AQUAPRO
Rubber Dam

www.arcon-aquapro.com

THE MOST VERSATILE DAM IN THE WORLD

Hydroelectric Power, Irrigation, Flood Control, Water Supply, Water Cooling, Separation of Fresh and Sea Water, Navigation Channels, Recreational, Ground Water Recharging, Urban Regeneration

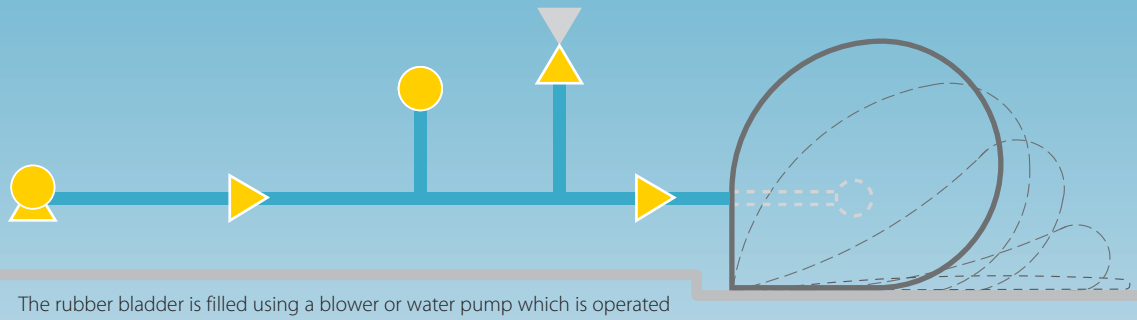
Arcon

What is a Rubber Dam?
A Rubber Dam is a highly efficient water controlling structure which significantly outperforms conventional steel gate systems. It comprises of a flexible, high tensile, rubber-coated fabric bladder, which is permanently clamped to a reinforced concrete foundation. The bladder is inflated either by air or water, which in turn impounds and controls water flow, and is lowered by releasing the air or water from inside the bladder.

Arcon AquaPro, in partnership with Floecksmühle, supply the highest specification Rubber Dam systems available in the industry today. We have been designing, developing, manufacturing and installing custom built air-filled and water-filled Rubber Dams worldwide since 1984, using the highest grade Continental® rubber and internationally recognised quality components, exceeding materials used elsewhere in the industry. These advantages combined with the inherent simplicity of the design and unrivalled intelligent control systems, flow controls and advanced fail-safe systems, make Arcon AquaPro Rubber Dams the new standard available today.

