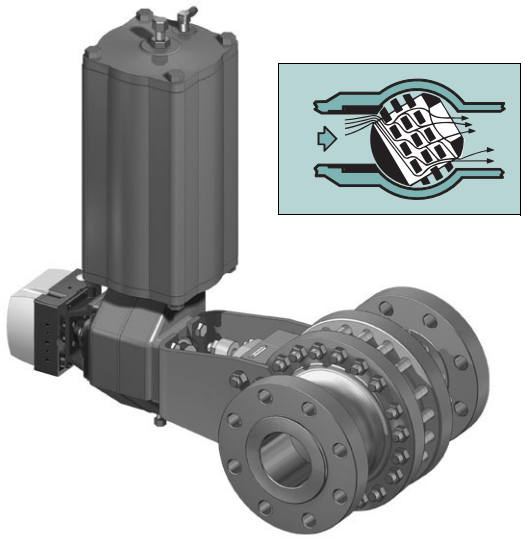
NELES Q-BALL® QUIET METAL SEATED CONTROL BALL VALVE

The Q-Ball control valve offers a unique concept of noise abatement, cavitation control, and excellent control properties combined with very large flow capacity. The Q-Ball provides noise reduction of up to 18 dB (A) when compared to normal valves.
The design is simple and effective. Parallel perforated plates in the flow opening, stage the pressure drop as the flow passes through. This flow treatment reduces velocities, noise generation and cavitation.
The Neles Q-Ball has the advantages to make this control valve so successfull: rugged metal-to-metal seating with advanced friction reduction, wide temperature range and self-cleaning trim, very high Cv and very wide rangeability.



FEATURES

- Low noise, minimum cavitation, velocity & vibration control.
- High capacity and rangeability.
- Self-cleaning, non-clogging.
- Unique size range DN 25… 900 / 1"… 36".

THE PRINCIPLE OF THE Q-BALL

When the Q-ball is opened the fluid passes through the upstream seating orifice encountering resistance inside the ball flow opening. The flow is forced through the holes in the successive perforated attenuator plates. The plates create a frictional path, where each plate and the seating orifice reduce the pressure step by step. This prevents excessive velocity generation, lowers the noise level and minimizes cavitation. When the opening angle is increased, resistance decreases as the flow by-passes the plates. This gives optimal valve flow characteristics and thus high rangeability and capacity.

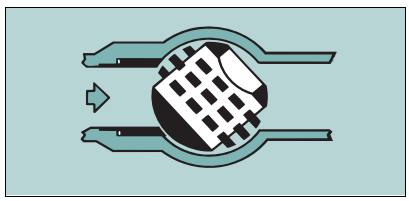
APPLICATIONS

- Hydrocarbon Processing, Petrochemical, Power Generation and Pulp & Paper industries.
- Gases, Liquids and Steam, pure or impure.
- Flow and Pressure control in general & demanding services.
- Blow down.
- Flare control
- Pressure equalization.
- High temperature service.
- Tight shut-off requirements.

SPECIAL FEATURES

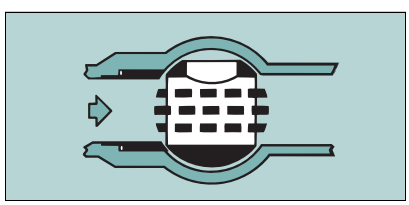
The Q-Ball improves the characteristic of a full bore, double restriction, control ball valve. It retains all the advantages of that design and further adds essential properties, thus increasing applicability.

Resistance of the attenuator plates varying with opening means:



- wide rangeability
- good control characteristics.

The attenuator plates parallel to the ball opening means



- high capacity
- suitability for impure fluids
- non-clogging.

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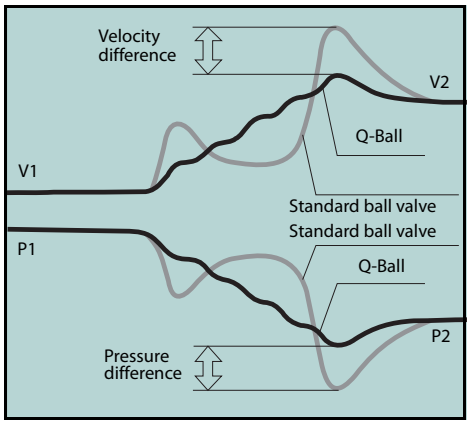
Expect results



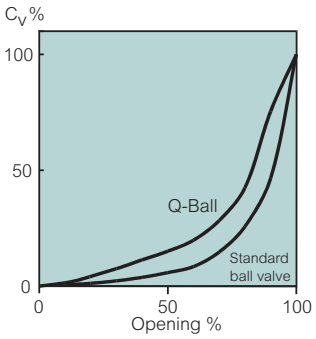
Less velocity means

- □ less kinetic energy
- □ less noise
- □ less erosion.

Reduced pressure recovery means

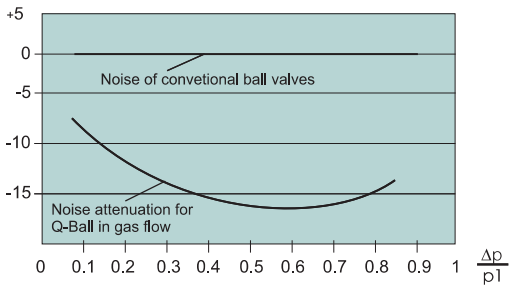
- □ less cavitation
- □ less noise
- □ less vibration.

OPERATIONAL PROPERTIES



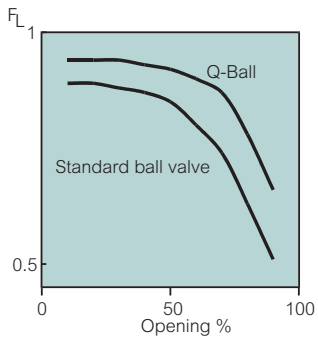
Control

The graphs show the improved characteristic of the Q-Ball compared to a full bore, double restriction, control ball valve.
The full bore ball valve has an equal percentage characteristic, wide rangeability and the highest possible capacity Cv per nominal size. This gives an excellent starting point for a low noise valve. The Q-Ball retains a high capacity and a good characteristic over a wide range of travel and flow rates.



Aerodynamic noise reduction

The diagram shows the maximum reduction in noise achieved with the Q-Ball. The Q-Ball allows a higher differential pressure before reaching choked flow or other critical flow conditions. It reduces the aerodynamic noise generated by supersonic flow shock waves. The attenuator plates are designed to reduce the noise frequencies to which the human ear is most sensitive.



Cavitation

The pressure recovery factor (FL) of the Q-Ball is higher. This allows higher differential pressure over the valve with less tendency for cavitation and choked flow. Further, the hydrodynamic noise level is lower. There is less cavitational erosion and vibration. Seating surfaces are well protected against direct flow impingement and tightness is therefore preserved over the valve lifetime.

Subject to change without prior notice.

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