

The Australian Industry Group

The quest for a level playing field

The non-conforming building products dilemma

NOVEMBER 2013



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**The non-conforming building product
dilemma**

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Key messages



This report raises serious concerns about the effectiveness of Australia's approach to ensuring the quality and safety of building and construction products.

These concerns put a spotlight on the design and effectiveness of the conformance framework – the standards and regulations - that we rely on to ensure that products are fit for purpose. Conformance frameworks also need to be effective to ensure there is a fair and level playing field for the businesses that do adhere to relevant standards and regulations.

Businesses supplying products to the building and construction sector are concerned at what they see as increasing competition from products that do not conform to Australian standards and regulatory requirements. Non-conforming product affects importers, manufacturers and fabricators. Immediate business impacts of this uneven playing field are usually in the form of eroded margins and reduced revenues. This report has found that the majority of companies responding to the survey believe their market is penetrated by non-conforming product.

Australia has extensive regulations and standards in the building and construction sector. However, this report suggests that the lack of independent verification and visible regulatory authority is making the conformance framework ineffective and unfair. The end result is undermined confidence in the regulatory system.

Businesses are confused about who the relevant regulator is; what enforcement powers they have; and how to lodge complaints.

Gaps and weaknesses in the building and construction conformance framework are also highlighted in the report's findings. The report suggests that non-conforming products have been allowed into the market due to inadequate: surveillance; audit checks; testing; first party certification; and enforcement. It also suggests that building certifiers bear a disproportionate share of the burden for product conformance - raising the question of whether more responsibility should rest with product suppliers and builders.

The impact of non-conforming product is a major concern for industry and this report points to the need to reform the current system to ensure the quality of building and construction products so that importers, manufacturers and fabricators who make and supply conforming product have a level playing field.

Ai Group believes that to solve the problem of non-conforming product, stakeholders, in consultation with all tiers of Government, need to work together to examine how to best address the gaps and weaknesses in the building and construction sector conformance framework.

There has been significant co-operation from regulators, industry associations and stakeholders in developing this report. I particularly want to acknowledge our key collaborators: CSIRO; the Housing Industry Association, the Construction, Forestry, Mining and Energy Union, BlueScope Steel Limited, and Schneider Electric (Australia) Pty Ltd for their contributions.

A number of other industry associations were also invaluable in providing unique perspectives on the product sectors covered in the report. I also thank the Australian Steel Institute, the Australian Window Association, the Engineered Wood Products Association of Australasia, the Australian Paint Manufacturers Federation and the Plastics Industry Pipe Association.

A handwritten signature in black ink that reads "Innes Willox". The signature is written in a cursive style and is underlined with a single horizontal line.

Innes Willox

Chief Executive
Australian Industry Group

Executive summary

Over the past decade there has been a growing body of anecdotal reports by business about the use of non-conforming products. Local producers conforming with relevant standards and regulations can be at a competitive disadvantage when the price at which competing product is sold reflects lower levels of attention to the quality that is required under Australia's conformance framework.

This accumulation of reports of non-conforming product has coincided with the rapid growth of new centres of global production, the high Australian dollar and the greater penetration of imports into many sectors of the economy.

These anecdotal reports led us to undertake this project to analyse the steel, electrical, glass, aluminium, engineered wood and paint sectors to gauge the scale of the problem and its causes. The key high-level findings are:

- That **92%** of 222 respondent companies reported non-conforming product (NCP) in their market sector. The extent of this penetration varied across the sectors surveyed.
- Nearly **half** of all respondents indicated market penetration by NCP of between **11%** and **50%**.
- **45%** of respondents reported NCP had adversely impacted on revenue, margins and employment numbers.
- **43%** of respondents had not lodged a complaint when encountering NCP. Of these, close to half indicated that: they did not know who to complain to; or how to lodge a complaint; or reported that complaints previously lodged did not achieve a result.

Gaps and weaknesses were identified in the building and construction conformance framework allowing non-conforming product onto the market. These include inadequacies of: surveillance; audit checks; testing; first party certification and enforcement. The report suggests that building certifiers bear a disproportionate share of the burden for ensuring product conformance. Greater emphasis on conformance at point of sale and increased responsibility on product suppliers and builders may be required.

The product conformance framework, that is collectively made up of the regulators, regulation, codes of practice and standards, does not operate effectively. There is confusion among stakeholders about who has responsibility and the arrangements for recourse when non-conforming product is found.

The end result is an uneven playing field. Companies, including importers, manufacturers and fabricators that are playing by the rules are adversely impacted by suppliers of NCP paying scant regard to the standards and requirements set by Government and industry. Industry needs to show leadership and cohesion to tackle this issue.

FINDINGS

The findings of this report are:

1. There are gaps and weaknesses in the building products conformance framework resulting from:
 - a. Confusion amongst stakeholders about the responsibilities of regulators and insufficient knowledge of the conformance framework;
 - b. Inadequate surveillance, audit checks, testing, enforcement and first party certification;
 - c. Too much responsibility placed on building certifiers by the current conformance framework and inadequate clarity of their role; and
 - d. The conformance framework placing an over emphasis on regulatory controls at the point-of-installation.

- 2a. In some cases the gaps and weaknesses in the building products conformance framework give rise to third party product certification schemes and market surveillance. These arrangements can be effective.
- 2b. These gaps and weaknesses also result in confusion about how and where to report non-conforming product.
3. There is significant non-conforming product penetration in the building and construction sector. Not all sectors are impacted equally.
4. Non-conforming product negatively impacts Australian businesses.
5. Non-conforming product can increase safety risks to employees and the public.
6. Non-conforming product can impact long term asset values.

RECOMMENDATIONS

This reports recommends:

1. That stakeholders, in consultation with all tiers of government promote awareness of the role of regulatory bodies in the building and construction sector and in particular how to report non-conforming product.
2. That state and territory governments review their building certification arrangements with a specific focus on clarifying the role of building certifiers and assessing the adequacy of existing arrangements in preventing the installation of non-conforming product.
3. That stakeholders, in consultation with all tiers of Government, examine how to best address the gaps and weaknesses in the building and construction sector conformance framework.
4. Further research be undertaken to identify leading national and international conformance models that are effective and that keep compliance costs to a minimum.
5. Research be undertaken into non-conforming product in other sectors of the economy drawing on the insights of this report.

Observations of product sectors

This section gives a high level summary of issues relevant to each product sector.

Steel product

95% of respondents in the **Steel product** sector reported non-complying product in their market. **40%** of respondents advised that they had suffered reductions in revenue, margin and employment numbers as a consequence. **49%** indicated a NCP market penetration between **11%** and **50%** with structural steel fabricators reporting penetration toward and beyond the upper end of this range.

Steel fabricators as well as steel building products manufacturers are the hardest hit by non-conforming product due a conformance framework that is overly reliant on first party certification and an increasing exposure to non-conforming imported structures and products.

The Australian Steel Institute (ASI) commented:

“The construction products industry in Australia is faced with a choice: it can follow a path of the lowest cost denominator in which case be exposed to the worst in quality the world can produce, or , it can implement product conformity systems similar to what is in place in most of the developed world that inform the client of achievement of levels of quality compliance benchmark . Nowhere is this better demonstrated than in the area of structural bolts where Australia has followed a path of lowest global cost, at the expense of functionality and safety, whilst other countries like the USA and the UK have quickly implemented compliance procedures and have avoided our costly failures.”

Electrical product

Every respondent in the **Electrical product** sector reported non-conforming product in their market with **71%** of respondents indicating that they have lost revenue, margin and employment numbers as a result. **Half** indicated a NCP market penetration of between **11%** and **50%** with the electrical lighting industry being particularly hard hit due to: the false claims of competitors; a lack of verifications to NCC electrical equipment requirements; and counterfeit products. The electrical accessory market is suffering due to counterfeit and potentially unsafe product not meeting safety standards and regulations.

Respondents report:

- A perceived reluctance of regulators to act;
- A lack of knowledge about how and where to report non-conforming product;
- Inconsistent regulations and regulatory actions across jurisdictions;
- A lack of verification of first party claims in relation to NCC electrical equipment requirements (e.g. lighting requirements, controls, lift installations etc);
- Increasing rates of counterfeits in the residential, commercial and industrial electrical product markets; and
- A reduction in the frequency of electrical inspections.

The Ai Group Electrical Manufacturing Member Reference Group expressed the following view regarding NCP:

“There is a high degree of frustration amongst the electrical product supply industry that products making false claims, not fit for purpose or not conforming to Australian Standards are allowed to remain on the market to the detriment of legitimate product suppliers and considerable safety risks for consumers and employees. This issue is affecting the very viability of legitimate businesses. Jobs are being lost now and we are seeing a downward spiral of product quality and conformity.”

Glass and aluminium product

In the **Glass and aluminium product** sector, **81%** of respondents reported NCP in their market with **65%** advising reduced margins, revenue and employment numbers as a consequence. **48%** indicated that the market penetration of NCP was between **11%** and **50%**.

Respondents reported concerns with: the building certification system being a paper collection exercise; lack of a visible regulator; quality fade/component substitution; reduced ability to invest in innovative new products due to a lack of profit margins; and quoting at a loss to retain customers.

The Australian Window Association (AWA) summed up the views of the NCP issue in the sector:

“The AWA expresses deep concern regarding extent of the NCP products in the industry and questions the resulting impact on SME manufacturers and the contribution to the worst building stock in the country. What level of failure is required before someone does something.”

Other product sectors

Paint

There was minimal evidence of NCP reported by respondents in the architectural and decorative **Paint product** sector due to a number of factors including:

- high brand loyalty creating a barrier for new market entrants;
- product characteristics that favoured local production;
- aggressive competition amongst manufacturers who are also cognisant of the common good issues and self regulate on issues such as volatile organic compounds; and
- a widely embraced third party certification scheme (APAS).

The Australian Paint Manufacturers Federation (APMF) commented:

“APMF members are committed to sustainability and to producing world class surface coatings. The APMF also maintains strong relationships with the various regulators to ensure compliance across the industry.”

Engineered wood product

Engineered wood product sector respondents reported that NCP is prevalent in their structural plywood market. They reported: a lack of testing to Australian standards even though contracts may require this; formaldehyde used in resin systems; watered down resins; a lack of labelling, incorrect and fraudulent labelling; and understrength products. The EWPAA reports that their market surveillance and targeted check testing over the past 12 months has resulted in approximately 70% of samples failing to meet safety standards.

Respondents reported that the NCP volume and the number of organisations responsible for placing it onto the market, are both growing.

The Engineered Wood Products Association of Australasia (EWPAA) summarised the perspectives of engineered wood products producers:

“There is a total lack of enforcement. The system is there however regulators are not resourced and lack the will to act. The situation of non-compliant product is not taken seriously and regulators do not act on complaints nor impose penalties.”

Plastic pipe and fittings

Respondents reported that NCP had penetrated the **Plastic pipe and fittings product** sector but not yet to a significant extent however concern lay with it gaining a foothold in the supply chain.

