

FLOATING FLOORS FOR SWISS TRAINS (CH)

CASE STUDY

Long-term reference
with Sylomer®

PROPERTIES UNCHANGED
AFTER 20 YEARS OF USE.

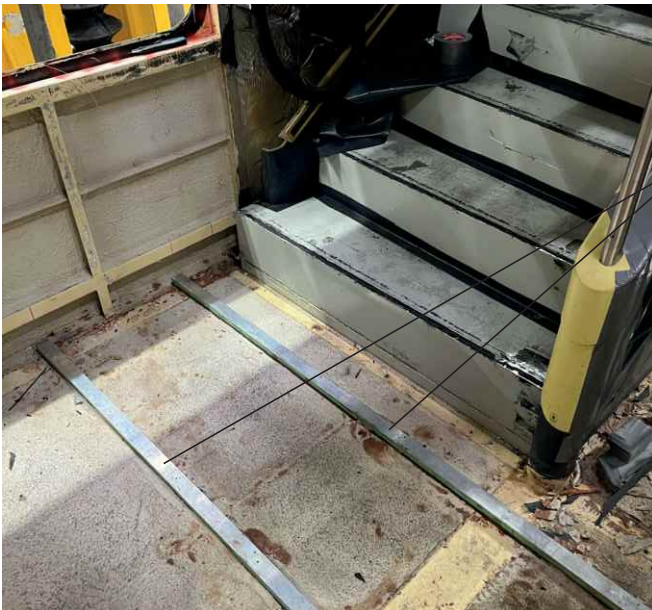


PROJECT

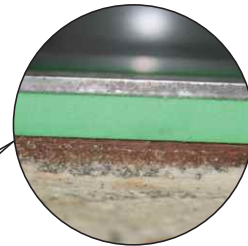
The RABe 514 sets of double-decker coaches used by Swiss Federal Railways (SBB) were built and equipped with elastically separated floors from 2006 onwards. Our standard material at the time, Sylomer® L, was selected for the floating floors based on precise calculations, which accounted in particular for the varying loads to which the carriages would be exposed.

Floating floors are installed on different levels of the double-deck carriages. The lower deck, which houses the saloon and the WCs, is fitted with Sylomer strips applied to the steel skeleton of the carriage. On the intermediate level, which connects the upper and lower decks via stairs, 12 by 40 mm (H x W) Sylomer® L

strips are bonded to oak strips. In both cases, an aluminium plate attached to the Sylomer® seals the structure, to which the floor panel is then bolted.



On the intermediate level, Sylomer® L is bonded to an oak strip and an aluminium plate.



The SBB has a total of 61 four-carriage, double-decker train sets in its fleet. After around 20 years in service, a retrofit of these trains has been underway since 2025. The vehicles are being completely stripped down, sand-blasted, re-painted and then reassembled. Original materials are being re-used to avoid another lengthy approval procedure, however modern standards - especially concerning fire protection - must be adhered to during the refit. It is for this reason that Sylomer® FR 355 is now being installed. It has the same properties as Sylomer® L and meets the criteria of HL 3, the highest fire safety classification in accordance with DIN 45545-2.

MEASUREMENTS

As part of the retrofit project, material samples have been removed so that their physical properties can be checked after 20 years in service. The samples were taken at the SBB depot in Olten, Switzerland, under the supervision of representatives from Getzner.

After preparing the samples at our headquarters in Bürs it became clear that those taken from the intermediate level was most suitable for the planned tests, as the loads are greatest in this area. Before the measurements were taken the wooden strips were sanded off to minimise their influence on the test results.

With the assistance of experts from the University of Innsbruck, the 20-year-old material was subjected to a number of measurements including both static and dynamic load tests as well as elongation at break and tensile strength tests.

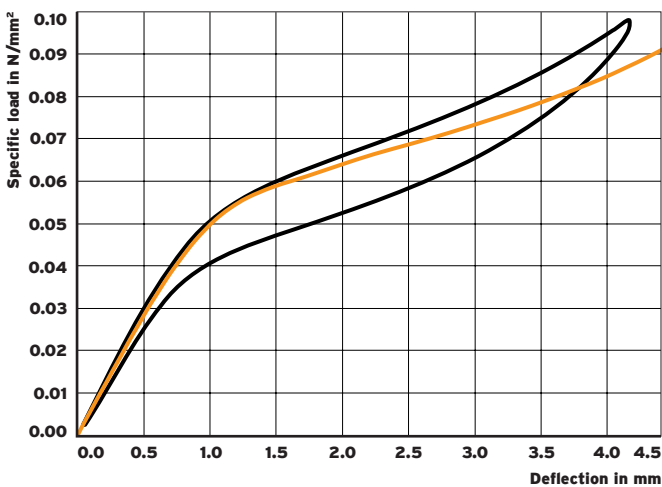
The static load test involved compressing the sample material between two steel plates to ascertain the load deflection curve. The loads selected were equivalent to the typical load scenarios in the carriages, which, according to the standard table, equate to an empty carriage, a carriage in normal operation and a carriage filled to maximum capacity.

For the dynamic test the behaviour of the sample was determined under different loads at frequencies of 10 Hz and 20 Hz.

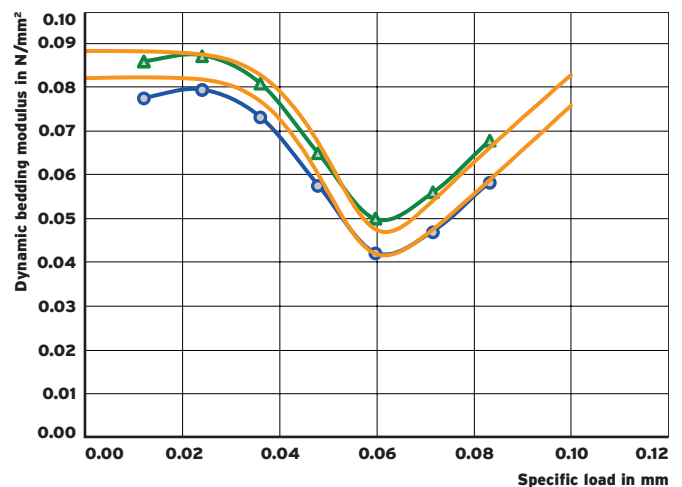


The tensile strength was tested in accordance with DIN ISO 527-1.

The tests performed showed that the sampled material had not lost any of its mechanical properties. In fact the measured values are practically unchanged compared to the original information in the data sheet, proving the exceptional long-term stability and durability of Sylomer® under real conditions over a period of two decades.



— Load deflection curve
— Data sheet Sylomer® L



— Data sheet Sylomer® L 10 Hz
— Data sheet Sylomer® L 20 Hz
— Dynamic measurement 10 Hz
— Dynamic measurement 20 Hz



THE SOLUTION AT A GLANCE

Elastically separated floors on trains prevent disruptive vibrations, which would otherwise cause noise and place a strain on the interior fittings, from being able to propagate into the carriage structure.

Careful calculations and precise material selection results in the following advantages:

- Greater passenger comfort
- Lower carriage life cycle costs
- Low installation height due to efficient materials

Project	Retrofitting SBB RaBe 514 trains
Location	Zurich, Switzerland
Principal	Swiss Federal Railways (SBB)
Solution	Replacement of the existing floating floors as part of a complete retrofit of the train sets, long-term behaviour tests on Sylomer®.
Implementation	2025

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