

### The spray coating characteristics of surface protection solutions using swirl-type nozzles

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The hard coating solution applied to surface protection film of mobile phones was utilized in spray coating using swirl-type nozzles. As the coated substrate, poly carbonate was used, and changes in the thickness of coated film according to changes in air pressure of nozzles, dilution ratio of coating solution, substrate feed rate, supply flow rate of coating solution were observed during the coating process. As the height between the nozzle and the coated substrate was fixed to 7cm, feed rate of the substrate was fixed to 5mm/s, and the supply flow rates of the coating solution increased from 0.3 to 5ml/min, the thickness of the coated film increased from 9 to 32 $\mu$ m. On the other hand, as the substrate feed rate increased from 5 to 12mm/s, the thickness of the coated film decreased from 19 to 1 $\mu$ m, when the air pressure of the nozzle and supply flow rates of the coating solution were fixed to 0.15MPa and 0.5ml/min respectively. Meanwhile, as the supply flow rates of the solution were fixed to 1.0 ml/min, the air pressure of the nozzle was fixed to 0.15Mpa, and the ratio of an undiluted solution to a diluted solution was changed from 1:1 to 1:2.3, the thickness of the coated film decreased from 15 $\mu$ m to 7 $\mu$ m.