

BRIEFING PAPER ILUKA ZIRCON PRODUCTS AND PRICING

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This paper is designed to provide information on Iluka's range of zircon products, including end use sectors, sales mix and pricing outcomes.

Iluka produces 18 different zircon products and supplies over 100 customers in six different regions. The zircon product range includes different qualities of zircon as well as zircon specifications to target specific intermediate and end market sectors. This is consistent with Iluka's approach to utilise its well-developed logistics and distribution capability to efficiently deliver "fit for purpose" products to a wide range of customers around the world.

ILUKA'S ZIRCON PRODUCT RANGE

The main categories of zircon products are as follows:

- Premium – typically used for ceramics manufacturing (for example tiles, sanitary wear) but also for high-tolerance casting/foundry applications and additive manufacturing.
- Universal and standard grade products – used for a range of applications, including digital printing, lower quality ceramics, zirconium chemicals, casting, foundry and other applications.
- Zircon in concentrate –this typically residual non-magnetic material accumulated over time from Iluka operations that has been difficult or uneconomic to fully recover. Iluka monetises this product by selling directly to processors that market the product or by having the material toll-treated through off-shore facilities and then Iluka selling the product.

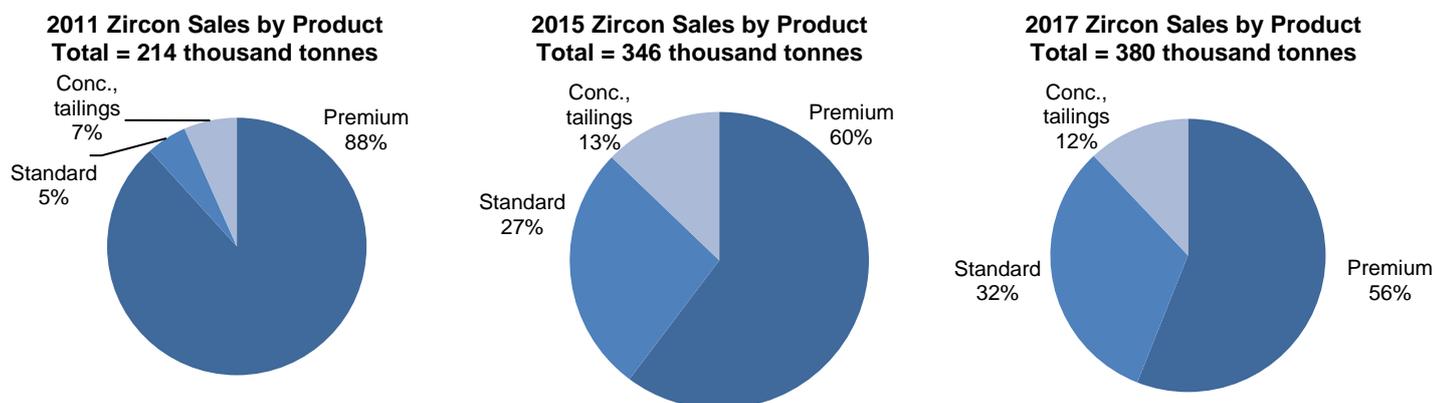
In addition, Iluka has recently begun selling proprietary products developed for niche end-user applications – this emerging product category is not included in the following analysis due to its recent market launch. Details of these categories of products are shown in the Appendix along with some of the end use applications.

The composition of sales can vary over time, influenced by various factors including:

- market conditions: in some markets, depending on the health of end sectors, customers can elect to reduce the quality of their input (with implications for output quality) and as such purchase lower priced inputs and/or lower volumes in general;
- new product development, for example, Iluka has sought to develop a wider range of products to broaden its product reach. Recently this has included the development of an "anti-veining" zircon suitable for the precision casting market;

- competitive factors or product availability, for example, as Iluka has indicated, limited availability of its high quality Virginia zircon following idling of operations, combined with competitive pricing from some new entrants in this market, has resulted in the company forfeiting some market share; and
- monetisation decisions as in the case of non-magnetic residual material streams.

