



RUBBER SCREEN CLOTHS – are they suitable for your screening operation?

Rubber screens have been around for many years now and most of us would be aware of the many benefits such as long wear life, reduced noise and excellent self-cleaning qualities.

However many operators still pass up the opportunity to enjoy these benefits simply because they are unsure if rubber will work on their screens.



A common belief amongst those who have never used rubber is that rubber screens are less efficient than wire simply because rubber screen cloths have less open area.

It is obviously true that wire screen cloths have many more openings than rubber, but that does not always mean wire will be more efficient.

Under ideal operating conditions (no pegging, no blinding, non-abrasive ores), wire screens will most likely be around 10-15% more efficient than rubber screen cloths. However, introduce one or more of those adverse elements and the scene can dramatically change.

Any pegging or blinding of the wire screen cloths can easily reduce the open area to the point where rubber screen cloths will actually have more open area than the wire cloth and the rubber will most likely be more productive.

Rubber screen cloths have certain characteristics that help improve their efficiency to similar levels as wire screen cloths, even though the open area may be considerably less.

Rubber has a greater coefficient of friction than wire. This translates to slower movement and **longer retention time** of the material on the screen surface, giving the undersize material more opportunity to pass through the apertures.

When designed and installed **correctly rubber screen cloths improve the stratification of the feed material**. This is due to the fact that rubber screens do not oscillate uniformly over the entire deck area. The section of screen surface closest to the screen's stringer bars starts and finishes the oscillations earlier than the screen surface in the middle of the stringers.

Additionally the rubber cloth can oscillate several times throughout a single stroke of the machine. This effect is known as **SECONDARY VIBRATION**.

This same constant flexing of the rubber screen cloth offers several other advantages.

Rubber screens have far more flex than wire. The greater flexibility means that as the machine vibrates the surface of the rubber screen cloth actually travels through a greater range of motion than the machine itself. This can be somewhat likened to increasing the stroke of the screen, further aiding the stratification process in some cases.

Excellent Anti Pegging qualities - The extra movement gained by the rubber cloth greatly improves the ability of the screen cloth to expel or reject near sized particles from the apertures, preventing blocking of the screen apertures due to pegging.

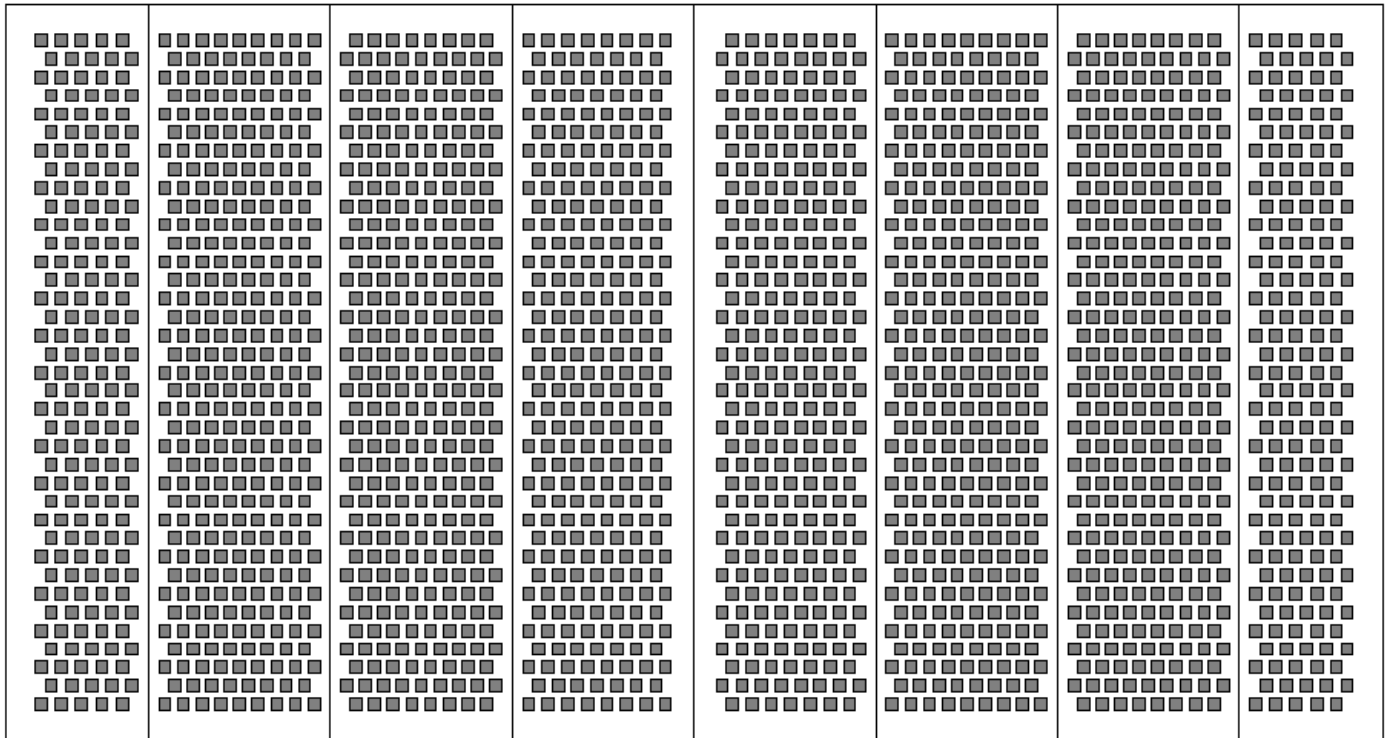
Excellent Anti Blinding qualities - The flexible and constantly moving screen surface assists in the prevention of moist sticky material "caking" on the screen surface and in the apertures. As the screen surface flexes the sticky fine particles break up and fall away.

