

ALL ON EDGE

Development of Objective Test Methods for Furniture Edges and Rims

Work Package A
„Mechanical and adhesion resistance“
Part „Impact“

Overview of working steps

START

- Background: Existing methods not satisfying

MATERIAL

- Chosen: 13 finished samples
- Delivered: 5 finished samples + 2 extra variants

TESTS WITH TWO PROTOTYPES

- Knowledge about the possibility to use the method
- Testing of different falling masses

COMPARATIVE TEST AND RRT

- Knowledge about repeatability and reproducibility of the method

GOAL

- New testing method

■ Tasks:

- **Task-A1: Definition, preparation and providing of samples with different furniture edges**
- **Task-A2: Methodological investigations on impact on edges and rims**
- **Task-A3: Methodological investigations on adhesion resistance on edges and rims**
- **Task-A4: Comparative tests of the optimized methods**
- **Task-A5: Round Robin Tests of the optimized methods**
- **Task-A6: Final description of suitable methods on mechanical resistance**

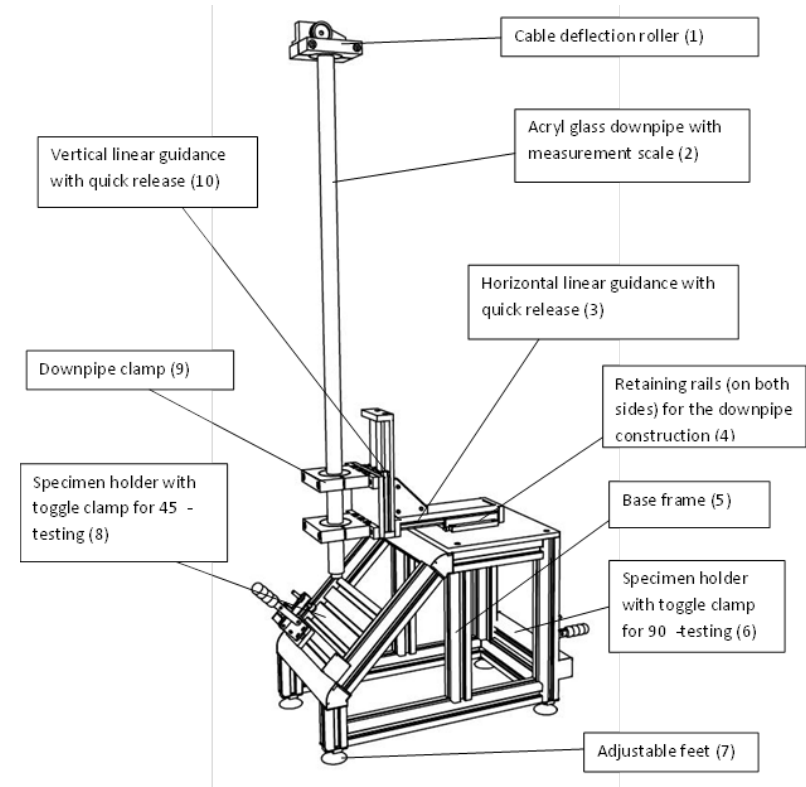
- Material used for the investigations:

Var.	Substrate	Edge-Material Type	Profile
A-I-1	PB	HPL 1	flat
A-I-2	PB	HPL 2	flat
A-I-5	MF PB	ABS	flat
A-I-7	PB	Postforming HPL	rounded
A-I-8	PB	Postforming CPL	rounded
A-I-14	UV-lacquered MDF1	WB Acrylic 1	flat
A-I-15	UV-lacquered MDF2	WB Acrylic 2	flat

- Tests with the first prototype according to IHD work standard 470 (impact resistance testing for doors):
 - Clearly defined impact (ball mass and diameter).
 - Good ability of positioning of the impact with two angles.
 - Defined clamping of the sample.
 - Prevention of impact repetition possible.
 - Test device commercially available.
- Several diameters of balls together with variations of falling heights were investigated.
 - Method is suitable if the impact mass as well as the construction can be adjusted for the need of furniture parts.
 - A user-friendly construction is needed.
 - The assessment of damages needs an easier description.

