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Influence of adhesive rheology for various dispensing systems to achieve very small dot size

Several adhesives with different rheology behavior were used to investigate the viscosity effect on time-pressure and microdot-valve dispensing systems. For time-pressure dispensing system, epoxy adhesive with viscosity of 400,000 cps showed linearly increase of dot volume as increasing pressure between 4 to 7 bar. In this operating region, the dot size increases as increasing needle diameter from 100 to 150 μm and decreasing needle length from 18.64 to 7 mm. This variation can be described by normal flow fluid. However at lower pressure of 2-4 bar, the dot size does not depend on the needle size neither needle diameter nor length. In addition, at this low pressure the dispensing dot volume does not systematically depend on the pressure and time. This was investigated more by relative low viscosity fluid of acrylate adhesive with viscosity of 60,000 and 100,000 cps. The dot volume of these low viscosity dispensing shows the strongly depend on needle size for the whole entire pressure range of 2-7 bar. In order to achieve the small dot size of diameter about 200 μm with small variation, the microdot-valve dispensing system was also examined and found that the dot size from this dispensing system strongly depended on the stroke adjustment and depended on the needle size for the whole entire set parameters for three types of adhesive.

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