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**Authorisation**

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**RECOMMENDATION**  
Buy

**PRICE**  
\$0.13

**TARGET**  
\$0.24

**RISK**  
Speculative

**BRIEF COMPANY DESCRIPTION**

Alexium is a specialty chemical company that has developed a cost effective, environmentally friendly way of treating highly flammable synthetic fabrics to make them flame retardant. The company is commencing the commercial roll out of its four main Flame Retardant (FR) products, Polytron-Hometex (home furnishings), Nycolon (Nylon-Cotton), Nuvalon (Polyester-Cotton) & Ascalon (95%+ Nylon).

Alexium's patented Reactive Surface Treatment (RST) process that allows surface modification and attachment of nano particles or multiple chemical functional groups to surfaces to provide functions such as flame retardance (FR), water proofing, oil proofing, anti-microbial, non-stick and UV protection.

Applications under development include but are not limited to textiles, composites, paints, packaging, glass, marine antifouling and building materials.

**COMPANY DATA (22.08.2014)**

ASX Code	AJX.ASX
Market Capitalisation	~\$26.2m
Enterprise Value	~\$22m
Shares on Issue	202m
12 Month High/Low	\$0.19/0.08
Ave Monthly Turnover	~5.5m
Cash – July 2014 Qtr	~\$4.2m

**12 MONTH SHARE PRICE**



# Recommendation - BUY

Alexium's quarterly update revealed that the Company is successfully developing its pipeline of Flame Resistant (FR) chemical treatments and is well and truly on the path to commercialisation and we expect is on the verge of generating significant growth from its various FR chemical treatments. We expect FY14/15 to be a defining year for Alexium as all products increase in sales but with a particular focus on growth in Home Furnishings/Upholstery. We have reviewed our forecasts and have made changes to our estimates FY15, FY16 & FY17. We have accounted for dilution from the capital raising and SPP and we have adjusted our probability of success for all Alexium's products in light of the company's continued advancement of their product range. We maintain our BUY recommendation on Alexium (AJX) with a risk-adjusted share price target of A\$0.24/sh (from A\$0.28/sh) and A\$0.55/sh optimistic case due to the increased capital.

We view the last six months as serving as a major de-risking period for the Company as further customer contracts have been signed and additional chemical sales have been achieved. Furthermore, new products in different target areas have been launched (home furnishings) and repeat orders for these products received. Initial sales have been a little less than expected but we see this as merely a timing issue. This will result in sales we expected to occur in 1HCY (Jan-Jun 2014) occurring in 2HCY (Jul-Dec 2014), but importantly we anticipate sales will be greater for all products over the life of the business.

We believe recent share price weakness creates an opportunity for investors. It is important to note that it takes time for a disruptive technology to gain traction in such an industry as Textiles which is less amenable to change than other industries. First revenues are always the hardest to attain for an emerging company and we believe the company's revenues will steadily grow from here.

**New Customers signed, New Partnerships formed and various Sales Contracts executed**

New customers (iTextiles, Euroflam) and new partners (Marlin Co.) is further evidence of Alexium's novel technology being validated and accepted by the industry in which it operates. Management continue to be very positive regarding near term sales and this is shown in the Company's July Newsletter where Management refer to 12 current development/trial projects with customers across the product spectrum. Each project represents a significant (~\$0.5m) p.a. average revenue opportunity with small sales quantities on all products already being booked.

**ICL Grant and Collaboration to co-develop flame retardant chemicals and treatment packages**

The \$250,000 grant from the South Carolina/Israel Collaborative Industry R&D Program is globally significant and should not be underestimated by the investment community as it is akin to a biotech collaborating with a global pharmaceutical company and is further validation of Alexium's novel technology.

**Sales Team Strengthened and Expanded**

Alexium has expanded its sales team and added key industry heavyweight figure Jon Heard. This will drive sales as Mr Heard has a vast network of contacts and extensive experience in the FR industry having grown his own FR Company to the stage it was acquired by leading global textile & fiber producer INVISTA.

**Successful capital raising significantly strengthened balance sheet**

The successful capital raising involved a Placement to Institutional and Sophisticated Investors and a Share Purchase Plan strengthens Alexium balance sheet leaving \$4.2m as of 30th June. We see this increased cash level being sufficient to provide runway for at least the next 1 ½ years at current burn rate of ~\$250,000 per month, increasing chemical sales will significantly extend the runway further.

**New products brought to market increasing product offering**

The contracts with Euroflam (U.K. based FR commission finisher specialising in home textiles, furnishings) and iTextiles® (a regional distributor of premium textile products and brand chemical intermediates in Pakistan) are just starting to bear fruit. The textile industry in Pakistan and the Middle East is a \$13 Billion market alone. Furthermore iTextiles® is closely associated with industry majors including INVISTA and Dow Chemical.

(All dollars referred to in this report are in Australian dollars unless otherwise stated)

## Highlights – 10 Reasons to Invest in Alexium

**Alexium has added the Polytron™ – Hometex™ home furnishing/upholstery products to its existing range of Flame Retardant (FR) products Ascalon™, Nycolon™ & Nuvalon™** and has already received small revenues and repeat orders for all these products thus showing growing market acceptance of their FR technology.

**Alexium has just been awarded a \$250,000 grant from the South Carolina/Israel Collaborative Industry R&D Program**, a bi-national initiative that facilitates bilateral industrial R&D projects between companies from South Carolina and Israel. In addition, Alexium's RST Technology was selected as the winner of the 2009 World Best Technology Showcase voted upon by the US Venture Capital Association and Fortune 500 firms. **Alexium was also recognized by the Frost and Sullivan's 2013 Technology Innovation Leadership Award.**

**Over 2 million US soldiers are issued 50/50 Nylon/Cotton garments as standard issue uniforms that currently have no Flame Retardant treatment**, representing a potential 25 million yards p.a.

