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

May 6, 2020

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.

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

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.

Sincerely,

Raymond Santoyo

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: 5/5/2020

Reference Standard: ISO 148-2

SERIES NUMBER	CLIENT VALUES					UNITS	AVERAGE (J)		BIAS	REPEATABILITY	RESULT
	1	2	3	4	5		CLIENT	NIST			
Low LL-170	16.6	14.6	14.6	14.6	14.8	J	15.0	15.0	0.0 J	2	Pass
High HH-169	99.5	95.2	101.0	96.6	90.6	J	96.6	93.1	3.7%	11.17%	Pass
Super High SH-50	170.6	169.4	161.7	169.8	167.4	J	167.8	166.0	1.1%	5.36%	Pass

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

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-170	15.0	0.88	5	0.39	4	15.0	0.074	62	0.147
HH-169	96.6	4.05	5	1.81	4	93.1	0.309	70	0.617
SH-50	167.8	3.60	5	1.61	4	166.0	0.479	94	0.952

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).

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: May 5, 2020

Signature: 

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