

25. testXpo Internationale Fachmesse für Prüftechnik

10 Years of Proficiency Tests and Certified Reference Materials – Where are the benefits?

Ulm

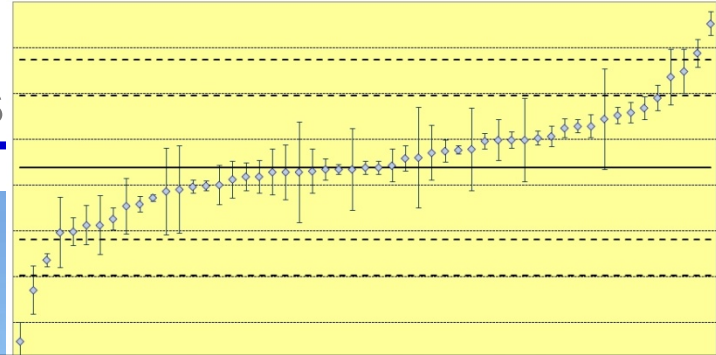
Thursday, 13th October 2016

Dipl.-Ing. Christian Weißmüller

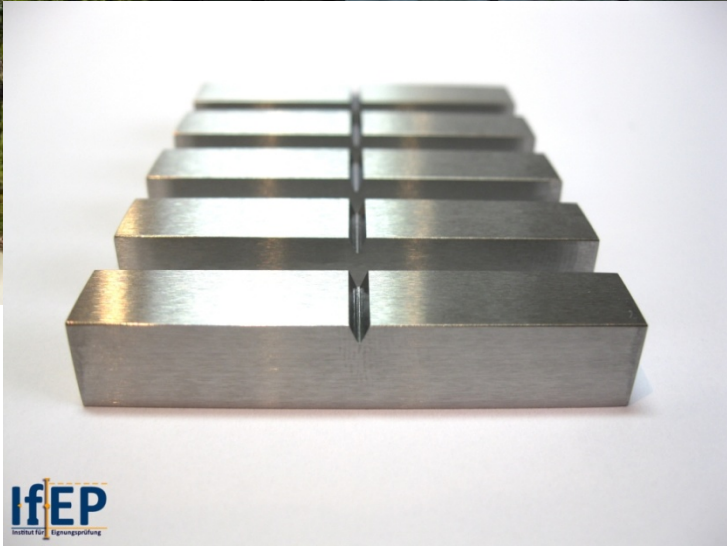


Since 2004

Eignungs



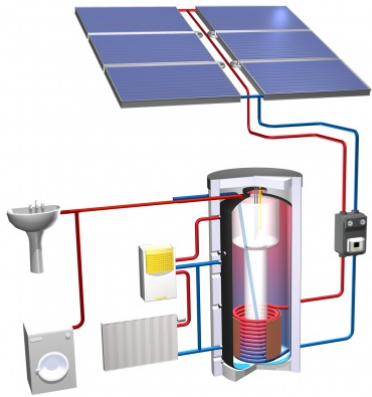
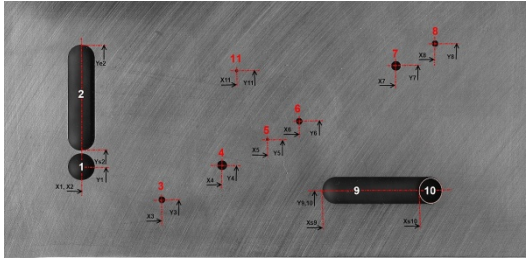
Since 2000; accredited 2005



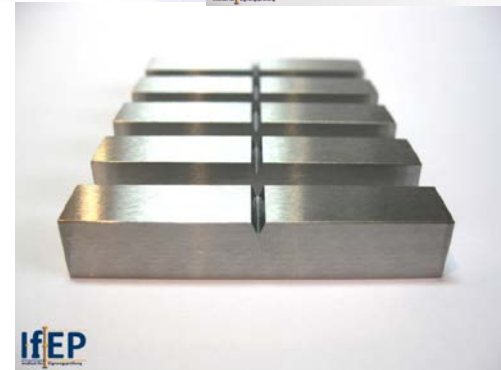
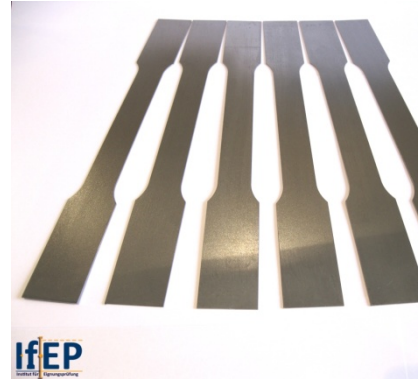
Since 2008; accredited 2009

