

## **Mitigation of high-frequency pulsations, using Multi Bore Restriction Orifices**

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In reciprocating fluid displacement systems, a trend toward high-speed machinery and application of stepless capacity-control system is observed. Badly designed compression systems may cause excessive high-frequency noise and vibration levels, which are a risk from a structural integrity point-of-view. Furthermore, noise levels, conflicting with both environmental and HSE legislation may result in reduced system capacity or even process shutdown. Therefore, a robust system design should focus on the mitigation of high-frequency pulsations in an early design stage. This paper highlights the multi-bore orifice plates (MBRO's) as powerful damping devices of in-line, high-frequency pressure pulsations. MBRO's provide efficient pulsation damping behavior at high frequencies (up to 1 kHz) where conventional (single bore) orifices plates fail. Within the TNO research program, in collaboration with an industrial partner, prediction models have been developed that describe the static and dynamic performance of MBRO's. Experimental validation confirms the validity of these models. The paper concludes with a realistic field case, where MBRO's are applied to reduce the high-frequency pressure pulsations to acceptable levels.