

## 25. testXpo Internationale Fachmesse für Prüftechnik

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

**Ulm**

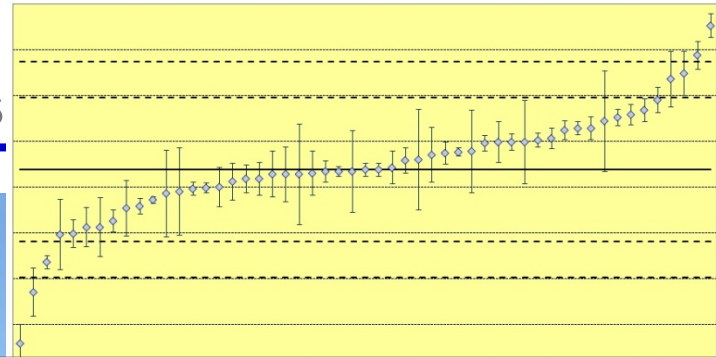
**Thursday, 13<sup>th</sup> October 2016**

Dipl.-Ing. Christian Weißmüller

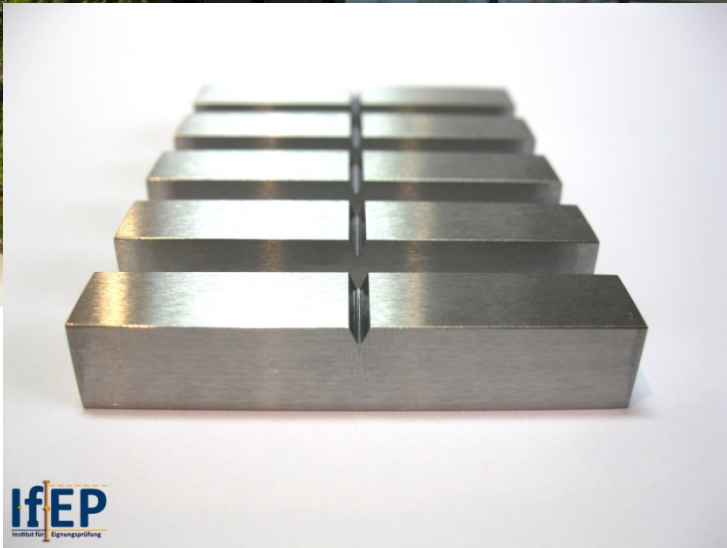


Since 2004

# Eignungs



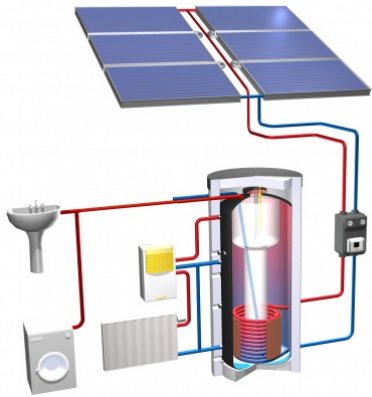
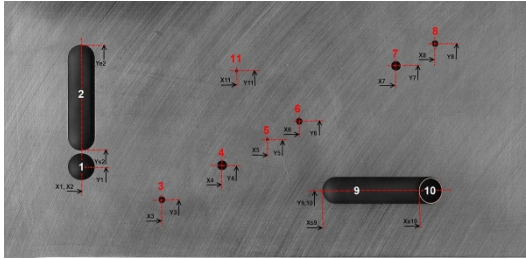
Since 2000; accredited 2005



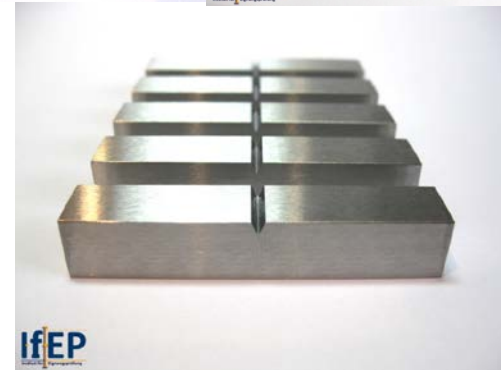
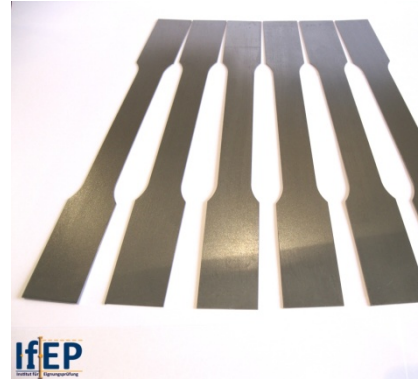
Since 2008; accredited 2009