IfEP – Program

Proficiency tests



Reference material



+ 2.600 participations of 650
labs from 40 Ländern

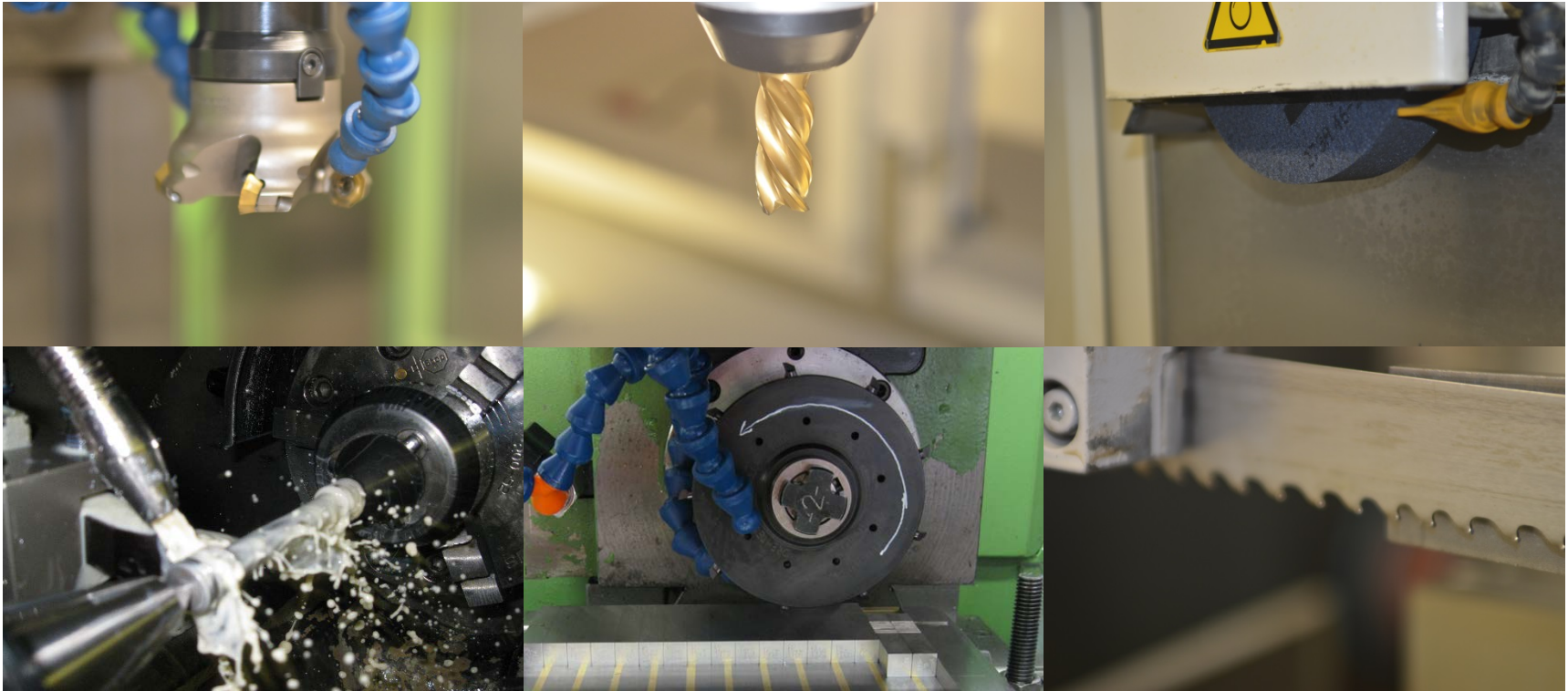
app. 8.000 sets á 5/6 Proben

IfEP GmbH – new production site

Since February 2015



Specimen production



Precise machining of kind of specimen geometry

Basics to proficiency testing

ISO 17043: Proficiency testing

„... evaluation of participant performance against pre-established criteria by means of interlaboratory comparisons.“

Interlaboratory comparison

„... organization, performance and evaluation of measurements or tests on the same or similar items by two or more laboratories in accordance with predetermined conditions.“



Use of proficiency testing in accreditation



71 SD 0 010 | Revision: 1.2 | 14. April 2016



Scope:

This rule conduces to the implementation of international requirements and the summarization of the national requirements for the use of proficiency testing in the accreditation process of testing and calibration laboratories, medical laboratories (in the following described as laboratories) and also inspection bodies¹. It describes the requirements for participation in proficiency test at accredi-

Proficiency testing – general rules

Availability of proficiency tests

