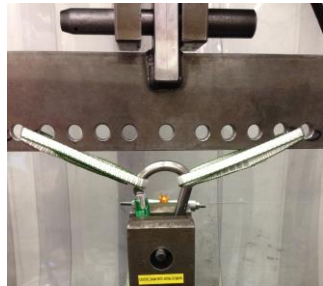
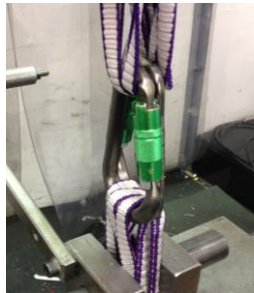


Dartec M1000/RF SPECIALS TEST RECORD FORM : TEST No. SP2360

PLEASE NOTE : THIS FORM SHOULD BE USED FOR RECORDING ANY SPECIAL (ie. NON STANDARD) TESTS CARRIED OUT AND MAY BE USED FOR DMM PRODUCTS, DESIGN PROTOTYPES, CUSTOMER RETURNS, etc. IT IS IMPORTANT TO INCLUDE AS MUCH INFORMATION AS POSSIBLE ABOUT THE PRODUCT, THE REASON FOR THE TEST, WHO ASKED FOR THE TEST AND ALL RESULTS, OBSERVATIONS AND CONCERNS.

Please remember to fill in the index at the front of the Specials Test Record File and file a copy in the relevant Design File if for Design/Prototype Tests. Thankyou.

PRODUCT TYPE/DESCRIPTION		
Aero HMS SG		
CATALOGUE No.:	BATCH No.:	DWG. ISSUE No.:
A362	Type Test	2
MATERIAL SPEC. & P/O. No.:		DESIGN PROJECT No. & MANAGER :
See Technical File.		N/A
REASON FOR TEST, TYPE OF TEST TO BE CARRIED OUT and REFERENCE STANDARD(S) :		
1. Query on spread of load at large bend affecting karabiner strength.		
2. Query on strength and failure mode of doubled karabiners orientated "back to back"		
TEST METHOD, JIGS, FIXTURES (DIAGRAM IF REQUIRED) :		
1. All tests to be carried out on Aero HMS karabiners with doubled 10mm Dyneema slings at large bend, 10mm test pin at small bend (see figure 1). (pull speed 200mm/min)		
A)Straight pull between slings B)Sling angle 80° C)Sling angle 95° D)Sling angle 130°		
		
<i>Fig1: Sling angle set up. (130° pictured)</i>		
2. Test on doubled opposing gate karabiners to be carried out on two Aero HMS L/S carabiners between 2 quadrupled 10mm dyneema slings at each end.(see figure 2). (pull speed 200mm/min)		
		
<i>Fig2: Opposing gate test set up</i>		

TEST RESULTS/OBSERVATIONS :**1.Sling Angle Test**

Sling Angle	Space between slings at large bend (mm)	Strength (kN)
0° (Straight pull)	N/A	27.0
80°	25	22.7
95°	30	19.8
130°	40	17.3

2.Opposing Gate Test

The test as described above achieved tensile strength of 55.3kN With the carabiners' failure mode matching that of production.

CONCLUSION :**Sling Angle Test**

Important: Note that the sling angle test results reflect the effect of sling angle on the strength of the carabiner only. Such sling angles would introduce a force multiplying effect on individual anchors set at such angles.

The sling angle test has shown a reduction in strength as the angle has grown, but the tensile strength has not been reduced to a force that would be experienced in normal climbing situations.

Opposing Gate Test

The opposing gate test has shown that the holding strength of two carabiners in this orientation is effectively double that of a single carabiner. However, this test has been tested in controlled conditions with the carabiners aligned. This test does not allow for factors that may be encountered in climbing situations creating loading configurations differing to the above setup (e.g. carabiners becoming "crossed")

SIGNED :**DATE :****COPIES TO :****G. J. Manifold****23/4/2015****FH/WC/NT/GD****QA Engineer.**

PLEASE ENSURE THAT THIS RECORD IS ACCURATE AND COMPLETE