



**PULSATION
DAMPENERS**



AXCES

Steam and Flow Control

THE SOUND OF SILENCE BECOMING AXCES STEAM AND FLOW CONTROL

Q.E. International B.V. was established in 1979. In April 2019, Q.E. International B.V. was acquired by The Axces Group. The official company name after this point will become Axces Steam and Flow Control B.V. while the trade name will remain Q.E. International.

Axces Steam and Flow Control (ASFC) is the expert on working towards a quieter and safer industrial environment. With innovative solutions in the field of noise, vibration, and pulsation, ASFC sets a higher standard than the competition. Solving a broad range of noise pollution issues worldwide built a reputation suitable for an international organisation. Custom products ensure that the noise pollution problems are dealt with adequately.



The knowledge is broad and safety is important. ASFC helps your company with handling precision equipment, calculations, legal requirements, and mandatory approval.

MISSION

Strive to be the expert in the field of noise, vibration, and pulsation. More than 35 years of experience has evolved into more innovative solutions and raising the bar of the competitors. We are providing the best results through custom-made products.

VISION

Our goal is to create a carefree, helpful, and understanding environment for our customers. Expect nothing less than the best quality, attention, and expertise. Our motivation is to deliver excellence through our experience. We thrive to establish a long-term relationship with all of our customers.

SUPPLIERS

We always select our suppliers carefully therefore, we only work with the best in the industry. Our suppliers are encouraged to be creative and innovative and to work on building a long-term relationship with us. That is why we can ensure quality and dedication to our customers.

ENVIRONMENT

The environment is one of our most important responsibilities. A safer and healthier environment is our goal and we are working towards that on a daily base. Therefore, we committed ourselves to the strict environmental rules of ISO 14001.



QUALITY

Quality means a lot to us. We are proud that we hold various certificates, which demonstrate how important quality standards are for Axces Steam and Flow Control. A result of this is that we are considered a pioneer in the market.

CUSTOM DESIGNS

ASFC has also specialized in the designs of silencers to comply with customer specifications. The extended experience is at your disposal in solving complex noise problems and in the translation of extreme demands into practical solutions and our continuing drive to be leaders in our chosen fields is evidenced by the successes that they have demonstrated. ASFC produces various industrial silencers and provides advice according to the customer's wishes.

PULSATION DAMPENERS

INTRODUCTION

Compressors form an important item in many production processes, for example, in the gas & oil industry, in the offshore world (ships, FPSO's and production platforms), and pneumatic transport systems and vacuum systems. Whether reciprocating compressors, pumps, roots-type blowers, sliding vane type, or screw compressors, they all displace gas (or liquid) pulse-wise and are thus a possible source of dynamic problems in the connected pipe system and equipment. Unless the generated pulsations are dampened to acceptable levels before entering the processing system.

Problems are not always limited to the pipe system, for some machine types excessive noise levels can occur, well-exceeding limits set by environmental or human protection regulation. Roots-type rotary piston blowers and screw compressors for instance generate high noise levels that, undampened, may exceed 160 dB(A)!

The compressor performance or reliability may also be affected by pulsations. Even the process control system can be affected by pulsations, due to, for instance, misreading of flow metering devices.

TECHNOLOGY

Frequently, plain empty vessels are used as a dampening device for pulsations, often in conjunction with restriction orifices at the inlet and outlet. Using 'volume' is indeed the first step in tackling pulsations. However, there are more sophisticated ways to reduce pulsations, also from an energy point of view. With acoustical filter techniques (based on the Helmholtz principle) a more efficient reduction can be achieved. Also, asymmetrical cones instead of regular shell heads can diminish the chance of internal resonances. The acoustical design can be further fine-tuned with the use of acoustically optimized diffuser parts or multiple hole orifices for example.

For reduction of radiated sound several alternatives can be provided, one of them being a custom made sand jacket.

To support the best design of the pulsation dampeners not only a large number of sophisticated calculation tools have been developed in-house (based on experimental testing and experience) but also state-of-the-art software has been acquired. Examples are ANSYS and FEMAP/NX NASTRAN for Finite Element modeling, TNO PULSIM for pulsation simulation, and Intergraph CAESAR II for static analysis.



