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- b_N Seam width, total width for overlap seams with test channel
- d Liner thickness
- B Width
 - 15 mm, at least 5-fold sheet thickness for homogenous sheets
 - 50 mm for reinforced sheets
- L_E Sum of both distances between the end of the seam width and clamping
 - $x + y = 40 \times$ sheet thickness d and $x, y \geq 10 \times d$
- L Length of sample $\geq 50 \text{ mm} + L_E$

1 Range of Application

The peeling test is designated for judgment of fusions on PE liners under short-term peeling stress. The quality of a seam can only be sufficiently judged in combination with other tests (e.g. dynamic mechanical analysis).

Sheets are made of thermoplastics or elastomer and fused by welding, vulcanization or gluing. Overlap joints and overlap seams with coated seams are applied.

The sheets can be built-up homogenous or as multi layer.

The fusion procedures are treated in DVS 2225-1, the on-site test in DVS 2225-2.

The requirements are settled in part 1 of this guideline.

2 Shape and Number of Samples

Strip shaped Samples are applied for the peeling test according to Fig. 1. They are taken out vertically to the fusion seam of the joint area of the liner the way the fusion seam is situated on the edge.

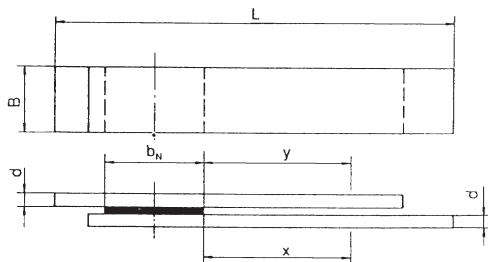


Figure 1. Sample for Peeling Test.

The Samples can be produced by sawing, milling, punching, cutting or similar procedures. Notches on the cutting edges should be avoided. At least 5 Samples have to be checked per test.

In case of sufficient overlap length at least 3 Samples have to be checked per side (Fig. 2).

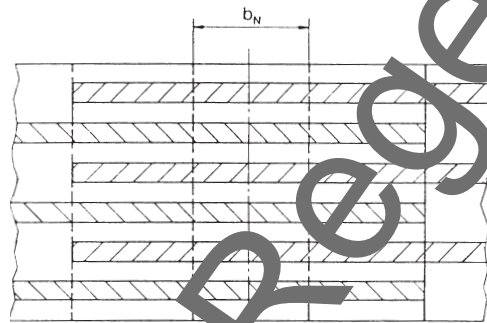


Figure 2. Taking out of sample under sufficient overlap length on both sides.

3 Procedure

If not determined otherwise, the peeling test is processed in normal climate 50/50-2 acc. to DIN 50 014.

The outer structure of the seam (bead, form and evenness over the seam length) is to be determined visually further to the test. Furthermore, the essential dimensions (sheet thickness, seam thickness and seam width) and the situation of the seam considering the manufacturing direction of the sheets have to be determined (see section 4.3 of DVS 2225-2).

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DVS, Technical Committee, Working Group W 4 "Plastics, Welding and Adhesive Bonding"

After opening of the sample edges non fused, overlapping and laying on top of each other, are clamped the way that the fusion spot is situated vertical to the lap direction and in the middle and subject to wear by peeling (look Fig. 3). The clamping length and the clamp distance have to be respected acc. to Fig. 1 and Fig. 3.

The test speed is 50 mm/min.

During the test the stress strain diagram (deformation measuring via transverse convey) is registered. It has to get over the fraction resp. distinctly over the segment limit to catch the deformation behavior.

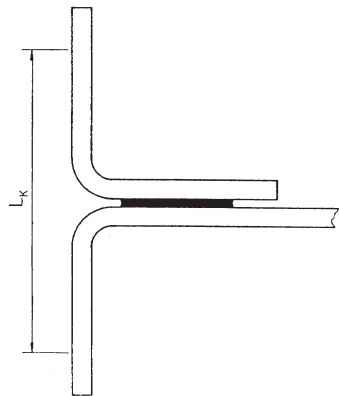


Figure 3. Clamping of the samples.

4 Evaluation

The result is mainly designated to judge the deformation and failure behavior of the fusion. Furthermore, the peeling resistance of the fusion " R_S " can be determined.

4.1 Types of Failure

Essentially the following types of failure may occur:

- Peeling of the seam (e.g. even fraction surface in the fusion level, fraction surface with tough fraction characteristics as white fraction, deeply fissured surface...)
- Elongations and/or fraction in the basic material outside the seam area
- Elongations and/or fraction in the junction area
- Elongations and/or fraction in the welding filler on coated seams.

Type of failure, especially kind of fraction or fraction characteristics (tough, white or brittle fraction) as well as the deformation behavior (e.g. elongation, peeling) have to be recorded for each sample.

4.2 Strength of fused joints

The peeling resistance is determined via stress strain diagram. In case of separation the average peeling resistance is to be determined according to DIN 53 359 and the average (separation) peeling resistance has " R_S " to be calculated.

It results as quotient from the average peeling strength and the width of the sample and has to be stated in N/mm.

In case of elongation or fraction of the sample the maximum strength achieved is related to the width of the sample and indicated in N/mm. In this case the peeling resistance " R_S " has to be provided with the sign >.

5 Inspection Record

With reference to this guideline the inspection record must include:

- About liner
Type, material, manufacturer and designation (eventually analog for welding filler)
- About fusion
Fusion procedure, seam shape and designation
- About sample
Shape and number, dimensions
- About test conditions
Climate, speed, clamping length
- About result
Visual judgment, seam dimensions, deformation behavior and type of failure, strength, short-term fusion factor
- Conditions differing from this guideline
- Date of inspection and signature

6 Standards, Guidelines and Regulations

- DIN 16 726 Plastic roof liners, plastic sealing liners, tests
- DIN 50 014 Climate and thermal applications, normal climates
- DIN 53 455 Testing of plastics – tensile test
- DIN 53 539 Evaluation of tensile separation and peeling tests
- DVS 2225-1 Fusion of PE liners for ground and water construction – welding, vulcanization, gluing
- DVS 2225-2 Fusion of PE liners for ground and water construction – on site test
- DVS 2226-1 Tests and fusions on PE liners – requirements
- DVS 2226-2 Test of fusions on PE liners –lap shear test
- DVS 2226-3 Test of fusions on PE liners – tensile creep test