# IfEP – Program

## Proficiency tests



## Reference material



+ 2.600 participations of 650  
labs from 40 Ländern

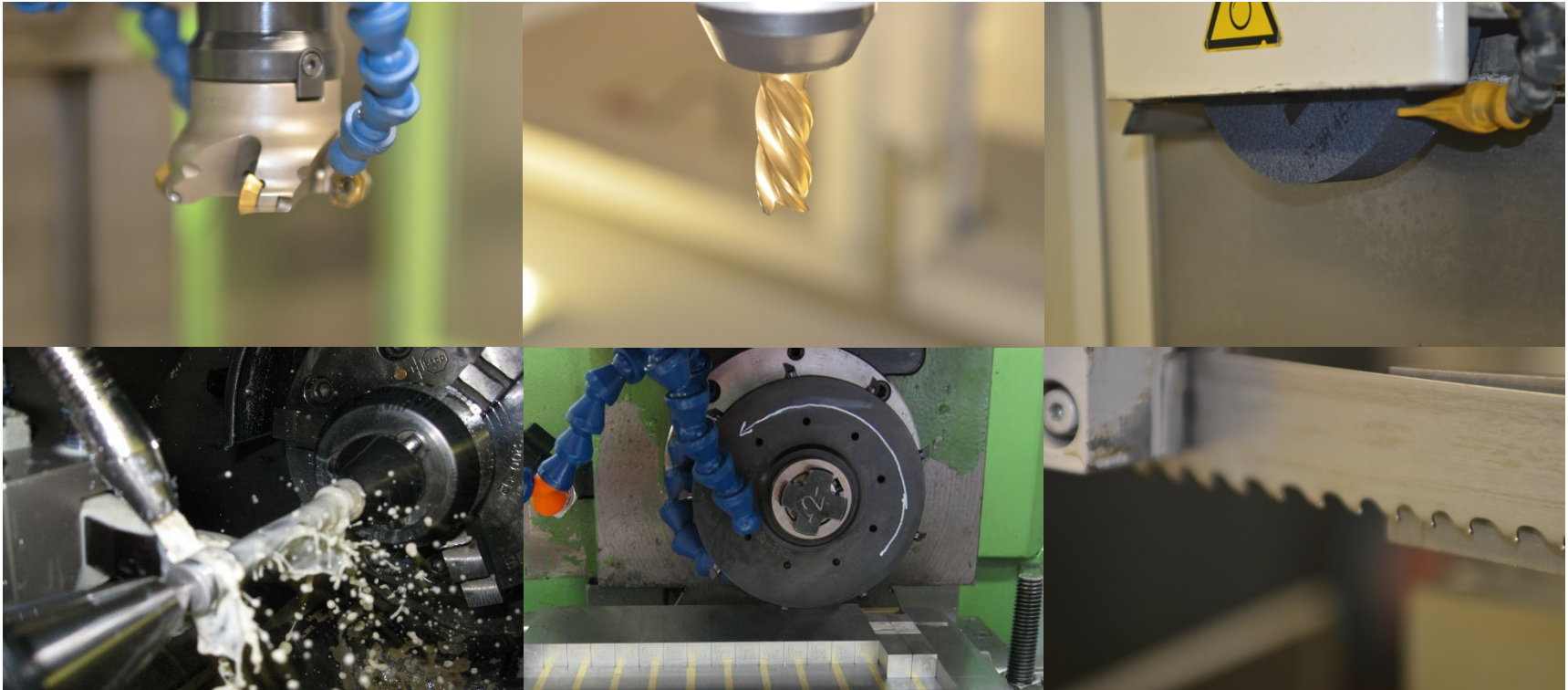
app. 8.000 sets á 5/6 Proben

# IfEP GmbH – new production site

## Since February 2015



# Specimen production



Precise machining of kind of specimen geometry

# Basics to proficiency testing

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## **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 bodies<sup>1</sup>. It describes the requirements for participation in proficiency test at accredi-

## Proficiency testing – general rules

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### 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

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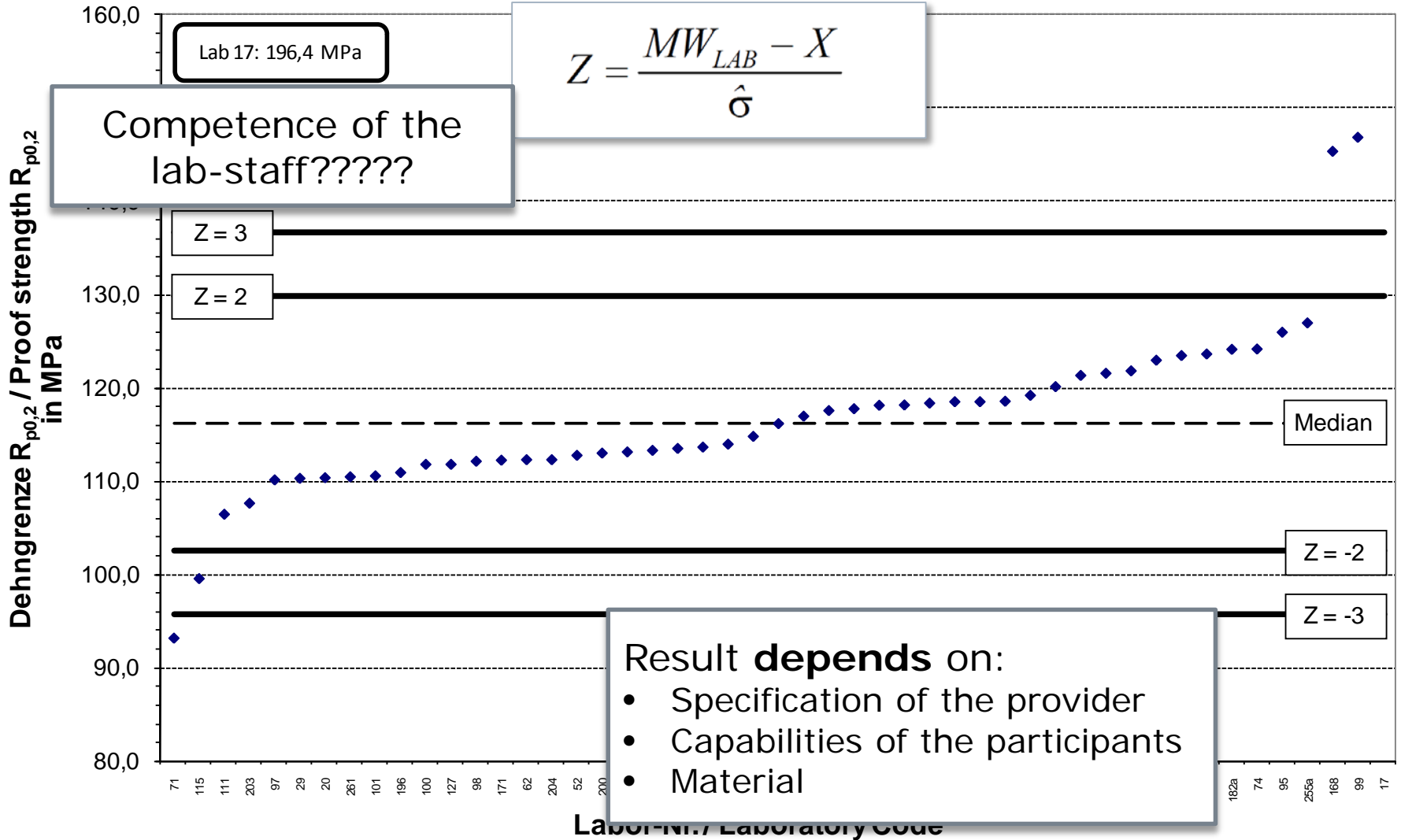
- Always critical without given (fixed) limits,
- Very dependent on the application area,
- Rather tendencies than „facts“.

