

## Alternative Cooling Fluids for EUV Lithography Systems

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### Abstract

Source powers of future EUV lithography systems present increasing thermal challenges to the supporting optical and mechanical systems. In order to support higher heat fluxes on critical surfaces, as well as to ensure stability of reference structures, new cooling strategies and cooling fluids could be implemented. This work presents a selection of candidate cooling fluids, their properties and performance indicators, for both single phase and two phase cooling under low heat flux and high heat flux conditions. Ultimately, selecting the optimum cooling fluid and heat transfer strategy is a tradeoff which depends not only on heating scenario and thermal properties, but on overall system compatibility.

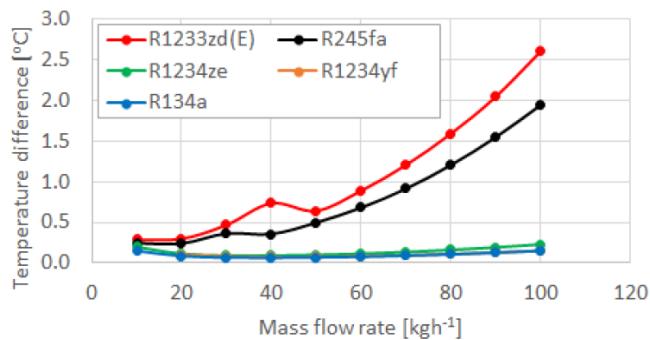


Figure 1: Wall temperature variation of cooling fluids in a structural frame as a function of mass flow rate