Rubber screens - not enough open area?????

The greatest factor limiting the wider use of rubber screen cloths has been the loss in screening efficiency. Over the years many plant operators expressed a desire to use rubber screen cloths but felt they could not do so due to what they perceived to be a large loss of open area. In recent times there have been some big gains in open area. Improved rubber compounds, reinforcing and manufacturing methods have resulted in significant increases in open area over the traditional rubber screen cloth of years gone by.

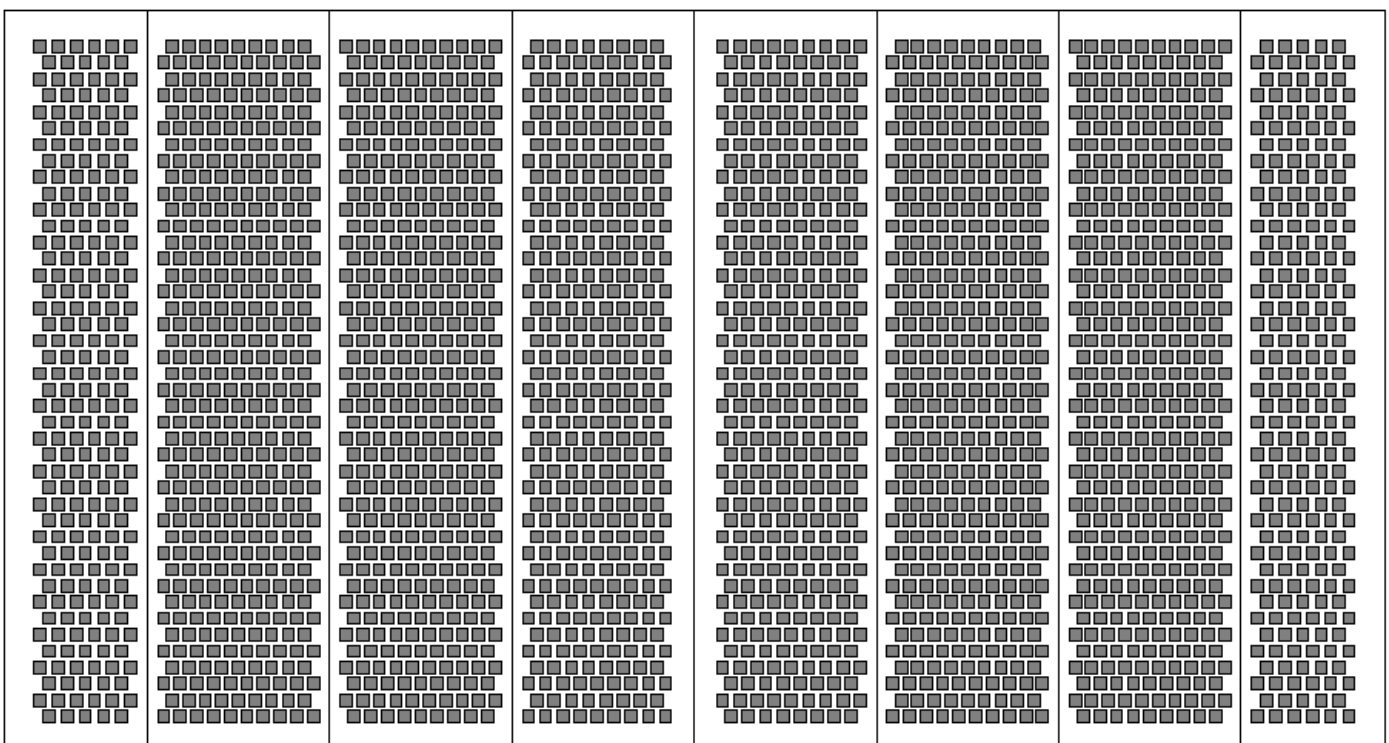
The main concern when designing the high open area *Hi-Flow rubber* screen cloth is reduced wear life. Whilst this can sometimes be the case, with clever design and careful material selection very good wear life can still be achieved even under quite extreme conditions.