A custom acoustical diffuser

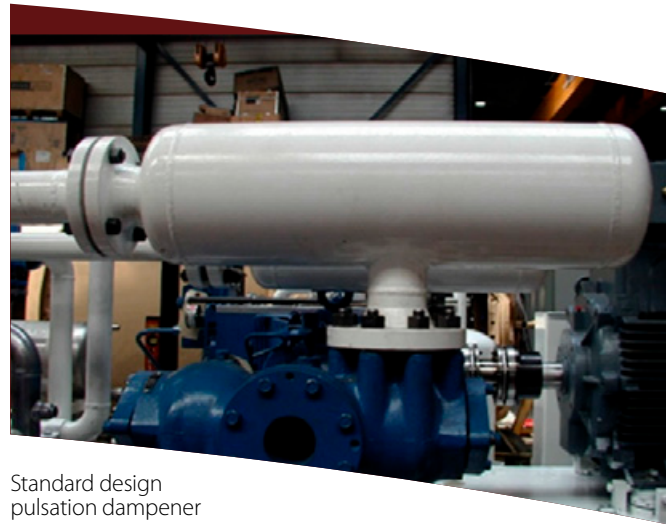
EXTENDED EXPERIENCE

ASFC has built, over several decades, an outstanding reputation for supplying high-quality pulsation dampeners. Dampeners that have been successfully installed throughout the world. Several compressor producers have employed ASFC standard designs. In addition to these, ASFC has a long-standing tradition in custom-built equipment that is designed for incorporation into specific compressor/piping configurations to the complete satisfaction of the plant user. Irrespective of installation complexity, ASFC has demonstrated reliable, tailor-made, high quality, guaranteed solutions. By fabricating the dampeners in the most economic locations, pricing is extremely competitive.

STANDARD VERSUS CUSTOM DESIGN

ASFC offers a series of standardized dampeners at very attractive prices. These are complete, internally and externally in pressure vessel quality carbon steel.

Because of the extreme loadings, the demands upon the construction of the pulsation dampeners can be very high. In many cases, a standardized design no longer meets the requirement. ASFC is unrivaled in the supply of custom-built dampeners, the design of which is often determined by following complex studies.



Standard design pulsation dampener

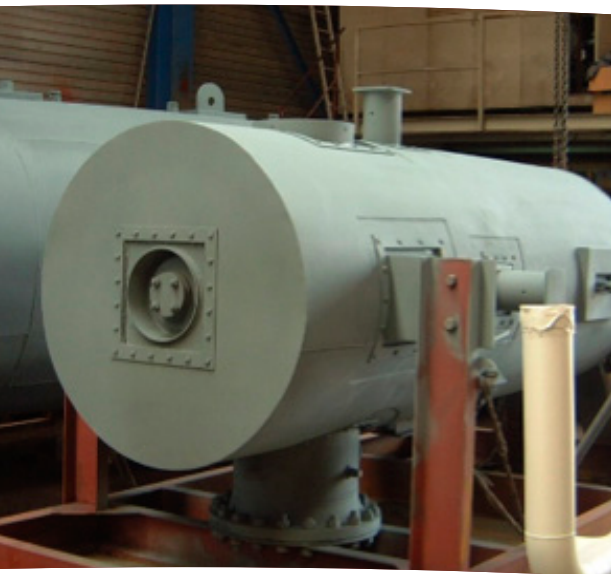
DESIGN CALCULATION

Because the loadings upon the dampeners are high, the pressure containing components are designed and constructed to comply with a ruling Pressure Vessel Code. Examples of such codes are ASME VIII Division 1 and 2, European EN13445, or any other international standard (AD 2000, BS5500, CODAP, GB150, etc).

One can design and fabricate a near-perfect pulsation dampener, but when installed it may come clear that its operation can not be seen independent from other components connected. The gas composition or operating conditions may differ from the specified design cases. Also, the pipe system connected to the compressor-dampener will not be free of acoustical resonances.

This may all contribute to higher than expected levels of vibration and pulsation in the up- and downstream piping. As a standard, we check our designs in a so-called sensitivity analysis. This will reveal how the dampener performs under conditions slightly off-nominal design condition.

Additionally, we strongly recommend including the pipe system in these analyses as well (for some of our customers this service is included per default).



Custom design pulsation dampener with sand jacket



THE AXCES GROUP

The Axces Group designs and manufactures industrial exhaust systems, silencers and chimneys including flue gas cleaning systems as well as acoustic enclosures, steel structures and steel products.

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