The agglomeration process of cocoa beverages can transform a fine powder to granules, with modification of the product physical structure, and the characteristics of granules achieved dependent on the type of process used and the operating conditions. The changes in the physical structure of powder that occurs due to the agglomeration with steam, are mainly in size and format of the granules, and can be retracted through morphological analysis. The objectives of this study was to evaluate the influence of operating conditions of the agglomeration process with steam in the physical properties (size and shape) of granules and to characterize the shape of them, describing them by way of descriptors. The cocoa beverage powders were obtained in pilot plant equipment (ICF Industrie Cibec spa, Italy). In morphological characterization was used stereoscopic microscope SZX9, coupled to a Camera Sony CCD-IRIS. The images were analyzed with the software Image-Pro Plus® - version 4.2 for Windows TM from Media Cybernetics. The results showed that there is no difference between the descriptors of shape (curvature, circularity, roughness and rate of appearance) in the conditions of process evaluated. It was concluded that the cocoa beverage powder agglomerated with steam have elongated shape. As for descriptors of size (area, perimeter, perimeter of the convex shape and diameter of Ferret minimum and maximum) there was difference between the conditions of process for larger granules that 600 μm. In case of minimum process condition, where low amount of solid food (400g/min) for a vapor pressure of 1.0 bar, there was obtained an optimum condition granulation, with retention of 91.5% granules in the sieves between 300 and 1190 microns.