Proficiency tests are available, if they are offered by proficiency test providers and the required documents are provided in the **national language** of the participating body or in English.

Technical adequacy of proficiency tests

A proficiency test is regarded as technically adequate, if its scope similar to the daily practice in the participating body. In case of specific measurement techniques, for which no exact consistent proficiency test is available, it may be adequate to choose a proficiency test, which is similar to the scope or which covers an important partial aspect of the task.

Economical adequacy of proficiency tests

Proficiency test are regarded as economical adequate, if the entire costs of proficiency test have no considerable influence on the price of the test **or calibration**. In this instance the costs of the proficiency tests plus the costs which would be charged to a third party for this test of such a sample on the market, should be calculated. If for a test normally no prices are obtained (e.g. public CAB) so the internal efforts (staff and material costs) need to be considered.

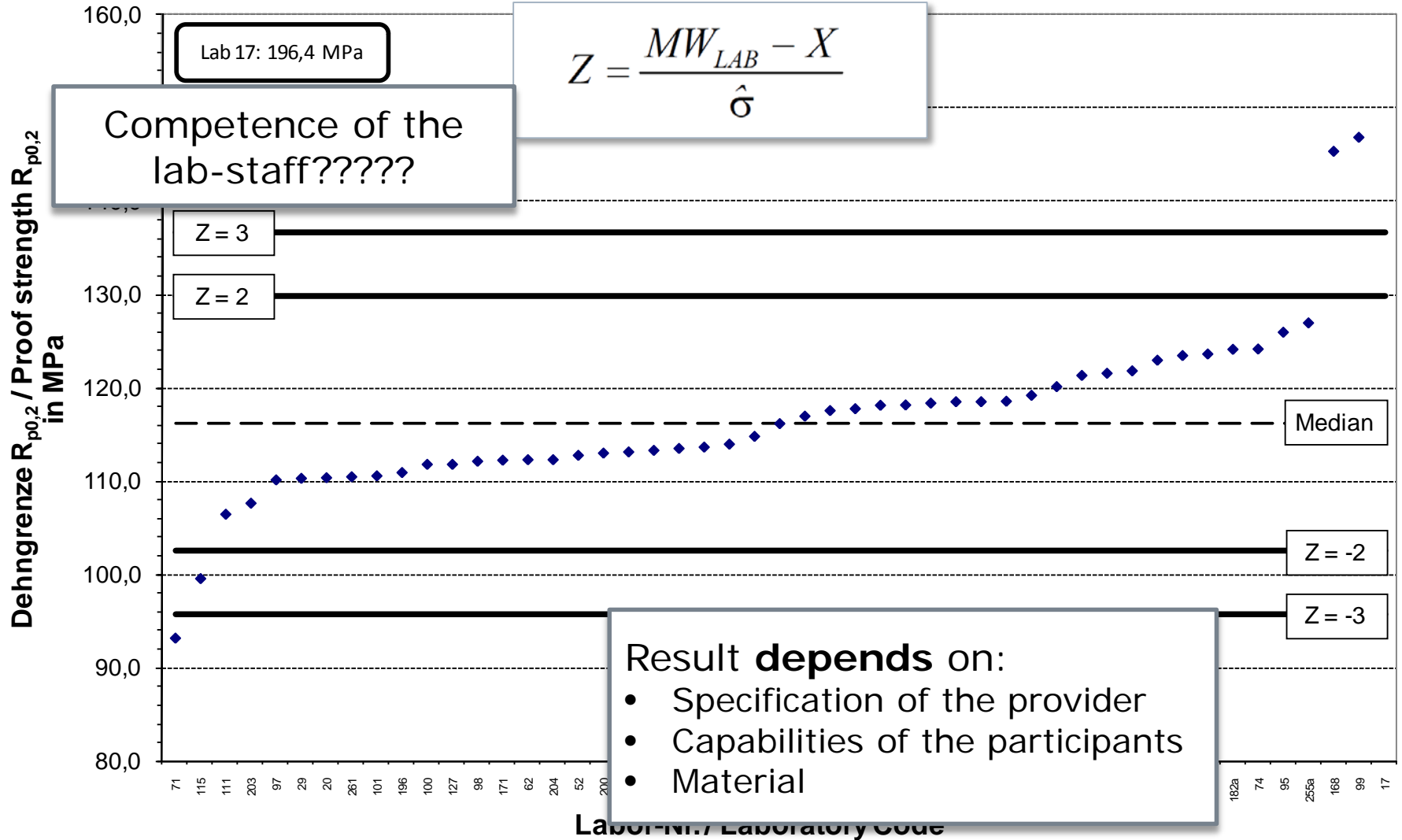
Comparison of results

- Always critical without given (fixed) limits,
- Very dependent on the application area,
- Rather tendencies than „facts“.

