

## **1.15 Development and Testing of a Home-Built Vapor Injection System for Highly Volatile Compounds**

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The evaporation of organic materials in the UHV vacuum deposition process with different physical properties necessitates evaporation sources with stable flux rates over a wide temperature range of 30 ° to 350 °C. Apart from three modified Knudsen-type effusion cells we have developed three home-built external vapor injectors for materials with higher vapor pressures. These vapor injectors were designed as a compact cluster of three independent external gas sources. The evaporation sources consisted of thermalized, gold-coated vessels connected to the UHV system via computer-controlled pneumatic valves. The vapor injectors' UHV outlets were heated to temperatures sufficiently high to prevent adsorption on their inner surfaces. The evaporation temperature range was limited by the heating/cooling systems within -20 and 120 °C. The injection tubes could be heated up to 180 °C, which was found to be indispensable for short on/off evaporation cycles. Too cold injector tubes led to a delayed beam response after closure of the UHV-valves. The diameter of the tube was narrowed by an aperture between the pneumatic valve and the injection tube to one tenth to avoid a flux overshoot immediately after opening the valve in the UHV-system. The stability of the flux rate was monitored with a mass spectrometer by measuring the intensity of a predominant peak of the evaporated compound.