U.S. Department of Commerce
National Institute of Standards and Technology
Gaithersburg, MD 20899

Certificate Number: 88-008A4

National Type Evaluation Program

Certificate of Conformance

for Weighing and Measuring Devices

For:

Load Cell
Shear Beam
Model: 743
n_{max}, Class III, Multiple Cells: 5000
n_{max}, Class III L, Multiple Cells: 10 000
Capacity: 1000 lb to 75 000 lb

Accuracy Class: III/III L

Submitted by:

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Standard Features and Options

See Page 2 for specific load cell parameters.

Wire Design: 4 wire
Material: Stainless steel
Excitation Voltage: 5 to 15 volts (AC/DC)
Nominal Output: 2 mV/V

Temperature Range: -10 °C to 40 °C (14 °F to 104 °F)

This device was evaluated under the National Type Evaluation Program (NTEP) and was found to comply with the applicable technical requirements of Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages.

Effective Date: March 3, 1998

Gilbert M. Ugiansky, Ph.D.
Chief, Office of Weights and Measures
Issue Date: June 23, 1998

Mettler-Toledo, Inc.
Shear Beam Load Cell
Model: 743

Application: The load cells may be used in Class III and III L scales for multiple cell applications consistent with the model designations, number of scale divisions, and parameters specified in this certificate. Load cells of a given accuracy class may be used in applications with lower accuracy class requirements provided the number of scale divisions, the v_{min} values, and temperature range are suitable for the application. The manufacturer may market the load cell with fewer divisions (n_{max}) and with larger v_{min} values than those listed on the certificate. However, the load cells must be marked with the appropriate n_{max} and v_{min} for which the load cell may be used.

Load Cell Parameters

Capacity (lb)	Accuracy Class	n_{max}	v_{min} (lb)	Minimum Dead Load (lb)
1000*	III	5000	0.2	10
3000	III	5000	0.6	30
5000	III	5000	1.0	50
10 000*	III	5000	2.0	100
20 000* **	III	5000	2.8	200
30 000*	III	5000	4.2	200
45 000*	III	5000	6.4	200
35 000	III L	10 000	3.5	200
45 000*	III L	10 000	4.5	200
75 000	III L	10 000	5.25	0

* Hermetic sealing option
** Load cell tested

Identification: A pressure sensitive identification badge containing the manufacturer, model designation, and serial number is located on the load cell. All other required information must be on an accompanying document including the serial number of the load cell.

Test Conditions: This Certificate supersedes Certificate of Conformance Number 88-008A3 and is issued to change the 20 000-lb and 45 000-lb capacities to hermetically sealed and to add a 30 000-lb capacity hermetically sealed load cell.

Two 20 000-lb capacity hermetically sealed load cells were tested at NIST using dead weights as the reference standard. The data were analyzed for multiple load cell applications. The cells were tested over a temperature range of -10 °C to 40 °C. Three tests were run on each cell at each temperature. The temperature effect on zero was measured and a time dependence (creep) test was performed. The barometric pressure test was waived due to the insensitivity of the load cell design to changes in barometric pressure.

The test conditions from previous certificates are listed below for reference.

Mettler-Toledo, Inc.
Shear Beam Load Cell
Model: 743

Certificate of Conformance Number 88-008A3: This Certificate superseded Certificate of Conformance Number 88-008A2 and was issued to add the Model 743, Class III L, 75 000-lb load cell with a 350-ohm gage and to revise the v_{min} ratings.

Two 50 000-lb capacity load cells was were tested at NIST using dead weights. The data were analyzed for multiple load cell applications. The cells were tested over a temperature range of -10 °C to 40 °C. Three tests were run on the each cell at each temperature. The temperature effect on zero was measured and a time dependence (creep) test was performed. The barometric pressure test was waived due to the insensitivity of the load cell design to changes in barometric pressure.

Certificate of Conformance Number 88-008A2: This Certificate superseded Certificate of Conformance Number 88-008A1 and was issued to include the Model 743, Class III L, 45 000-lb load cell with a 350-ohm gage and Model 743, Class III L, 35 000-lb load cell. The original Model 743, 45 000-lb load cell, has a 2000-ohm gage. This difference does not appear to significantly affect the metrological characteristics of the load cell; however, the two load cells are not interchangeable because they are electrically different.

In addition to the testing conducted for Certificate of Conformance Number 88-008, two 45 000-lb load cells with 350-ohm gages were tested using dead weights, a force machine with a load cell as the reference standard. The data were analyzed for multiple load cell applications. The cells were tested over a temperature range of -10 °C to 40 °C. Three tests were run on each cell at each temperature. The temperature effect on zero was measured and a time dependence (creep) test was performed. The barometric pressure test was waived due to the insensitivity of the load cell design to changes in barometric pressure.

Certificate of Conformance Number 88-008A1: This Certificate superseded Certificate of Conformance Number 88-008 (dated October 2, 1989) and was issued to reflect new values for v_{min} for Class III load cells evaluated for multiple load cell applications. The new values for v_{min} reflect a change made in the NTEP application of the tolerances for these load cells.

Certificate of Conformance Number 88-008: This Certificate superseded Certificates of Conformance Numbers 88-008P and 88-008P Amended and was issued to upgrade the status of the certificate from provisional to full.

Two 1000-lb, two 10 000-lb, and two 20 000-lb capacity load cells were tested using dead weights, a force machine with a load cell as the reference standard. The data were analyzed for multiple load cell applications. The cells were tested over a temperature range of -10 °C to 40 °C. Three tests were run on each cell at each temperature. The temperature effect on zero was measured and a time dependence (creep) test was performed. The barometric pressure test was waived due to the insensitivity of the load cell design to changes in barometric pressure. The manufacturer's laboratory was used to collect the test data.

Representatives from the National Institute of Standards and Technology evaluated the manufacturer's test facility, witnessed repeat tests on the load cells, and analyzed the data.

The results indicate that the load cells comply with the applicable requirements of NIST Handbook 44.

Type Evaluation Criteria Used: NIST Handbook 44, 1998 Edition

Tested By: NIST Force Group, NIST Office of Weights and Measures

Information Reviewed By: R. Whipple (NIST) & Constantine Cotsoradis (NIST) 88-008A3; R. Suiter (NIST) 88-008A4