

Moth Forestay Tang Testing

This report has been compiled to show some historic test results for the moth forestay tang development. This shows some of the conditions it has been subjected to as well as the adhesive applied.

Test Report CST-3733 (11/06/2019)

CST Carbon Forestay Tang Testing

ID #	Vang Batch #	Preperation Description	Shackle Size	Front of nose to hole edge (mm)	Bottom of nose to holde edge (mm)	Max Load (kg)
0	10081	Not drilled out - shackle hammered on	5mm	as supplied	as supplied	1328*
1	10081	Hole drilled out with 1/4inch drill	6mm	na	na	1633
2	10081	Hole drilled out with 1/4inch drill	6mm	na	na	1277
3	10081	Hole wiggled closer to front/bottom of nose with 5mm drill	5mm	10.5	11.5	1734
4	10081	Hole wiggled closer to front/bottom of nose with 5mm drill	5mm	10	9.2	1314
5	9733	Hole wiggled closer to front/bottom of nose with 1/4inch drill	5mm	9.2	10	909
6	10081	Hole wiggled closer to front/bottom of nose with 1/4inch mm drill	5mm	10	9.5	1048



Test Report CST-3733-2 (14/11/2019)

CST Machined Aluminium Forestay Tang Testing

Background:

Following up from testing of carbon forestay fittings (see report cst-3733), we decided to machine aluminium forestay tangs. Round 1 testing was conducted on two prototypes. The design evolved to it's eventual state. This report BRIEFLY documents that testing.

Method:

Testing was conducted as per same test method (CST-3733) as for carbon forestay testing.

Standard plexus preparation and gluing (MA420).

Some testing was conducted at elevated temperature and room temp. See results.

Results:

With the 5mm shackle, even at elevated temp of 80 degrees C, the forestay survived and the **shackle** broke around 1700kg load. One sample was tested 5 times repeatedly with new 5mm shackles and it broke every shackle. It was then tested with a 6mm shackle, the fitting delaminated the tube at 2100kg. See following pictures. The above results were **considered to be satisfactory** in comparison to the carbon fittings, samples exceeded the working load applied for typical 2.5 and 3mm Stainless steel wires of 690kg (6767N) and 1000kg (9807N) as such these went into production.

Dyform - a more compact stainless steel wire strand G316

Part No.	Construction	Nominal Diameter mm	Weight Kg/100 Mtrs	Minimum Breaking Load
D07-025	1 x 7	2.5	3.4	690
D07-030	1 x 7	3	4.9	1000
D07-035	1 x 7	3.5	6.7	1350

Picture below shows how it rips the laminate apart.



Adhesive used for bonding Aluminium Forestay Tang

Our standard adhesive used for bonding the Aluminium forestay fitting is Plexus MA420. The reason we use this adhesive is that it has different properties to the standard Epoxy as can be seen in the table below.

Plexus is a high performance, flexible two-part methacrylate adhesive designed for structural bonding of thermoplastics, metals and composites. It is self-etching which gives it a great bond to these surfaces and as seen in the table below has superior strain to failure and operating temperature.

	Plexus MA420	SPAbond 345
working time	4-6 min	28min
fixture time	18-22 min	5.5 hrs
strain to failure %	30% - 50%	5 - 7 % ???
shear strength Mpa	20.7 - 26.2 Mpa	37 Mpa
tensile strength Mpa	18.6 - 20.7 Mpa	-
operating temperature	-55°C to 121°C	<u>57@28 days at 21°C</u> <u>68@16 hours at 50°C</u> <u>76@5 hours at 70°C</u>
shelf life	10 months	24 months