In this study, it was focused on the investigation of comfort-related properties of the fabrics treated with microcapsules containing phase change materials (PCMs microcapsules). There are limited findings about the effect of prepared PCM microcapsules on fabric properties related with the tactile comfort. In this work, we applied our produced microcapsules to the cotton fabrics and researched these fabrics’ tactile comfort-related properties such as bending rigidity, drape, fabric-fabric friction and tenacity. One of the outstanding properties of the our microcapsules is reactive carboxylic acid groups on their wall. They have the ability to bind to the fabrics in terms of their reactive chemical groups. Microcapsules on the fabrics can durable to the effects of the rubbing and repeated washings. The fabric test results indicated that air permeability, bending rigidity, tensile strength decrease with the microcapsule treatment whereas the fabric drape and coefficient of friction of the fabrics increase depending on the amount of microcapsules added on the fabric.