

CONTROL VORTEX POSITION IN A VERTICAL TUBE TO REDUCE SPRAY DEFECTS AND REVAMPING SIX-SIGMA IMAGE VERIFICATION TOOL

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Abstract

Ideal-Standard factory sever from disturbance in covering Bathtubs with chemical painting liquid, this liquid covers all surfaces by the same thickness, but the vortex appeared in the liquid makes bubbles cause a defect in the process. The repairing of this defect consumes more than 60% of spraying process time. The vortex must be determined to guarantee equal liquid distribution on bathtub surfaces. Vortex flows are a number of major structural changes involving very large disturbances when a characteristic ratio of azimuthal velocity components is varied. This problem led to pushing liquid in the painting gun with different pressures, which difference generates unbalanced covers of chemical liquid on bathtubs. This phenomenon is one of the most instability problems that led to spot burn bathtubs and reduce bathtub resistance against heating circumstances.

The results revealed that there are a total of three distinct modes of the disruption of the vortex core as the Reynolds number (Re) and circulation number (Ω) of the flow were varied. The position was found to be dependent on Re and Ω of the flow. Whereas, for all Re values an increase in Ω always results in moving the vortex position along the tube for all Re values. The vortex position values are smaller for anti-clockwise flow direction than that, when vane rotates in clockwise flow direction for long and short tube.