# Example

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## Tensile test

# Example



## Example

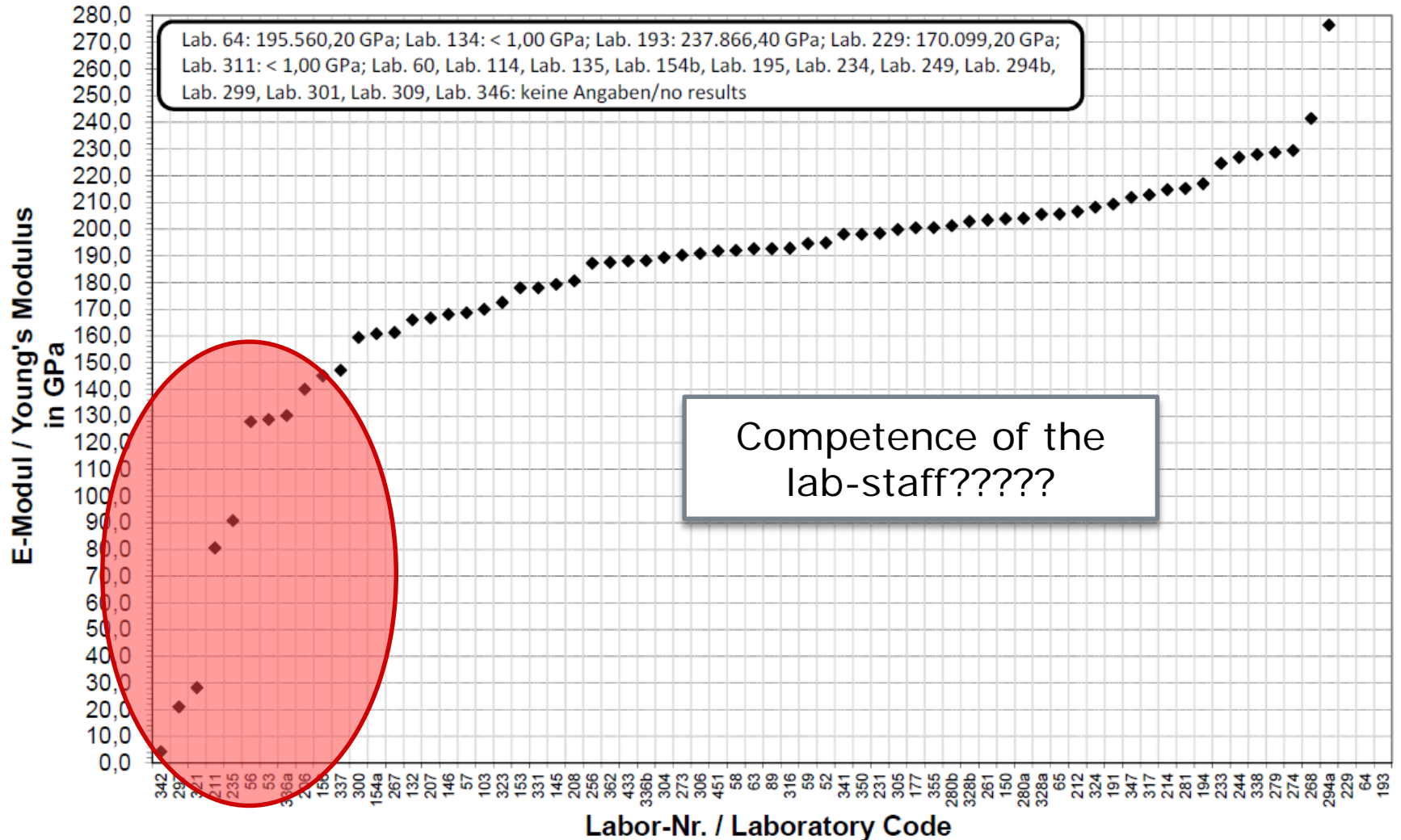


Bild A5: Steigung im elastischen Teil der Spannung/Extensometer-Dehnung-Kurve,  $m_E$ ; Mittelwerte aller Laboratorien (nicht bewertet)

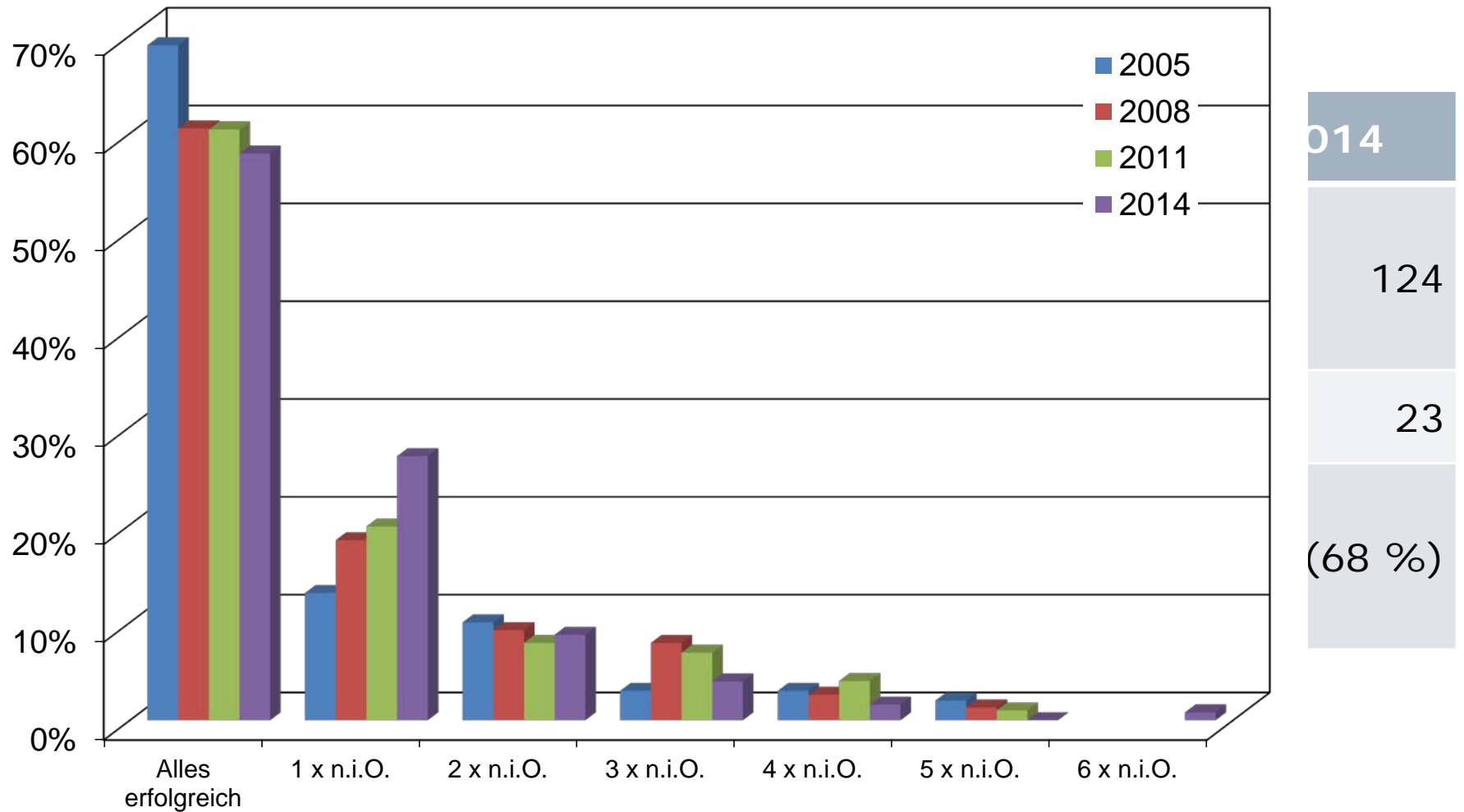
Figure A5: Slope of the elastic part of the stress-percentage extension curve,  $m_E$ ; Mean values of all laboratories (not assessed)