Example

Tensile test

Example



Example

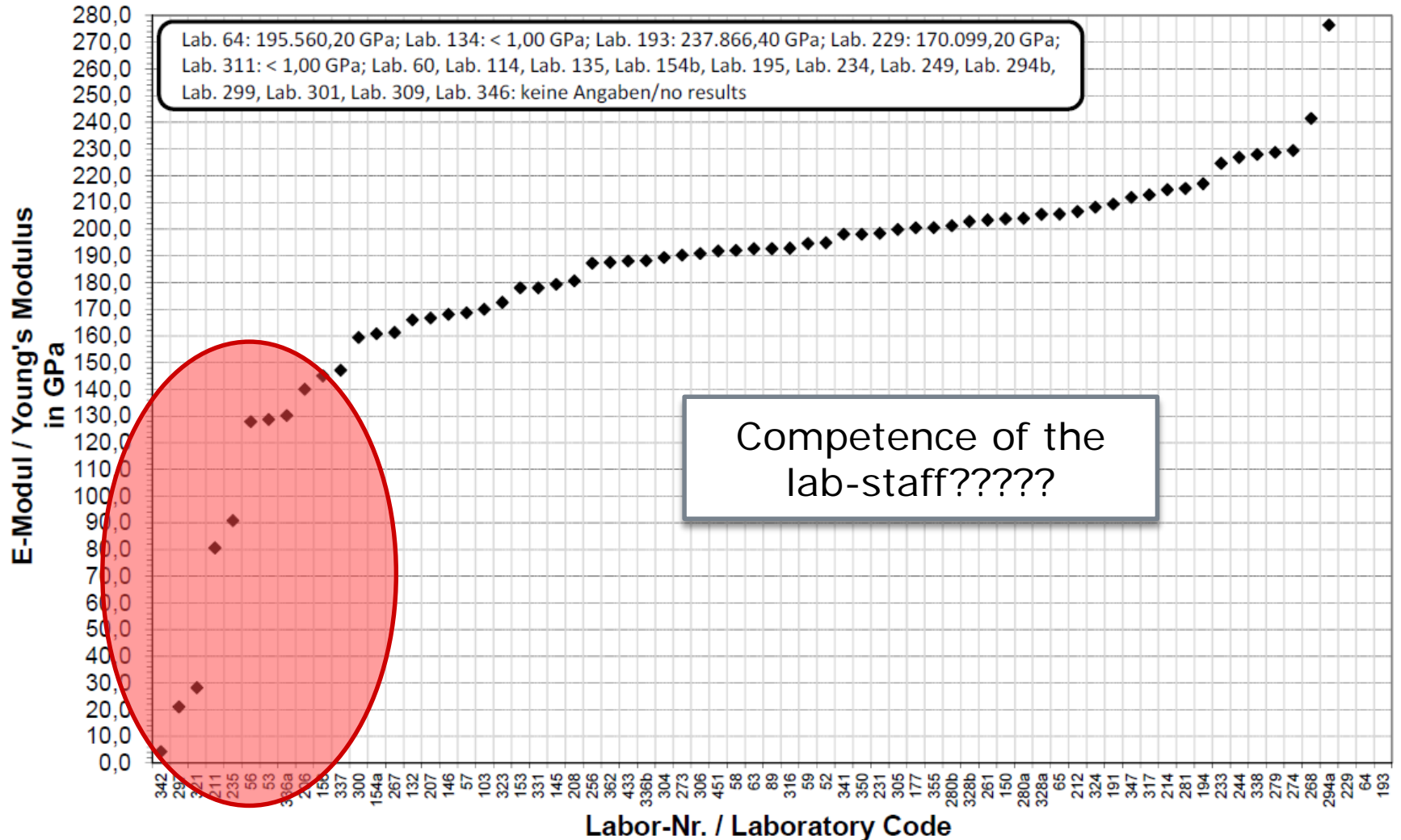


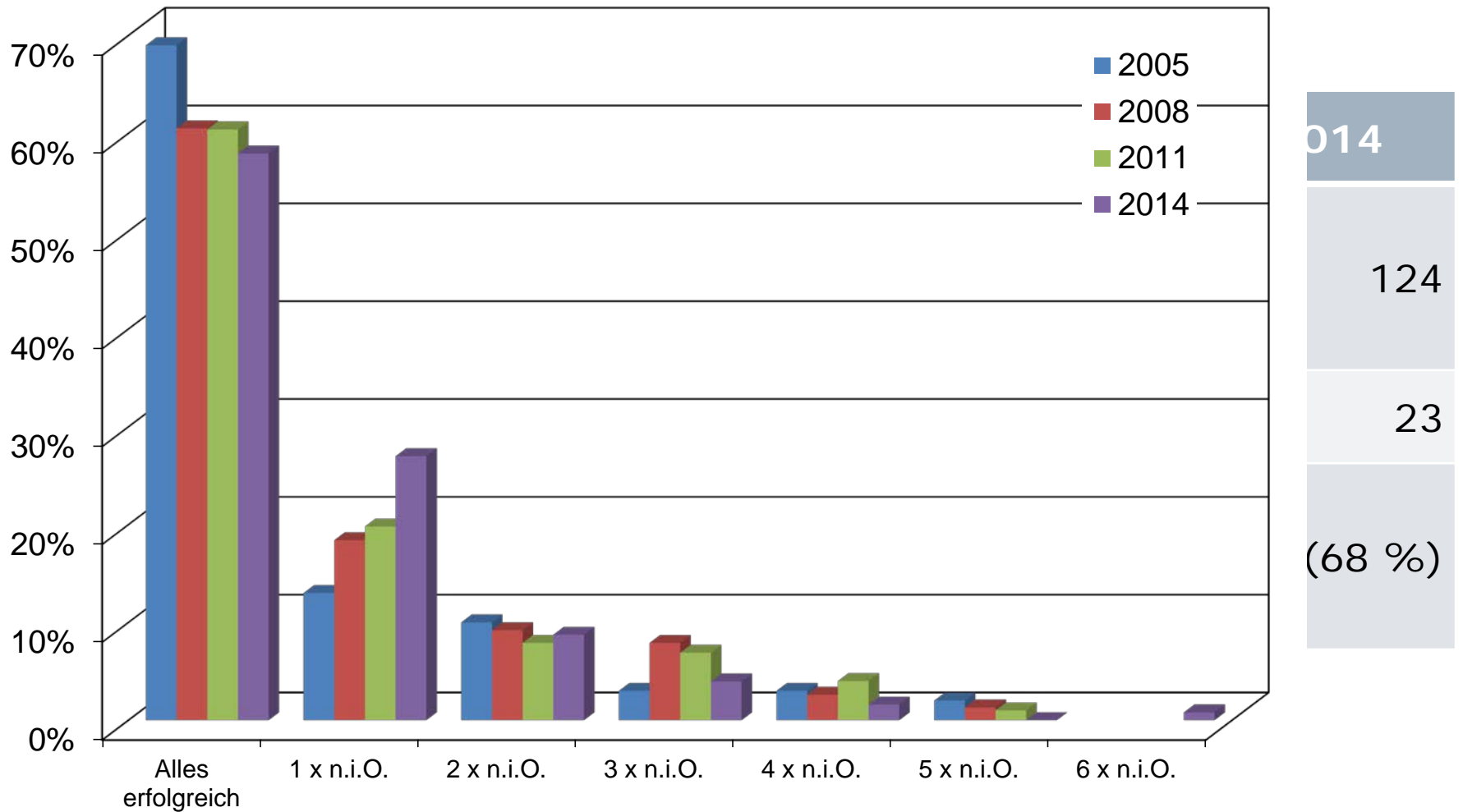
Bild A5: Steigung im elastischen Teil der Spannung/Extensometer-Dehnung-Kurve, m_E ; Mittelwerte aller Laboratorien (nicht bewertet)

