

Durability Expectancy of FPB Fire Protection Blankets for project owners

General Requirements

Stay Cable Bridges nowadays are designed for up to 125 years service life. For Fire Protection systems used for stay cables no minimum service life requirements are named by existing PTI or FIB recommendations so far.

Mechanical Properties

Due to expected low physical stress of the fire protection blankets while installed, these can be expected to remain in good position, shape, and function.

Thermal Properties

All material layers of our FPB Blanket are stable within temperature of -50°C - + 80°C (-58°F to 176°F) so can be expected long time stable.

Physical Properties

All material layers of our FPB Blanket are hydrophobic, so humidity should not influence the properties.

Further Considerations

We ourselves as a non-PT system supplier, by missing the needed anchorages and stressing equipment, have not performed our FPB fire protection blanket under strand load, but one client did successfully. Unfortunately, we are prohibited to present their internal test report.

We can just confirm that the results were similar for loaded strand bundles than our results of unloaded strand bundles, which to us sounds logical, as we have no idea why at temperatures of max 300°C there should be any differences.

Our named 30 years durability were chosen as a conservative number not only related to the material durability itself, but also to the function of the blanket. Since we are using latest material developments, some of them invented less than 10 years ago, there are no available long-term experiences of the same. Also most of the available experiences of such materials are related to the industrial indoor use, so not to exposed use where the materials may get wet by humidity through condensation and may be under much different temperature conditions like minus degree Celsius.

In fact all our used materials are hydrophobic, so from this point of view should also remain good for 100 years, but this may be related just the material durability. Since in fact the blanket performance is the key issue, we seriously don't know for how long the same remains at tested values.

Considering how to achieve an accelerated aging of our blanket, a major problem is that existing equipment for such tests can use just small material samples only, where bigger blanket sizes consisting of all blanket layers would be required for such a test. By this we feel to be more reliable to name a durability of 30+ years which is based on 10 years real time experiences with assumption by at least 3 times, than to name 7-10 times or 20-30 times without any serious back ground.

Naming 30 years we have in mind, that the project owner by this may consider that depending on our blanket experiences during the next 20 years, he may have to exchange our blanket after 30 years or in best case much later, but most probably at least once before the todays standard bridge design life of 125 years.

Generally we think, that reliable fire protection blanket durability performance verification for exposed applications is a target difficult to achieve, (not just related to the bridge business, but also offshore platforms, industrial use etc.).

Conclusion

PESTEC FPB Blanket use State of The Art material layers shown perfect test results according latest specifications and are designed for highest durability possible by today to protect cable stay bridges.