The following charts show the composition of Iluka's zircon sales in 2011, 2015 and 2017.



Standard zircon includes Iluka's Universal Grade product developed in 2013 for frit and digital printing applications.

ZIRCON REFERENCE PRICING FRAMEWORK

Iluka introduced a Zircon Reference Price framework from early 2015. The Reference Price is the benchmark against which all Iluka zircon products are priced and is based on the most commonly sold tonnage combination (Eucla Basin premium zircon, 2 tonne bags, DAT China warehouse). Iluka then differentiates to provide a 'net' price for customers based on product quality, location, method of delivery and other factors. Select customers also enjoy access to "Iluka Rewards" which is a loyalty programme that recognises their commitment and buying behaviour.

Because the reference price is based on Iluka's premium zircon, non-premium products can and are typically priced lower, dependent on product characteristics. In addition, approximately 60 per cent of zircon sales are to customers participating in Iluka Rewards which results in an adjustment to the net price. As such, Iluka's weighted average received price will vary from the reference price based on mix, commercial terms and participation with Iluka Rewards.

Iluka reviews and can adjust the Zircon Reference Price on a quarterly basis. From Iluka's perspective, the approach provides:

- improved transparency of pricing for customers;
- ability for customers to pass-on price decreases/increases downstream; and
- assistance in price predictability over time across regions and varying product categories.

Historical pricing is provided below.

2011 – 2017 Iluka Weighted Average Prices

Iluka Price US\$/tonne FOB	2011	2012	2013	2014	2015	2016	2017
Zircon – premium and standard	1,886	2,080	1,171	1,054	986	810	958

Premium and standard zircon prices are not given separately for commercial reasons.

Zircon in concentrate receives a lower price, however this does not necessarily reflect a lower margin on sales. In the case of these products, they often have a lower carrying value and, as such, contribute positive margin and free cash flow even though it may have the effect of lowering, albeit slightly given the lower volume of these sales, the weighted average received price.

Appendix: Iluka's Main Zircon Categories and End Use Markets

Iluka's main categories of zircon products are as follows:

<p>Premium 66.0% ZrO₂ min; very low TiO₂ & Fe₂O₃ impurities</p>	<p>High end applications in ceramics, fused zirconia, refractory, casting.</p> <p>Use in ceramics provides opacifier intensity and high DE (Delta to Eneabba – the benchmark for “whiteness”).</p>
<p>Universal and Standard Grade 66.0% and 65.0% ZrO₂ min respectively, impurities vary;</p>	<p>Universal developed in 2013 for frit production and digital printing.</p> <p>Standard is preferred feedstock of some zirconium oxychloride (ZOC) producers and can be used in foundry and some ceramic applications.</p>
<p>Zircon in Concentrate 25-50% zircon range (Iluka reports volume as zircon sand equivalent)</p>	<p>Majority of Iluka zircon in concentrate product is from non-recoverable non-magnetic processing streams. This material is toll processed overseas under an arrangement which is financially more efficient than if Iluka attempted to re-process this residual stream (final products sold by Iluka) and also sold directly to end users with upgrading capacity.</p>

 <p>Alumina Zirconia Silica (AZS) bricks 33-45% ZrO₂ content</p>	 <p>Fused zirconia bubbles</p>	
<p>REFRACTORY APPLICATIONS</p> <ul style="list-style-type: none"> • Steel • Oil and gas making industrial applications 	<p>FUSED ZIRCONIA</p> <ul style="list-style-type: none"> • Industrial abrasives, auto brake pads, fine polishing, ceramic pigments, paint coatings. 	<p>ZIRCONIUM CHEMICALS</p> <p>Highly diversified end uses:</p> <ul style="list-style-type: none"> • Paper coatings, paint dryers, auto catalysts, fire retardant, • Antiperspirants, cosmetics, artificial teeth • Nuclear fuel tubing

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- exchange rate assumptions
- product pricing assumptions
- mine plans and/or resources
- equipment life or capability
- current or new technical challenges
- market conditions
- management decisions

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