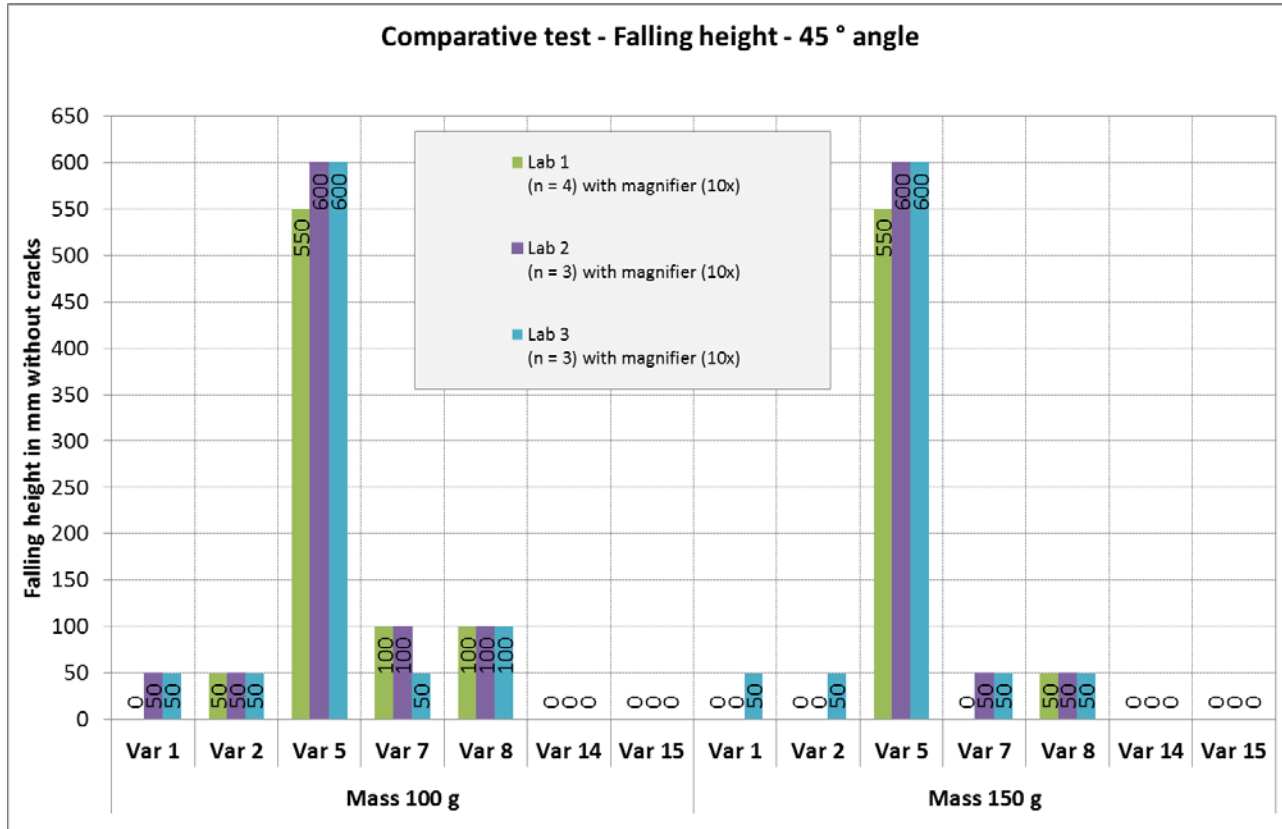


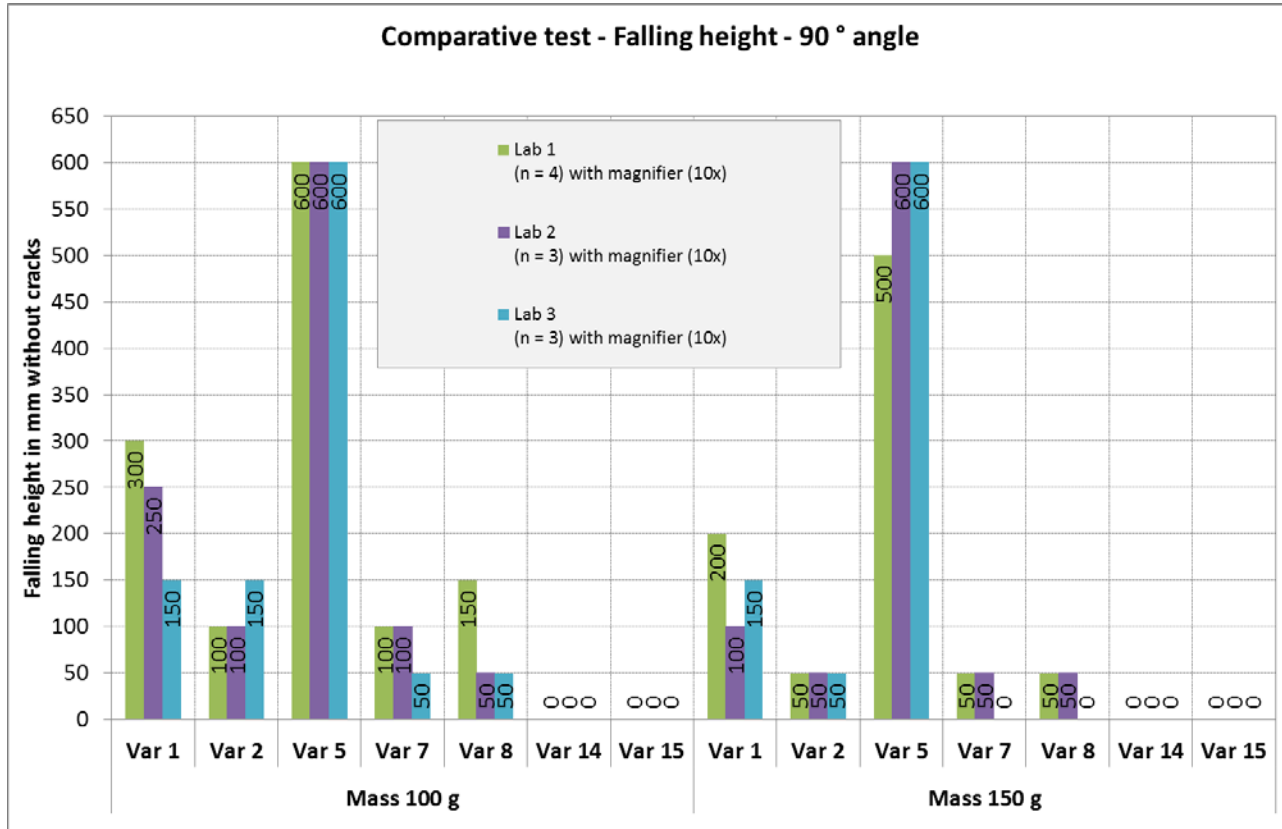
- A new Tester was developed: Impact Resistance Tester for Furniture Parts, Model No. 70 – 4590
- Two scale assessments were tested (with and without mark size measurement)
 - Together with the members of User Committee it has been decided to use the easier assessment scheme with **cracks visibility as fail/pass criterion.**
 - No differentiation between different types of cracks.



