery Corporation
2009 San Bernardino Road
West Covina, California, USA 27106

RG-128-1, RG-128-2, RG-128-3

24 VOLT 3.8 Ah, VALVE REGULATED, LEAD-ACID, AIRCRAFT BATTERY

DECLARATION OF DESIGN PERFORMANCE

TO THE REQUIREMENTS OF

RTCA DO-293 and IEC60952

Applications: Emergency Aircraft Battery

NOTE: Applications may not be a complete list of all applications for this battery type.

The item or Technical Data contained herein has been reviewed and approved for general release on the basis that it contains no Export-controlled information.

Characteristic	Part / Clause	Requirement/Performance	Test Report / Reference
Description	<p>The RG-128-1, RG-128-2 and RG-128-3 are 24 volt, 3.8 ampere hour, valve regulated lead-acid aircraft storage batteries.</p> <p>They consist of two parallel strings of twelve 2 volt cells connected in series. The individual cells are enclosed by an epoxy fuse coated aluminum container and cover. The battery hold down is accomplished by 4 bolts that pass through the housing and anchor into the aircraft structure. 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.</p> <p>The RG-128-1, RG-128-2, and RG-128-3 are identical except for the ratings of the circuit breakers on the output and number of output circuits available. See envelope drawing for schematic and details.</p> <p>The battery assembly is mechanically substantially identical in design and construction with the RG-129 which contains the identical cells and arrangement but incorporates electrical resistance heaters and controls internal to the battery. Therefore, certain electrical and environmental tests are qualified by similarity to the RG-129.</p>		
Format	IEC 60952-2	Concorde Drawing No. RG-128	
Connector	IEC 60952-2	The battery has a circular connector conforming to MS3120E14-5S	
Mass		5.1 Kg (11.2 lbs.) Max.	
Charging method	IEC 60952-1, 4.3	Constant potential at 28.25 V	
Any auxiliary requirement:	N/A	The battery assembly is equipped with a mid point voltage tap that is fused at 2A. The battery is equipped with one input/output that is not current limited. Depending on the dash number, the battery has up to two additional outputs that are current limited by circuit breakers. See schematics on drawing RG-128.	
Ventilation	DO-293, 2.2.2 IEC 60952-2	N/A	
Flammability	IEC 60952-2	Outer container is fire resistant	
Unspillability		Non spill	
Electrical Performance			
Rated Capacity (C ₁)	DO-293, 2.2.2 IEC 60952-1, 5.1.1	3.8 Ah	
Capacity at -18°C	DO-293, 2.2.3 IEC 60952-1, 5.1.2	2.5 Ah	
Capacity at -30°C	DO-293, 2.2.4 IEC 60952-1, 5.1.3	2.0 Ah	
Capacity at +50°C	DO-293, 2.2.5 IEC 60952-1, 5.1.4	4.3 Ah	
Power Rating +23°C	DO-293, 2.2.6.1 IEC 60952-1, 5.2.1.1	N/A, for engine starting batteries only.	
Power Rating -18°C	DO-293, 2.2.6.2 IEC 60952-1, 5.2.1.2	N/A, for engine starting batteries only.	
Power Rating -30°C	DO-293, 2.2.6.3 IEC 60952-1, 5.2.1.3	N/A, for engine starting batteries only.	
Rapid Discharge Capacity at 23°C	DO-293, 2.3.1 IEC 60952-1, 5.3.1	N/A, output limited by circuit breaker.	

Characteristic	Part / Clause	Requirement/Performance	Test Report / Reference
Rapid Discharge Capacity at -30°C	DO-293, 2.3.2 IEC 60952-1, 5.3.2	N/A, output limited by circuit breaker.	
Charge Retention	DO-293, 2.4 IEC 60952-1, 5.4	23°C - Rating value for design = 95%	
		50°C - Rating value for design = 75%	
Storage	DO-293, 2.5 IEC 60952-1, 5.5	DO-293 - Completed 1 year storage life test. Battery delivered 100% of rated capacity after storage.	
Charge Stability	DO-293, 2.6 IEC 60952-1, 5.6, Class I	OK. Max battery temperature on charge = 50.3°C. Charge current fell during the entire charge period. Capacity at end of test was greater than the C ₁ .	
Short-circuit Current	DO-293, 2.7 IEC 60952-1, 5.7	Circuit breaker tripped as designed.	
Charge Acceptance	DO-293, 2.8 IEC 60952-1, 5.8	+23°C = 103%	
		-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	N/A	
Water Consumption	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 completed.	
Deep Discharge	DO-293, 2.13 IEC 60952-1, 5.14	All samples successfully met the test requirements.	
Induced Destructive Overcharge	DO-293, 2.14 IEC 60952-1, 5.15	All samples successfully met the test requirements.	
Electrical Emissions	DO-293, 2.15 IEC 60952-1, 5.16	N/A, batteries contains no active electronics.	
Environmental Performance			
Vibration	DO-293, 3.1 IEC 60952-1, 6.1	RG-129 was tested and qualified to DO-160D, Category S, Curve C. RG-129 was tested and qualified to the initial resonance search IAW DO-293. All RG-128 series battery types are of a similar construction and considered to be qualified by similarity.	
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	RG-129 was tested and qualified to DO-160D, Category B. All RG-128 series battery types are of a similar construction and considered to be qualified by similarity.	