Respondents also advised of issues with the conformance framework’s reliance on point-of-installation/post installation regulatory control and the inability of the existing framework to provide regulators with the necessary power to intervene to remove NCP at point-of-sale.

The Plastic Industry Pipe Association (PIPA) summarised their view on NCP:

“Even in regulated applications with established product standards and independent product certification the lack of effective surveillance and enforcement at point of sale permits NCP to enter the market”

Findings and recommendations

Report findings

Finding 1

There are gaps and weaknesses in the building products conformance framework resulting from:

a. Confusion amongst stakeholders about the responsibilities of regulators and insufficient knowledge of the conformance framework;

Most respondents in the **Steel, Electrical, Glass and aluminium product** sectors identified the appropriate state building legislation, regulations, referenced code (NCC) and standards covering their products. However, small businesses and new market entrants were found to lack a clear understanding in this area.

Most pointed to building regulators, builders, building certifiers and council authorities as being responsible for individual installation non-conformance issues but then responses varied as to who to approach for ongoing or widespread NCP issues.

b. Inadequate surveillance, audit checks, testing, enforcement and first party certification;

Those interviewed in the **Steel, Glass and aluminium, and Engineered wood product** sectors reported limited surveillance at the point of installation by building certifiers, no audit checks, limited testing, limited enforcement and inadequate first party certification in their product categories.

Voluntary industry third-party certification schemes conduct limited market surveillance, auditing of certified manufacturers' products and testing of suspected non-conforming products.

Government infrastructure procurement agencies conduct limited third-party oversight including pre-qualification, testing and audit checks of structural steel fabricators and fabrications (In Australia and overseas).

In the **Engineered wood product** sector, respondents observed they had received little feedback from the WHS regulators after requests to act against non-conforming "formply" identified from testing.

In the **Electrical product** sector, pre-market third party conformity assessment is conducted for high risk residential equipment. State regulators conduct limited surveillance and enforcement activities varying by jurisdiction. ERAC has started to conduct some audit check testing in high risk areas however, industry is reporting that non-conforming products continue to appear on the market and regulators seem to be enforcing only against the worst safety related non-conformance issues and not in less severe cases.

c. Too much responsibility placed on building certifiers by the current conformance framework and inadequate clarity of their role;

Steel and Glass and aluminium product sector manufacturers report their expectations of the building certifier to verify the conformance of their product areas.

Building certifiers report that they are not on building sites full-time checking every stage of construction and the installation of all building products. They undertake mandatory inspections of specific building works only and they believe it is not their role to check the conformance of all building materials, products and components against the requirements of the NCC and the various product standards.

Building certifiers argue that current state building legislation and regulation places too much responsibility for all building products conformance with them.

Building certifiers highlight that they have asked their professional accreditation body to clarify their role.

d. Conformance framework places an over emphasis on regulatory controls at the point-of-installation.

Building regulations apply to the design and construction of buildings through the building approval and certification process. In regard to building products, the regulations are enforceable at the point of installation during construction, at which point the product may be difficult to see and identify or difficult and costly to remove. Also, building certifiers have commented that they are unable to verify every building component.

Building regulation does not act to remove NCP from the supply chain and relies on building certifiers issuing enforcement notices on a case by case basis against individual building projects.

Non-conforming building products can enter the Australian market and there seems to be very little in the way of them being installed, aside from industry competitors self-policing on an installation by installation basis.

Finding 2

a. In some cases the gaps and weaknesses in the building products conformance framework give rise to third party product certification schemes and market surveillance. These arrangements can be effective.

The EWPAA operate an industry led third-party certification scheme involving batch sample testing to Australian Standards and auditing manufacturing sites. They also conduct market surveillance and spend \$40,000 per annum purchasing product from the market and testing it to ascertain compliance with relevant standards. If product fail testing, the EWPAA take a range of actions including writing to the importer, advising WHS regulators and/or commencing litigation.

The AWA has established a third party certification scheme that aims to ensure windows and doors meet the relevant Australian Standards. The AWA also allocates significant resources to responding to consumer and industry complaints about non-conforming products including undertaking on-site testing and providing written reports. The AWA operates a market surveillance scheme called 'Dob-in-a-site' where individuals are encouraged to report on a confidential basis if they believe a builder is installing NCP doors/windows.

ACRS is a third party certification scheme for steel materials.

The ASI advise (see Appendix C) that they are establishing a National Steelwork Compliance Certification scheme due to deteriorating compliance to standards.

All of these industry schemes are voluntary and rely on education of the market, specification in contracts and support from all participants in the supply chain to succeed.

b. These gaps and weaknesses also result in confusion about how and where to report non-conforming product.

43% of respondents to the online survey stated that they had not lodged a complaint regarding NCP. Of these, close to half indicated that: they did not know who to complain to or how to lodge a complaint; or complaints previously lodged did not achieve a result.

No one interviewed in the **Steel** and **Glass and aluminium product** sectors could identify an appropriate regulator to whom they could raise a NCP complaint. Comments received also indicate a sensitivity to report NCP because of the potential cost impact on downstream customers (forced to rectify work) and the potential damage to future business relationships with those customers.

Respondents were also unclear about the type, level and detail of information required by authorities to prompt them to act.

Finding 3

There is significant non-conforming product penetration in the building and construction sector however, not all sectors are impacted equally.

92% of respondents believed that their market had been penetrated by non-conforming product with **67%** validating this from on-site failures or visual inspections. Close to a **half** indicated that their NCP market penetration lay between **11%** and **50%**.

Of the **Steel product** sector **95%** of respondents indicated that their market had NCP with **64%** basing their assessment on building site product failure or visual inspections. **Half** of respondents believed that the NCP penetration of their market was between 11% and 50%. The incidence of non-conforming product had decreased where third party certification schemes (e.g. ACRS) were present. Steel fabricators indicated a high prevalence of non-conforming product in their sector primarily due to the lack of verification around first party certification.

All **Electrical product** sector respondents (**100%**) indicated that they believed their market had been penetrated by NCP. **Half** indicated a NCP market penetration of between **11%** and **50%** with the electrical lighting industry being particularly hard hit due to: the false claims of competitors; a lack of verifications to NCC lighting requirements; and counterfeit products. The electrical accessory market is suffering due to counterfeit and potentially unsafe product not meeting safety standards and regulations.

Of the respondents in the **Glass and aluminium product** sector, **81%** indicated that NCP existed. **48%** believed that NCP accounted for between 11% and 50% of the market. Door and window manufacturers/fabricators pointed to significant quantities of imported product that was non-conforming, particularly in the curtain wall market area. This is due to consistent sizing driving the market to commodity products produced in low cost base economies. Aluminium extruders identified product dumping as an issue with little evidence of NCP.

Respondents in the **Other product** sector reported differing NCP penetrations. Paint manufacturers (decorative and architectural) did not identify any significant NCP in the market. This contrasted with engineered wood product manufacturers who pointed to significant NCP in their market particularly structural plywood. Interviews indicate NCP is having a damaging effect on this industry. Manufacturers of plastic pipes and fittings noted only a small part their market is currently impacted by NCP however market participants are concerned this level could grow due to the lower cost structures of NCP producers.

Finding 4

Non-conforming product has negatively impacted Australian businesses.

A majority of respondents, **82%**, indicated that NCP had impacted their business of which **45%** of respondents reported NCP had adversely affected revenue/margins and employment numbers. A positive impact from NCP was identified by **5%** of survey participants and was explained by respondents in the **Steel product** sector and **Glass and aluminium product** sector as high margin rectification work.

In the **Electrical product** sector, **71%** of respondents indicated that they have lost revenue, margin and employment to NCP. **65%** of **Glass and aluminium product** sector respondents indicated that they had lost revenue, margin and employment as a result of NCP.

Companies in these sectors reported that NCP was eroding their ability to invest in new, innovative products. They indicated that the Australian market was headed towards being a highly commoditised, stagnant market lacking product innovation and variation.

Finding 5

Non-conforming product can increase safety risks to employees and the public.

A number of examples were provided by respondents of safety risks (see Appendix B) attributed to NCP:

- Glass windows falling from multi-story buildings onto pedestrian walkways;
- Sign structure falling onto a busy road;
- Collapse of aircraft hanger whilst under construction;
- Collapse of formwork resulting in a death;
- Electrical cable recall due to the risk of fire and electric shock; and
- Non-conforming structural steel fabrications.

Finding 6

Non-conforming product can impact long term asset values.

In the **Steel product** sector reinforcing bar is used in concrete for the foundations in all buildings. The ACRS scheme was started because of industry concern relating to the possible compromised quality of reinforcing bar from NCP and the massive negative consequences that this would have in the future on the structural integrity of buildings.

In the **Electrical product** sector a recent recall of electrical cable that is non-conforming with standards has a long term safety risk to homes and buildings. The non-conforming insulation deteriorates with time and the live conductors can be exposed. There is substantial cost associated with removing these cables from structures.

Respondents from the **Glass and aluminium product** sector gave examples (see Appendix B) of NCP potentially impacting long term asset values. Examples include:

- windows that fall from buildings;
- doors and windows (and other NCP) in a house where the rectification bill was estimated at \$800,000; and
- a detention centre where imported windows did not fit resulting in capital remediation costs.

Report recommendations

Improving awareness of, and access to regulatory agencies in the building and construction sector

Recommendation 1

That stakeholders, in consultation with all tiers of government, promote awareness of the role of regulatory bodies in the building and construction sector and in particular how to report non-conforming product.

To address Finding 1(a), there needs to be more information on how the conformance framework in the building and construction sector operates as a whole to enable the removal of non-conforming product.

Improve building certification arrangements

Recommendation 2

That state and territory governments review their building certification arrangements with a specific focus on clarifying the role of building certifiers and assessing the adequacy of existing arrangements in preventing the installation of non-conforming product.

Providing clarity on the role expected of building certifiers may help to focus where more responsibility for building product conformance should be placed.

Making building and construction conformance arrangements fit for purpose

Recommendation 3

That stakeholders, in consultation with all tiers of Government, examine how to best address the gaps and weaknesses in the building and construction sector conformance framework.

An issue across the product sectors has been the emphasis on conformance at point-of-installation. Ai Group believes that the incidence of NCP can be reduced if control points exist at point-of-sale with greater product conformance responsibility on builders, contractors and product suppliers.

Further research

Recommendation 4

Further research be undertaken to identify leading national and international conformance models that are effective and that keep compliance costs to a minimum.

Many of our trading partners grapple with the same non-conforming product issue. Addressing NCP requires cost effective conformance frameworks that deliver results while keeping regulatory burden on business to a minimum.

Recommendation 5

Research be undertaken into non-conforming product in other sectors of the economy drawing on the insights of this report.

This report, having provided insights into the scale of non-conforming product and an understanding of the failure points, provides the foundations for stakeholders to move forward. Stakeholders in other sectors will benefit from similar research.