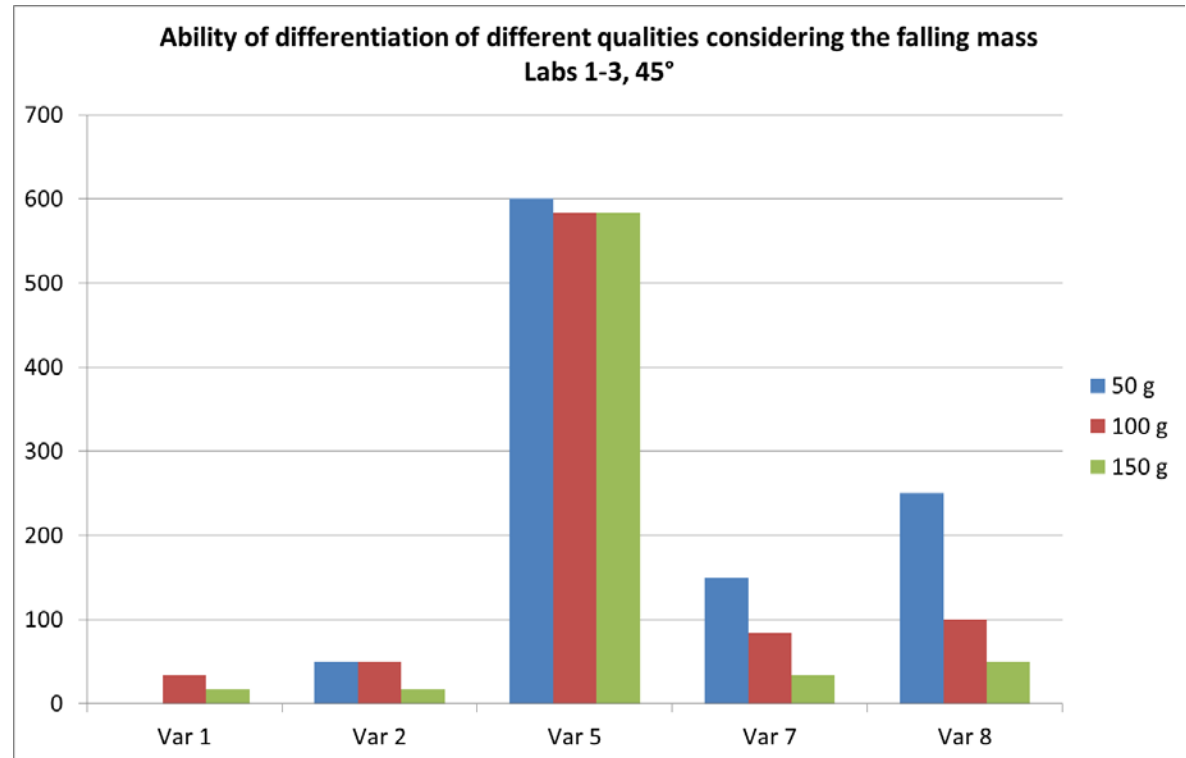
- Developed Tester: Impact Resistance Tester for Furniture Parts, Model No. 70 – 4590
- Goal: One mass, different falling heights.
- Testing procedure and operating procedure were published.
- Comparative investigations were carried out using 100 g and 150 g of falling mass, showing good results considering comparability, but also showing need for a better differentiation.