**The global market for flame retardant chemicals in terms of revenues was estimated to be worth US\$4.8 billion in 2011 and is expected to reach US\$7.1 billion in 2017.**

**Market trends are shifting away from halogenated FR chemistries to halogen-free alternatives;** California is bringing in new laws governing the use of harmful flame retardant chemicals and the industry is moving away from certain brominated FR chemistry with customers demanding safe and effective non-halogenated solutions – **and Alexium having available solutions.**

**In addition to contracts/sales agreements with iTextiles and Euroflam, Alexium is expected to steadily increase the number of contracts and licences** for their other FR Treated products – Nycolon™ and Nuvalon™ where the market for other military fabrics and industrial work wear is >75 million yards p.a.

**Contracts/Trials have been entered into with the US Department of Defence “DoD” for Alexium's novel RST treatments** thus validating the technology for military use and opening AJX up to multi-billion dollar markets. Alexium continue to work closely with the DoD on a range of FR solutions and this is expected to be a significant part of their business over the coming years.

**Alexium's FR/RST treatments are completely unique and novel and there are no other known environmentally friendly treatments** that can make Nylon flame retardant, thus making the technology disruptive. RST is a patented technology with granted patents and a growing patent portfolio.

**Broad range of applications from textiles to composites, paints and glass**, there is very large potential upside should this technology be applied across various industries: the aircraft industry, the building industry, carpets, curtains, paints etc.

**Sound Financial position with over \$4.2m in cash and low monthly cash spend.** Alexium's current spend is approximately \$250,000 per month provides for over 1 ½ years runway assuming no other income. With expected revenues increasing the company's target is to be cashflow positive in approximately six months from now.

## Company Overview

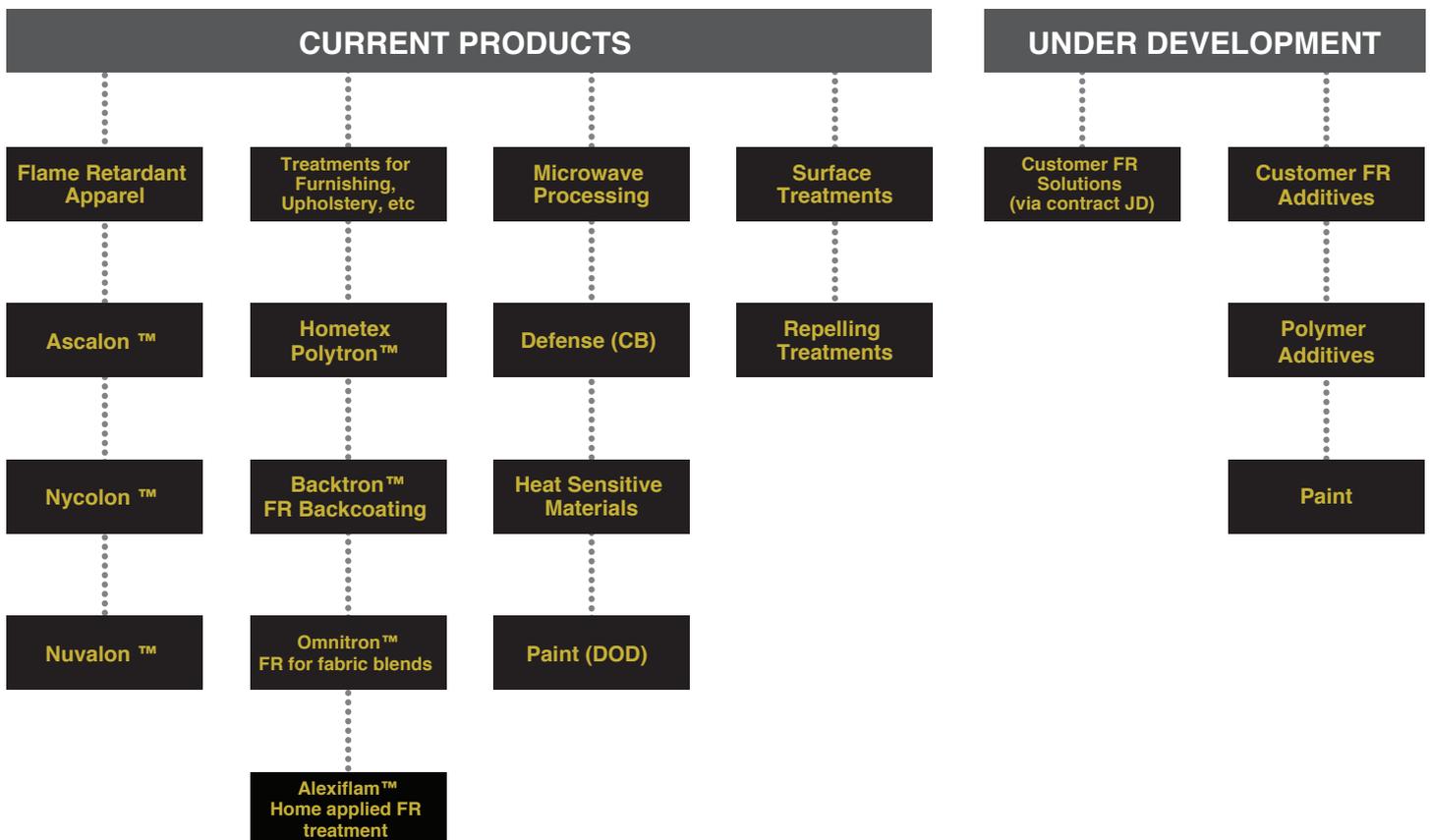
Alexium is a specialty chemicals company that provides chemical treatments for a range of textiles (both synthetic and natural) to produce additional properties to that specific textile. The technology was originally developed within the U.S. Air Force for the Department of Defense (DoD) as a Reactive Service Treatment (RST) process with US\$30m invested in Research and Development by the DoD to date. The process has been developed to treat synthetics and synthetic blends with a topical, durable, environmentally friendly, cost effective chemical finish that provides additional properties such as Flame Retardence (FR), oil and water repellency. This is significant because low cost synthetic fibers such as Polyester and Nylon are extremely flammable but due to their strength, (which significantly adds to the life of the garment), abrasion resistance, long wear and their low cost, are widely used and preferred in the textile industry.

