

A study on precise velocity control of the air floating gantry type

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In recent year, gantry type slit nozzle coater replaces the conventional spin coater in the field of flat panel display manufacturing, as the glass size becomes large. When coating resin on the glass of the LCD panels, flatness of the glass profile is required, so the velocity deviation when dispensing the resin should be small. In order to accomplish this, the gantry type precision stage is an air floating type adopting the air bearing technology. Therefore, it is important to suppress the pitch motion of the gantry and the decrease of the velocity deviation and leg deviation when coating the resin on the surface of the glass. In this research, first, velocity deviation and leg deviation satisfy the required specification enough during the constant velocity period on the field equipment. Next, independent leg control adopting the acceleration compensation feedback control also reduces the velocity deviation and leg deviation on the miniature gantry, which has a similar characteristic to the field equipment. Finally, focusing on the velocity deviation and leg deviation during the acceleration and settling period, it is considered that these cause the pitch motion of the gantry. Then, cross coupling control including gain scheduling control and acceleration feedback control is proposed and this control enables the smooth settling to the dispensing velocity and also enables to shorten the elimination distance.