

Title	Spray cleaning systems in food processing machines and the simulation of CIP-coverage tests
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Summary paragraph	Computer aided constructive design and optimisation tool for complex spray cleaning systems to improving the hygienic design of food processing machinery. The paper presents a software solution that is capable of simulating the coverage of relevant equipment surfaces with cleaning fluids from nozzles by means of ray tracing. The simulation results are confirmed by cleaning tests.
Novel/notable aspects	Simplified simulation of spray cleaning by CAD and ray tracing
Flow key words	Nozzle's spray pattern on complex parts
Cleaning type key words or Research topic	Virtual design of cleaning-in-place (CIP) systems, decrease of cleaning risks, increase of cleaning efficiency
Field/background	Food industry, pharmaceutical industry
Theory/method/analysis key words	Virtual coverage test by means of CAD, optimisation of cleaning systems