Figure A5: Slope of the elastic part of the stress-percentage extension curve, m_E ; Mean values of all laboratories (not assessed)

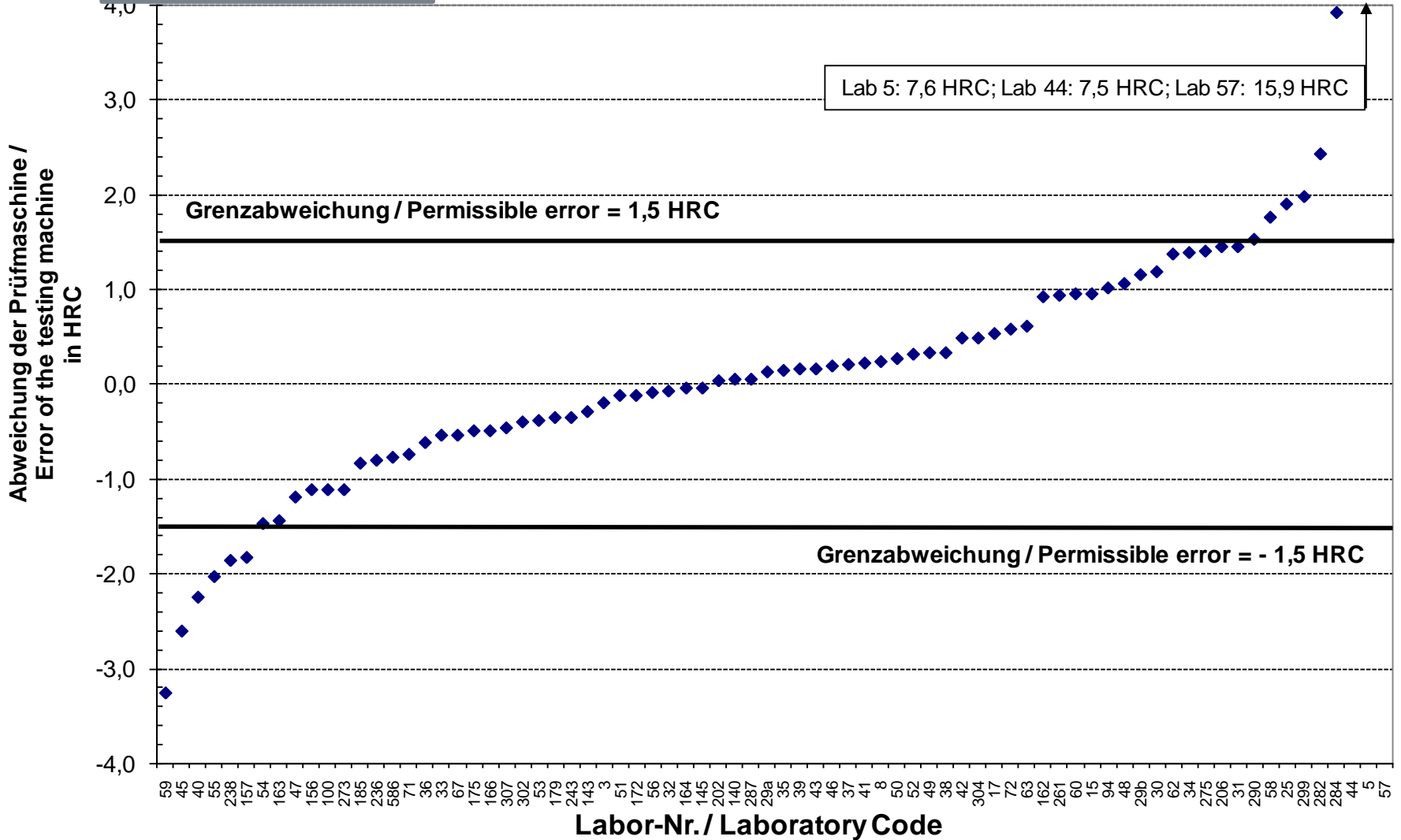
Example

Hardness

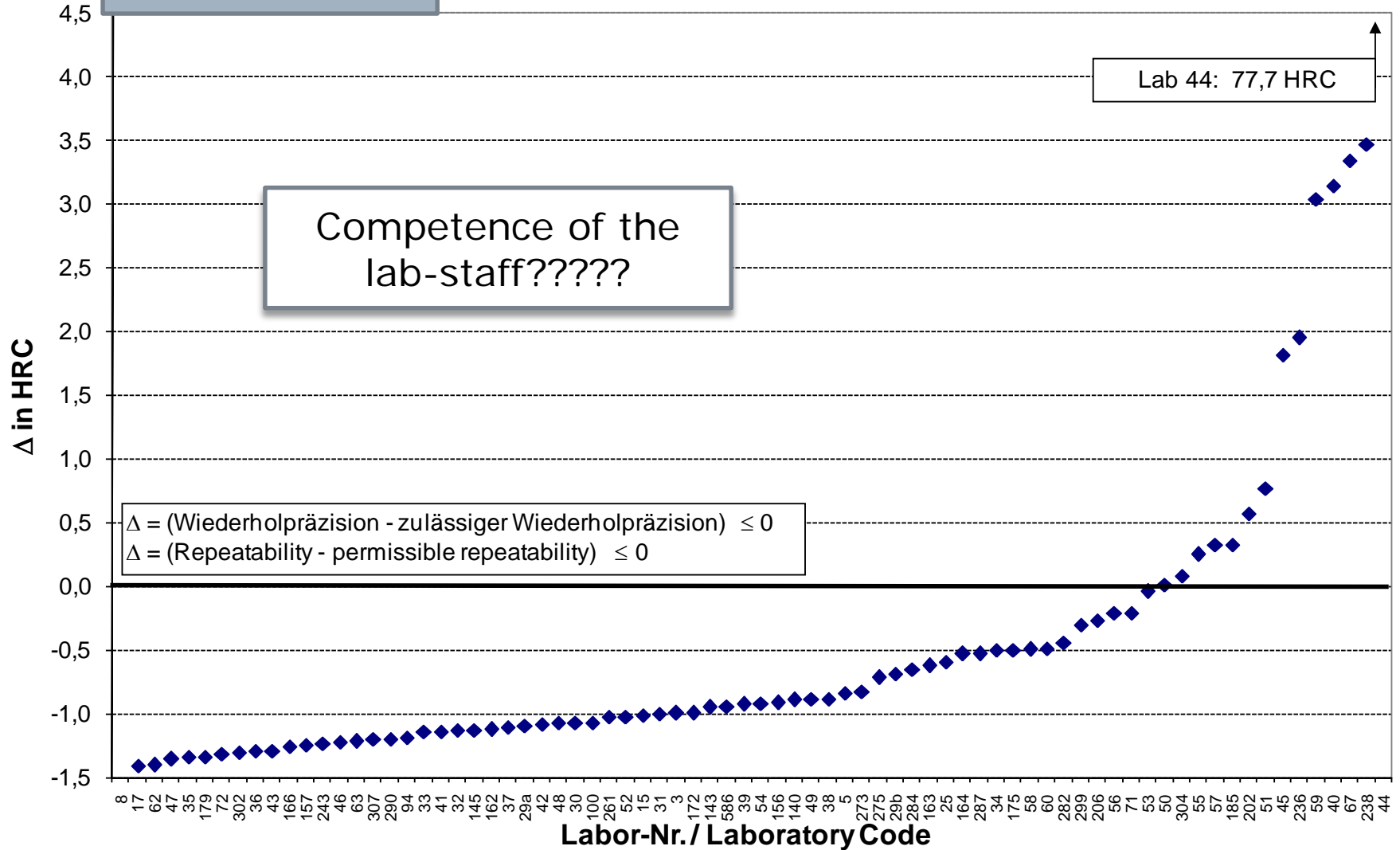
HRC Overview about participants



25 HRC / 82 %



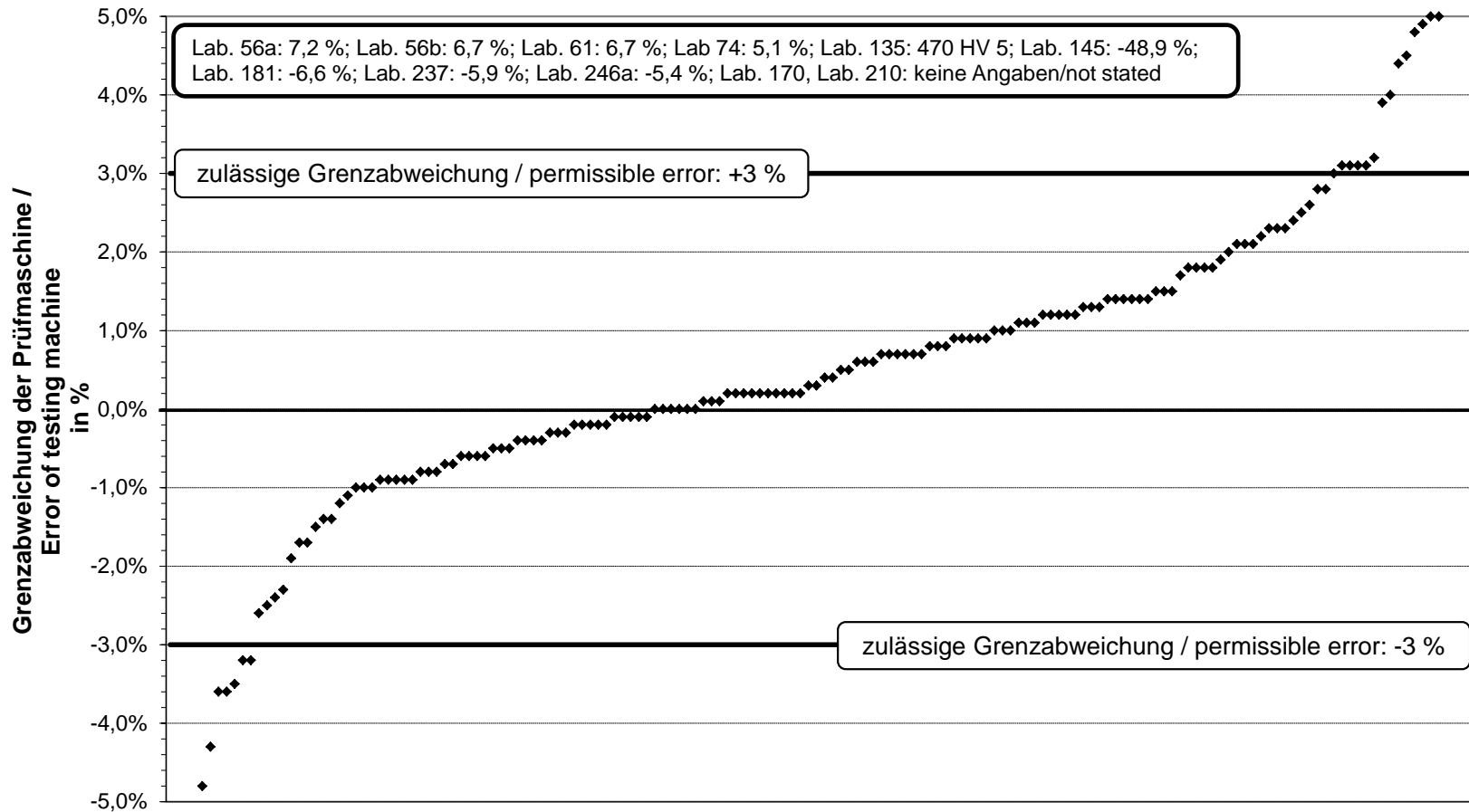
25 HRC / 83 %