Alexium has four major product lines Ascalon™ (Nylon), Nycolon™ (Nylon/Cotton) and Nuvalon™ (Polyester/Cotton), CleanShell CB™ (RST-Chem-Bio applications) and now Hometex/Polytron™ range (FR treatments for home furnishings and upholstery).

Alexium provides environmentally friendly Flame Retardant Treatments & Reactive Surface Treatments such as oil proofing, water proofing etc.

Alexium is a specialty chemical supply company.

## Product Map



# New Products

## Home Furnishings, Upholstery, Curtains & Carpets

### **HOMETEX™ – POLYTRON™**

Hometex™ – Polytron™ is a novel, halogen-free treatment package for customers seeking to flame retard standard polyester fabrics in non-apparel applications. Alexium's chemical package offers a number of key advantages over existing FR polyester (FRP) "inherent" fibers, such as Trevira®. The FR chemical package, developed as a topical treatment for conventional polyester fabric, provides a lower cost alternative and offers key technical advantages over FRPs like Trevira®.

Hometex has been able to be launched relatively quickly compared to the Alexium's apparel FR products because it doesn't require as lengthy certification and testing cycles.

In addition to being able to provide a lower cost solution, Alexium was able to develop a solution that overcomes many of the technical limitations of FRPs. The treatment is compatible with further topical treatments such as water/oil repellency or antimicrobial treatments while providing an excellent, durable (50+ wash) FR performance.

Customers demand these multi-functional fabric properties in home and contract textile applications, but FRP's have been unable to meet the demand for multifunctional treatments. Alexium is also working with the full colour/design pallet of conventional polyester fabrics, whereas the available colour/design range of FRP fabrics is generally much more limited.

In 2013, one of the world's leading FRP fiber brands, the German company Trevira® GmbH, reported annual sales of approximately €250 million, a production capacity of approximately 90,000 tons per annum for polyester fibers and filament yarns, and over 78% of Trevira® being sold to customers in non-apparel markets (technical fabrics, home textiles, and transportation).

Given Hometex™'s advantages we believe it should be relatively easy for Alexium to build a name for itself in this industry once the market becomes aware of its brands.

In summary, the advantages of Hometex™ are:

1. Low Cost;
2. Environmentally friendly and Halogen free;
3. Multifunction capability: compatible with further topical treatments such as a water/oil repellency or antimicrobial treatments;
4. Provides an excellent, durable (50+ wash) FR performance; and
5. Ability to work with full color/design pallet of conventional polyester fabrics

The curtain fabrics market in the United Kingdom is approximately £542 million. A large portion of the upholstery and curtain markets require FR treatment for usage in hotels, nursing homes, hospitals, transportation, and public institutions. Beyond the UK market, Alexium is targeting fabric markets in the broader EU market. The European consumption of soft furnishings fabrics is significantly larger, with the upholstered furniture market alone being approximately €11.4 billion, with a large portion of these fabrics having to comply with fire protection laws and regulations.

**Bactron™** is a highly effective, halogen-free, fabric back-coating for the upholstery and furnishings industry. This treatment, only applied to one side of a fabric, passed key upholstery standard tests for the UK and Europe.

**Omnitron™** is a highly effective FR treatment package, halogen-free, for a range of fabric blends in the upholstery and furnishings market.

Both treatments are applied in a single application pass and offer durability as well as effective FR protection.

The market for home textiles and furnishings is estimated at USD\$30 billion p.a. in 2014 according to Ibis World and Hometex-Polytron will compete with existing halogenated FR treatments as well as offering solutions where no FR treatment is currently used.

The company stated revenue targets are expected to be in the vicinity of \$2-3 per yard, but will ultimately depend on the application as certain uses will require more chemical (more lbs) per yard than other uses. Profit margin will also vary with a 75% profit margin target being a goal for Alexium.

### **NYCOLON™ FR CHEMICALS FOR NYLON BLENDS**

The US Military standard battle fatigue uniforms use a 50:50 Nylon-Cotton blend which currently has no Flame Retardant qualities. Nylon is added to cotton blends to dramatically improve the physical strength and abrasion resistance, producing a much tougher fabric than cotton alone.

While 50/50 NyCo fabrics are proven performers in military operations and are a relatively low cost option, they can cause serious burn injury if the soldier is exposed to flames or attacked by improvised explosive devices (IEDs). 50/50 Ny/Co fabrics melt and drip when exposed to high heat, sticking to the skin and intensifying soldier (burn) injuries.

For this reason, the US DoD services issue FR garment options to soldiers deployed into combat missions or in theatre. FR garments, such as the Marine Corps FR Organization Garment (FROG), the Army's FR Army Combat Uniform (FR ACU) or the Air Force's FR Airmen Battle Uniform (AF-ABU) are comprised of relatively expensive fibers, such as para-aramids, which add over US\$50 to the cost of each end item (e.g. for the FR-ACU US\$129.61 vs. US\$77.90 for ACU). In addition to being more expensive, the fielded FR uniforms have shown to have significantly shorter service life and much higher than anticipated replenishment costs, as a result of weaker fabric constituents, such as rayon.

