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High performance mixtures: two new technologies brought together, ThinGap with RAR designed with *i-Mix Design*, a new mix design approach

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ABSTRACT. This paper addresses the effect of reacted and activated rubber (RAR) and fine aggregate nature (basalt and limestone, respectively) on the volumetric and performance properties of ThinGap mixtures.

The volumetric and performance properties of two ThinGap mixtures were initially predicted according to software, *i-Mix Design*, developed by Miranda (2016), that is a new mix design approach, based only on mixture volumetrics and using performance properties correlations. Additionally, volumetric and performance predicted properties were compared and validated with the ones obtain according to Marshall method, permanent deformation and fatigue tests.

The results obtain indicated that the use of RAR, as well as basalt as fine aggregate in ThinGap mixture played critical roles in the mixtures performance improvement. Furthermore, *i-Mix Design* method, reveal to be a cost-effective guidance tool for ThinGap design, allowing to predict and optimize two ThinGap volumetric and performance properties, in only one day, comparatively to around two months needed for Marshall and performance evaluation in laboratory.

KEYWORDS: Road and airport pavements, asphalt rubber mixtures, reacted and activated rubber, mix design