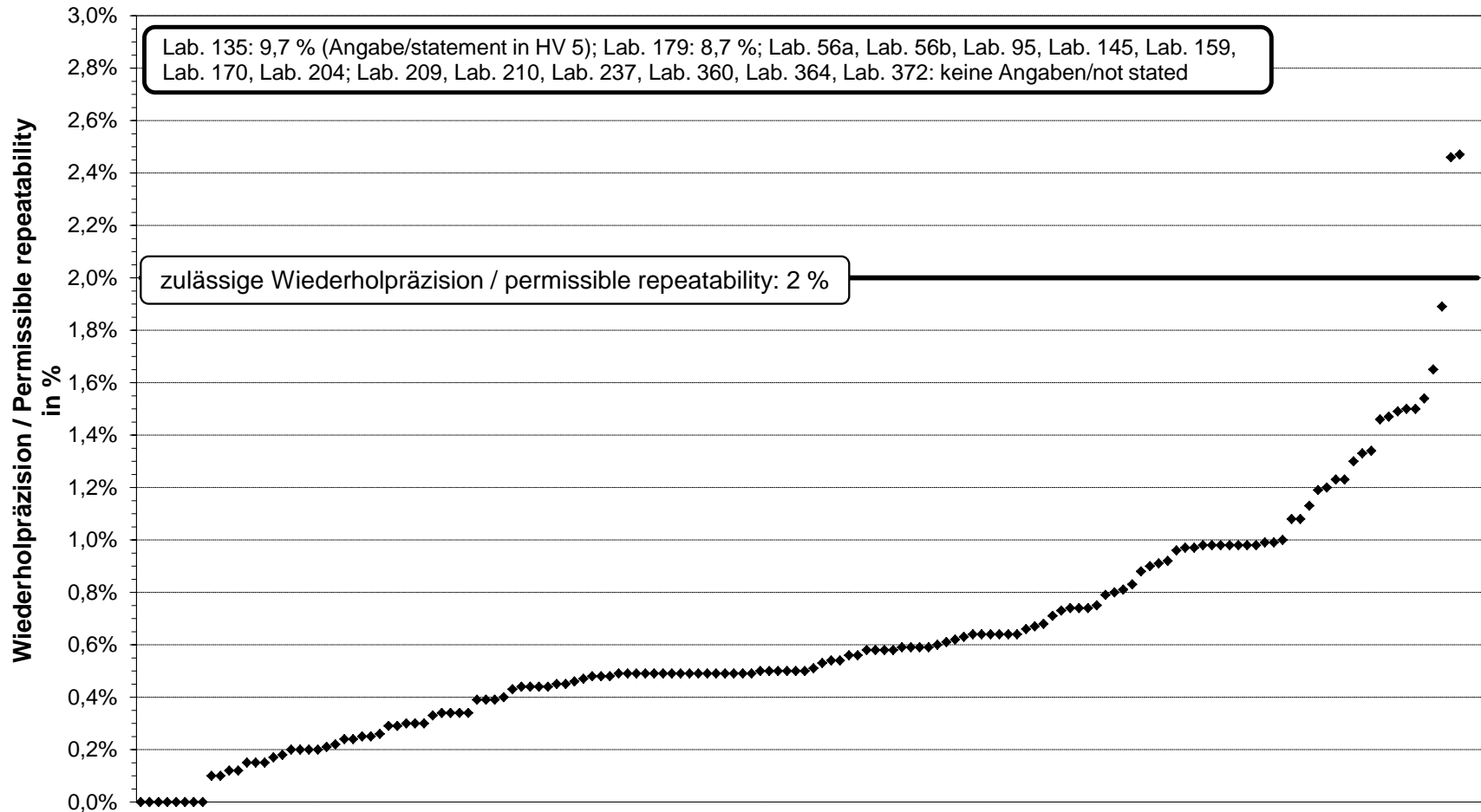
Hardness Vickers HV 10 / HV 30 – 2006 - 2012

Value	2006		2012	
	No. of assessed results	satisfactory	No. of assessed results	satisfactory
Error HV 10	79	88 %	162	83 %
Repeatability HV 10 (Diagonals)	72	96 %	152	98 %
Error HV 30	79	82 %	139	83 %
Repeatability HV 30 (Diagonals)	73	100 %	133	100 %