Sketch of a typical 20mm aperture rubber screen for a 20'x8' screen = 29% open area

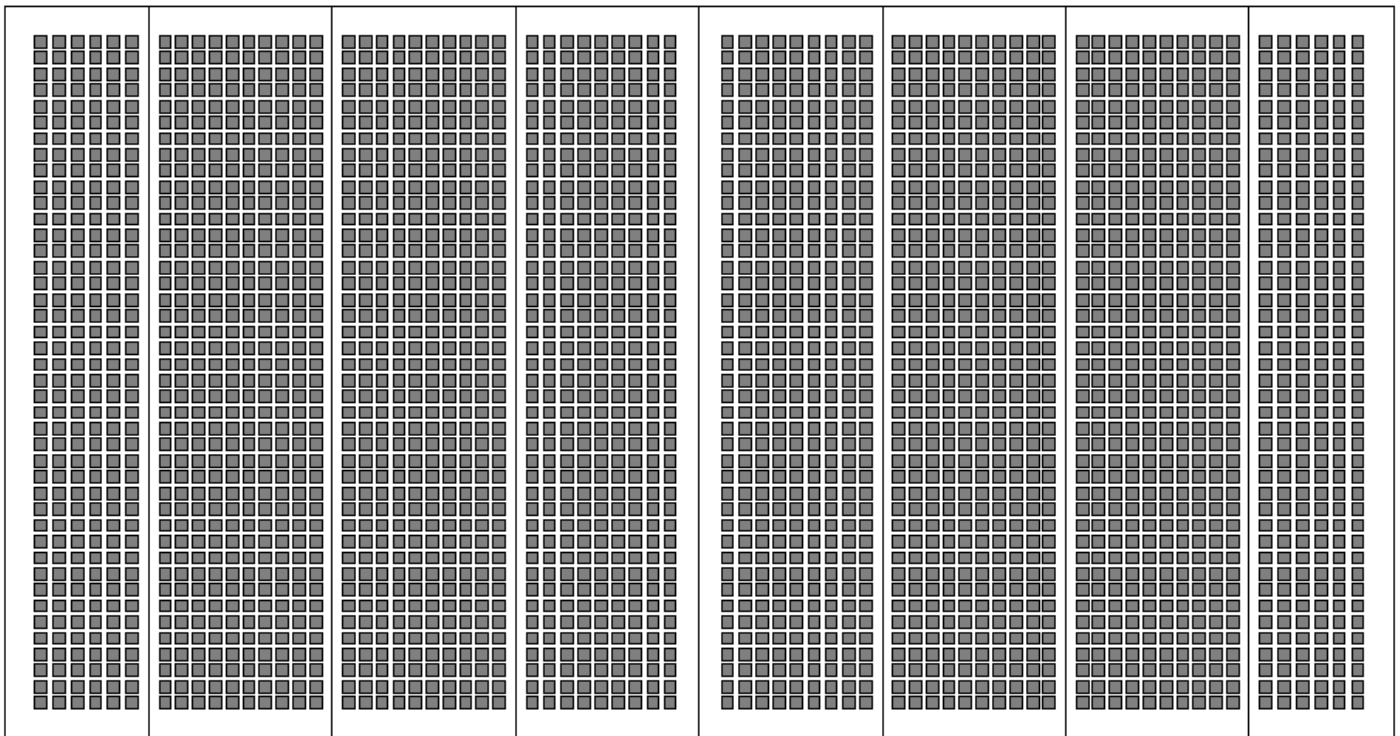


Depending on the application and the conditions under which the cloths must perform, increases in open area of around 30% over standard rubber screen cloths are quite normal. This can sometimes bring the open area of the "*Hi-Flow*" cloths close to that of a woven wire screen.

Sketch of high open area 20mm aperture rubber screen for 20'x8' screen deck = 37% open area



**Sketch of a maximum open area 20mm aperture rubber cloth for 20'x8' screen deck = 40% open area
a 35% increase in open area over standard rubber screen**



In comparison a 20mm aperture x 8mm Ø wire screen cloth has 51% open area

High open area rubber screen cloths are now used in a wide variety of applications including high volume iron ore screening, heap leach mining and quarry aggregate sizing.

When can't you use rubber screen cloths?

Quite often screens are heavily overloaded. Where there is no pegging or no blinding evident and wire cannot cope, rubber definitely won't stand a chance either.

A good guide to the effectiveness of rubber is to examine the overs leaving the screen deck using wire screens. If the bed depth on the discharge end is around 50mm or greater and there is still some undersize product in the material, rubber is most likely not suitable for that application. Alternatively, if you can see some screen cloth surface at the discharge end of the deck whilst under full production load, there is a very good chance rubber screens would be suitable.



Important

Hi open area rubber screen cloths are not suitable for every application.

Direct impact and large material should be avoided.

Some common concerns when considering rubber screen cloths

Many operators believe rubber screen cloths are **too expensive**.

On average a rubber screen cloths sell for around 2-3 times that of a wire screen cloth, however the average wear life of rubber is 5-10 times longer than wire.

In reality rubber screen cloths are actually cheaper than wire on a cost per tonne basis.

Wire screen cloths are cheaper to buy

Rubber screen cloths are cheaper to use