FR rayon fibers are a critical component in the flame-resistant uniforms currently worn by US soldiers deployed into combat. While congress included language in the fiscal year 2012 National Defense Authorization Act (NDAA) to eliminate future restrictions on the use of FR (flame-resistant) rayon fiber by the US military, rayon is sourced from overseas and is therefore not technically Berry Amendment compliant. As a superior and cheaper alternative treatment to current aramid blends, Alexium's FR treated Nylon-Cotton could replace aramid blends such as Tencate's Defender-M for the US Military. Given Alexium's

production is located in the US and based on an existing domestic supply chain of Nylon-Cotton fabric producers, it will be able to offer a fully Berry Amendment-compliant product. The Berry Amendment requires the DoD to give preference in procurement to domestically produced, manufactured, or home-grown products, most notably food, clothing & fabrics.

The market for standard military uniforms used by US DoD is estimated >25Mil yards p.a. and it is viewed that providing a general FR protection for NyCo is the holy grail of the US military textile industry and Nycolon is potentially the product that could be used to protect all existing NyCo uniforms for little cost add-on.

Alexium has previously been awarded various development contracts with US Marine Corps through Alexium Government Solutions LLC and expects to receive further research contracts and grants over FY2014/15.

The market for Industrial workwear applications in the US is estimated at >25Mil yards p.a. and Nycolon will compete with high-cost aramid-blends.

The company stated revenue targets are \$2-3 per yard, depending on the type of fabric, dye and ultimate use and there is potential to achieve up to a 75% profit margin.

#### **NUVALON™ FR CHEMICALS FOR POLYESTER BLENDS**

The global market for polyester is far greater than the global market for nylon with an annual production of 65 Billion Pounds which equates to US\$33B p.a. with an annual Growth Rate of 6-7%.

Polyester is approximately 30% cheaper than Cotton, 4X cheaper than Nylon and in many categories has similar physical/performance characteristics as Nylon.

We would estimate the global market (Protective Workwear & Military, Upholstery and Home Textiles) for Polyester's that could use Nuvalon would be in excess of 75m yards p.a. and believe the company could achieve revenue targets of \$1.50 per yard, with the potential to achieve up to a 50% profit margin target.

As polyester is more widely used in the EU there will be considerable interest in Nuvalon™ from the Textile and Chemical Industry outside of the US. Similar to the Nylon-Cotton FR treatments, Alexium's technology offers a high performance FR product at a low cost.

#### **ASCALON™ FR CHEMICALS FOR NYLON**

Until Alexium had developed this technology it had been impossible to make Nylon flame retardant without significantly changing the existing properties of the Nylon fabric (breathability, feel, drape etc). A number of traditional FR treatments remain in industry involving the use of halogenated/brominated compounds in very heavy back-coating applications. Halogenated FR chemicals have received increased scrutiny over the last couple of years, forcing certain halogenated compounds out of the market due to documented environmental and safety concerns. A number of Scandinavian countries have banned all halogenated compounds and industries across the globe are working to remove these substances of high concern from the market.

Alexium's FR Technology for Nylon has been validated by the execution of a Licence Transaction with the Military Textile supplier Duro Textiles LLC for the North American market. Duro's customers range from aircraft manufacturer Boeing to workwear producers, and the US Military.

Orders and sales to growth through Duro over CY2014 has been slower than expected as Duro has undergone various upper management changes which have impacted on time it takes both Alexium and Duro to conduct internal testing, run productions runs etc for their various clients.

It could still take 3-6 months per client to complete the necessary production runs but once a transition is made to Ascalon we believe it will be permanent and could result in further widespread use through each organisation.

The immediate target market for Ascalon is 5-10 million linear yards p.a. but due to the early nature of this market it could be multiples larger as would be users adopt it globally.

#### **CLEANSHELL CB™ (RST-Chem-Bio)**

The Company's first several years involved developing their patented RST technology, which they licensed from the US DoD, in conjunction with Cold Microwave (low energy microwave) to provide enhanced properties to heat sensitive materials (namely synthetics) to produce high capability and therefore high value treated fabrics. The fabrics are to be primarily used in Chemical/Biological (Chem-Bio) suits (sealed suits that protect against chemical/biological agents by prohibiting the chemical from going through the fabric).

Alexium's RST Chem-Bio technology currently repels various chemical compounds/agents for a period 1,000 times longer (in addition to all other critical standards being met) than the existing Chem-Bio suits whilst providing breathability, improved feel/drape and importantly oil/water repellency. It is for this reason that the US Military is extending testing programs for Alexium's Chem-Bio RST technology providing large revenue potential in the medium/longer term.

There is further longer term potential upside from Cleanshell CB™ developments on RST treated military applications (paints, outershell finishes, antimicrobial applications). These programs are currently being funded by the DoD with approximately US\$30 million spent to date. Alexium will have first rights on any commercial opportunities arriving from any technology developed by the DoD/Air Force.

### **Pipeline — Other products under development**

#### **FR Fabric Treatments – Custom Blends**

Alexium is currently developing FR treatments as natural extensions of their Ascalon/Nycolon/Nuvalon products. These "custom blend" products include backcoatings on furnishings, upholstery, and topical treatments of home textiles and institutional/contract fabrics.

#### **FR Polymer Additives**

Alexium is developing various FR Polymer Additives for use in the Plastics industry (PA, PC, PE, etc) and is working with a Major FR Chemical Company in this area. Plastics are obviously used in large volume applications across the globe and represent a very large target market for Alexium.

#### **Paints**

There is potential to improve fire/heat resistance by incorporating FR into various paints and whilst this is likewise a very attractive and large target market development not yet been initiated.

