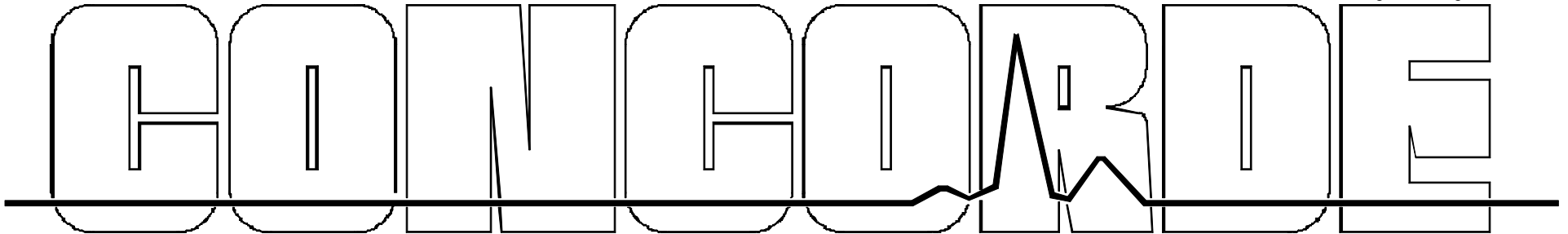


... the heart of your system. ®



Concorde Battery Corporation

2009 San Bernardino Road
West Covina, California, USA 27106

RG-380E/44 Series

24 VOLT 42.0 Ah, VALVE REGULATED, LEAD-ACID, AIRCRAFT BATTERY

USER DECLARATION OF DESIGN PERFORMANCE

TO THE REQUIREMENTS OF

RTCA DO-293 and IEC60952

Applications: Engine Starting and Emergency Power

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-380E/44 Series is a 24 volt, 42 Ah, valve regulated lead-acid aircraft storage battery. This series of batteries consists of a basic battery and a variety of outer packaging assemblies.</p> <p>The basic RG-380E/44 battery consists of twelve 2 volt cells connected in series. The cells are enclosed by a one piece plastic monoblock container and a plastic one piece top which is secured to the monoblock with an epoxy cement. The monoblock and top are made of high impact polypropylene. The cover of the battery is an epoxy fuse coated aluminum and incorporates the hold down. 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-380E/44L and RG-380E/44K incorporate the RG-380E/44 battery with an outer housing that is an epoxy fuse coated aluminum fire resistant container and cover. The battery hold down is incorporated into the outer housing.</p> <p>The RG-380E/44LS and the RG-380E/44KS incorporate the RG-380E/44 battery with an outer housing that is a stainless steel fire proof container and cover. The battery hold down is incorporated into the outer housing.</p> <p>The basic RG-380E/44 is sufficiently similar to the D8565/15-1 battery that the military specification qualification testing performed on the D8565/15-1 battery is considered applicable to the RG-380E/44. The D8565/15-1 is a Qualified Product Listed to Mil-B-8565.</p>	
Format	IEC 60952-2	Concorde Drawing No. RG-380E/44 rev NC, RG-380E/44L(S) rev NC and RG-380E/44K(S) rev NC	
Connector	IEC 60952-2	The battery is equipped with an IEC Type Q (MS3509) connector	
Mass		RG-380E/44 - 39.0 Kg (86.0 lbs) Max RG-380E/44L - 40.4 Kg (89.0 lbs) Max RG-380E/44K - 40.4 Kg (89.0 lbs) Max RG-380E/44LS - 41.3 Kg (91.0 lbs) Max RG-380E/44KS - 41.3 Kg (91.0 lbs) Max	
Charging method	IEC 60952-1, 4.3	Constant potential at 28.25 VDC \pm 0.25 VDC	
Any auxiliary requirement:	N/A	The RG-380E/L and /LS series batteries are equipped with a mounting plate for the attachment of a temperature sensor.	
Ventilation	DO-293, 2.2.2 IEC 60952-2	RG-380E/44 battery is equipped with vent tubes. RG-380E/44K and /44KS batteries are equipped with vent louvers. RG-380E/44L and /LS batteries are equipped with vent tubes.	
Flammability	IEC 60952-2	RG-380E/44 series outer container is flammable. RG-380E/44K and /L series outer container is fire resistant. RG-380E/44KS and /LS series outer container is fire proof.	
Unspillability		Non spill	
Electrical Performance			
Rated Capacity (C ₁)	DO-293, 2.2.2 IEC 60952-1, 5.1.1	42 Ah	
Capacity at -18°C	DO-293, 2.2.3 IEC 60952-1, 5.1.2	30 Ah	