Glossary

ABCB – Australian Building Codes Board

ACCC – Australian Competition and Consumer Commission

ACRS – Australasian Certification Authority for Reinforcing and Structural Steels

APCC – Australian Procurement and Construction Council

ASI – Australian Steel Institute

AWA – Australian Windows Association

Building Certifier – professionals participating in the certification of building and subdivision works

Conformance Framework – all regulations, codes of practice, standards, certification scheme (first, second or third) or accreditation schemes that bring about product conformance in the building and construction sector.

Building and Construction sector¹ – The construction industry consists of those businesses mainly engaged in the construction of residential and non-residential buildings (including alterations and additions), engineering structures and related trade services classified under the Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006.

ERAC – Electrical Regulatory Authorities Council

EES – Electrical Equipment Safety System

EMC – Electromagnetic Compatibility

EME – Electromagnetic Emissions

EWPA – Engineered Wood Products Association of Australasia

EWP – Engineered Wood Products - also called composite wood, man-made wood, or manufactured board; includes a range of derivative wood products which are manufactured by binding the strands, particles, fibers, or veneers of wood, together with adhesives, to form composite materials²

First-Party Certification – The manufacturer or supplier declares on his own responsibility that tests and other Conformity Assessment activities, which are needed to show that a product is conforming, have been carried out. Generally the company will carry out typical Conformity Assessment activities, including testing and inspection, in-house. It then delivers an SDoC (Supplier's Declaration of Conformity).³

Formply – Structural plywood designed for use in formwork applications

GEMS – Greenhouse and Energy Minimum Standards

NCC – National Construction Code

NCP – Non-Conforming Product - Products that: do not meet regulatory, Australian or industry standards; are not fit for their intended purpose; are defectively made or not of acceptable quality; contain false and misleading claims; do not meet performance claims (whether intentionally or unintentionally) or are intentionally counterfeit.

PCA – Plumbing Code of Australia

Structural Steel Fabricator – Structural steel fabricators manufacture, assemble, modify and repair steel structures of all types such as steel-framed buildings and bridges. They cut, shape, join and finish steel using detailed specifications to fabricate the members, parts and sub-assemblies of the structure (source – ASI)

Steel Material Producer⁴ – A manufacturer of steel materials including steel sheet, beams, sections, rails, bars, rods and wire

¹ Source ABS www.abs.gov.au

² Source Wikipedia

³ Source International Electrotechnical Commission

⁴ Source Wikipedia, "Steel"

Third-Party Certification⁵ –A conformity assessment activity that is performed by a person or body that is independent of the seller and the buyer. It is usually called certification and provides the highest level of confidence. Certification is an independently-provided unbiased assurance of the safety of products and processes. This conformity assessment is applied where a major market makes it cost-effective or where it is mandated by legislation. Since certification bodies are usually for-profit companies it is also more expensive than first-party conformity assessment.

WHS – Work Health & Safety

⁵ International Electrotechnical Commission (IEC)

1. Introduction

Australian manufacturers, importers and suppliers had been voicing their concerns over the last decade that products are being placed onto the market that reflect lower levels of attention to the quality and performance required under Australia's conformance framework. This has created an uneven market to the detriment of the local industry.

Ai Group sought funding from the Department of Industry to conduct research to determine the scope and scale of non-conforming product and identify the conformance failure points in the building and construction sector.

For the purposes of this project non-conforming product was defined as: product that does not meet regulatory, Australian or industry standards; is not fit for the intended purpose; is defective or not of acceptable quality; is associated with false and misleading claims; does not meet performance claims (whether intentionally or unintentionally); or that is intentionally counterfeit.

We sought to understand the effects of non-conforming product on Australian industry and the potential impact on the Australian economy. The project considered:

- Which building industry sectors have significant problems with NCP and the scale of the issue?
- Where are the success and failure points for each building industry sector?
- What are the effects of non-conforming products on competition in the market place?
- What are the regulatory controls in place and when is it mandatory for the various building industry sub-sector products to comply with standards and conformity assessment schemes?
- What focus is placed on product quality, reliability and cost by building industry sub-sectors and supply chains?
- What are the policy and regulatory priorities?

The industries chosen for the project were the manufacturing product sectors of **Steel product, Glass and aluminium product, Electrical product, Engineered wood product**, and Paint/adhesives.

Survey

An online survey was developed (See Appendix A) with questions about the respondents: business, position in the supply chain, product area; experiences with non-conforming products and regulatory issues encountered.

Surveying commenced in August 2013 and ran through to October 2013. It was sent out electronically to members of Ai Group and relevant industry associations who are known to operate in the product segments listed above. All responses remain confidential and were analysed in aggregate only.

There were 222 responses received to the online survey. By product type, **Steel product** accounted for **41%** of responses followed by **Electrical product 14%, Aluminium product 13%, Glass product 11%** and **Other product 17%**.

This survey was complemented with structured interviews and group discussions (at the Australian Steel Institute's and Australian Window Association's conferences) resulting in an estimated 240 individuals participating from government departments, regulatory agencies, technical infrastructure bodies, industry associations and businesses.

There were product sectors within the scope of the project where the number of responses to the online survey was small. These included paints, adhesives, and engineered wood products. Data from these product areas were aggregated into an "Other products" category. Where it was possible to obtain interviews with the relevant industry body and at least 50% of local manufactures, an analysis was conducted of the product sector and is included in this report. This high level coverage was achieved for the paint, engineered wood products and plastic pipe/fittings product sectors.

The data for the Aluminium product and Glass product sectors was complicated by an overlap from the respondents involved in the manufacture/fabrication of door and windows. The online survey had also specifically indicated that the glass product sector included glass windows and doors. Given this overlap the **Glass product** and **Aluminium product** sectors were analysed together as **Glass and aluminium product**.

All findings in this report are numbered to link the discussions in the body of the report to the overall findings and recommendations.

2. Regulation and conformance assessment

A common theme amongst most survey respondents is concern on the design and effectiveness of the conformance framework – the standards and regulations relied upon to ensure that products are fit for purpose.

Respondents in the selected sectors argued weaknesses exist in the conformance assessment of building products against regulatory requirements⁶. For example, conformance assessment currently requires only first party assessment as a minimum⁷ and there seems to be little in the way of regulatory audit programs in place to check the claims of products and the claims of conforming installation of those products.

First party conformity assessment occurs when a manufacturer self declares that a product conforms to a standard. This form of conformity assessment is quite common for low risk products and is basically a cheap and easy form of information because no independent checking is applied. Manufacturers should base their declarations on at least in house testing and inspection, however the current conformance framework requires no minimum level of evidence.

Respondents report that requests for detailed evidence of suitability or fitness for purpose varies considerably depending on the market area. In many cases, third party declaration is not sought by the supply chain or building certifier.

Also, overreach on the part of building certifiers may be occurring when they consider certificates issued by other regulatory agencies in order to agree compliance to National Construction Code of Australia (NCC) requirements. For example, a WHS design registration certificate will have been issued considering only the WHS legislative requirements and not the NCC requirements.

Many comments were received during interviews indicating that false and misleading claims were being made by products in many categories. This is a particularly prevalent in the electrical lighting industry where false claims of lumens output and over extended claims of LED lamp expected lifetimes are common.

When non-conforming products are found in the market, complainants would prefer that a regulator be available and keen to remove such products from the market as soon as possible. Regulators have compliance and enforcement priorities, limited resources and prioritise product safety issues which have the greatest potential to cause serious harm.

State building regulations

The regulation of building products is covered by a range of state legislative instruments⁸ that require⁹ building work to be carried out in accordance with the requirements of the NCC.

Under state building laws¹⁰, building certifiers are responsible to assess the conformance of all components of a building and are empowered by the various state Acts¹¹ to issue construction, compliance and occupancy certificates. These certificates are linked back to the requirements of the NCC and the standards referenced within pertaining to the various building components. The issuing of a final occupation certificate indicates that the building works are conforming with the NCC including all materials, products and workmanship.

⁶ NCC *Deemed-to-Satisfy*(NCC Volume 1, Part A0.8) and *Alternative Solution*)

⁷ NCC Volume 1, Part A2.2(a)(vi)

⁸An example is the “NSW Environmental Planning and Assessment Act 1979” and “NSW Environmental Planning and Assessment Regulation 2000”

⁹ For example, “NSW Environmental Planning and Assessment Regulation 2000”, Section 98.

¹⁰ NSW Environmental Planning and Assessment Act 1979, Section 109D refers to “Certifying authorities”. “Building Certifier” is the generic term used through this report to denote certifying authorities.

¹¹ For Example, Part 4A of the NSW Environmental Planning and Assessment Act 1979.

The NSW Department of Planning & Infrastructure provided the following:

“In NSW, the Environmental Planning and Assessment Regulation 2000, requires that all new building work must comply with the requirements of the Building Code of Australia (BCA). Ensuring products comply with the requirements of the BCA and relevant Australian Standards is generally the responsibility of the builder. Certifying authorities may also request evidence that products are compliant in certain circumstances.”

NSW Fair Trading

NSW Fair Trading provided the following comment in relation to their role in the building, electrical, gas and plumbing regulatory framework:

“NSW Fair Trading advised that they receive over 40,000 complaints and enquiries each year from consumers and traders about goods and services, including defective goods. Fair Trading assists consumer and traders to understand and meet obligations related to guarantees and warranties covering these goods under the national Australian Consumer Law.

Fair Trading’s Home Building Service also has specific regulatory roles and responsibilities in NSW in relation to electrical and gas articles and appliances and plumbing products, including pre-market and in-market safety and conformity requirements.

Under the NSW Home Building Act 1989 the Home Building Service receives complaints, mediates disputes, and undertakes investigation and compliance activities in relation to specialist work and residential building work. Information regarding defective work or materials used in building work received from consumers or industry can be investigated by Fair Trading. The statutory warranty obligations under the Act require that all materials supplied or used in building work must be ‘good and suitable’ and ‘fit for purpose’. The interaction of the Home Building Act and NSW planning legislation requires compliance with the Building Code of Australia and referenced Australian Standards.

NSW Fair Trading does not have specific powers or functions to conduct pre-market approvals or conformity checks of general building products.”

Certifying Authorities

Many of those interviewed from the product manufacturing and supply chain indicated that building certification is an area of concern because individual products do not seem to be verified as conforming either before or after being installed.

A state building regulator commented:

“Builders are purchasing on price and not using specified systems. There is a culture of certificate collection”

“Certifiers are generalists and not expert in every product, design or building area”

“The building industry including certification is high pressure, highly competitive, low margins. There is currently a race to the bottom in terms of price and quality in the area of certification. Builders use the certifier who is cheapest and easiest to work with. i.e. responsive and likely to certify. Building certifiers who do a good job of checking compliance of all aspects simply don’t get the next job”

“The building certifier doesn’t supervise the job constantly so is not aware of all components installed. The certifier is looking for documentary evidence only and reasonable compliance”

“The BCA alternative solution was originally intended for innovative products. There is abuse of the system because non-complying products or systems are being installed and then pointing to the alternative solution allows the builder to skirt the process.”