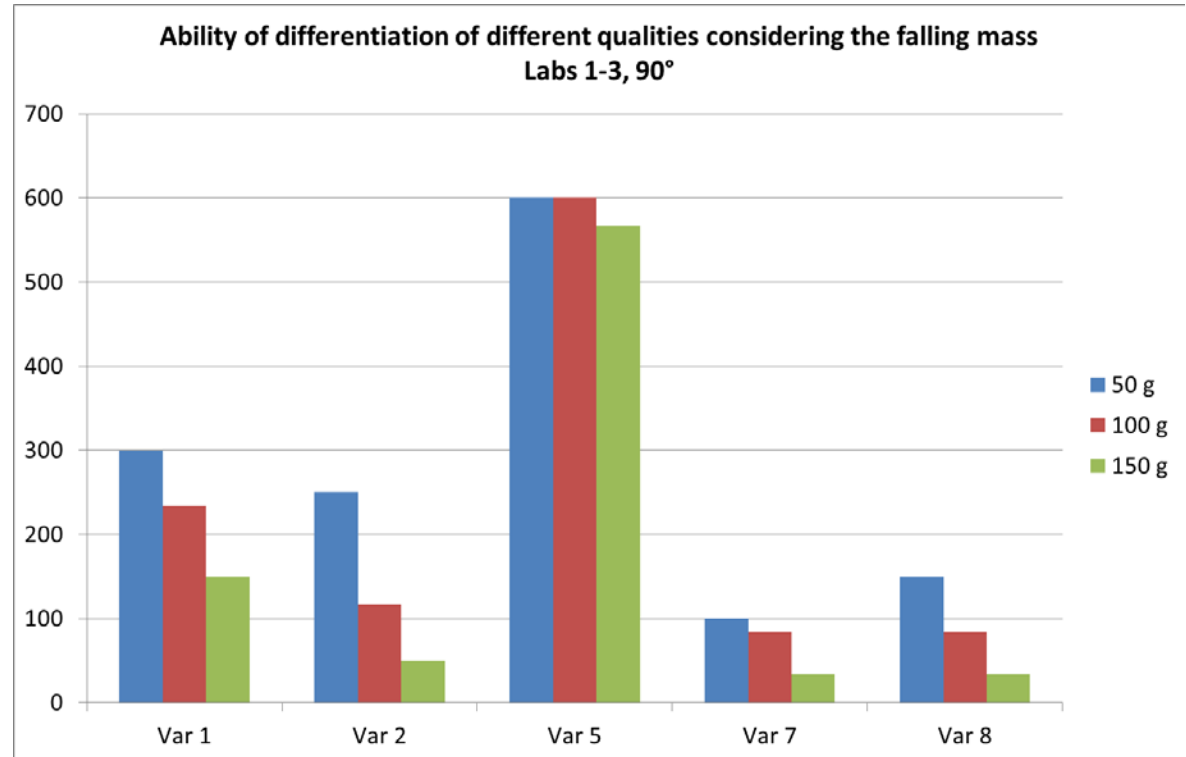




- For 150 g, the differentiation between the qualities is poor.
- Lowering the mass to 100 g gives a better, but still not a perfect picture (difficult for building quality classes, as the differences are too small).



- A better differentiation between the qualities could be reached using an even lower falling mass.
- Decision: **RRT with 50 g of falling mass.**
- Open question: will the results be satisfying, e.g. regarding repeatability?