Error HV 10



Repeatability diagonals



Example

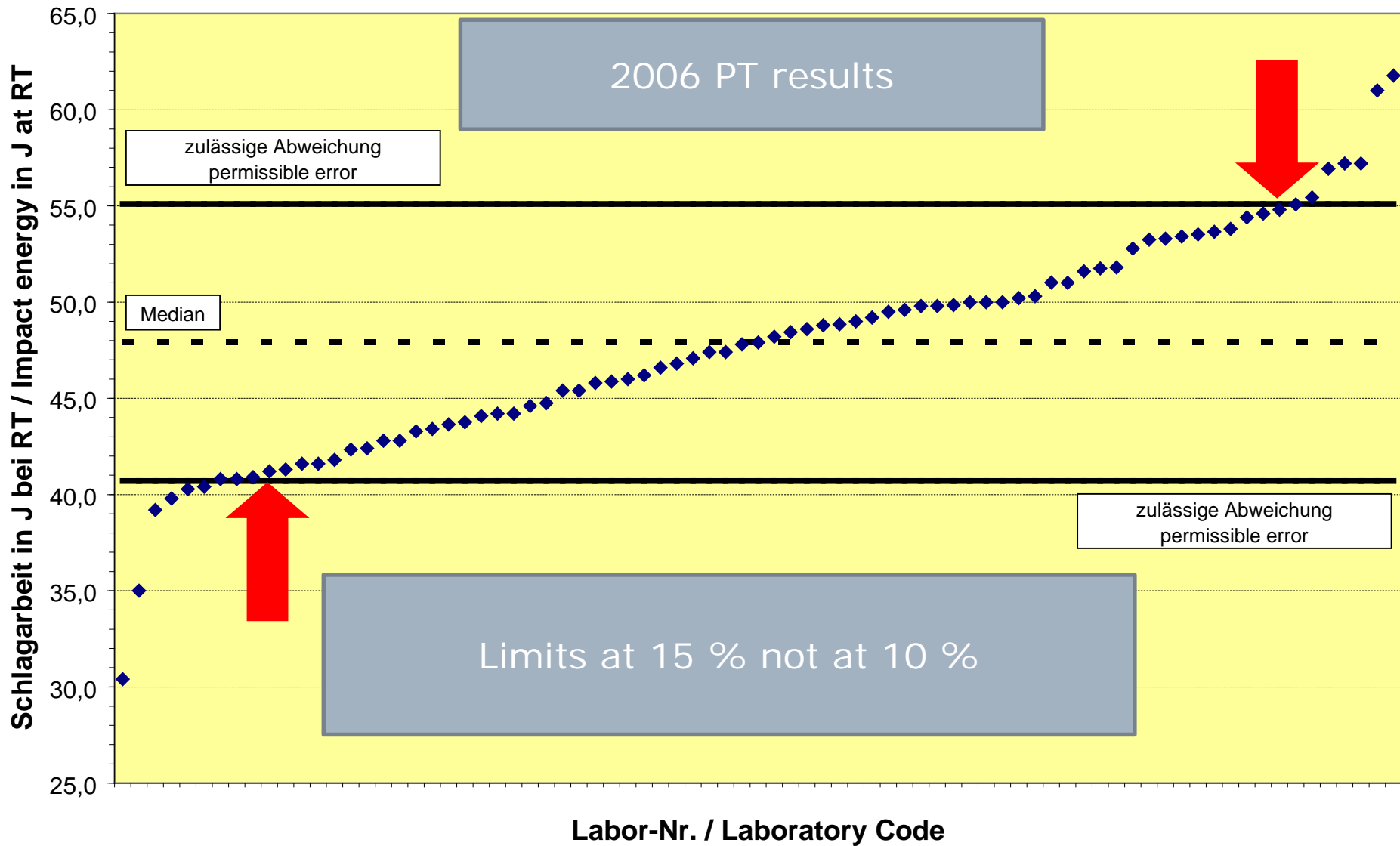
Charpy acc. to ISO 148

Assessment criteria

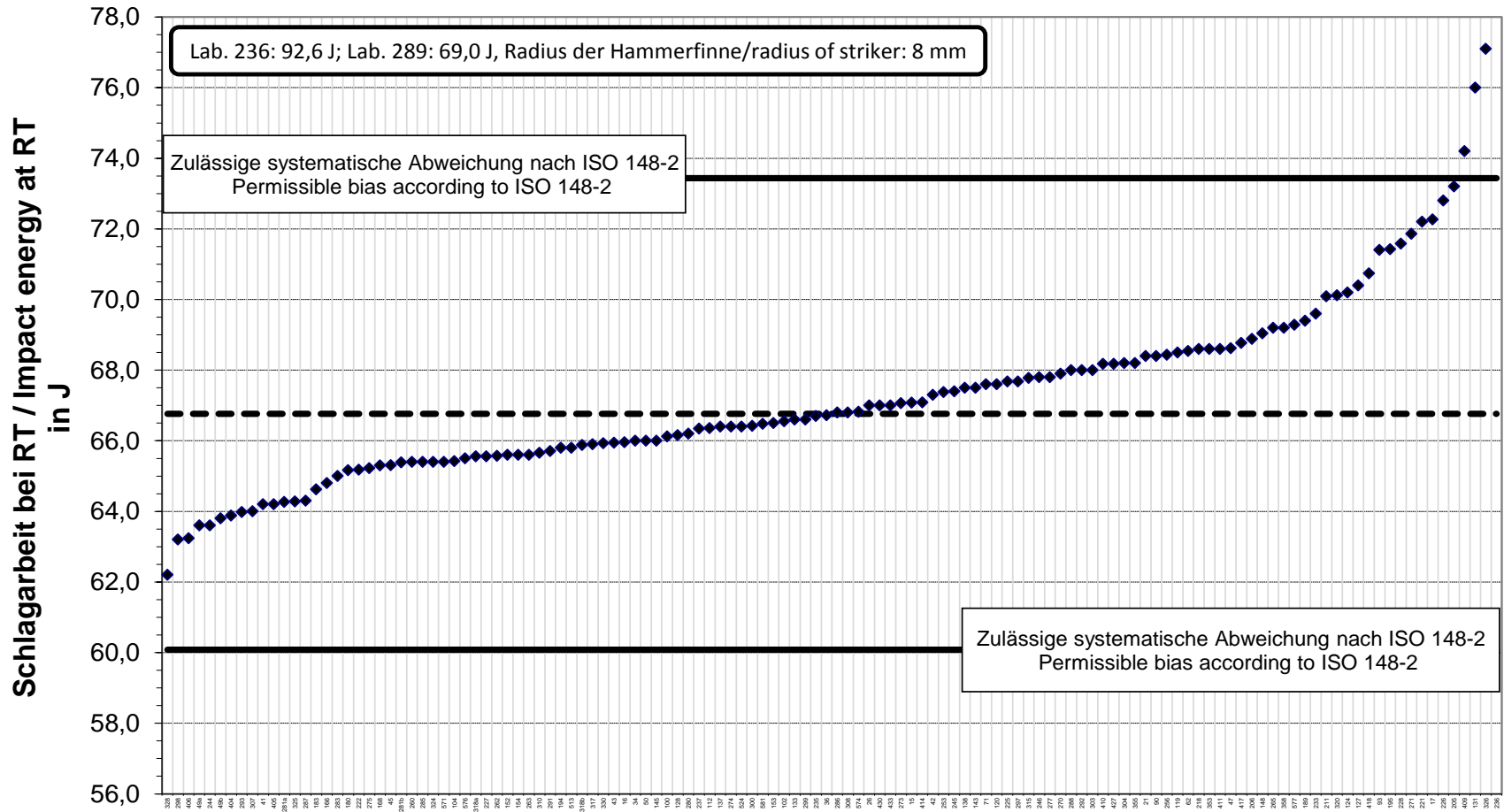
Indirect verification (ISO 148-2):

	Requirements of ISO 148-2
Number of energy levels	min. 2
Number of specimen per level	5
Bias*	4 J / 10 %
Repeatability*	6 J / 15 %