“Builders aren’t accountable. In some states there is no building insurance and hence no liability held by the builder”.

A local council building certifier stated:

“The priorities of certifiers are those points spelled out in the development application. Issues like the building classification, placement, heights, payment of fees, conditions like geotechnical aspects, fire safety as well as the aspects specific to the mandatory stage inspections (Excavation, prior to concrete pouring, timber frames, waterproofing, stormwater connections, final occupancy).”

“There is a problem with the regulations. The certification industry has been asking the Building Professionals Board to define certifier responsibilities and coverage. The problem is that the certifier is seen as the be all and end of compliance of all elements of a building yet only a small proportion of all the building elements are seen by the certifier. For the fees currently charged by certifiers, it would not be possible for all elements to be checked by certifiers.”

“There is too much responsibility on the certifier and the situation is getting worse. Builders should be responsible and accountable for doing work in accordance with regulations, the BCA and standards.”

A private certifier noted:

“The Government regulations have incorrectly set expectations about the role of building certifiers. The certifier’s role is not to check everything. The certifier performs basic or rudimentary inspections, is not on site every day and can’t check every product installed against its standard or an alternative solution. The expectations are clearly wrong and this is a real problem for building certifiers and the industry as a whole. Even validating the basic components is not easy. How is a building certifier supposed to validate every component? The certifier can never get all certificates for every product. Neither can the builder.”

“There are 160 odd standards directly referenced by the BCA. There is no way for a certifier to possibly obtain, verify and compile all this compliance information. Currently occupation certificates are issued on the balance of probability that everything is OK”.

“The issue of non-conformance is an industry wide challenge and shouldn’t sit with the building certifier”

“The system is currently incomplete and dangerous. There are potential safety issues”

“The role of the certifier needs to be clarified.”

“Builders, trades people and product suppliers need to be accountable for the products that are placed onto the market and installed.”

“Transparency is needed so that authorised people can upload their compliance certificates for their own area. The various trades should be issuing and uploading their own Part 4A certificates for their own area of work including the builder, engineers, various trades, electrician, plumber etc”

“Harmonisation of all states building regulations is needed.”

The 2011 Victorian Auditor-General’s Report¹² into Compliance with Building Permits concludes,

“The [Victorian Building] commission cannot demonstrate that the building permit system is working effectively or that building surveyors are effectively discharging their role to uphold and enforce minimum building and safety standards”. “Ninety-six per cent of permits examined did not comply with minimum statutory building and safety standards. Instead, our results have revealed a system marked by confusion and inadequate practice, including lack of transparency and accountability for decisions made. In consequence, there exists significant scope for collusion and conflicts of interest.” “Consequently, there is little assurance that surveyors are carrying out their work competently, that the Act is being complied with, and the risk of injury or damage to any person is being minimised.”

FINDING (1c) - There is inadequate clarity on the role of building certifiers.

FINDING (1d) - There is an overemphasis on regulatory control at the point-of-installation.

FINDING (2b) - There is a lack of clarity amongst stakeholders as to how and where to report non-conforming product.

¹² Victorian Auditor-general’s Report, Compliance with Building Permits, December 2011, pg viii

State electrical safety regulation

The state and territory governments implement electrical safety legislation¹³ and regulation¹⁴ in each jurisdiction. High risk electrical equipment used in residential installations is required to be third party certified before being placed on to the market. This is referred to as pre-market approval. All other electrical articles are required to be electrically safe before being placed onto the market.

State electrical safety regulators have the authority to intervene at any point in the supply chain where products are sold. They also have the ability to issue information bulletins, warnings, alerts, infringement notices, prohibition of sale notices and product recall notices.

Currently the Electrical Regulatory Authorities Council (ERAC) is coordinating harmonisation of the state based regulations with the proposed Electrical Equipment Safety System (EESS) including national model regulation scoped to include residential electrical equipment. This proposal is mainly due to: the changing market dynamics (“[The market] profile has changed and today most electrical equipment is manufactured offshore, usually in Asia, and is often imported by smaller Australian and New Zealand based companies with little technical expertise”); “inconsistent practices and procedures” between the different states regulators and accredited third party certifiers; and an increase in electrical related fires.¹⁵ Not all states currently agree with the proposal and the approaches to issues like common product regulatory marking have recently become divergent.

Electrical industry commentators agree there is a lack of harmonisation between state electrical safety regulations leading to disparate approaches by regulators and accredited third party certifiers in the application of product standards, product approval practices, product marking requirements and enforcement actions against NCP. Electrical products can sometimes be legally sold in some jurisdictions, but are banned from sale in others. Commentators further state that the ERAC EESS proposal would give greater visibility of product suppliers and align practices across jurisdictions which should enable quicker identification of all responsible suppliers when problems are detected.

Work Health and Safety Legislation

Work Health and Safety (WHS) in Australia is regulated and enforced by the Commonwealth, states and territories in their respective jurisdictions. An intergovernmental agreement formalises cooperation and consistency in this area through mainly harmonised legislation, although there are some state variations. WHS legislation aims to provide for a balanced and nationally consistent framework to secure the health and safety of workers and workplaces.

Relevant to this report, WHS regulators enforce safety on worksites where engineered wood (“formply”) is used in concrete formwork and also require design registration of specific high risk plant (e.g. electrical lifts used in buildings).

WHS legislation is performance and risk based and no longer refers to particular standards (except in a few instances in the WHS Regulation). Obligations are placed onto principle duty holders to eliminate and minimise risks, so far as reasonably practicable and including due diligence requirements for officers (for example, understanding the hazards and risks associated with the operation of their business, demonstrating knowledge of the requirements of relevant codes and standards, etc). For example, AS 3610 *Formwork for concrete* is no longer directly referenced in the WHS Regulation, so it is not mandatory to comply with, however builders would need to demonstrate an equivalent level of safety.

If suppliers are making false claims about strength ratings of products or equipment, then WHS regulators can take enforcement action against the suppliers.

Priorities for surveillance and enforcement activities are driven by work-related injuries and illness statistics from reports as well as the level of possible consequence. For example, high consequence, low frequency risks are also being prioritised. Specific WHS regulators may increase focus on plant and equipment manufacturers, suppliers, importers and design verifiers in future.

¹³ For example, NSW Electricity (Consumer Safety) Act 2004;

¹⁴ For example, NSW Electricity (Consumer Safety) Regulation 2006;

¹⁵ Electrical Regulatory Authorities Council – *Proposed Electrical Equipment Safety System, Final Regulation Impact statement, May 2009.*

A WHS regulator highlighted that WHS complaints are responded to within a triaging response framework. Actions could range from investigation of specific worksites to including complaints within categories for further investigation. It may be possible to obtain more information on regulatory actions via freedom of information requests (Government Information Public Access (GIPA) in NSW). The allocation of limited resources is based on risk.

In regard to the design registration of specific high risk plant, WHS regulators check that the paper work submitted is in order and registers the plant. Installation, commissioning and verification is not witnessed or conducted by the regulator.

In regard to “formply” claims of non-conformance, WHS regulatory inspectors can investigate issues raised at any time and especially if there has been an incident. WHS regulatory product testing is mainly performed to support prosecution activities after a death, incident or issue of high consequence, however regulators can ask duty holders to organise independent testing.

Federal Regulation

The Australian Competition and Consumer Commission (ACCC)

Not all building product installation work is covered by state planning and building regulations. Consumers rely on the provisions of the Australian Consumer Law (ACL) where a specific product or service is provided by a tradesperson or maintenance person. The Australian Consumer Law contains guarantees that goods and services must be of acceptable quality, fit for purpose and not make false claims.

The ACCC promotes competition and fair trade in markets to benefit consumers, businesses and the community. Their primary responsibility is to ensure that individuals and businesses comply with Australian competition, fair trading and consumer protection laws, in particular the *Competition and Consumer Act 2010* (CCA).

In regard to concerns about non-conforming building products, where CCA related concerns are identified, these are assessed on a case by case basis in the context of the ACCC’s Compliance and Enforcement Policy as to whether further action is warranted.

Concerns may arise under the ACL where false or misleading representations are made by suppliers that their products meet a standard and they do not. The ACCC is not in a position to pursue every complaint it receives and focus on those circumstances that harm the competitive process or result in widespread consumer detriment. The ACCC Compliance and Enforcement Policy states,

“that current ACCC enforcement priority areas are in relation to conduct of significant public interest or concern; or conduct resulting in substantial consumer detriment; unconscionable conduct; conduct demonstrating a blatant disregard for the law; conduct involving issues of national or international significance; conduct involving a significant new or emerging market issue; conduct that is industry-wide or is likely to become widespread if the ACCC does not intervene, ...”.

The ACCC has received complaints: regarding building products allegedly not complying with specified standards, despite supplier claims to the contrary; alleging that particular products in the building industry are not of acceptable quality; and alleging that particular products used in the building industry raise product safety concerns.

Actions available to the ACCC include:

- resolution by administrative actions or litigation;
- education and information;
- recalls of unsafe consumer goods; and
- working with other agencies to implement these strategies.

The ACCC agrees that while they can investigate complaints of potential contraventions under the CCA, in some instances an issue raised by complainants will need to be addressed more broadly at the industry level.

The Australian Building Code Board

The Australian Building Codes Board (ABCB) is a Council of Australian Government (COAG) standards writing body that is responsible for the National Construction Code (NCC) which comprises the Building Code of Australia (BCA) and the Plumbing Code of Australia (PCA). It is a joint initiative of the Commonwealth, state and territory governments and is maintained by an Inter-government agreement (IGA) signed by the nine governments.

The Australian Building Codes Board addresses issues relating to safety, health, amenity and sustainability in the design and performance of buildings through the National Construction Code (NCC) Series, and the development of effective regulatory systems and appropriate non-regulatory solutions. The States and Territories are responsible for regulating building and plumbing control and call up the provisions of the NCC through relevant legislation particular to each jurisdiction.

Property protection, building durability and maintenance aspects are not covered by the NCC. State regulations include maintenance requirements for some building aspects such as fire protection.

Compliance with the NCC is met if a building solution satisfies the *Performance Requirements* of the NCC. The *Performance Requirements* of the NCC can only be achieved by compliance with the *Deemed-to-Satisfy Provisions* or an *Alternative Solution* or combination of both.

Building materials claiming compliance with the BCA provisions must be assessed using: *Evidence*; or *Verification* as accepted by appropriate authorities; or comparison with *Deemed-to-Satisfy* provisions; or *Expert judgement*.

Compliance can be shown by either—

- complying with the Deemed-to-Satisfy Provisions;
- formulating an Alternative Solution; or
- a mixture of Deemed-to-Satisfy Provisions and Alternative Solutions.

If compliance with the Deemed-to-Satisfy Provisions is chosen, the building solution will be deemed to have complied with the relevant Performance Requirements.