Characteristic	Part / Clause	Requirement/Performance	Test Report / Reference
Crash Safety Shock	DO-293, 3.3.2 IEC 60952-1, 6.3	RG-129 was tested and qualified to DO-160D, Category B, impulse. All RG-128 series battery types are of a similar construction and considered to be qualified by similarity.	
		RG-129 was tested and qualified to the sustained shock test in Table 7-1 of DO-160E, Aircraft type 5 at a sustained acceleration level of 20g's in each axis including inverted. All RG-128 series battery types are of a similar construction and considered to be qualified by similarity.	
Explosion Containment	DO-293, 3.4 IEC 60952-1, 6.4	RG-129 was tested and qualified to explosion containment IAW DO-293. All RG-128 series battery types are of a similar construction and considered to be qualified by similarity.	
Altitude	DO-293, 3.5 IEC 60952-1, 6.6	RG-129 was tested to 20,621m (67,654 ft) IAW DO-293. The sample successfully met the test requirements. All RG-128 series battery types are of a similar construction and considered to be qualified by similarity.	
Rapid Decompression	DO-293, 3.5.2 IEC 60952 no requirement	RG-129 was tested from 2,300m (8,000 ft) to 20,621m (67,654 ft) IAW DO-293. The test article successfully met all test requirements. All RG-128 series battery types are of a similar construction and considered to be qualified by similarity.	
Temperature Shock	DO-293, 3.6 IEC 60952-1, 6.7	RG-129 was tested IAW DO-293. The sample successfully met all test requirements. All RG-128 series battery types are of a similar construction and considered to be qualified by similarity.	
Fungus Resistance	DO-293, 3.7 IEC 60952-1, 6.8	DO-160E Category F. All samples successfully met the test requirement	
Humidity	DO-293, 3.8 IEC 60952-1, 6.9	RG-129 was tested and qualified to DO-160D, Category C. All RG-128 series battery types are of a similar construction and considered to be qualified by similarity.	

Characteristic	Part / Clause	Requirement/Performance	Test Report / Reference
Fluid Contamination	DO-293, 3.9 IEC 60952-1, 6.10	<p>Test was performed on representative material samples.</p> <p>Fluids tested:</p> <p>Fuels. All samples successfully met the test requirement.</p> <ul style="list-style-type: none"> Aviation Jet A fuel Aviation piston engine fuel (100LL AVGAS) <p>Hydraulic fluids</p> <ul style="list-style-type: none"> Mineral based (MIL-H-5606) Non-mineral based synthetic (MIL-PRF-83282 and MIL-PRF-87257) <p>Lubricating oils</p> <ul style="list-style-type: none"> Mineral based (MIL-L-6081) Ester based synthetic (MIL-L-23699) Internal combustion engine SAE 15W40 <p>Solvents and cleaning fluids</p> <ul style="list-style-type: none"> Isopropyl alcohol (TT-I-735) Denatured alcohol <p>De-icing fluid</p> <ul style="list-style-type: none"> Ethylene Glycol Propylene Glycol AMS 1424 (SAE AEA Type I) AMS 1428 (SAE AEA Type II) <p>Insecticides - none Sullage - none</p> <p>Disinfectants (heavy duty phenolics) - none</p> <p>Coolant dielectric fluid - none</p> <p>Fire extinguishants - none</p>	
Salt Spray	DO-293, 3.10 IEC 60952-1, 6.11	RG-129 was tested to DO-160E, Category S IAW DO-293. The tested article successfully met all test requirements. All RG-128 series battery types are of a similar construction and considered to be qualified by similarity.	
Physical Integrity at High Temperature	DO-293, 3.11 IEC 60952-1, 6.12	RG-129 was tested to DO-293. The sample successfully met the test requirements. All RG-128 series battery types are of a similar construction and considered to be qualified by similarity.	
Flammability	DO-293, 3.12 IEC 60952-1, 6.14	Not tested. See Page 2.	
Electrolyte Resistance	DO-293, 3.13 IEC 60952-1, 6.15	All components met the specification 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	All components met the specification requirements.	
Battery Airtightness	DO-293, no requirement IEC 60952-1, 6.17	N/A	
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	N/A, connector strength dictated by military specification for connector.	

