



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

April 16, 2018

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, have been received for evaluation along with the completed questionnaire. We have analyzed the results (see attached table) and find that the average values fall within the acceptable ranges at all the energy levels tested, in accordance with the current ASTM E23 standard. The following paragraphs describe further analysis of the questionnaire, the test results, and the fractured specimens.

The brinelling marks on the fractured specimens indicate that several specimens were tested off-center. We suggest the use of centering tongs which utilize the specimen notch as a centering guide. These tongs should be similar to those illustrated in Figure 6 of the current ASTM Standard E 23.

The brinelling marks on the fractured specimens indicate that the anvils may be worn. Please inspect the anvils and replace if necessary.

In order to expedite the evaluation of your broken specimens, please follow the wrapping instructions supplied with the new questionnaire.

This machine satisfies the indirect verification requirements of the current ASTM E23 standard from an absorbed energy level of 10.0 J (7.4 ft-lbf) to 80 % of the maximum capacity of the machine.

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 (see ASTM E23). 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,

A handwritten signature in black ink that reads "Raymond Santoyo". The signature is written in a cursive style with a large, stylized initial 'R'.

Raymond L. Santoyo  
Applied Chemicals & Materials Division

3 Enclosures

National Institute of Standards and Technology  
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Facility: Inspecta S.R.L., Via Giovanni Giolitti, 10  
 Ravenna, Ravenna 48123 Italy

Machine Manufacturer: Galdabini      Serial Number: VAUP/02

Test Date: 4/9/2018

Reference Standard: ASTM E23

SERIES NUMBER	PT* Code	CLIENT VALUES					UNITS	AVERAGE (J)		DIFFERENCE	RESULT
		1	2	3	4	5		CLIENT	NIST		
Low LL-152	81598	16.9	17.6	15.6	16.5	15.6	J	16.4	17.2	-0.8 J	Pass
High HH-161	81599	100.4	100.0	99.5	102.1	98.1	J	100.0	97.0	3.1%	Pass
Super-High											N/A

Allowable difference is 1.4 J or 5 %, whichever is greater.

N/A = not commercially available.

\* Proficiency Test (PT) results for your data are available online. To access the PT data, you need to go to the [PT website](#) and enter the Series Number and PT Code for each energy level of interest.

## 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-152	16.4	0.86	5	0.39	4	17.2	0.0626	68	0.1249
HH-161	100.0	1.45	5	0.65	4	97.0	0.301	70	0.6

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 ASTM Standard E23

Machine Serial Number: *VAUP/02*

Verification Date: April 9, 2018

Range of Verification: *From 10.0 J (7.4 ft-lbf) to 80% of the machine capacity*

Signature: *Raymond Santoyo*

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