Pulp injection molding (hereafter called PIM) is an injection molding technique using molding material made up mainly of pulp and starch, which aims to replace resin moldings with low environmental-load materials. In normal injection molding processes using thermoplastic resins, when the mold has flow channels consisting of partial widening areas such as ribs and areas with enlarged thickness, the resins tend to flow first to thick-walled areas of the mold due to the low flow resistance of these widening areas. Then from these partial thick-walled areas, the resins diverge, as if overflowing, to return to the original flat cavity in the downstream area behind the thick-walled areas. On the contrary, with PIM, the molding material dries as it flows and sometimes the hard tip of the flowing material gets caught by the step-change areas located at the end of thick-walled area while returning to thin-walled one. Thus in such cases, these step-change areas act like obstacles blocking flow. Sometimes, weld-lines or areas with reduced strength are also formed along the downstream of these thick-walled areas. Therefore, the clarification of material flow behavior at thick-walled areas is a very important theme for preventing such defects in PIM products. In this study, we applied pigment line-markers containing aluminum powder to directly be drawn on both sides of the cavity surface before injection, and after molding, visualized the flow traces of the markers inside the molded samples using X-ray CT technology. As a result, we succeeded in clarifying material flow behavior near the rib cavities with different thickness and height combinations.