# Example

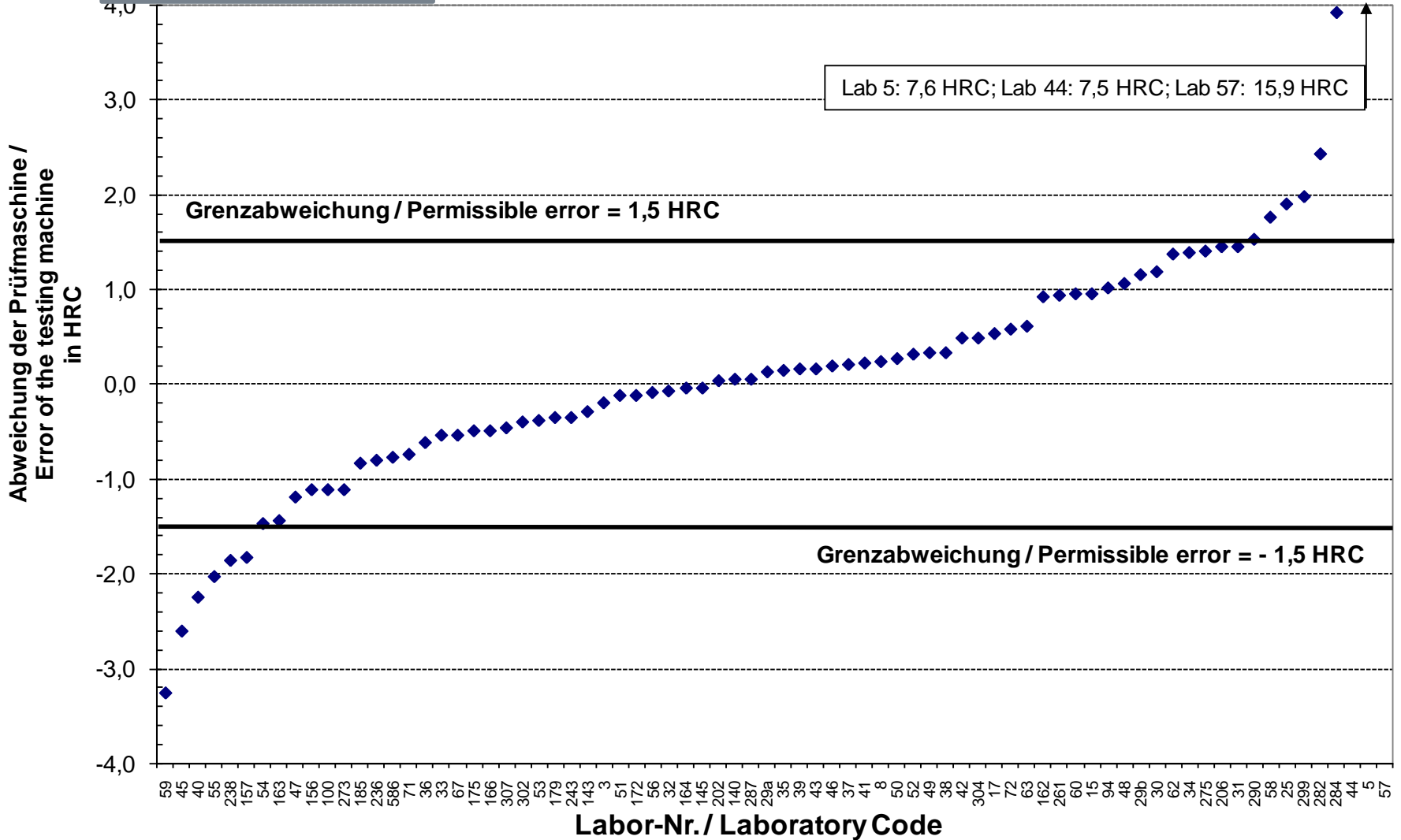
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# Hardness