Sizing accuracy can be a legitimate concern. During the life of a rubber screen cloth, particularly the thicker cloths, the aperture size will become larger and the rubber cloth thinner. This will result in progressively larger material passing through the apertures as the cloth wears.

We supply many quarry operators with rubber screens for the sizing of concrete and road aggregates. Our wide variety of aperture sizes and aperture shapes combined with our years of experience enable us to select aperture sizes with a high degree of accuracy.

Screen cloth weight can affect the performance of a screen deck. Some rubber screen cloths are a little heavier than wire cloths and some are a little lighter. A 5mm or 7mm thick rubber dust screen cloth will weigh less than the equivalent wire mesh cloth, while a 35mm thick rubber screen cloth weighs around the same as a steel punch plate screen.

If you compare for example a 1.8m x 6.0m screen handling 400 TPH with a transport rate of 0.5 meters/second the constant load on the screen is 1350 kg.

A full set of 50mm thick rubber screens weigh approximately 400 kg and the equivalent set of steel screens weigh 360 kg.

The additional 40 kg in relation to the 1350 kg load hardly rates mentioning.

Frequent changes of aperture sizes. Mobile plants and contract crushers can have frequent changes of aperture sizes. If the cloths have to be changed regularly to meet customer demand and there is little chance of repeating the product size in the near future, then wire is obviously the most suitable screening media.

On the other hand, if the product is a common size that will be required again, it may be more cost effective to use rubber cloths. Wire screens don't re-tension very well after being used. Rubber screens can be removed and re-used time & time again with no detrimental effect.

In summary, rubber screens can solve screening problems such as high wear, pegging, blinding and noise, however they can also be the cause of screening problems if the screen is too heavily loaded or the screen cloth is poorly designed for the application.

Your experienced Nepean Rubber representative can audit your screening plant, offer technical advice and recommend the most suitable combination of screen media for maximum screening performance.

