A Cradle of Future Leaders in Robotics



## ARM Robot : Automatic Rubber Loading Machine

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Many industries such as automotive industries, consumer products, and medical equipment are consuming a large amount of rubber raw material each year. However, the supply and demand of rubber raw material to such industries is not well balanced due to the limitation in production processes. The Southland Rubber Co., Ltd., the leader in rubber material producer not only foresees the need for Robotic and Automation technology but also emphasizes on acquiring top quality homegrown technologies to help boost the output and quality of the products at reasonable cost.

The Southland Rubber Co., Ltd. selects the Institute of FIeld RoBOtics (FIBO) at the King Mongkut's University of Technology as a key provider of Robotic and Automation technology. With mutual agreement, the cooperation between the Southland Rubber Co., Ltd. and FIBO begun with the launch of the Automation Rubber Loading Machine (ARM) project in 2002. By way of the FIBO Corp Co., Ltd. FIBO conveniently channeled the human resource and crucial technologies to provide the best solution for the customer.

The ARM project looked to solve the problem of rubber raw material handling. The flexibility of rubber raw materials serves a big challenge to conventional idea of manipulation and transportation in production line. Most material handling system works efficiently with the rigid material. When it comes to flexible, feeble shape, and sticky material such as rubber, the grasping and manipulation in a required cycle time post a very challenging problem. Previously the workers had to carry a 15 kilograms rubber bar from the tray to conveyor line. The process way was very slow and inefficient since the process cycle time cannot be fully controlled. More importantly, human workers were susceptible to a very serious back injury.

The ARM robot is the answer to the problem. The robot was built and integrated into the transporting process to help mobilized the rubber material. The highlight of the ARM robot is its highly advanced grippers. The gripper was carefully designed based on the study of the human worker action during the transportation process. Therefore, it can grasp and manipulate the flexible material with ease at the required cycle time. The robot workspace is about 400 square meters and the operating height is 2 meters. The prototyped model of the robot is now completed and fully functioned in the production line as shown in figure 1.



FIBO's cooperation with the Southland Rubber Co., Ltd. is an excellent example of "Technology Sufficiency" promotion. The cooperation produces win-win situation. FIBO а wholeheartedly believes that with increasing number of such cooperation between Universities and the private industrial sector, there is no doubt that Thai industries can be highly competitive in the new world economy. At FIBO, we have never designed problems. Real problems in industry design FIBO.

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