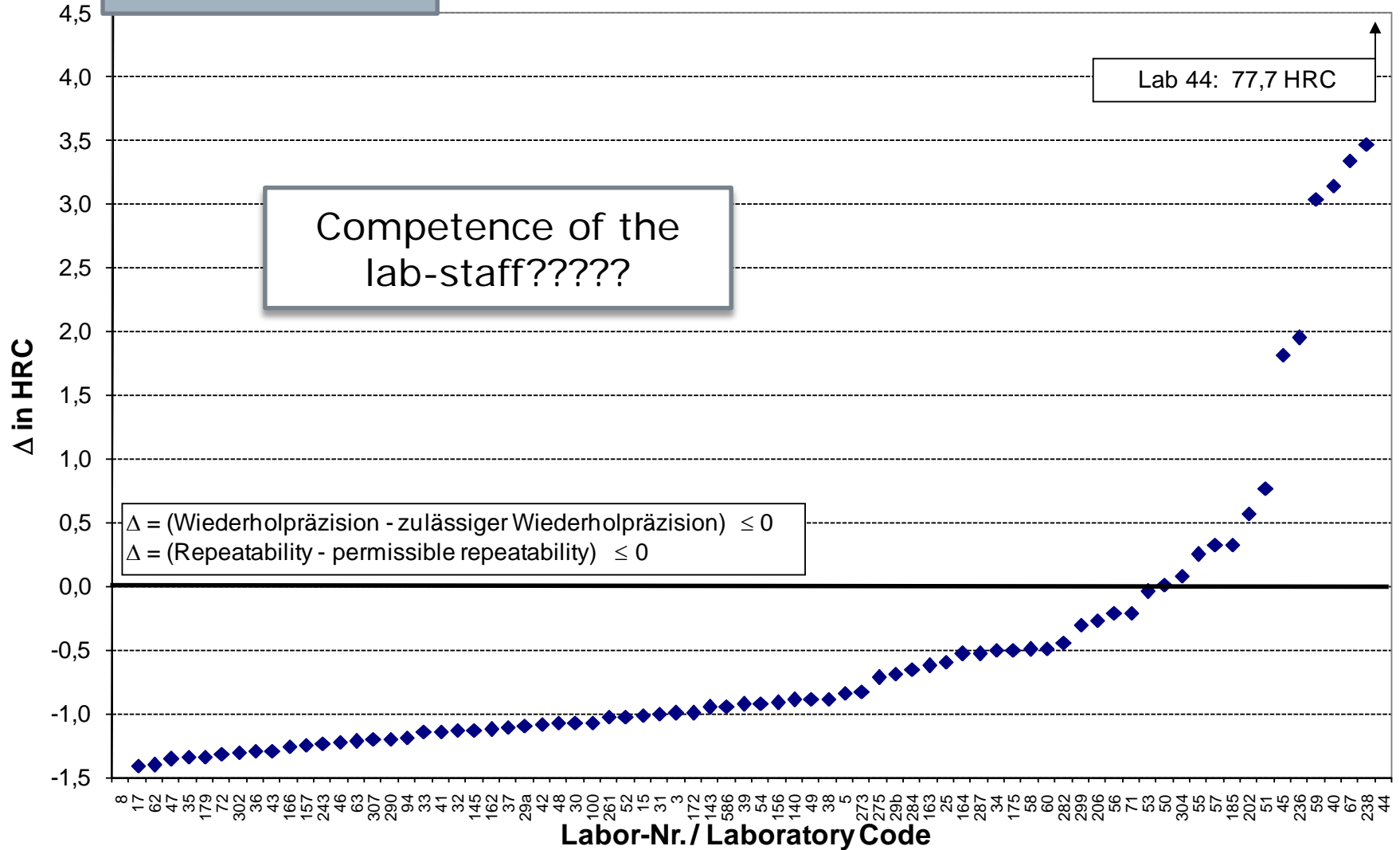
# HRC Overview about participants



25 HRC / 82 %



25 HRC / 83 %

