Status of MACRO PMT pressure tests at SAB

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2010 October 14

overview

- 150 waterproof MACRO EMI PMT assemblies need to be pressure tested at the SAB. They have already passed performance tests at DGUT.
- We test about 10 PMTs per week (mid-August to December).
- For more information, see doc 5373.

As of October 14, we have passed 70 of 78 tested MACRO PMTs and 1 of 1 tested Hamamatsu PMT.

pressure test results

11 PMTs were tested during the past week (October 7 - October 13).

SN	mass (g)	pressure (psig)	test time (h:m)	result
6289	599.0	12.0	14:50	PASS[2]
7315	615.5	12.1	8:38	PASS[1]
7431	603.5	12.0	15:01	PASS[2]
6400	636.5	12.1	8:25	PASS[2]
8618	564.0	12.0	15:49	PASS[1]
7487	519.0	6.0	46:45	PASS[1]
6623	513.0	5.8	8:22	PASS[1]
7508	527.5	6.1	16:09	PASS[1]
7492	516.0	6.1	6:44	PASS[1]
Hamamatsu† WSD2598	4631.0‡	14.2	15:23	PASS[1]

† This is the first water-proof Hamamatsu PMT tested. The PMT holder in the water tank held the Hamamatsu PMT well.
‡ Weight of PMT, base and cable as a whole.

1	Cable dry. No leaks or cracks.
2	1+Some water penetrated the mastic tape seal of the cable strain relief plug, but did not penetrate the UW cable plug.

signal test results

The operational capability of a PMT is verified after pressure testing:
The PMT is placed in a dark box, connected to a single channel decoupler box, and set to its 2E7 gain voltage, as recorded in the DGUT data. After tens of minutes, the count rate, rise time, and pulse height are recorded. We use a threshold of 3.00 mV, which is roughly 1/4 pe.

SN	Rate (kHz)	DGUT rate (kHz)	Rise time (ns)	DGUT rise time (ns)
8819	4.0	1.08	4.6	4.8
6380	7.0	3.47	4.9	4.2
7925	2.4	0.85	5.9	6.5
7525	7.0	0.40	4.7	7.6
6796	5.2	3.38	4.9	5.1
6289	2.2	0.45	5.0	5.2
7315	2.0	0.64	5.7	6.0
7431	1.0	0.95	4.8	8.7

- Rates are all below 10 kHz.