## Investment View

We view the last six months as serving as a major de-risking period for the Company as further customer contracts have been signed and first chemical sales have been achieved. In addition, new products in different target areas have been launched and repeat orders for these products received. The new Hometex-Polytron products that cater for the home furnishing and upholstery markets are a big game changer that has gone unnoticed by the investment community. Alexium is increasing its focus on the home furnishings market as the certification and testing cycles are much shorter compared to apparel, meaning treatments can be fine tuned to customer specifications more quickly and products enter the market sooner.

Alexium's quarterly update revealed that the Company is successfully developing its pipeline of Flame Resistant (FR) chemical treatments and is well and truly on the path to commercialisation and is on the verge of generating significant growth from its various FR treatments. We expect FY14/15 to be a defining period for the company as all products increase in sales but with a particular focus on growth in Home Furnishings.

We have reviewed our forecasts and have made changes to our estimates FY14/15, FY15/16 & FY16/17. We have accounted for dilution from the capital raising and SPP and we have adjusted our probability of success for all Alexium's products in light of the company's continued advancement of their product range. We maintain our BUY recommendation on Alexium (AJX) with a risk-adjusted share price target of \$0.24/sh (from \$0.28/sh), (\$0.55 optimistic case from \$0.61/sh).

Initial sales have been a little less than expected but we see this as merely a timing issue. This will result in sales we expected to occur in 1H (Jan-Jun 2014) occurring in 2H (Jul-Dec 2014), but importantly we anticipate sales will be greater for all products over the life of the business and therefore have adjusted our optimistic case DCF valuation, after taking into account the added dilution from the capital raise.

We believe recent share price weakness creates an opportunity for investors with the company sitting close to an enterprise value of \$22m we feel it is very cheap, especially given the progress Alexium has made in terms of overall de-risking the company and bringing new products to market.

We note that a \$0.24 per cent share price would result in an approximate market capitalization of \$49m (\$59m fully diluted) which could be easily justified with earnings of \$2.5m using a multiple of 20x, something not out of the ordinary for a unique, patented technology with the global application of Alexium's RST/FR technology on a high trajectory of revenue growth.

Alexium's RST/FR Treatments are starting to become recognized in the industry in both the US and Europe and we believe it is only a matter of time before the disruptive technologies change the way synthetic textiles are being used. We believe Alexium could inevitably corner the FR Market for fabrics and textiles not only in the US but also the EU with global adoption to follow thereafter.

The fact that there is no other known treatment that can make Nylons and Polyesters Flame Retardant in the same way that Alexium's technology does is a remarkable differentiator. Alexium's FR treatments;

- Do not contain halogens,
- Do not reduce comfort,
- Do not increase weight above an acceptable level (10-15% increase which is less than existing treatments),
- Do not affect breathability, and
- Have a high durability, and
- Are launderable for 50+ washes for apparel (5-10 washes for upholstery & curtains), which is a minimum benchmark. It has become apparent that certain fabrics can achieve 100+ washes without impacting their Alexium FR treatment.

Over the last 6 months we have seen new chemical sales contracts and distribution agreements as commercial validation of their novel technology and a critical step in the development of the company.

We believe the existing contracts are worth potentially millions of dollars in chemical sales and royalties over the next 12 months and ramping up thereafter. We do acknowledge that sales have been slower than anticipated for the first half of CY2014 but this is not entirely surprising given the textile industry

New Hometex-Polytron products that cater for the home furnishing and upholstery markets are a big game changer and will drive sales in the short term

Recent share price weakness creates an opportunity for investors with the company sitting close to an enterprise value of \$22m

A \$0.24 per cent share price would result in an approximate market capitalization of \$49m

## Investment View Continued

is traditionally very slow moving and we now believe market acceptance is occurring and that repeat sales are being evidenced. Alexium is just starting to see results from its dual pronged strategy of partnering its various technologies with market leaders in the textile finishing industry and faster moving midtier/smaller fabric makers who are looking to bolster their presence as early adopters in what is a highly competitive market.

In addition, we are pleased to note that Alexium has addressed the staffing area of its business which should result in future sales targets being hit and potentially exceeded. Key to this is the appointment of key industry heavyweight figure Jon Heard and the expansion of its sales team. We are confident this will drive sales as Mr Heard has a vast network of contacts at the executive level with companies in the FR/Speciality Chemical industry and also with the textile producers that supply the military. Mr Heard has extensive experience in the FR industry having grown his own FR Company to the stage it was acquired by leading the global textile & fiber producer INVISTA and will also believe this will be valuable to Alexium management as it enters a period of solid growth.

We hold the view that Alexium will ultimately be a target for these traditionally slow moving established textile industry companies or more likely a market leading chemical company. What gives us comfort in forming this opinion is the recent grant by the South C South Carolina/Israel Collaborative Industry R&D Program, a bi-national initiative that facilitates bilateral industrial R&D projects between companies from South Carolina and Israel. Alexium will work with ICL (Tel Aviv Stock Exchange - TASE: ILCO) of Israel to develop flame retardant chemicals and treatment packages to be supplied to the textile industry. ICL is the world's leading producer of elemental bromine and a major player in the FR industry, both through its manufacture and sale of bromine-based FRs and its world-leading production of organophosphorus-based flame retardants. ICL currently employs around 12,000 people worldwide, and its 2012 sales totaled \$6.5 billion, nearly 70% of which derived from products manufactured outside of Israel.

We view the collaboration with ICL as being similar to a biotech company collaborating with a global pharmaceutical company in the sense that it validates the Alexium's technology and provides a strong distribution partner for the time when products need to be distributed to global markets. The fact that ICL, the world's leader in the elemental bromine industry, is interested enough in Alexium to publicly collaborate with them is a huge vote of confidence in the chemistry of Alexium and an indication that they ultimately see value in the FR solutions that Alexium is providing.

