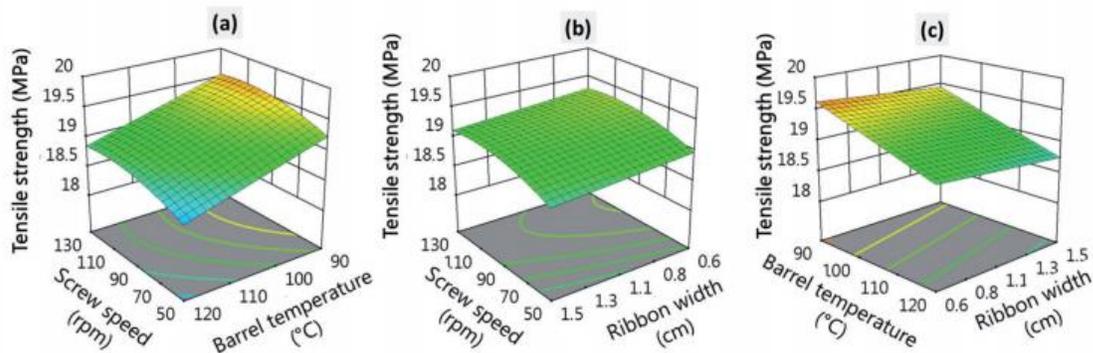


Twin Screw Extruder for the Production of Carbon Black filled Styrene-Butadiene Rubber

Twin-screw extruders (TSE) are common mixers in the plastics industry. Nowadays, they have become widely used in the rubber industries because of their high capabilities for continuous production and good filler dispersion. Despite having these advantages, the TSE is usually not applied with direct compounding of rubber and fillers. Since high filler loadings are needed to achieve sufficient reinforcement, the rubber and filler are usually pre-mixed before being fed into the TSE. Commonly, this is achieved by using an internal mixer. After undergoing the filler incorporation stage, the premix is obtained as either granules or ribbons for further feeding into the TSE. In this project, various extrusion parameters (i.e., screw speed, barrel temperature and ribbon width) and their effects on the properties of rubber compounds are studied. Response surface methodology (RSM) is applied in the study to minimize a number of experiments.

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3-dimensional response surface plots of the tensile strength

Reference:

J. Narongthong, P. Sae-Oui, C. Sirisinha, Effects of the extrusion parameters of a co-rotating twin screw extruder and their interactions on the properties of carbon black filled styrene-butadiene rubber, *Kautschuk & Gummi-Kunststoffe*, 73(10), 63-71, 2019.