If an Alternative Solution is chosen, the practitioner must ensure that an Assessment Method is chosen which satisfactorily indicates that the Alternative Solution will meet the relevant Performance Requirements. The nature of the Assessment Method will vary depending on the complexity of the Alternative Solution.

Performance or material claims must be supported by documentary evidence. The minimum requirement of “any other form of documentary evidence that correctly describes the properties and performance of the material” could be a first party declaration by a company that their product or material conforms to a standard or certain performance requirements¹⁶.

The ABCB doesn’t have regulatory powers and is not an oversight body for product compliance however it can pass information regarding product non-conformance onto state and territory regulators.

¹⁶ NCC Part A2.2(a)(vi)

3. Steel product

Survey

Of the online survey respondents in the **Steel product** sector, **65%** are manufacturers or fabricators, **13%** are product wholesalers/ suppliers/ importers/ distributors, **14%** are design engineers or site services, **3%** are construction industry head contractors and **3%** were from other steel sector areas. **51%** of responses were received from small businesses, **29%** from medium sized businesses and **20%** from large businesses.

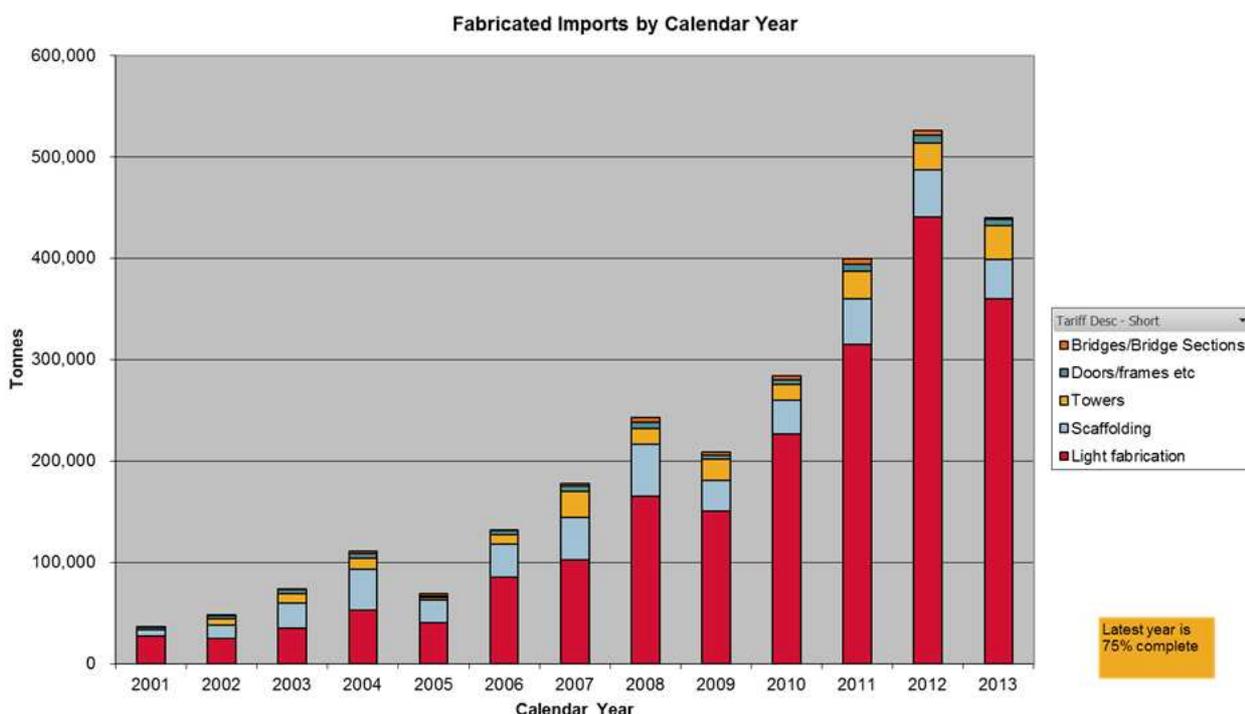
Interviews were conducted with steel material manufacturers, distributors, structural steel fabricators, design engineers and “repetitious” steel building product manufacturers.

Market

The iron smelting, steel manufacturing and structural steel fabricating industry in Australia currently generates annual revenue of approximately \$20.2 billion, directly employs approximately 43 800 people. Annualised revenue is expected to fall over the five years through 2014 by 8.4% (iron smelting and steel manufacturing) and 4.2% (structural steel fabricating).¹⁷

Imported fabricated steel structures (See Figure 1 – “Light fabrication”) increased from less than 100 000 tonnes/year in 2006 to over 400 000 tonnes/year in 2012. The 2013 data is a year to date total for the first three quarters of the year. Based on this preliminary number, the total level of imports for 2013 is expected to exceed 2012 by a significant margin.¹⁸

Figure 1 - Fabricated imports by year



Source – Onesteel¹⁸

¹⁷ IBISWorld.com.au: Iron Smelting, Steel Manufacturing and structural steel fabricating in Australia: Market Research Report – Report Snapshot.

¹⁸ Data compiled by Onesteel from ABS figures for the following HTISC steel codes (Bridges/ Bridge Sections, Towers, Doors/Frames, Scaffolding, light fabrication). The HTISC code 7308900049 for “light fabrication” is described as, “Plates, rods, angles, shapes, sections, tubes and the like, prepared for use in structures of iron or steel”.

Respondents indicated that margins are low and are under intense pressure. Margins are reduced by maintaining conformance with standards and specification requirements.

From a steel fabricator

“There is intense competition with margins now between 0 – 9% (before tax). We recently bid \$26 million for a project, at 5% margin, and were beaten by an overseas fabricator who came in at \$22M which is around 10% under our cost.”

From a steel distributor

“The additional cost to maintain conformity is between 3% and 5%. Conforming documentation is required to be attached to each piece or batch of steel and flows right through the supply chain to maintain traceability.”

Case study – The costs to maintain conformance (structural steel fabrication)

One small Australian structural steel fabricator with 17 employees spends the following on quality assurance and maintaining conformance with Australian Standard requirements:

- An average of between 7.6%* to 11%# additional project costs due to the required additional labour for a conforming process^ (work preparation, practices, supervision) and non-destructive testing; plus
- An average of \$19 000 per annum for the business over the last 5 years for worker qualifications and procedure development;

*A mix of “SP” butt joints and “GP” fillet welding.

“SP” quality welding only.

^ AS/NZS 1554 *Structural Steel Welding* - requires a qualified welding procedure used by a qualified welder and under the guidance of a welding supervisor to meet the requirements and intent of the standard.

Regulation

Regulatory Structure

The NCC references the Australian Standards for steel structures¹⁹ as *Deemed-to-Satisfy*²⁰ provisions relevant to steel construction. Specific product standards, for example galvanised²¹ and pre-painted²² metal building products, are then referenced within the standard for cold formed steel structures.

Similarly, the product standard for drainage grates²³ is referred to within the Australian Standard for plumbing and drainage²⁴ which is referenced within the NCC²⁵ as a *Deemed-to-Satisfy* provision for stormwater drainage.

The Australian standards referred to above have been developed over time to accommodate for Australian environmental conditions (Ultraviolet radiation and corrosive environments), user expectations and to safely coordinate the correct specification of materials and finished products.

¹⁹ National Construction Code of Australia, Volume 1 Part B1.4(c)(i), (ii) and (iii) references AS 4100 *Steel structures*, AS 4600 *Cold formed steel structures* and “Residential and low rise steel framing: NASH Standard” respectively.

²⁰ NCC Volume 1, Part A0.7

²¹ AS 1397 *Continuous hot-dip metallic coated steel sheet and strip*

²² AS/NZS 2728 *Prefinished/pre-painted sheet metal products for interior/exterior building applications*

²³ AS 3996-2006 *Access covers and grates*

²⁴ AS/NZS 3500.3 *Plumbing and Drainage-Stormwater drainage*

²⁵ National Construction Code of Australia, Volume 1, Part F1.1

Failure Points

First party conformity assessment

Many respondents pointed to first party declarations as a weakness in the current system. The following quote from a procurer sums up the sentiment:

“A letter stating a first party declaration without a test report is more useless than a piece of toilet paper”.

Structural steel fabricators highlight that third party assessment of high risk steel structures is currently not mandatory in Australia.

A structural steel fabricator reported:

“Only a minority of fabricators do undertake third party testing. I know this because non-destructive testing of welds leaves white marks on the tested areas from magnetic particle test paint and a galvanising company in Brisbane told me that only two fabricating companies out of around thirty fabricators whose structures they galvanise ever had this white test paint on the welds.”

In Queensland, Forms 15 and 16²⁶ are able to be issued by “competent persons” to help a building certifier assess building elements. A quote from a steel fabricator sums up current market practice:

“Fabricators and engineers are assessing their own work, signing their own compliance certificates (forms 15 and 16) and building certifiers are relying solely on those forms for their conformity assessment. Third party checks to guarantee conformance are not mandatory”.

Case study: The ACRS Third Party Certification scheme (Steel materials)

In the 1990s the steel and construction industry became aware of growing issues of non-conformance in the steel reinforcing market segment. The Australasian Certification Authority for Reinforcing and Structural Steels (ACRS) administers a voluntary industry-based, third-party product certification scheme, certifying manufacturers and suppliers of reinforcing, prestressing and structural steels to Australian and New Zealand Standards formed by industry in 2000.

ACRS is supported and endorsed by member companies ranging across engineering, inspection, manufacture, government, and importantly, customer bodies. ACRS currently certifies over 150 manufacturing locations²⁷, in 15 countries around the world. In 2007, ACRS was expanded to include pre-stressing steels (e.g. for bridge building). In 2011 ACRS was extended to structural steels.

An ACRS representative stated, “By 2007, 90% of reinforcing steel was voluntarily ACRS certified. ACRS does not require anything new for competent steel makers and processor/fabricators as they currently handle multiple certifications for the EU and other countries.”

Builder responsibility

Respondents in the steel supply chain pointed to the possibility of varying degrees of motivation and diligence amongst project proponents and builders to ensure conformance to Australian standards for critical elements like steel structures. Instead of examination of conformance documentation, the focus seems to be on paperwork collection aimed at administrative compliance:

“Builders and developers who will not retain the buildings themselves and seek to on-sell immediately may have lower motivation to ensure conformance of all aspects? They can put weak compliance systems in place, obtain correct design specifications, obtain conforming first party paperwork for the designs and construction and will have fulfilled their statutory obligations, yet there has been no third party assessment”

²⁶ Forms 15 and 16 are used for the purposes of section 10(c) and 279 of the QLD Building act 1975 and /or sections 32,35B, 43, 44 and 47 of the QLD Building Regulations 2006.

²⁷ <http://www.steelcertification.com/>

The following comment points to the possibility of widely varying structural steel conformance levels available in the market,

“Specifying steel and fabrication to Australian Standards and then writing an order assuming it will all happen as designed and ordered is ignorance. Only an idiot would assume that would really happen.”