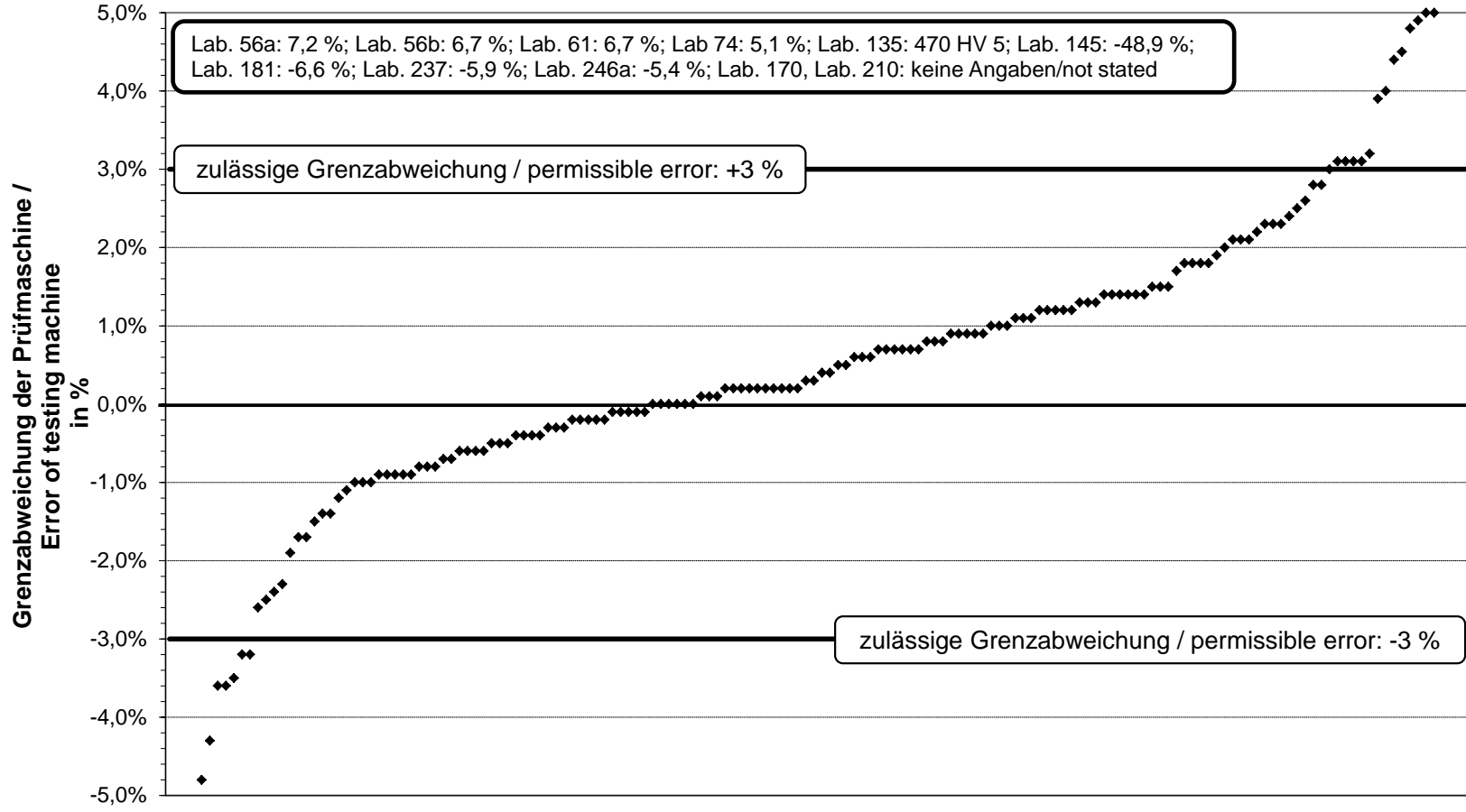




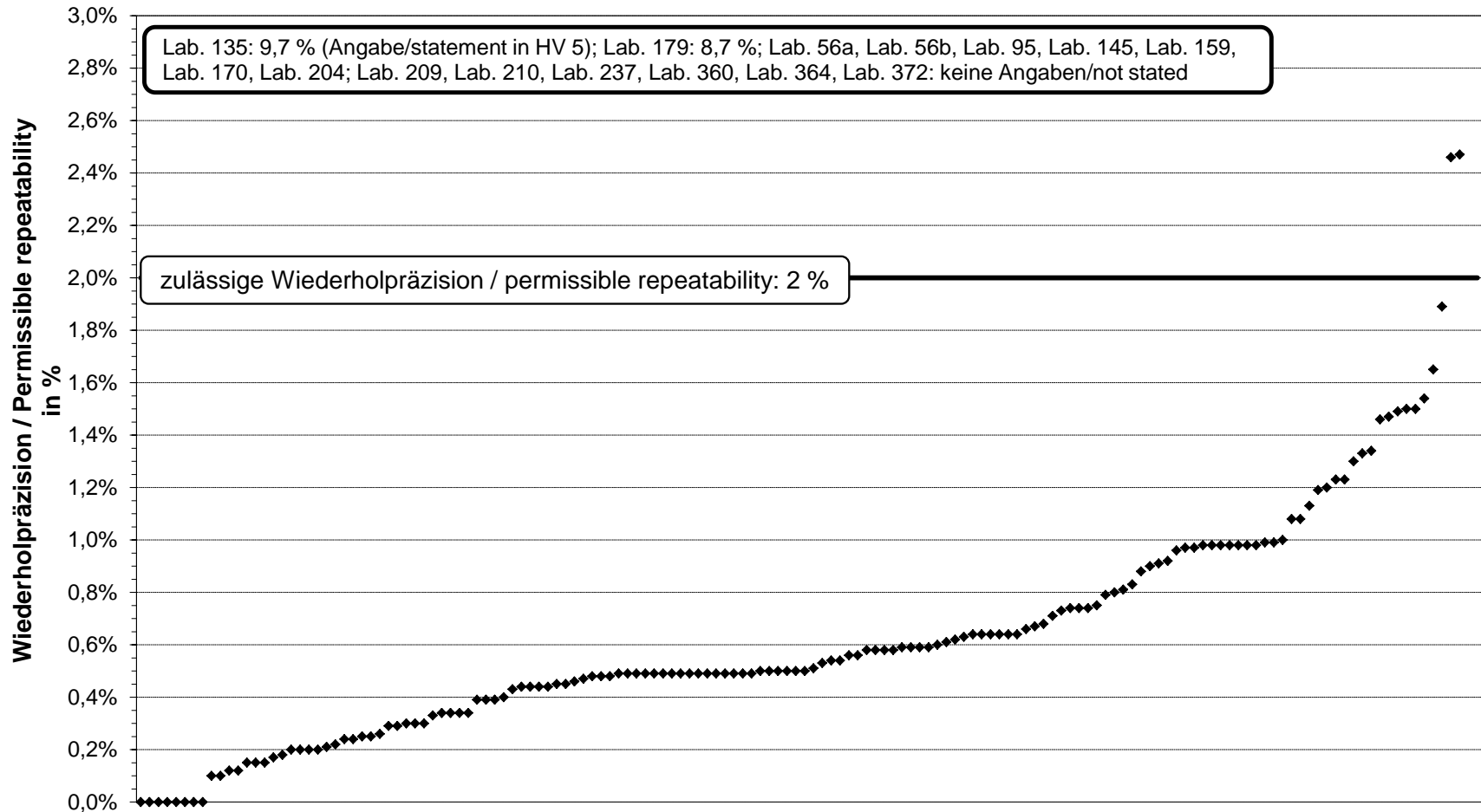
# Hardness Vickers HV 10 / HV 30 – 2006 - 2012