Characteristic	Part / Clause	Requirement/Performance	Test Report / Reference
Capacity at -30°C	DO-293, 2.2.4 IEC 60952-1, 5.1.3	23 Ah	
Capacity at +50°C	DO-293, 2.2.5 IEC 60952-1, 5.1.4	42 Ah	
Power Rating +23°C	DO-293, 2.2.6.1 IEC 60952-1, 5.2.1.1	I _{pp} = 1350 A I _{pr} = 1000 A	
Power Rating -18°C	DO-293, 2.2.6.2 IEC 60952-1, 5.2.1.2	I _{pp} = 875 A I _{pr} = 750 A	
Power Rating -30°C	DO-293, 2.2.6.3 IEC 60952-1, 5.2.1.3	I _{pp} = 750 A I _{pr} = 600 A	
Rapid Discharge Capacity at 23°C	DO-293, 2.3.1 IEC 60952-1, 5.3.1	25 Ah	
Rapid Discharge Capacity at -30°C	DO-293, 2.3.2 IEC 60952-1, 5.3.2	5 Ah	
Charge Retention	DO-293, 2.4 IEC 60952-1, 5.4	23°C - Rating value for design = 90 %	
		50°C - Rating value for design = 70 %	
Storage	DO-293, 2.5 IEC 60952-1, 5.5	Testing in progress.	
Charge Stability	DO-293, 2.6 IEC 60952-1, 5.6, Class I	Max battery temperature on charge = 51°C. Charge current fell during the entire charge period. Capacity at end of test was greater than the C ₁ rate.	
Short-circuit Current	DO-293, 2.7 IEC 60952-1, 5.7	Battery met all test requirements: Peak current: 2677 A Last Current: 2123 A at 4 sec	
Charge Acceptance	DO-293, 2.8 IEC 60952-1, 5.8	+23°C = 101 %	
		-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 cycle requirement successfully completed.	
Water Consumption	DO-293, 2.11 IEC 60952-1, 5.11	N/A, applies to flooded electrolyte batteries only.	
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 cycle requirement successfully completed.	

Characteristic	Part / Clause	Requirement/Performance	Test Report / Reference
Deep Discharge	DO-293, 2.13 IEC 60952-1, 5.14	All test requirements were met.	
Induced Destructive Overcharge	DO-293, 2.14 IEC 60952-1, 5.15	All test requirements were met.	
Electrical Emissions	DO-293, 2.15 IEC 60952-1, 5.16	N/A, battery contains no active electronics.	
Environmental Performance			
Vibration	DO-293, 3.1 IEC 60952-1, 6.1	RG-380E/44, RG-380E/44L and RG-380E/44LS were subjected to the random vibration test per Curve C, section 8 of DO-160E, 1 hr per axis. All batteries met the vibration test requirements. The /L and /LS versions are sufficiently similar to the /K and /KS that test results are considered representative.	
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	Category B, DO-160. All batteries met the requirements.	
Crash Safety Shock	DO-293, 3.3.2 IEC 60952-1, 6.3	Category B, DO-160. The sustained shocks were performed at an acceleration of 4g's in the up direction, 20g's in the down direction and 18g's in the forward, aft and sides for 3 sec in each direction. All batteries met the test requirements.	
Explosion Containment	DO-293, 3.4 IEC 60952-1, 6.4	All batteries met the requirements.	
Altitude	DO-293, 3.5 IEC 60952-1, 6.6	Tested to 20,621m (67,654 ft).	
Rapid Decompression	DO-293, 3.5.2 IEC 60952 no requirement	Tested from 2,300m (8,000 ft) to 20,621m (67,654 ft).	
Temperature Shock	DO-293, 3.6 IEC 60952-1, 6.7	All batteries met the requirements.	
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	Category B, DO-160. All batteries met the requirements.	

Characteristic	Part / Clause	Requirement/Performance	Test Report / Reference
Fluid Contamination	DO-293, 3.9 IEC 60952-1, 6.10	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 II) 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	Category S, DO-160. All batteries met the requirements.	
Physical Integrity at High Temperature	DO-293, 3.11 IEC 60952-1, 6.12	All batteries met the requirements.	
Flammability	DO-293, 3.12 IEC 60952-1, 6.14	Not tested. See section 1	
Electrolyte Resistance	DO-293, 3.13 IEC 60952-1, 6.15	All components 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	All components met the test 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.	

Characteristic	Part / Clause	Requirement/Performance	Test Report / Reference
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.

Signed:

Name of signatory: John B. Timmons, PE

Title or Function: Vice President Engineering