FlexFlector® deflector with overflow during flow control

Simplicity of Design

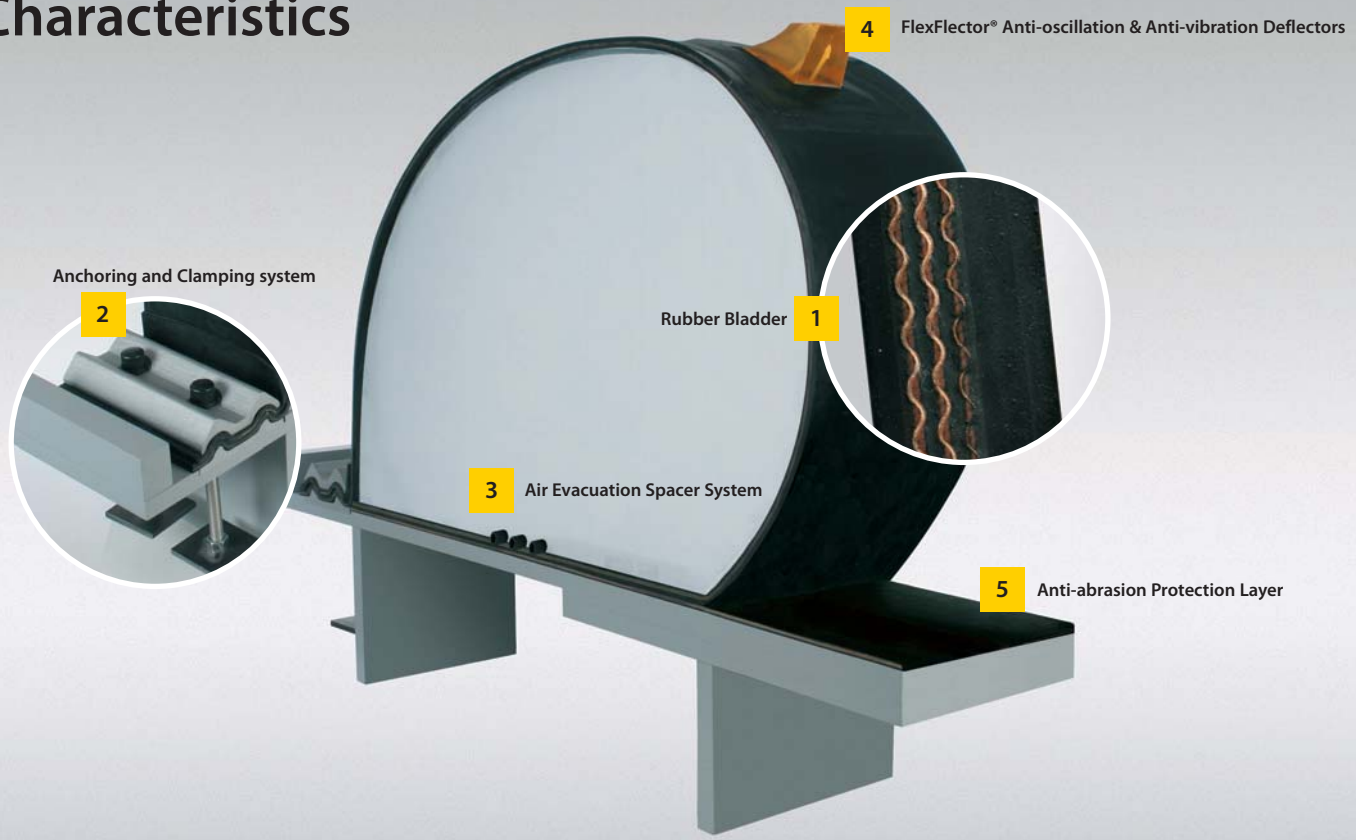


The rubber bladder is filled using a blower or water pump which is operated by a sophisticated yet simple to use control system. The bladder is lowered by means of an exhaust system, which is backed up by a mechanically operated failsafe deflation system in case of a power failure.

How does an Arcon AQUAPRO Rubber Dam compare to conventional alternatives?

	RUBBER DAM	STEEL GATE	PNEUMATIC OPERATED STEEL GATE
Low installation, operating and maintenance costs	✔	✘	✘
Simple and quick to install	✔	✘	✘
Simple to operate, maintain and repair	✔	✘	✘
Manual and automatic operation	✔	✔	✔
NO generalized ice risks	✔	✘	✘
Does NOT require multiple air connections	✔	✔	✘
Does NOT require a high pressure compressor	✔	✔	✘
Does NOT require motor driven mechanical equipment	✔	✘	✔
Does NOT require stiffeners for stability of high sections	✔	✘	✘
Does NOT require accurate foundation tolerances	✔	✘	✘
Does NOT require vertical side walls	✔	✘	✘
Does NOT suffer from leaking seals between sections	✔	✘	✘
Does NOT require sub-structures	✔	✘	✘
Does NOT disrupt flow	✔	✘	✘
Precise control of upstream headwater	✔	✔	✔
Operates well with high downstream water levels	✔	✔	✘
Good impact resistance	✔	✘	✘
Absorbs shock & vibration	✔	✘	✘
Corrosion resistant	✔	✘	✘
No lubrication of moving parts	✔	✘	✔
No painting of steel parts	✔	✘	✘
No danger of oil spills during operation or maintenance	✔	✘	✘
Lifting equipment not required	✔	✘	✔
Reliable failsafe device in case of power failure	✔	✘	✔
Non-intrusive structure	✔	✘	✔
Installed on flat foundations	✔	✔	✔
Installed on ogee crests	✔	✘	✔

Characteristics



1 Rubber Bladder

The AquaPro Rubber Bladder is made up of 100% EPDM rubber which resists weathering, ozone, ultra violet light, the effects of extreme temperatures and significantly out-performs CR rubbers which are more commonly used. The AquaPro Rubber Bladder incorporates a reinforcement Polyester fabric which gives the bladder its high tensile strength and has a significant advantage in terms of its 'memory' of shape during long periods of deflation, as well as being 100% watertight in comparison to the absorbent Nylon fabrics traditionally used. The bladder is available in a range of thicknesses, used in accordance with the conditions on-site.

2 Anchoring & Clamping System

The Anchoring & Clamping System is simple, easy to install and provides an airtight/watertight seal. Depending on factors such as the overflow and the down stream water level, a single or a double anchor line is used to fix the rubber bladder to the foundation. The embedded plates and anchor bolts are normally cast into new concrete foundations, however, they can also be effectively fixed with resin on existing foundations.

3 Air Evacuation Spacer System

In case of air-filled rubber dams, it is important that the bladder lies flat when fully deflated. A unique spacer system channels the evacuating air to an air-exhaust outlet, making sure no air pockets are formed thus ensuring a flat profile when fully deflated.