Alexium also anticipates receiving contract funding and grants from the US Military/DoD and is in ongoing discussions with the DoD regarding potential co-development of various flame retardant solutions for military applications.

The directors of Alexium have purchased shares on market and given they already hold a significant portion of the issued capital we see this on market support as a sign of confidence in the potential of the company as directors are very much aligned to the success of the company and its share price.

Alexium will also stand to receive small upfront and milestone payments from partners but the textile industry standard transactions are based on the amount (often measured in pounds) of treatment chemicals used and hence production yardage and ultimately chemicals sold in pounds (lb) becomes the most important factor for assessing chemical sales opportunities.

## Upcoming Catalysts

Over the next 6 months we expect:

- Several existing customers to significantly increase the amount of chemical they purchase resulting in sizable revenues from these customers.
- Formal negotiations with a number of customers leading to longer term commitments with Alexium for a range of Alexium's products.
- The successful soft launch of the Company's Phase 2 Sales Campaign which will fill the development pipeline.
- Continued co-development with various divisions of the Department of Defense on flame retardant solutions for military applications.

Staff and Sales team has been expanded to support increased demand

# Target Markets

## Home Textiles

The Home Textiles markets is made up of polyester and synthetic fabrics that are used in non-apparel applications typically in civilian home settings e.g. around the house, hotels, hospitals and office buildings. The Interior Textiles segment of the home furnishings market includes household textiles, carpets and rugs, bedding products, kitchen linen, bathroom furnishings, window treatments, hammocks, table linen, curtains, and upholstery fabrics. In these settings there are various items that are the main volatile objects associated with home fires. Many companies are searching for a non-halogenated solution to provide cost-effective FR treatments to these items. The upholstered furniture market in Europe alone is estimated at approximately €11.4 billion. The US and Europe are the largest markets for home furnishings and it is these countries that place particular importance on having higher functional textiles.

A large number of significant developments have taken place in home textiles over recent years. The global market of home furnishings, also called soft furnishings, have a very wide range of fiber combinations, fabrics, designs, textures and colors.

Performance apparel technologies are now successfully used in home textile products also. Home textiles are also being made from various functional materials including thermally adaptive bedding, environmental-friendly textiles, antimicrobial fabrics, stain protective treatments, flame retardant materials and fragrance encapsulating technologies. Alexium is well positioned to take advantage of this change in consumer sentiment towards multi-functional, environmentally friendly FR treatments.

## Industrial & Military

The obvious target markets are work situations where there is a risk of being attacked by flame or fire or where one can be exposed to flame for a short duration (such as a flash fire) and the garments will be worn for an extended period of time and thus comfort is a consideration. Examples of this include the military, oil & gas sector, wildland fire fighting garments and general workwear in the chemical, electrical, oil, gas and petrochemical industries right through to ferrous metal foundries, welding and flame cut applications. The US military textiles market is worth ~US\$2.4 billion alone.

## Chem-Bio Protection / Military

In the Chem-Bio suit market the Joint Service Lightweight Integrated Suit Technology (JSLIST) is the current DoD-funded program that is focused on the development of a new CBRN ensemble which is not only thinner, more breathable, more flexible, and lighter than existing suits but also provides identical or improved level of protection.

Alexium is looking to commercialise its technology by pursuing textile and CBRN suit providers with whom to apply RST in order to achieve the enhanced modifications. The market for JSLIST-type suits is huge as GlobalSecurity.org estimates that more than 4.5 million suits are currently under use by the US DoD. Alexium has identified specialist DoD textiles as a key area of focus and has started negotiations with various DoD textile suppliers to license the RST technology for non-CBRN clothing as well.

# Intellectual Property

A critical part of this work is managing Alexium's intellectual property (IP), which includes patents, trademarks, and trade secrets for Alexium technologies.

The Company has patents pending on the core chemistries that are used for Nycolon™, Nuvalon™, Polytron™, and Omnitron™. This provides patent protection for their "Alexiflam™" brand of products. Additionally, patents are currently in process for commercial products based on the Alexi-flam™ technology. To protect the Alexium brand, trademarks are also in place for these product lines.

# Partners

## New Partners & Customers

### ICL – Israel Corp

Alexium and ICL have agreed to co-develop flame retardant chemicals and treatment packages under the SCRA-ICL grant. ICL is a leading global fertilizer and specialty chemicals company, the world's leading producer of elemental bromine and a major player in the FR industry. ICL is majority owned by Israel Corp one of Israel's largest holding companies and one of the top ten companies listed on the Tel Aviv Stock Exchange (TASE: ILCO). 12,000 employees worldwide, 2012 sales US\$6.5 billion, over 70% of its consolidated revenues derived from worldwide operations.

### iTextiles

Established since 2006, iTextiles® (Pvt) Ltd. is a leading textiles trading company in Pakistan, representing premium textile products from international companies like INVISTA (USA), Dow Chemical (USA), Kaneka Corp. (Japan), Ashburn Hill Corp. (USA), Rong Sheng (China), Thailon Tech (Thailand), and others. iTextiles® is ISO 9001:2008 qualified and based out of Karachi, Pakistan with branch offices in Dubai. iTextiles will also be selling Alexium chemical treatments on a commission/agency basis to other textile finishers in the middle east.

### Euroflam

Essex Flameproofing Ltd. (Euroflam), a U.K.-based FR commission finisher specializing in home textiles, furnishings, and institutional/contract fabrics. Euroflam is a well-established FR commission finisher, located in Hampshire, U.K. Euroflam offers the most up to date FR treatments to EU and US standards, treating a very large variety of fabrics used in the home textile, upholstery, and contract markets. Euroflam's customer list includes leading wholesalers, converters, hotel groups, independent and chain retailers, large and small upholstery manufacturers, interior designers and specifiers.