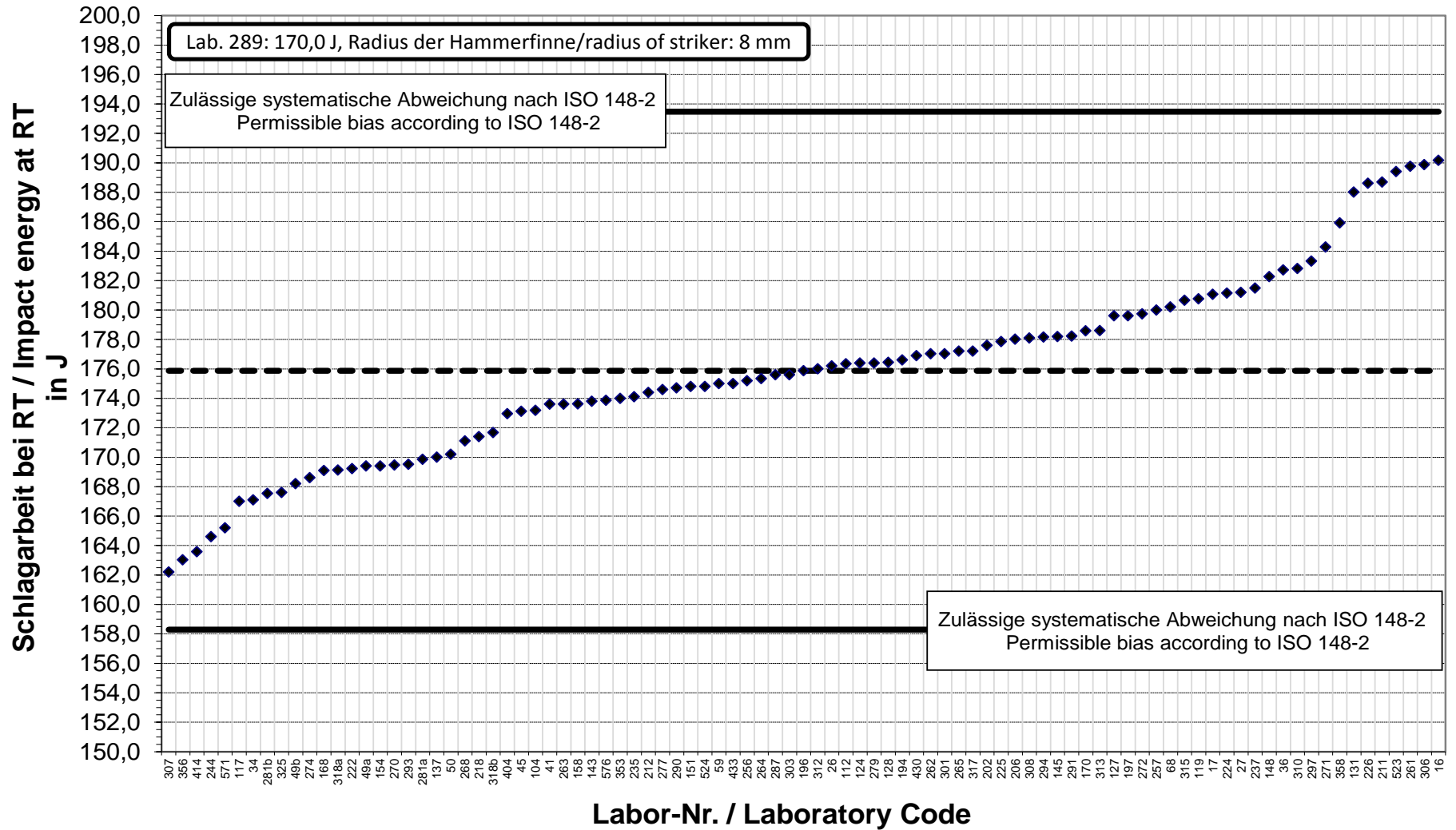
* up to 40 J: statement in Joule, from 40 J: relative statement in percent



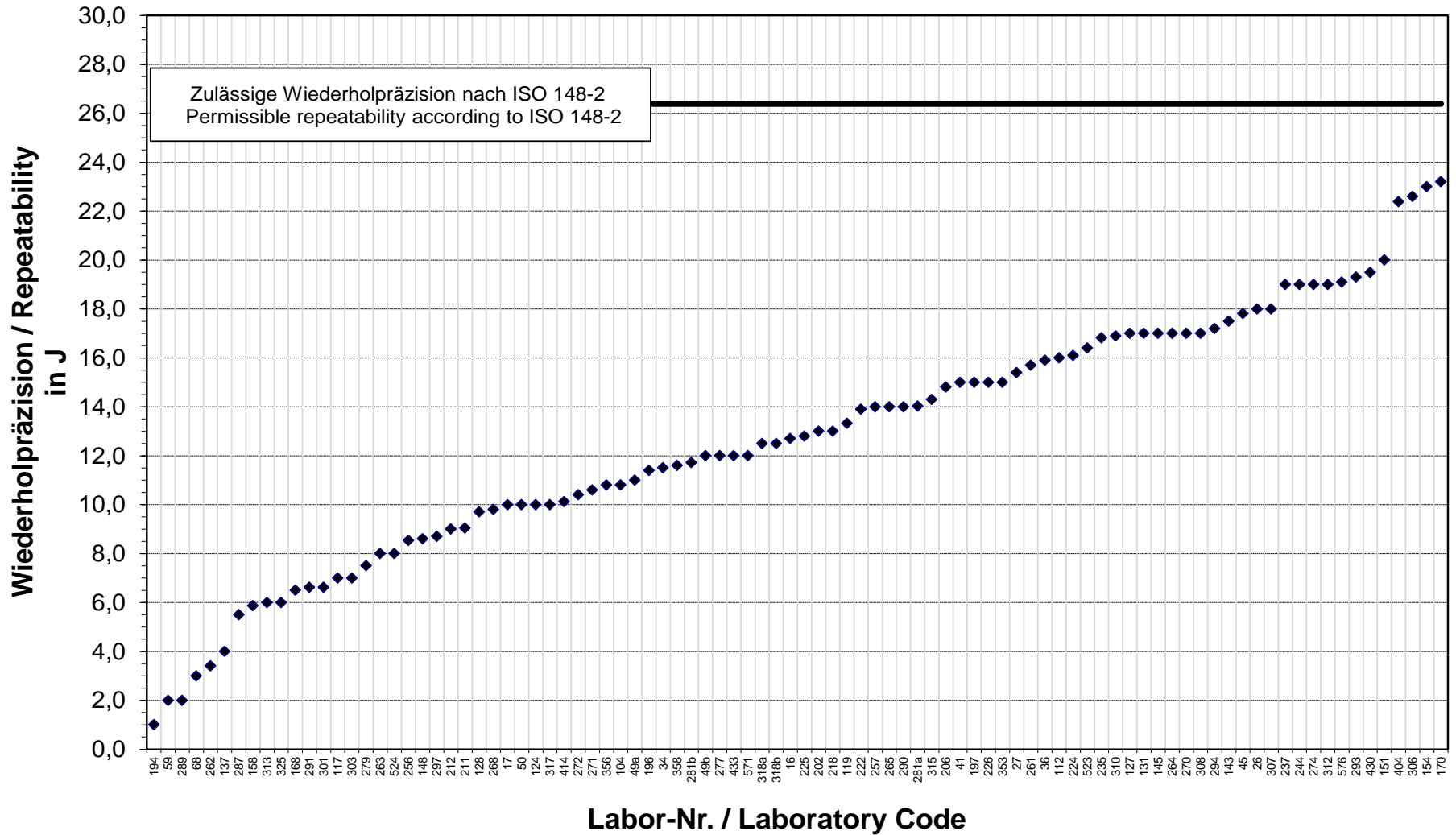
Charpy Pt results AVERAGE, bias



Charpy Pt results HIGH, bias



Charpy Pt results HIGH, repeatability



Summary

- Proficiency tests are fixed in the (DAkkS) rules,
- It is very difficult to state something to the improvements to testing quality over time,
- It is always a good idea to train the staff!



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the international database for
certified reference materials

