



0.32-second take-out: Is this K's fastest robot?

By Stephen Moore

“WHY IS A MASSIVE, several-hundred-pound robot needed to take out a molded part that weighs just a few hundred grams?” **Yushin Precision Equipment (Stand 12E51)** asked itself this question and decided to employ the process of design optimization—often used to maximize lightweighting in aircraft components—to rid its latest robot of as much mass as possible. Net result? A 13% lighter robot boasts an 11% faster take-out and a 14% faster full cycle.

Additional benefits from removing metal where it is not required for rigidity include a 38% slimmer wrist that allows mold opening to be narrowed by 41 mm.

At K, the lightweight robot was operating with a Sumitomo (SHI) Demag injection molding machine molding a Nokia cellphone housing with a take-out time as fast as 0.32 second. Hollowing out the main arm and reinforcing it with carbon fiber-reinforced plastic also contributes to faster speeds.

Yushin initially applied design optimization to end-of-arm tooling in a joint research project with Kyoto University. “Mass optimization of EOAT reduces settling time



Yushin: Robot takes the part out at a zippy 0.32 second.

[the time required for tool extremities to cease any flutter after a tool comes to rest] enabling shorter, smoother, steadier take-outs,” says Takayo Kotani, senior manager of R&D at Yushin. In a medical product application, EOAT mass was reduced by 40% compared with a conventional tool, and cycle time was reduced by 10%.