

Two-zone model is one of the most interesting engine simulation tools, especially for SI engines. However, the pertinence of the simulation depends on the accuracy of the heat transfer model. In fact, an important part of the fuel energy is transformed to heat loss from the chamber walls. Also, knock appearance is closely related to heat exchange. However, in the previous studies using two-zone models, many choices are made for heat transfer evaluation and no choice influence study has been carried out, in the literature. The current study aims to investigate the effect of the choice of both the heat transfer correlation and burned zone heat transfer area calculation method and provide an optimized choice for a more efficient two-zone thermodynamic model, in the case of natural gas SI engines. For this purpose, a computer simulation is developed. Experimental measurements are carried out for comparison and validation. The effect of correlation choice has been first studied. The most known correlations have been tested and compared. Our experimental pressure results, supported for more general and reliable conclusions, by a literature survey of many other studies, based on measured heat transfer rates for several SI engines, are used for correlation selection. It is found that Hohenberg's correlation is the best choice. However, the influence of the burned zone heat transfer area calculation method is negligible