**Study on Micro Flow Calibration System using Double Piston for Medical Devices Application at RCM LIPI**

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# Abstract

Regulation from Indonesian Government through the Health Ministry stated that every medical device used in hospitals has to be calibrated. Unfortunately, the amount of calibration laboratory in Indonesia which is capable of doing the calibration is insufficient. Research from National Standardization Agency of Indonesia in 2013 shows that among 214 kinds of medical devices used in hospital, 17 kinds of them are most widely used. From these 17 kinds, only 7 kinds of medical devices have established its traceability and can be calibrated, while the rest haven’t solved its traceability and calibration problem. One of the unsolved kind of medical instrument is infusion pump. RCM LIPI as a National Metrology Institute has a big role to solve this traceability and calibration problem. Right now, RCM LIPI is using micro flow measurement system with a single piston for infusion pump calibration. This measurement system has some shortcomings. The flow is not continuous when generated and there are instabilities in its mechanical actuator. This measurement system can only be used in range between 90.2 mL/h to 1177.1 mL/h with the biggest uncertainty is 12%. To improve the quality of measurement, a new micro flow measurement system using double piston is being planned. This new calibration system is expected to yield a smaller uncertainty in the amount of 5%.

**Keywords:** medical devices, infusion pump, micro flow, double piston