### Marlin Company

Marlin Company is the second toll manufacturer of the emulsion used in Alexium's leading-edge Nycolon®, Nuvalon®, and Polytron® flame retardant products. The Marlin Company, located in Lenoir, North Carolina and close to Alexium's plant in South Carolina, is a well-established custom blender and toll manufacturer with ISO 9001:2008 certification. As a toll manufacturer for Alexium, the Marlin Company offers large-scale production and blending capacity to supply the textile market.

## Existing Partners & Customers

### Duro Textiles LLC

Duro Textiles is one of the United States' largest dyers, printers, finishers and distributors of textile products and is headquartered in Fall River, MA and has been operating since 1947. Duro's military products range from light to heavy weight fabrics that are used in everything from ultra light-weight-breathable ponchos, tents, sleep systems, physical training uniforms, to the extreme durability of ballistic nylon tactical outerwear. Duro is also a major fabric supplier to the performance apparel, industrial, tactical, home, and hospitality markets. Duro Industries and sister companies Galey & Lord, and Best Textiles are part of Patriarch Partners, LLC, a private equity firm managing US\$7 billion in assets in more than 70 companies.

### Major US-based textile finisher

In addition, on the 17th December 2013 Alexium announced the first chemicals sales of its Nycolon™ flame retardant chemicals to a major US-based textile finisher. The purchase is directed towards a production trial at the finishers' facilities. This sale marks the completion of a yearlong product development cycle, the recent official product launch, and the beginning of the product sales phase. The Nycolon™ chemical sales are to a major finisher in the US technical textile market who has decades of experience in the military and technical textile markets. We assume the name of the partner was not announced so as to not impact on other ongoing partner/contract negotiations.

### InChem Inc

Alexium has selected InChem Corporation as large-volume toll manufacturer of Ascalon™ chemicals. InChem is a private, global supplier of custom chemicals and operates plants in Rock Hill, SC and Duncan, SC. Alexium are Building minimum production capacity of 150,000 litres per yr with the capacity to grow this significantly.

Alexium is not restricted to using InChem and will no doubt enter into toll agreements with a select few chemical suppliers.



# Financial Summary

## ALEXIUM INTERNATIONAL GROUP LTD

Date: 22-Aug-14  
Share Price (\$A): \$0.13  
Year End: 30-Jun

Shares on Issue 202,025,435 Current Mkt Cap \$26.2m  
Share Price \$0.13  
Rating: Buy  
Price Target 0.24 per Share  
Valuation \$0.53 DCF WACC 13.60%  
Upside/(Downside):  
Risk High (Speculative)

PROFIT & LOSS (A\$m) - year ended 30th June	FY13/14A	FY14/15E	FY15/16E	FY16/17E	FY17/18E
Sales Revenue	0.26	5.3	12.9	29.5	51.6
Cost Of Sales	0.13	2.3	5.2	12	19
<b>Gross Profit</b>	<b>0.13</b>	<b>3</b>	<b>7.7</b>	<b>17.5</b>	<b>32.6</b>
Other Income	0.08	1.4	1.8	3.2	4.9
<b>Total Revenue</b>	<b>0.34</b>	<b>6.7</b>	<b>14.7</b>	<b>32.7</b>	<b>56.5</b>
Total Operating Expenses	3.01	5.2	9.1	15.5	24.3
Fair Value Change					
<b>EBITDA</b>	<b>-2.67</b>	<b>1.5</b>	<b>5.6</b>	<b>17.2</b>	<b>32.2</b>
Depreciation & Amortisation	0.80	0.8	1.1	1.25	1.3
<b>EBIT</b>	<b>-3.47</b>	<b>0.7</b>	<b>4.5</b>	<b>15.95</b>	<b>30.9</b>
Interest Revenue	0.03	0.05	0.1	0.1	0.1
Finance Costs	0.18	0.13	0.05	0.1	0.1
<b>Net Interest Expense</b>					
<b>Net Profit Before Tax</b>	<b>-3.47</b>	<b>0.62</b>	<b>4.55</b>	<b>15.95</b>	<b>30.9</b>
Income Tax Expense				3.19	7.725
<b>Net Profit After Tax</b>	<b>-3.47</b>	<b>0.62</b>	<b>4.55</b>	<b>12.76</b>	<b>23.175</b>

EARNINGS	FY13/14A	FY14/15E	FY15/16E	FY16/17E	FY17/18E
EPS - Basic	-0.017	0.003	0.023	0.063	0.115
EPS - Diluted	-0.014	0.003	0.018	0.052	0.094
EPS Growth (%)	n/a	n/a	633.87%	180.44%	81.62%
DPS	0	0	0	0	0
Franking (%)	0%	0%	0%	0%	0%
Payout Ratio (%0)	0%	0%	0%	0%	0%

