As an introduction, it is necessary to mention that ACCC® is a brand and not a conductor type. CIGRE Technical Brochure 695 proposed to call Type 4 conductors all the conductors having a polymer matrix composite core whatever the aluminum used. In this contribution, we will present the expected life of one conductor being part of Type 4 conductors: HVCRC®. Expected life calculation depends on two parameters:

- Method to extrapolate the ageing results to years.
- End of life criteria, which are the limits under which the conductor is considered as unusable.

Method to extrapolate is already exposed in the paper. Time-Temperature Superposition Principle (TTSP) was applied to experimental data at different ageing temperature. The TTSP is based on the theory that increasing the temperature is equivalent to shortening the time of the response of the material, herein accelerating the different losses.

End of life criteria needs to reflect the function of the conductor:

- Being able to withstand high load event
- Being able to withstand high temperature
- Being able to withstand others loads during maintenance or Aeolian vibrations (bike, new mid span joint, etc …)

That is why we consider two properties of the core, which ensure the conductor life:

1. Tensile strength
2. Glass transition temperature (Tg), which guarantee that the core will still be stiff at high temperature and reflect the level of degradation of the matrix. Indeed, with thermal ageing along the life of the conductor, the Tg value is reducing. We could have consider flexural strength or transversal compression, however it is very difficult to estimate an end of life criteria as flexural and compressive stresses are not used for dimensioning of the lines.

We consider the end of life criteria based on ASTM B987-20 requirements:

1. UTS (Ultimate Tensile Strength) > 95% RTS (Rated Tensile Strength)
   ⇨ In the case of HVCRC® core, RTS = 2250 MPa
2. Tg > Emergency temperature + 5°C
   ⇨ In the case of HVCRC® core, emergency temperature = 180°C

Campaign test being still in progress for tensile test after ageing, we are not able to show extrapolation yet. However, results for Tg are available. Tg losses being faster than tensile losses, Tg end of life criteria is often more conservative.
Tg extrapolation show the following expected life based on ASTM B987-20 requirements:

- 5.7 years at 180°C
- 109 years at 160°C

Selection of end of life criteria is crucial, as it can change drastically the expected life. For example, choosing Tg > 205°C instead of Tg > 185°C gives:

- 1.6 years at 180°C
- 31 years at 160°C