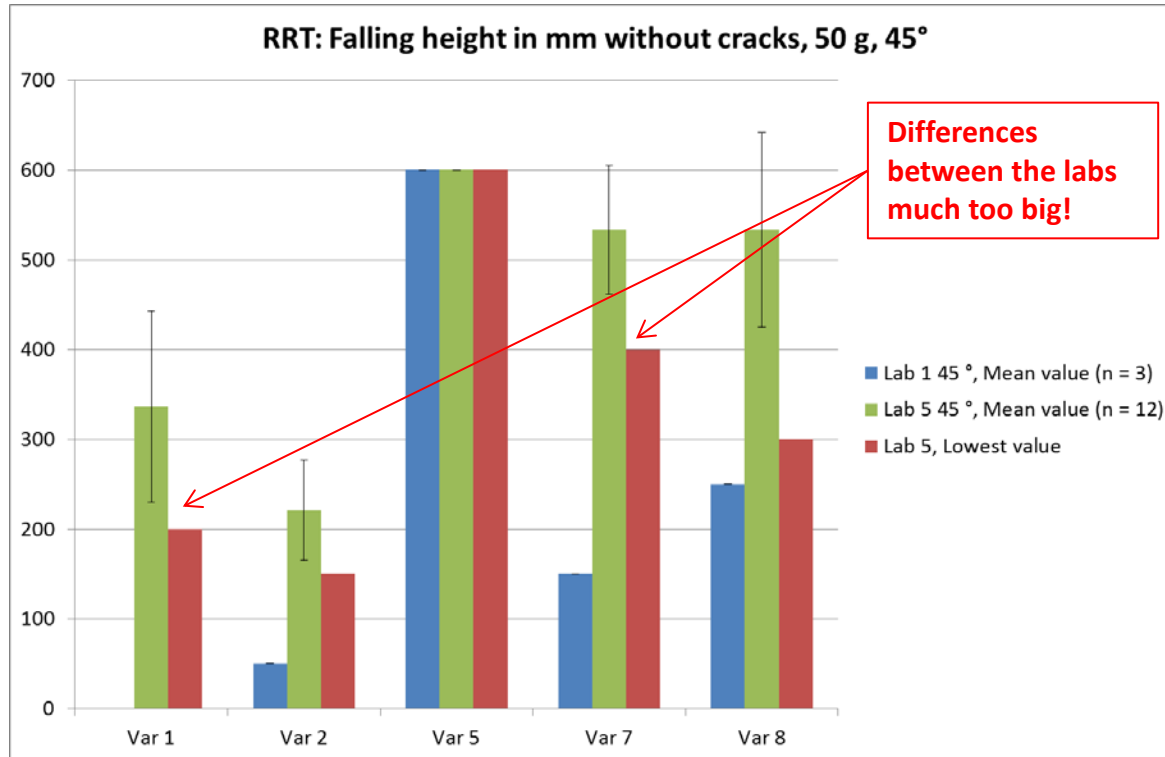
- Material used for the RRT:

Var.	Substrate	Edge-Material Type	Profile
A-I-1	PB	HPL 1	flat
A-I-2	PB	HPL 2	flat
A-I-5	MF PB	ABS	flat
A-I-7	PB	Postforming HPL	rounded
A-I-8	PB	Postforming CPL	rounded

- 3 samples per variant
- Until now, 3 labs took part but only 2 sets of results could be analysed (one had to be ignored due to mistakes in the procedure)

- 5 variants
- Working procedure and assessment according to IHD-W-483
“DRAFT - Determination of the impact for Furniture parts”
 - Change: falling mass 50 g instead of 100 g for a better differentiation
 - Usage of contrast powder or colouring solution for better visibility of cracks
 - Assessment with 10x magnifier
 - 45° and 90°
 - 3 or 4 assessors