BALANCE SHEET (A\$m)	FY13/14A	FY14/15E	FY15/16E	FY16/17E	FY17/18E
<b>Current Assets</b>					
Cash	4.2	5.0	13.8	37.4	79.4
Receivables	0.02	0.03	2.58	4.43	7.74
Inventories	-	-	-	-	-
Other	0.1	0.1	0.1	0.1	0.1
<b>Total Current Assets</b>	<b>4.32</b>	<b>5.1</b>	<b>16.4</b>	<b>41.9</b>	<b>87.2</b>
<b>Non Current Assets</b>					
Property, Plant and Equipment	0.5	0.7	0.9	1.1	1.5
Intangibles	9.68	10.5	11	12	13
Other	0.004	0.004	0.004	0.004	0.004
<b>Total Non Current Assets</b>	<b>10.184</b>	<b>11.204</b>	<b>11.904</b>	<b>13.104</b>	<b>14.504</b>
<b>Total Assets</b>	<b>14.504</b>	<b>16.284</b>	<b>28.334</b>	<b>55.029</b>	<b>101.694</b>
<b>Current Liabilities</b>					
Trade and other Payables	-0.13	-0.8	-1.4	-2.3	-3.6
Provisions	-0.03	-0.03	-0.03	-0.03	-0.03
Other - Deferred Income	0	0	0	0	0
<b>Total Current Liabilities</b>	<b>-0.16</b>	<b>-0.81</b>	<b>-1.395</b>	<b>-2.355</b>	<b>-3.675</b>
<b>Non-Current Liabilities</b>					
Convertible Notes	1	1			
Deferred Tax Liability	-2.78	-2.78	-2.78	-2.78	-2.78
<b>Total Non Current Liabilities</b>	<b>-1.78</b>	<b>-1.78</b>	<b>-2.78</b>	<b>-2.78</b>	<b>-2.78</b>
<b>Total Liabilities</b>	<b>-1.94</b>	<b>-2.59</b>	<b>-4.175</b>	<b>-5.135</b>	<b>-6.455</b>
<b>NET ASSETS</b>	<b>12.564</b>	<b>13.694</b>	<b>24.159</b>	<b>49.894</b>	<b>95.239</b>
Contributed Capital	26.92	28.92	28.92	28.92	28.92
Reserves	0.514	0.8	0.8	0.8	0.8
Accumulated Losses	-15.33	-14.7	-10.2	2.6	25.8
<b>Total Equity</b>	<b>12.104</b>	<b>15.01</b>	<b>19.56</b>	<b>32.32</b>	<b>55.495</b>

VALUATION	FY13/14A	FY14/15E	FY15/16E	FY16/17E	FY17/18E
P/E (x)	-7.58	42.36	5.77	2.06	1.13
EV/EBIT (x)	-6.87	34.03	5.29	1.49	0.77
EV/EBITDA (x)	-8.93	15.88	4.25	1.38	0.74
Dividend Yield (%)	0%	0%	0%	0%	0%
Price/Book (x)	6.08	5.17	1.60	0.63	0.30
Price/NTA (x)	5.44	4.54	1.52	0.61	0.30
Price/Cash/Flow per Share (x)	8.65	35.02	5.71	1.40	0.93

GROWTH	FY13/14A	FY14/15E	FY15/16E	FY16/17E	FY17/18E
Total Rev. Growth (% pcp)	n/a	1871%	119%	122%	73%
Op. Exp. Growth (% pcp)	n/a	73%	75%	70%	57%
EBITDA Growth (% pcp)	n/a	-156%	n/a	207%	87%
EBIT Growth (% pcp)	n/a	-120%	n/a	254%	94%
NPBT Growth (% pcp)	n/a	-118%	n/a	251%	94%
NPAT Growth (% pcp)	n/a	-118%	n/a	180%	82%

MARGINS & RETURNS	FY13/14A	FY14/15E	FY15/16E	FY16/17E	FY17/18E
EBITDA Margin (%)	-784%	22%	38%	53%	57%
EBIT Margin (%)	-1019%	10%	31%	49%	55%
NPBT Margin (%)	-1019%	9%	31%	49%	55%
ROIC (%)**NO DEBT***	-29%	4%	23%	39%	42%
ROE (%)	-29%	4%	23%	39%	42%
ROA (%)	-24%	4%	16%	23%	23%
Effective Tax Rate (%)					

GEARING	FY13/14A	FY14/15E	FY15/16E	FY16/17E	FY17/18E
Net Debt (A\$m)	0				
Net Debt/Equity (%)					

CASH FLOW (A\$m)	FY13/14A	FY14/15E	FY15/16E	FY16/17E	FY17/18E
Cash at Start	1.163	4.2	9.2	18.7	51.2
Cash Flow from Ops	-2.87	1.5	5.6	17.2	32.2
Cash Flow From Investing	-0.315	-2.75	-1	1.5	-4
Cash Flow From Financing	6.222	2	0	0	0
Net Cash Flow	3.037	0.75	4.6	18.7	28.2
Cash At End	4.2	4.95	13.75	37.4	79.35

## Key Risks

### Adoption Risk

Whilst the need for Alexium's FR technology might be real there is no guarantee that contracts will be executed and sales will result in revenues. Furthermore there is the risk that it may take longer for the market/customers to adopt/use Alexium's technologies.

### IP Risk

The company's sole source of revenue is through the commercialization of its RST technology. Although Alexium is the exclusive global holder to the IP rights of the technology, competing technologies could infringe upon these rights thus leading to protracted disputes, which could limit RST's growth potential or even render the technology obsolete.

### Reduction in R&D Spending

Alexium is dependent on the DoD for further R&D to develop certain aspects of the RST technology. If the DoD is unable to deploy sufficient resources for the same, it will become difficult for the company to exploit further opportunities for commercializing RST.

### Intense Competition

RST technology faces stiff competition from similar products, some of which are offered by well-established and financially-strong players with access to much greater resources. This could adversely impact the company's ability to garner favorable deals in both defense and civilian markets.

### Regulatory Risk

Alexium's efforts to commercialize the technology are exposed to changes in the regulatory environment. Consequently, any unfavorable change in regulation could make it extremely difficult for the company to effectively market its products or derive substantial margins from the same, which in turn could significantly impact financial results.

### Heavy Reliance on Partners/DoD

Alexium is currently in the initial stages of commercialization of the RST technology and would rely heavily on their Partners and DoD contracts for meaningful revenues. Accordingly, any delay in securing the contracts/rolling out products would materially impact the company's financial performance.

### Disruption in Sourcing Compounds

Alexium needs to source various compounds or chemicals for commercial application of RST. Any disruption sourcing these compounds would adversely impact the company's ability to undertake large-scale production and execute future contracts.

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