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

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# Charpy acc. to ISO 148

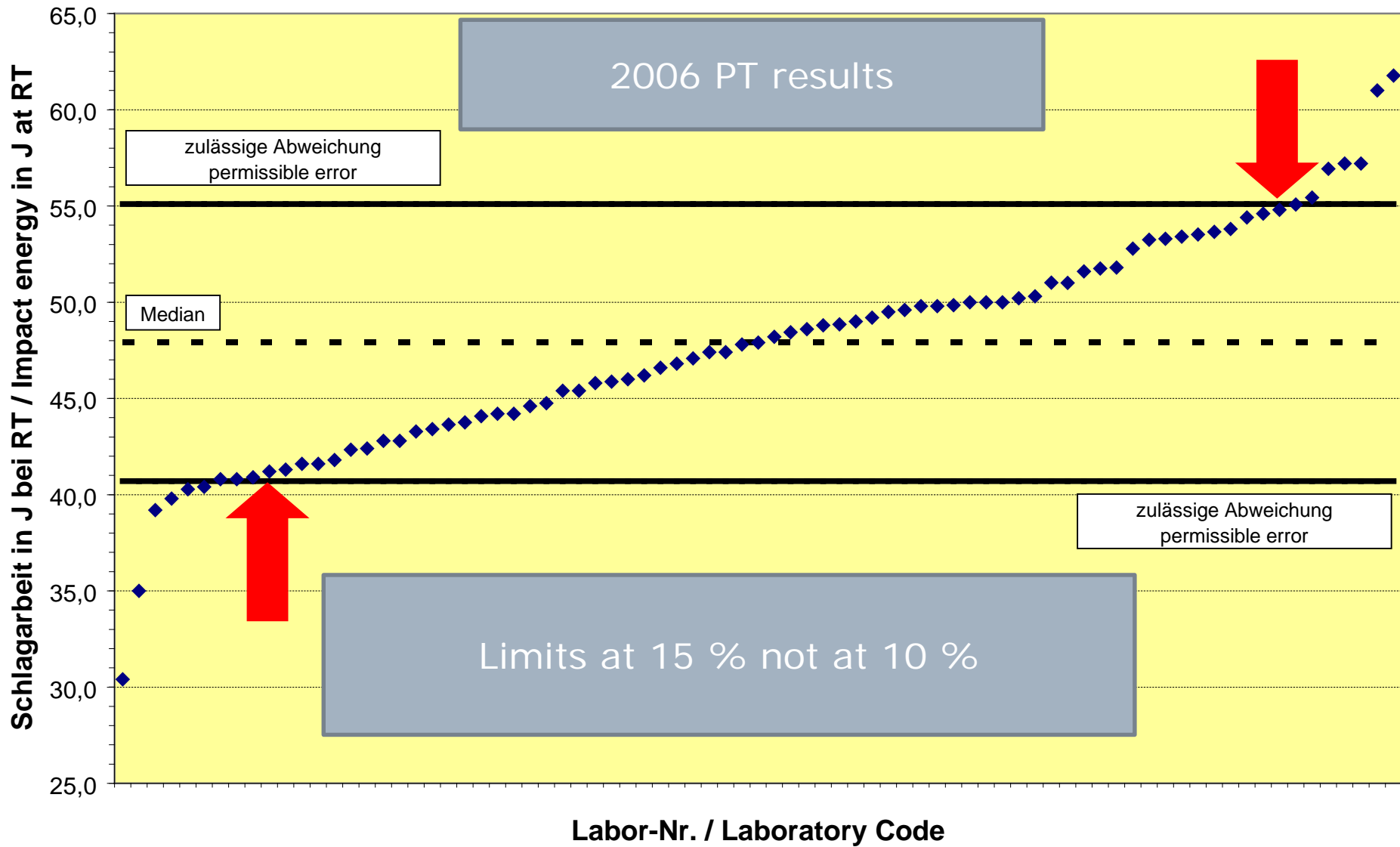
# Assessment criteria

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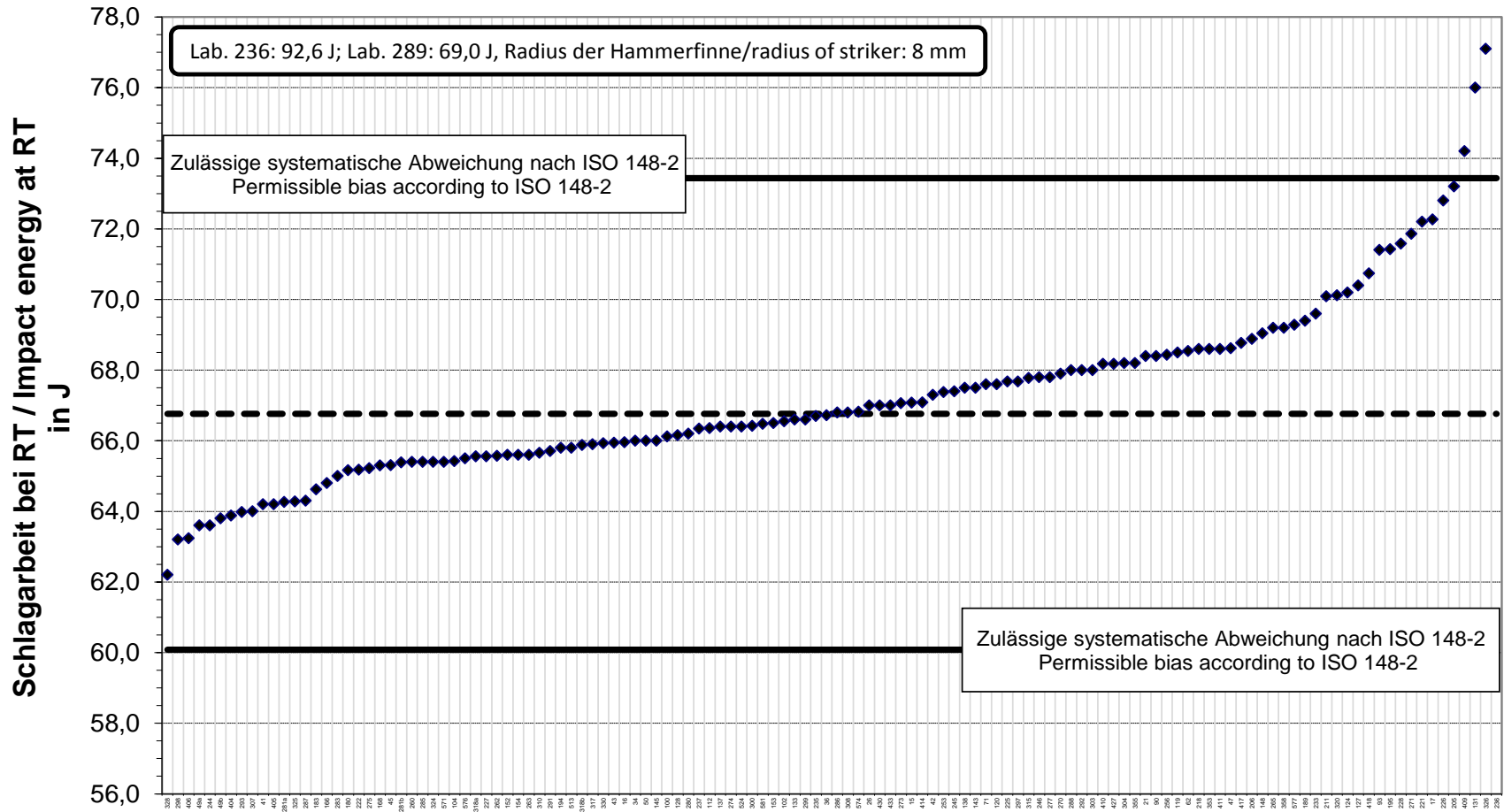
## Indirect verification (ISO 148-2):

