

INDUSTRY BULLETIN: Niobium: Another rare metal contributing to energy efficiency

While the rare earths continue to generate most of the headlines these days, we thought we would share some information about another rare metal *niobium*, one of the planned by-products from rare earth production from our Nechalacho deposit.

We have been reading a lot about Lithium-Ion and lanthanum-containing Nickel Metal Hydride (NiMH) batteries in the growing hybrid and electric vehicle world. We also know that permanent magnets that contain neodymium and dysprosium are the key to hybrid car technology, as well as glass that is made from cerium, allowing it to filter out UV light protecting our eyes and the plastic components inside the car. As with the above noted rare metals, niobium also has growing application in the automotive industry related to energy efficiency.

Niobium (chemical symbol 'Nb'), is used primarily as an additive in making some 'high strength low alloy' (HSLA) steel and stainless steel for oil and gas pipelines, tool steels, ships' hulls, and railroad tracks.

High strength steels were developed out of the need to make vehicles lighter following the 1970 fuel crisis. A lighter car means better fuel economy. HSLA steels are usually 20 to 30% lighter than carbon steel with the same strength. At a recent industry conference attended by the Company, CBMM, the worlds largest niobium producer, reported that just US \$9 worth of niobium in a typical automobile reduces the weight of the vehicle by 100kg resulting in 1 litre of fuel savings per 100 km!

It is important to note however, that although the metal is stronger, it is not necessarily stiffer. As such, if one looks at some of the latest vehicles, you will see that many panels are stiffened by the use of swaging. A 'swage line' is sometimes more than a crease or curvature in the side of the body used to create visual drama. The crease is functional and improves rigidity of the outer body.

Niobium is also used in camera lenses, coating on glass for computer screens, ceramic capacitors for electronic circuits, cathode protection systems for large steel structures, turbine blade applications in jet engines and land-based turbines, nuclear cladding, and in some superconducting magnetic coils in magnetic resonance imagery (MRI) and magnetic levitation transport systems.

There are primarily three companies, which in total produce about 85% of the world's demand for niobium products. The largest producer is CBMM in Brazil, followed by Iamgold's Niobec Mine in Quebec, Canada.

Avalon's Nechalacho rare earth elements deposit at Thor Lake, NWT, now ranks as the third largest niobium deposit in the world. Once in production, the operation is expected to produce approximately 1,700 tonnes of niobium pentoxide (Nb₂O₅) annually. Niobium pentoxide currently sells at around US\$45.00 per kilogram or US\$45,000 per tonne, and will contribute approximately 20% of the expected revenues to the operation.

If you have any comments or questions on this article or the rare earths generally, please do not hesitate to contact Avalon directly at ir@avalonraremetals.com.

ABOUT AVALON RARE METALS INC.

[Avalon Rare Metals Inc.](http://www.avalonraremetals.com) (TSX:AVL) (OTCQX:AVARE) is a mineral exploration and development company focused on rare metals deposits in Canada. Its flagship project, the 100%-owned Nechalacho Deposit, Thor Lake, NWT, is emerging as one of the largest undeveloped rare earth elements resources in the world. Its exceptional enrichment in the more valuable 'heavy' rare earth

elements, which are key to enabling advances in green energy technology and other growing high-tech applications, is one of the few potential sources of these critical elements outside of China, currently the source of 95% of world supply. Avalon is well funded, has no debt and its work programs are progressing steadily. Social responsibility and environmental stewardship are corporate cornerstones. Avalon's performance on community engagement in the north earned it the 2010 PDAC Environmental and Social Responsibility Award.