Summary

In December 1994 the DIBT (German Institute for Construction Technology) published the draft „Technical Guidelines for the Utilization of Line-shaped Supported Overhead Glazings". Based on previous experience, these rules proceed on the assumption that laminated glass consisting of two float-glass-panes connected with PVB foil comply to the safety requirements for splinter-bondage and residual load bearing, provided the foil has certain mechanical properties. In order not to exclude various other products, it was necessary to give a more precise definition particularly in regard to the residual load bearing.

Aim of the study was to carry out orientation tests as to the load bearing reaction of pre-damaged laminated glass connected with foil and casting resin under area loading (simulating weight of snow). Both a method for the reproducable destruction of panes and the load bearing reaction of the destructed pane was to be examined during the study.

The results of the orientation tests are compiled in the following table. It shows that the systems examined, which were suppported on two-sides and had a supporting width of 1,0 m, can carry a load of 0,5 kN/m^2 from several hours to days. As expected, the double-lying PVB-foil (thickness 0,76 mm) show the best results. Simple PVB-foil and „security" casting resin (S20 UCB) are approximately comparable. Casting resin for sound isolating glazing is not suitable for overhead glazings.

The preliminary tests have shown in particular that with a two-sided support, due to the high deformation, the bearing conditions viz. the fixing conditions resulting from the large edge corners are of great importance. Provided the edges of the pane are clamped tightly into the bearings, the rims of the breaking edges move apart up to several cm before the intermediate layer fails. Therefore, the breaking strength of the intermediate layer is solely decisive for the failure.

Far more satisfactory conditions are to be expected with supports on four sides. This already applies to insulating glass units supported on two sides due to the supporting impact of the glued glazing edge connection. Support conditions are therefore to be included in further studies.

Table 1 Compilation of the results

Test	Testspecimen	Load bearing reaction of the predamaged pane
1	2 x 4mm Float and PVB 1 x 0,38mm	Failure after 28 hours
2	2 x 4 mm Float and GH (System FLAG)	Failure immediately upon loading
3	2 x 4mm ESG and PVB 1 x 0,38mm	after 24 hours: deflection >200mm; failure cannot be assessed
4	2 x 4mm Float and PVB 2x 0,38mm	after 170 hours: deflection = 170 mm; no failure
5	2 x 4mm Float and GH (UCB S20)	after 21 hours: failure in the glass support
6	2 x 4mm Float and GH (UCB S20)	Failure after 20,5 hours
7	2 x 4mm Float and PVB 1x0,38mm	Failure after 48 hours