RRT: Results

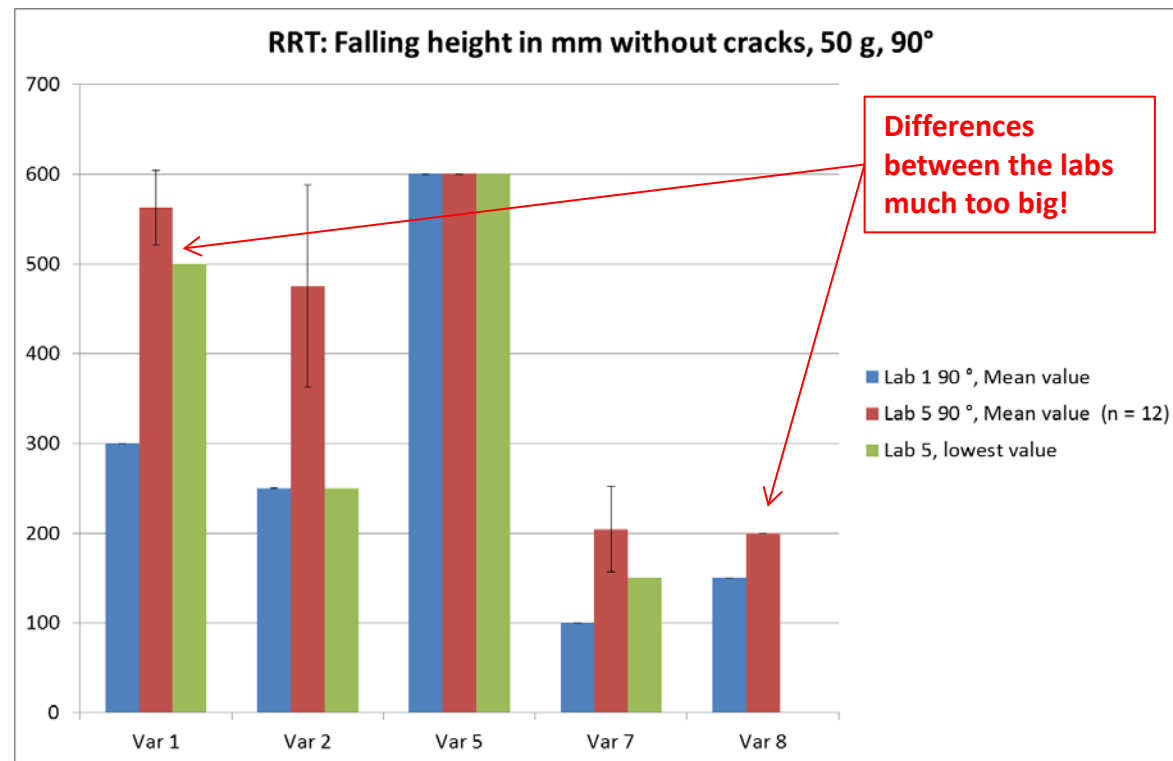


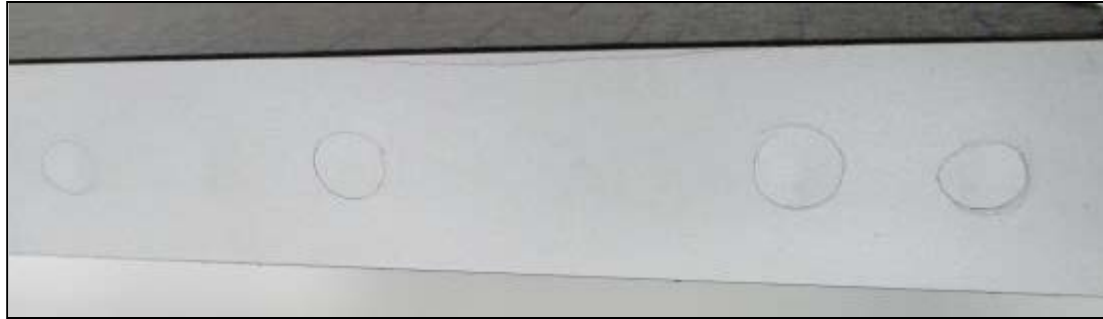
Variant A-I-1 (furniture front)



Variant A-I-7 (work top)

- Very strong differences between the labs (e.g. 200 mm considering Var. 1 at 90°).
- For some variants, the standard deviation exceeds 25 % - strong differences between the single assessors.
- At the time being, no statistical evaluation is possible.





Variant A-I-2 (furniture front)

Typical damages at 90° testing with very well visible cracks.

Variant A-I-8 (work top)



- In spite of a detailed description, the method seems to be too complicated for some users.
- The assessment of cracks is very hard or impossible without a contrast powder (graphite, talcum) or colouring solution.
- When using graphite powder, a soft detergent shall be allowed on order to wipe off the overdosed powder which is hindering a visibility of cracks (“graphite haze”).
- There are big differences in assessment dependant on the assessing person.
- A lower falling mass allows a better differentiation, but it seems that the comparability and reproducibility suffers strongly. The RRT must be pursued with more participants to statistically confirm this thesis.

- Finishing of RRT with 2-3 more partners.
- Decision about using 50 g or 100 g falling mass.
- Proposition of a classification scheme.
- Final description of the method within IHD-W-483.
- Presentation of the Method to Standardisation Committees.
- If feasible, a third RRT with different samples and more industrial partners.

**THANK YOU FOR YOUR
ATTENTION!**
QUESTIONS? REMARKS?

