

# Impact of high design pressures on heat inleaks

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FCC accelerator will require helium distribution system exceeding the presently exploited transfer lines by almost order of magnitude. The helium transfer line will contain 5 process pipes protected against heat leaks by a common thermal shield. The design pressure of the FCC process pipe with supercritical helium will be equal to 50 bar, significantly exceeding the 20 bar value in present state-of-art transfer lines. The increase of design pressure requires construction changes in the support system, vacuum barriers and compensation bellows. This will influence heat fluxes to the helium. The paper analyses the impact of design pressure increase on the heat flux. It seems from the preliminary scaling analysis that the increase of heat flux may scale with a square root of pressure increase, with basic design features of the transfer line unchanged. The design modifications of the compensation system including stainless steel replacements with invar, aimed at mitigation of the pressure increase will be discussed. Alternative designs of the FCC transfer lines will be compared on the basis of Second Law analysis.

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