A design engineer commented on the deferral of liability common in his area of the market:

“The language used on Forms 15 and 16 is qualified to defer liability ‘the works appear to be in accordance with the design’.”

Building certifier responsibility

A local government council building certification manager reported that,

“The scrutiny varies considerably and is generally only a visual inspection. Steel markings are not always checked, non-destructive testing is rarely performed and the thousands of other building products that go into making a building are not being assessed against a standard or fit for purpose requirements”

This assertion was backed up by a private building certifier:

“The Government regulations have incorrectly set expectations about the role of building certifiers. The certifier’s role is not to check everything. The certifier performs basic or rudimentary inspections, is not on site every day and can’t check every product installed against its standard or an alternative solution. The expectations are clearly wrong and this is a real problem for building certifiers and the industry as a whole. Even validating the basic components is not easy. How is a building certifier supposed to validate every component? The certifier can never get all certificates for every product. Neither can the builder.”

The overall sentiment is summed up by the following quote from the steel fabrication market sector:

“There exists an anything goes regulatory regime in Australia compared to other countries like the UK, US, Canada and EU where steel fabricator pre-qualification, product marking and auditing is conducted.”

FINDING (1b) – A gap / weaknesses exists in the building conformance framework for steel products resulting from inadequate surveillance, audit checks, testing, enforcement and an over reliance on first party certification.

FINDING (1c) – A gap / weaknesses exists in the building conformance framework for steel products resulting from inadequate clarity on the role of building certifiers.

FINDING (2a) – A gap / weaknesses has existed / exists in the building conformance framework for steel product resulting in industry bodies stepping in with third party certification schemes.

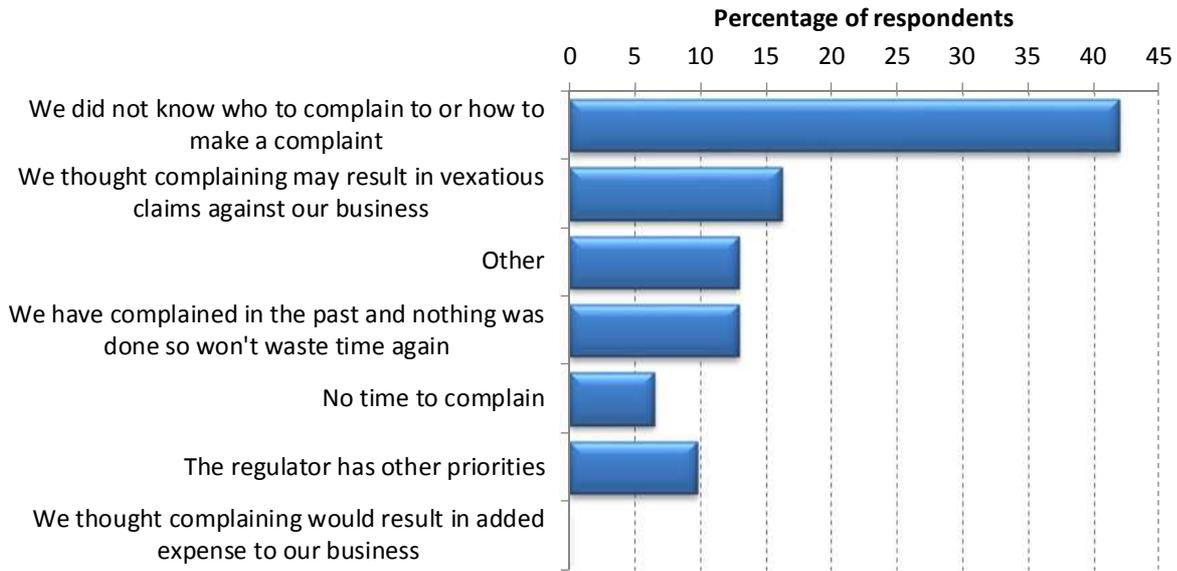
Complaints

Industry is confused as to whether regulatory authorities, who are able to accept and investigate complaints regarding non-conforming steel structures/ steel building products, actually exist. Respondents indicated that **42%** did not complain about NCP. Of those not complaining, **55%** indicated: that they did not know who to complain to or how to complain, or they had complained in the past and did not get a result.

None of those interviewed in the **Steel product** sector could identify an appropriate regulator to whom they could raise a complaint regarding non-conforming products.

Interviews also indicated a sensitivity to report NCP because of the potential cost impact on downstream customers (forced to rectify work) and the potential damage to future business relationships with those customers.

Figure 2 - Reasons for not complaining to a regulatory authority in the Steel product sector



Source – Ai Group

FINDING (2b) – A gap / weaknesses exists in the building conformance framework for steel product resulting in lack of clarity for stakeholders in terms of how and where to report NCP.

Non-conforming product

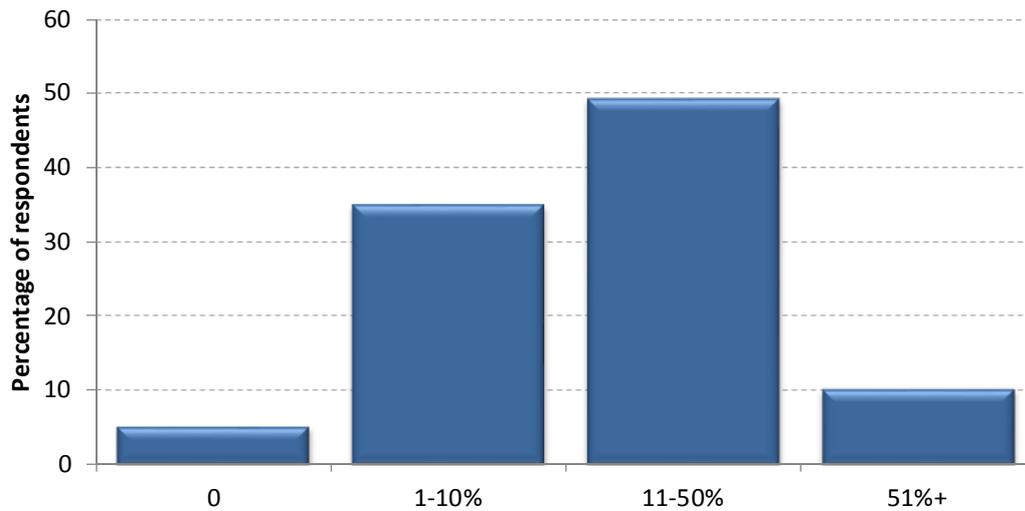
Existence

95% of respondents surveyed in the **Steel product** sector reported NCP in their supply chain.

49% indicated that NCP market penetration lay between **11%** and **50%**. Interviews indicate that the percentage of NCP varies by sub-sector with the incidence of NCP reported to be relatively high in the structural steel fabrication market and lower in the steel material producer market area.

In terms of the negative influence on businesses, **40%** reported lost revenue/margin and reduced employment numbers due to NCP.

Figure 3 - Percentage of products estimated to be non-conforming in the Steel product sector



Source – Ai Group

Survey respondents (**64%**) indicated the majority of faults are detected because of on-site product failures or visual inspections. This points to a lack of regulatory and conformance control measures in place right through the supply chain up until the point of installation. Respondents highlighted that this can also increase the cost of rectifying or replacing the NCP.

Queensland Transport and Main Roads believe they would be one of the more informed buyers of fabricated steel structures with strict conformity and audit procedures, yet their 2011 report titled, “Structural Steel Industry Review, Compliance, Sustainability and Value for TMR” highlights they encounter sub-standard materials and workmanship.²⁸

Respondents gave the following examples of alleged non-conformance in the **Steel product** sector raised during interviews include the following types of issues (See also Appendix B):

- Material substitution with lower grade material substituted for high grade material;
- Inconsistent business practices leading to non-conforming steel fabrication (e.g. separate production lines, one conforming with Australian standard requirements and the other non-conforming and focused on cost savings);
- Non-conforming fabricated steel structures;
- Failure to identify non-conforming materials;
- High silicon content steel (causing protective galvanising coatings to flake off);
- Non-conforming material test certificates;
- Incorrect steel chemistry, sub-standard mechanical properties and the inclusion of impurities;
- Differences between Australian and overseas standards causing finished structures and coated building products that are not suitable for maximum design loads under Australian standards;
- Non-conforming fasteners causing structural steel collapse;
- Difficulty to police (and high conformity costs) when components are sourced from numerous suppliers;
- Failed pre-qualification audits of structural steel fabricators by a government procurer due to a lack of knowledge in: Australian Standards; welding procedures; plan symbols; work preparation and supervision;
- Pre-stressing steel reinforcing made to low overseas standards and detected on site in Australia;
- Non-conforming steel strand product failed in a casting yard (potentially high WHS consequences);
- Failed balustrading due to incorrect welding, then corrosion (fillet instead of butt weld); and
- Non-conforming steel lintels and drainage grates (see case study).

²⁸ QLD Transport and Main Roads, “Structural Steel Industry Review”, 2011, p5

Other comments raised from steel fabricators during interviews indicate possible areas of concern around lack of: diligence to monitor conformity; education; independent conformity assessment; and worker skills.

“The industry area currently not asking for compliance information is the general building and construction sector. Constructors are importing structures themselves with little or no experience in steel fabrication and the critical requirements.”

“Engineers have said to me, what information should I be asking for in terms of compliance information?” demonstrating a lack of appropriate knowledge in the area they are assessing and certifying.”

“It is always possible to obtain paperwork stating conformance yet rectification work proves otherwise. The paper work is whatever you want it to say and not worth the paper it’s written on.”

“Non-conformance is demonstrated when we employ workers who have come from competitors never having seen a welding procedure or standard and with little knowledge of correct work preparation and set-up.”

FINDING (3) – Non-conforming product exists in the Steel products sector particularly the fabrication segment, repetitive steel products and coated steel building products. Non-conforming product may be less problematic in the steel material production market although still present.

Case study: Non-conforming structural steel fabrication

An ASI report (see Appendix B) highlights a steel and glass bridge truss used as an acoustic noise barrier for a housing estate that deflected beyond specifications once installed and needed to be replaced with a new structure. Once removed, the non-conforming structure was found to be deficient when compared to both the requirements of the specified Australian Standards~ and the proprietary specifications:

- Cracking of welds and steel sections;
- Permanent bending of main structural members beyond specifications;
- Under strength steel. Design specified as 450MPa yet tested at 338MPa;
- Non-conforming welding types (fillet instead of butt welds);
- Poor welding and finishing including undercutting (reduced wall thickness);
- Oversize and elongated bolt holes;
- Water filled hollow sections (The ASI report indicated this may have been deliberate to increase the overall structure weight to within specification); and
- Paint finish non-conforming with design specifications (top coat not applied).

The rectification and rebuild costs were estimated to be over \$800 000. The business responsible for the importation of the non-conforming structure became insolvent during the rectification process. Comments indicate the design engineer’s professional indemnity insurance may have paid for the rectification work.