4 FlexFlector® Anti-oscillation & Anti-vibration Deflectors

Due to a number of factors, including variable flow conditions, high overflow, and tailwater, the rubber bladder may oscillate and/or vibrate in fully or partially inflated positions. This is resolved by using FlexFlector® deflectors which equalise the ambient pressure with the air pressure behind the curtain of water overflowing the dam. The bladder is additionally stabilised by an anti oscillation function in the main Control System.

5 Anti-abrasion Protection Layer

To provide complete protection against abrasion and impact by water borne loads and preventing debris from lodging beneath the bladder, a specially designed Anti-abrasion Protection Layer is attached to the concrete foundation on the downstream side of the Rubber Dam.

Control Systems

Integrated and Intelligent Control system

Our sophisticated and fully programmable Control System can be integrated with operation systems of other related equipment and is designed to accurately retain maximum storage levels, even in the event of a power failure. The weir can be operated both manually and automatically and the PLC programmed to a client's specific operation requirements.

Condensate Drainage System

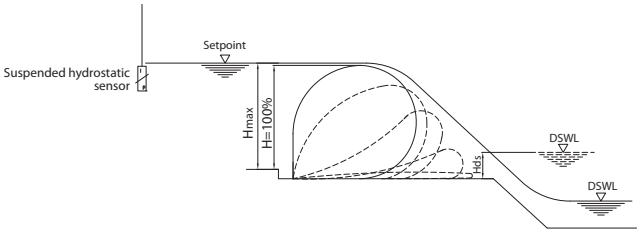
In the case of an air-filled Rubber Dam, condensation can occasionally form inside the bladder, especially where there has been a significant difference in temperature between night and day, and during warmer months. Under these conditions, the Condensate Drainage System effectively evacuates any water which has accumulated inside of the bladder.

Upstream Water Level Control

The full range of control offered in Arcon AquaPro Rubber Dams is unique.
There are two alternatives to control the upstream water level:

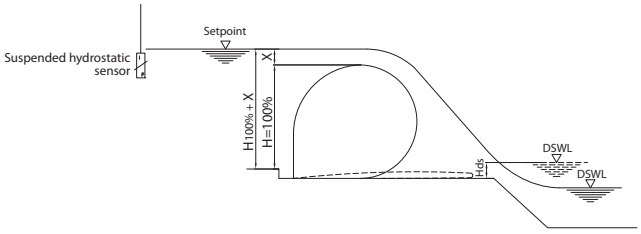
Dynamic Level Control

The control system provides the flexibility to accurately control the upstream water level to a variable set point. The PLC automatically responds to water levels above or below the set point by decreasing or increasing the internal pressure of the bladder to either pass or store water. This is particularly important in applications involving Hydroelectric Power.



Fixed Level Control

The control system is also capable of maintaining the bladder in either a fully inflated or fully deflated condition. The PLC automatically responds to a water level above the deflation set point by fully deflating the bladder. When the water level decreases below the inflation set point, the PLC responds by fully inflating the bladder.



Failsafe Systems

Failsafe Mechanical Deflation System

Unlike conventional steel gate systems, which require manual operation of often poorly maintained mechanical parts, the Arcon AquaPro Rubber Dam utilizes a failsafe mechanical deflation device, which lowers the bladder in the event of power failure. Deflation is triggered when the upstream water level rises to a mechanical deflation set point. This set point is configured at a level above the standard electrical set point, thereby allowing for a safety margin during which either the flow can stabilize or the power can be restored before deflation occurs. This minimises the risk of unnecessary downtime whilst still ensuring safe operation.

Over Pressure Relief Valve

A pressure relief valve is supplied to ensure that the bladder does not exceed the allowable inner pressure in the event of either equipment or power failure.

Pressure Control System

The PLC automatically monitors the pressure within the bladder. Should the pressure significantly decrease below or increase above the pressure set point, the PLC will operate either the inflation blower or the deflation valve to correct the deviation and return the internal pressure to that of the pressure target. This pressure deviation is often encountered during the normal diurnal cycle.

The number of **Arcon AquaPro** Rubber Dam installations is growing all the time as more engineers move away from conventional steel gate dams to flexible, safer and more reliable rubber dam systems. This trend can be seen from the rapidly increasing number of installations worldwide.

Top
1.60 mH x 33.80 mL x 1 span

Left
2.44 mH x 30.30 mL x 2 spans

Middle
2.0 mH x 12.0 mL x 1 span

Right
2.35 mH x 21.40 mL x 2 span

Arcon offers worldwide Rubber Dam technical & advisory support, maintenance and spares, as well as experienced teams of installation advisors and installers across the globe.

Arcon technicians make regular visits to all of their sites, giving advice and recommendations to operators on Rubber Dam operation, inspection and maintenance procedures.

Regional Representative:

Arcon AquaPro is part of the Arcon Environmental Division. Arcon was founded in 1974, with 11 offices worldwide.

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