	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

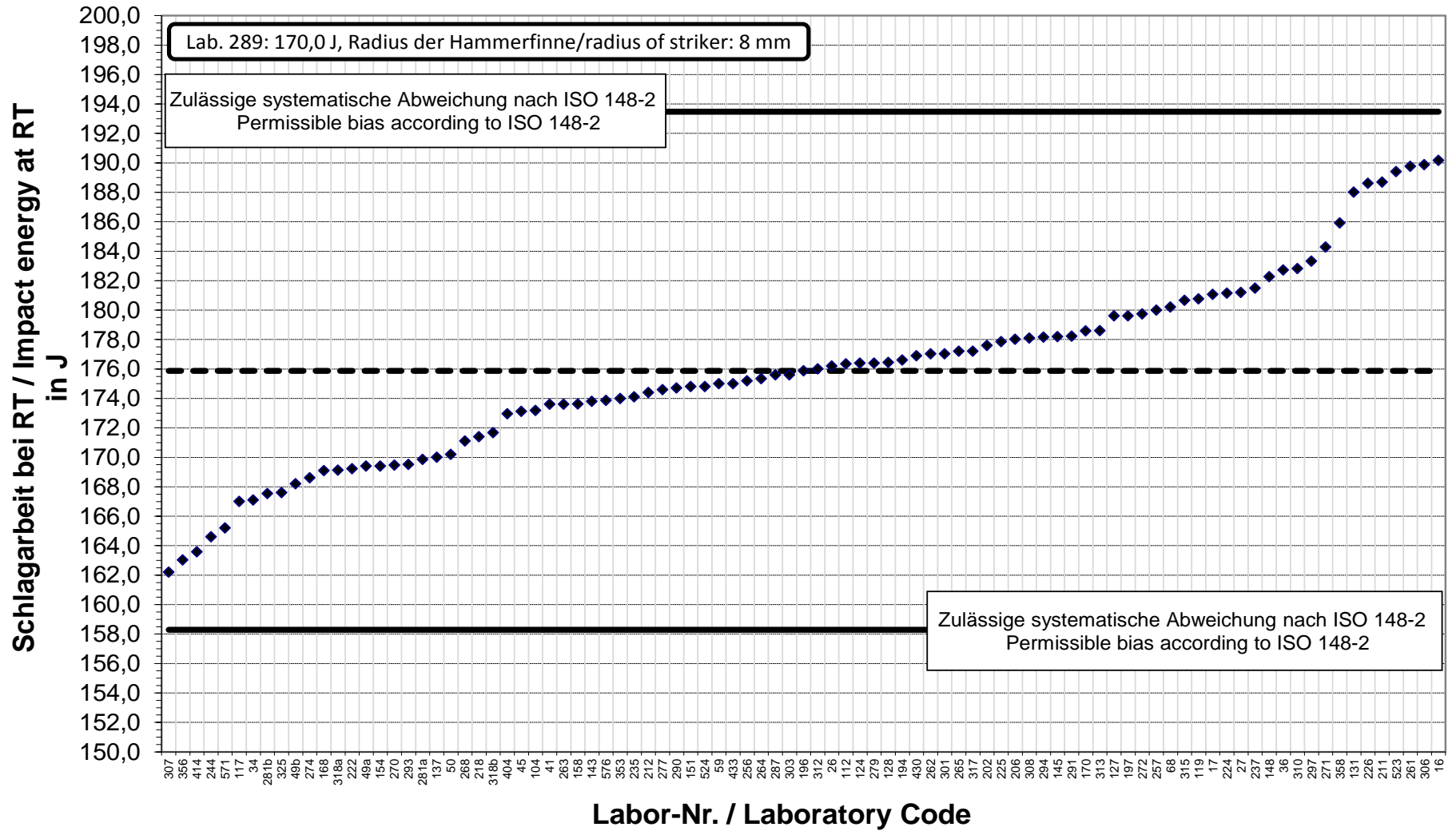


# Charpy Pt results AVERAGE, bias



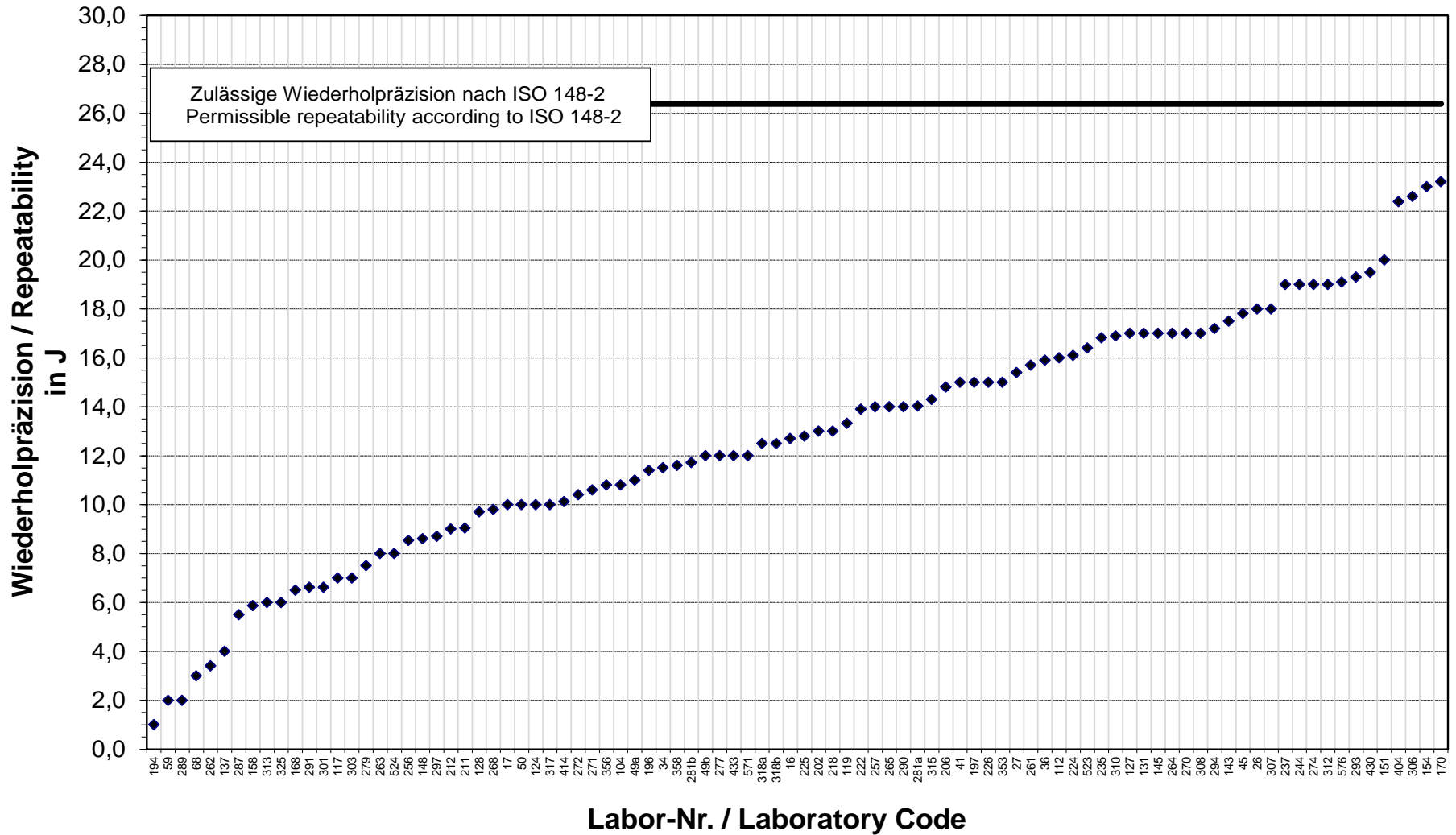
Labor-Nr. / Laboratory Code

# Charpy Pt results HIGH, bias





# Charpy Pt results HIGH, repeatability



# Summary

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- 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

