



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Institute of Standards and Technology**  
325 Broadway  
Boulder, CO 80305-3337

April 29, 2019

Claudio Pettinato  
Inspecta S.R.L.  
Via Giovanni Giolitti, 10  
Ravenna, Ravenna 48123  
Italy

Dear Mr. Pettinato:

Charpy verification specimens tested on the 450.0 J (331.9 ft-lbf) capacity Galdabini Machine, Serial No. VAUP/02 (2014), have been received for evaluation along with the completed questionnaire. We have analyzed the results (see attached table) and find that they satisfy the requirements of the current ISO 148-2 standard. The following paragraphs describe further analysis of the questionnaire, the test results, and the fractured specimens.

This machine satisfies the indirect verification requirements of the current ISO 148-2 Standard at the energy levels tested.

Enclosed is a Charpy Verification Sticker to attach to your machine.

If the machine is moved or undergoes any major repairs or adjustments, this verification becomes invalid and the machine must be rechecked (ISO 148-2). If a specimen stops the pendulum during a test, the machine should be checked to assure that the pendulum is straight, the anvils and striker have not been damaged, and that all bolts are still tight.

If you have any questions concerning the verification of your machine, you may contact me by phone at +1-303-497-3351, by fax at +1-303-497-5939, or by email at [charpy@boulder.nist.gov](mailto:charpy@boulder.nist.gov).

Sincerely,

Raymond L. Santoyo  
Applied Chemicals & Materials Division

3 Enclosures

National Institute of Standards and Technology  
 Applied Chemicals & Materials Division  
 325 Broadway, Boulder, CO 80305-3328

Facility: Inspecta S.R.L., Via Giovanni Giolitti, 10  
 Ravenna, Ravenna 48123 Italy

Machine Manufacturer: Galdabini      Serial Number: VAUP/02 (2014)

Test Date: 4/11/2019

Reference Standard: ISO 148-2

SERIES NUMBER	CLIENT VALUES					UNITS	AVERAGE (J)		BIAS	REPEATABILITY	RESULT
	1	2	3	4	5		CLIENT	NIST			
Low LL-167	14.3	14.7	14.7	15.4	14.1	J	14.6	14.9	-0.3 J	1.3	Pass
High HH-164	88.7	89.5	88.2	85.3	87.5	J	87.8	86.5	1.6%	4.86%	Pass
Super High N/A											N/A

Allowable bias is 4 J or 10 %, whichever is greater; allowable repeatability is 6 J or 15 %, whichever is greater (ISO Standard 148-2).

N/A = Not Commercially Available

## Additional Information

The information contained in Table 1 can be used to compute the uncertainty for a new material tested in your laboratory using the procedure outlined in NIST SP 960-18 [1].

See also: <https://www.nist.gov/programs-projects/nist-impact-verification-program>.

Table 1. Summary statistics for SRM materials and customer's verification test result.

Series Number	Client Statistics					NIST SRM Statistics			
	Client Average $\bar{V}$ (J)	Standard Deviation $S_V$ (J)	Number of Tests $n_V$	$S_V / \sqrt{n_V}$ (J)	Degrees Of Freedom $df_V$	Certified Reference Value $R$ (J)	Combined Uncertainty $u(R)$ (J)	Degrees Of Freedom $df_R$	Expanded Uncertainty $U$ (J)
LL-167	14.6	0.50	5	0.22	4	14.9	0.104	65	0.208
HH-164	87.8	1.60	5	0.71	4	86.5	0.651	71	0.327

The fifth column, labeled  $S_V / \sqrt{n_V}$ , is the uncertainty of the verification test mean,  $\bar{V}$ , if there are no additional sources of systematic error that need to be included. It is the customer's responsibility to determine the final uncertainty of  $\bar{V}$ .

The expanded uncertainty of the NIST reference value ( $U$ ), corresponding to a 95 % uncertainty interval, is based on a coverage factor from the Student's  $t$  distribution with  $df_R$  degrees of freedom. The expanded uncertainties include sources of error in the measurement and testing process at NIST, and are not the expanded uncertainties of the individual verification specimens or the uncertainties of tests performed in your laboratory.

## Reference

- [1] Splett, J. D., McCowan, C. N., Iyer, H. K., Wang, C.-M., "NIST Recommended Practice Guide: Computing Uncertainty for Charpy Impact Machine Test Results," NIST Special Publication 960-18, September, 2007 (available at: [https://www.nist.gov/sites/default/files/documents/mml/acmd/structural\\_materials/SP9602-18Final-2.pdf](https://www.nist.gov/sites/default/files/documents/mml/acmd/structural_materials/SP9602-18Final-2.pdf)).

**NIST Charpy Verification Sticker**

This machine meets the indirect verification requirements of the current ISO Standard 148-2

Machine Serial Number: VAUP/02 (2014)

Verification Date: April 11, 2019

Signature:



**Raymond Santoyo, Charpy Program Coordinator**  
National Institute of Standards and Technology