

Key Characteristics: Development of a protocol for the good performance of recycled bituminous mixtures • Implementation of Fenix test as a new method for characterizing the cracking resistance of recycled bituminous mixtures • The importance of cracking resistance as the main concern for the production of recycled asphalt mixtures •

Effect of Mixing Time and Temperature on Cracking Resistance of Bituminous Mixtures Containing RA

The material extracted from the milling of aged asphalt pavements has been employed in the manufacturing of new bituminous mixtures for many years.

Moreover, there has been a great interest in increasing the amount of recycled material used in asphalt mixtures in recent years because of the environmental benefits of this practice. Despite the benefits, the addition of RA results in stiffer mixtures have raised concern about the long-term performance of the material; thus, a mechanical characterisation of these mixtures is much needed. In the recycling of bituminous mixtures, it is always necessary to improve the ductility, with the aim of recovering the mixture flexibility lost by aging phenomena.

Therefore, the cracking resistance and ductility were evaluated using the Fenix test developed at the UPC-Barcelona Tech. This test has proved to be a convenient and effective method for characterising cracking behavior of bituminous mixtures at different temperatures.

The influence on cracking resistance of several variables was determined, such as different RA rates, mixing temperatures and times.

These results may support future civil engineers in taking decisions when designing and manufacturing mixtures with high RA content. Providing a method that is able to assess the cracking performance of mixtures with RA may encourage the use of recycling techniques more often in road maintenance •