~ AS/NZS 1554 *Structural steel welding*; AS/NZS 1163 *Cold-formed structural steel hollow sections*.

Case study: Non-conforming access covers and drainage grates

Access covers and drainage grates are used by state road authorities, municipal councils and in private industrial, commercial and residential building projects. Referenced within the NCC Volume 2 Part 3.1.1 Drainage, the performance requirement is satisfied if the drainage system is designed and constructed in accordance with AS/NZS 3500.3. Clause 2.13.3 of AS/NZS3500.3 requires metal access covers and sump grates to meet AS 3996:2006.

Most state road and traffic authorities and councils correctly specify and verify conforming grate products (as referenced above). Zones such as industrial zones, commercial precincts, shopping centre driveways and car parks, delivery routes, pedestrian zones contain heavy vehicles as well as pedestrian traffic.

Product suppliers have not been able to obtain clarity as to whether building certifiers or plumbing certifiers are responsible for certification of private sector grates. It is also unclear as to whether the sub-standard grates are claiming compliance as an *alternative solution* under NCC requirements.

The use of non-conforming grates is a public and worker safety issue as well as having the potential to damage vehicles and increase the cost of maintenance over time. The grates sit above pits up to 4m deep. Heavy vehicles cause deformation of the grates leading to failure over time. Non-conformance issues identified at the sites in the photos below include:

- Incorrect load class grates installed (not fit for purpose);
- Grate manufacturer and load class not identifiable (incorrect marking);
- Incorrect load class identifiable on the grate (false and misleading performance claims);
- Defective grates not of acceptable quality and not fit for purpose; and
- No grate weight marking (required by WHS regulation).

Incorrectly installed grates often require rectification work costing thousands of dollars per grate because of incorrect depth allowance for a conforming grate. This leads to like for like replacement with non-conforming replacement grates and repeatable failures over months and years. Also, deflection can cause damage to the surrounding concrete.

The non-conforming drainage grate market is estimated by respondents to be worth more than \$15million dollars per year. The total market is valued at \$25 – \$30 million annually.

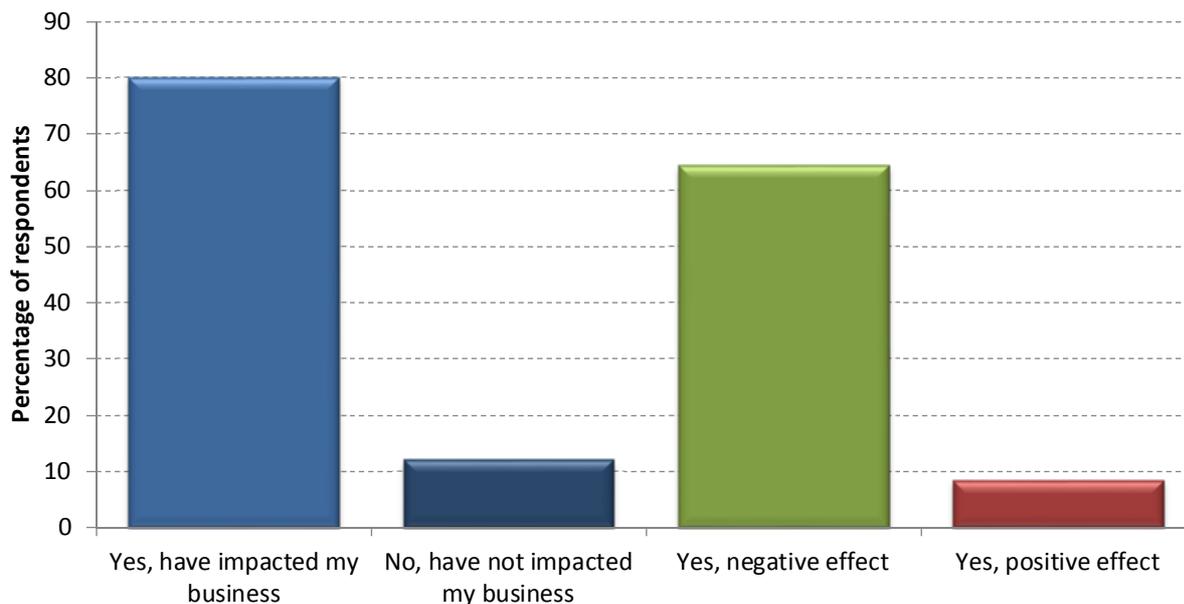


Business Impact

Respondents said that **64%** of steel sector businesses have been negatively affected by non-conforming products. **40%** of all businesses in the steel sector are losing revenue, margin and employment numbers due to NCP. Other businesses say they are downgrading their product quality and service offer in order to remain viable.

Another **8%** of businesses say they have been positively affected by non-conforming products because they obtain rectification work and this is often at higher margins because of the tight deadlines involved.

Figure 4 - The impact on business of non-conforming product in the Steel product sector



Source – Ai Group

Interviews indicated that the main impact on businesses is to their overall viability:

“Non-conforming competitors don’t have the same business costs as we do. They counterfeit our compliance information. We have to take legal action. They obviously don’t test their products, don’t do load tables, don’t mark products correctly, don’t have a quality system. This is costing our business margin and jobs. We’ve got 40 people in a factory in [regional town] that is not sufficiently profitable and we have dropped our staffing levels. There has definitely been commercial damage to our business from non-conforming products”

Others indicate their sales have been suffering due to high currency exchange rates, product dumping and non-conforming products and it is not possible for them to determine the precise fall in sales that is due to each of these concurrent factors.

Government procurers indicated there has been a cost impact on them due to the additional resources and systems needed to detect NCP.

FINDING (4) - A high proportion of businesses in the Steel product sector (40%) have been negatively impacted by non-conforming product. The main impact has been the loss of margin, revenue and employees.

Safety Impact

The examples of NCP raised during interviews indicate that NCP can affect both worker safety (e.g. collapse of hangar; pre-stressing steel strand failures; unmarked weights on grates, deforming grates) and have the potential to affect long term installation safety when full load rating (e.g. wind force or weight loading) is reached or corrosion occurs. The QLD WHS authority has linked non-conforming product with non-compliance to the WHS Act 2011.²⁹ Many of those interviewed highlighted that when deviations from design standards occur (e.g. using other product standards or unqualified procedures), there is a need for rigorous engineering analysis to prove equivalence to the original design. Australian fabricators believe such analysis is not occurring. Comments that summed up sentiment around safety are:

“There does not seem to be an adequate system for the approval of NCC alternative solutions including independent assessment or auditing. Structures are currently signed off as conforming in ignorance of the differences between standards.”

²⁹ <http://steel.org.au/key-issues/compliance/whs-2011>

“Engineers are relying on inherent ‘factors of safety’ built into materials and design standards and then signing off even though materials and fabrications are not up to design standards. However, structures may not see their full design load when certified and problems may become apparent when structures are heavily loaded.”

“Re-engineering (or re-grading) materials based on actual test report figures is dangerous because the test certificate is based on limited tests on a batch. As an example, standards for structural steels note that testing and inspection of one or two samples do not provide an acceptable representation of the actual variability in a batch of steel. This is because the result of testing and inspecting such a sample could fall within or outside the standard range by chance and does not present a valid picture of the characteristics being evaluated. The only way to handle limited test results without impacting on safety is to note what Standard/grade the product was initially manufactured to.”

“How can the responsible person demonstrate that the structure is safe if they cannot demonstrate that the safety critical materials and products that go into the structure are compliant?”

FINDING (5) – Non-conforming steel products and structures can increase the risk of personal injury to employees and has the potential to affect long term building and structure safety.

Long Term Asset Value Impact

Non-conforming steel materials and products can be affected over time due to strain aging, accelerated corrosion and deformation under load. Interviews raised examples of sub-standard protective coatings applied to products as well as incorrect welding types (fillet instead of butt welding) increasing the potential for corrosion to occur. Understrength steel materials can allow increased structural deflection which increases the risk of strain aging. There is the possibility for non-conforming assets to deteriorate at a quicker rate resulting in increased maintenance costs over time (the case studies on grates and non-conforming steel fabrications are prime examples).

The ACRS conformance scheme was started by industry and government procurers because of the high risk (and potentially large cost) over time of non-conforming reinforcing steel.

FINDING (6) – Non-conforming product in the steel sector can escalate deterioration rates in buildings, reduces value of holding assets and increases maintenance costs.

Potential solutions

Respondents in the **Steel product** sector suggested the following potential solutions:

- There should be a federal body to undertake market regulation, surveillance, auditing and enforcement of building products. Other economies such as the UK and Germany have higher levels of regulation in this sector. Such an authority should clarify the regulations, codes and standards (or alternative solutions) that need to be complied with. First party certification is not working;
- Clarify the role of building certifiers;
- Product suppliers and builders should be accountable for the products they supply and install;
- Mandatory (confidential) reporting of NCP should be implemented. CROSS (UK) is a current, effective model;
- An industry sector risk based approach is needed – Possibly including 3rd party certification including mutual recognition of international conformity assessment bodies, round robin testing and peer reviews;
- Active support from the public and private sector procurers to purchase third party certified products;
- Education of the market is required;
- An Australian Standard for steel fabrication should be developed; and
- Providing greater visibility of product standards within the NCC (direct references in the NCC instead of the current secondary references).

4. Electrical product

Survey

Of the online survey respondents in the **Electrical product** sector, **46%** are product manufacturers or fabricators and **43%** are part of the product wholesale/supply/import/distribution network. The other participants were electrical contractors or had diversified businesses including electrical manufacturing. **62%** of responses were received from small businesses, **21%** from medium sized businesses and **17%** from large businesses.

Structured interviews were conducted with electrical equipment manufacturers, electrical contractors, electrical equipment test laboratories, a third party product certifier and state electrical safety regulators.

Market

Research estimates³⁰ value the electrical lighting, cable, motors, generators and other electrical equipment market at around \$8 billion in Australia in 2013 and employing around 17 600 people.

Like other building products markets, interviews indicate the electrical product industry has been in a state of flux over the past decade and this is reflected in the characteristics of the various market segments:

The **residential** electrical construction market is dominated by very low margins, a flood of new market entrants importing equipment (overseas equipment manufacturers and start-up Australian importers including builders and electrical contractors) and new technology (e.g. LED lighting). The flood of new market entrants is enabled by low market barriers, a proliferation of new manufacturers in Asia and disruptive technologies such as LED lighting. The residential market is dominated mainly by low cost products. Product manufacturers constantly push the boundaries of engineering specifications in the drive to reduce product costs.

The **industrial** electrical construction market has traditionally been dominated by demanding applications, high quality and technically capable electrical equipment. Interviews indicate that counterfeit products are currently infiltrating the industrial lighting and electrical accessories market. Industrial market electrical products are normally required to be supported by a test report to an Australian Standard proving compliance with safety and performance requirements. The market is more demanding of technically competent products at the industrial level.

The **commercial** electrical construction market includes characteristics from both the residential and industrial markets. One significant change noticed in this market in the last 2 -3 years is a loss of technical expertise in the lower project value end of the market. Previously, engineering consultants would be involved in project development, starting at around \$10 million projects. Now engineers may not be involved until the project value is around \$100 million. Cost considerations (over other product attributes) are playing a major part in purchasing decisions in projects up to \$100 million.

Responses to the online survey and interview comments in the area of product attributes indicate the electrical construction market areas are currently bi-polar with some customers seeking high quality, reliable and conforming products whilst other customers seek the lowest cost products as their highest priority.

Regulation

Regulatory structure

The electrical products regulatory structure is covered by a web of state and federal government regulation and regulators.

Regulations:

- Each state has electrical safety legislation and regulation that includes a number of Australian Standards related to electrical products and installations. The primary standard referenced is the Wiring Rules (AS/NZS 3000:2007). ERAC is currently attempting to harmonise electrical safety regulations across all states and territories and New Zealand;

³⁰ IBISWorld.com.au (Categories C2431, C2432, C2439).

- Each state has building regulations that reference the NCC. The NCC sets additional performance requirements for electrical equipment in buildings (e.g. lighting levels and energy efficiency levels). Also electrical plant like lifts must satisfy fire safety and fit for purpose requirements;
- The Federal government regulates the electro-magnetic compatibility (EMC), electro-magnetic energy (EME) and telecommunications requirements of electrical products;
- The federal government Greenhouse Energy Minimum Standards (GEMS) Act regulates electrical products minimum energy efficiency performance standards;
- State Work, Health and Safety Regulations require high risk electrical equipment like building lifts and pressure vessels to be design registered; and
- The federal government's Australian Consumer Law regulates product claims (e.g. lighting lamp lifetime hours).

Regulators:

- Electrical Safety is regulated by state electrical safety offices;
- EMC, EME and Telecommunications is regulated by the Australian Communications and Media Authority (ACMA);
- Equipment Energy Efficiency is regulated by the GEMS Regulator;
- WHS regulation is regulated by state Work, Health and Safety Offices; and
- The Australian Consumer Law is administered by the Australian Competition and Consumer Commission and state fair trading agencies.

Failure points

Survey responses and interviews indicate a high degree of frustration amongst the electrical product supply industry that products making false claims, not fit for purpose or not conforming to Australian Standards are allowed to remain on the market to the detriment of legitimate product suppliers.

One small business reported a lack of knowledge regarding all regulations that could possibly apply to their business and products.

Interviews and survey respondents have indicated frustration with:

- the lack of harmonisation of electrical safety regulation amongst jurisdictions;
- a lack of surveillance, audit and enforcement activity (such comments are supported by a 2009 ERAC Regulatory Impact Statement titled "Proposed Electrical Equipment Safety system";
- regulatory actions and enforcements that appear to differ across jurisdictions; and
- a perceived decrease in the rates of electrical installation inspections over the past 15 years or so and an alleged increase in non-conforming installations.

A product manufacturer/supplier advised:

"Regulators have lost the ability to monitor the market with the proliferation of small start-up importer / suppliers"

A third party product certifier stated:

"Product suppliers are 'shopping' amongst certification bodies (including the state regulators) and there are inconsistencies between the information accepted by the various certifiers."

A test laboratory highlighted the potential for product conformance to decrease over time once a product has been certified and allowed onto the market.

"A product test report is required for initial certification, however there are no ongoing product audits conducted." "As imports rise and local manufacturing expertise dwindles, we should be beefing up the checks not reducing!";

Equipment suppliers stated:

"Products are able to be easily imported directly by consumers with no inspection regime at the border."

"Products are being imported directly by builders, developers and contractors on a per project basis from websites like "Ali Baba". Many of these products do not contain electrical safety test reports."

"Many lift installations are non-conforming with the Wiring Rules and there doesn't seem to be many inspections now"

Interviews with lighting and electrical lift manufacturers align with other building products areas and indicate a deficiency in the verification of performance claims of equipment and the performance of the finished installation. There is a perception that engineering rigour and verification is now missing in the sub-\$100 million commercial development area where design, construct and first party verification is undertaken by electrical sub-contractors using rules of thumb instead of calculation and measurement:

“Contractor and Builders buy anything thinking that they are buying conforming equivalent products and the finished installation does not meet the required performance and lifetime claims. There has been a substantial weakening of compliance because rules of thumb are used, product claims are not verified and the finished installation is not checked against Building Code requirements.”

A lift manufacturer warned:

“There is a proliferation of products available for direct purchase over internet and installation without the necessary conformance checks including design registration. Building inspectors are not checking designs or registrations. A recent example I saw is 3 non-conforming lifts installed in nursing homes. This application requires minimum internal dimensions for stretchers and is an obvious non-conformance issue with Building Code requirements.”

The same lift manufacturer perceives a:

“Lack of WHS inspectors active in the market. 15 years ago, every electrical lift installation and pressure vessel would be inspected. Now there are no inspections and the design registration and authorisation process is a paper shuffling exercise.”

Observation - There are weaknesses in the electrical products conformance framework that can be addressed by an accreditation body overseeing the entire system.

FINDING (1b) - There are gaps and weaknesses in the Electrical product conformance framework resulting from inadequate: surveillance; audit checks; testing; enforcement; and first party certification;

FINDING (1d) - There are gaps and weaknesses in the Electrical product conformance framework resulting from the conformance framework placing an over emphasis on regulatory controls at the point-of-installation (this finding is in mainly in regard to National Construction Code requirements for electrical equipment).

Case Study – Electrical cable

Two different brands of electrical cables were tested at independent NATA test laboratories and found to be non-conforming with the electrical safety standard for those products (AS/NZS 5000.1:2005). The first brand was found to be deficient against the ageing and minimum radial thickness tests. The second brand was found to have high conductor resistance and “testing of the cables has shown that deterioration of the insulation over time can cause wires to become exposed and potentially result in an electrical shock or fire”³¹ Both brand products were highlighted to electrical safety regulators with non-conforming NATA test reports.

In the first case, no response from the electrical regulator has been received by the complainant and it is believed that no warning to the market has been issued.

In the second case, Product Safety Recalls Australia has issued a warning regarding Infinity cables product. After this warning notice was issued, Infinity cables was placed into liquidation and one electrical regulator has issued a mandatory recall notice advising consumers to check with their electrician to determine whether Infinity cables were used in re-wiring work done in the past 12 months.

Other electrical safety regulators have various warnings, safety alerts and prohibition notices advising:

“Remove the product from sale, including display for sale. Cease use of this cable immediately and return to the point of sale for refund under Australian Consumer Law. It is an offence to supply any cable subject to the prohibition order.” This notice does not advise consumers to remove already installed cables. As advised by the Product Safety Recalls Australia warning, *“the risk is expected to increase over time”*.

Another regulator advises electricians that they “should” remove already installed cable, however this warning is not a mandatory requirement.

Another state regulator has issued a warning and “stop sale” notice only to electrical contractors asking for “unused cable to be returned to the place of purchase” and “none of the cabling should be used by electrical contractors in doing electrical installation work.”

The above approaches provides consumers and electrical contractors in various states with different messages and indicates that further work to coordinate regulation and regulatory activities would provide clearer messages to the market regarding NCP.

Industry commentators believe Infinity cables, if left installed, could lead to major long term safety risks with increased risks of fire and electric shock to employees and the public.

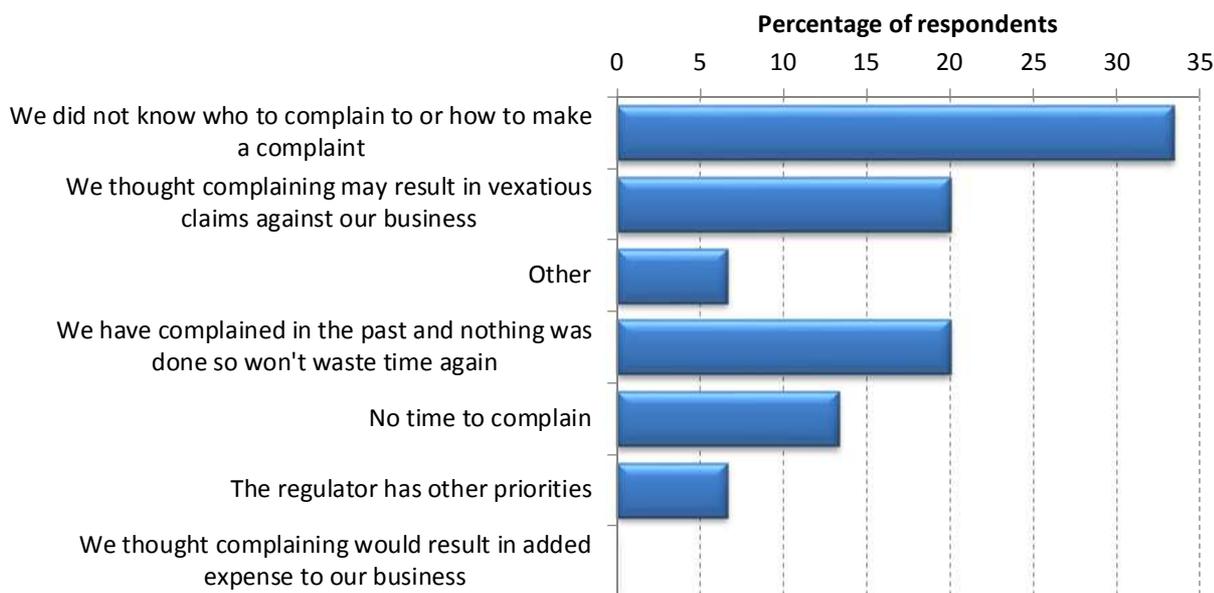
Complaints

Respondents indicate they had not made a complaint to a regulator (54%). Of those not complaining, 53% said they did not know who to complain to or how to make a complaint; or they have complained in the past and nothing was done so consider complaining a waste of time.

Of the 29% who had complained, all had complained to either a state electrical safety regulator, WHS regulator, federal government agency and in one case additionally to a peak industry body. One respondent was “not satisfied with the outcome on most occasions”. None of the others were satisfied with the outcome of raising complaints with these agencies.

³¹ Product Safety Recalls Australia, NSW: Mandatory recall: Infinity brand electrical cable

Figure 5 - Reasons for not complaining to a regulatory authority in the Electrical product sector



Source – Ai Group

Respondents highlighted specific complaints to various regulators:

Telecommunications:

- An Australian company presented a case of equipment non-compliance (Input impedance and voice quality) to the Telecommunications regulator who replied that the issue did not warrant investigation. The case involved an Australian company importing equipment from the UK directly to Australian customers.
- *“Those with a media profile get attention and action.”*

Electrical safety regulators:

- A complaint in regard to electrical safety marking requirements was raised to a state electrical safety regulator who referred the complainant to a second electrical safety regulator (The company importing the non-conforming product was based in the second jurisdiction). The second regulator referred the complainant back to first regulator as the complainant was based in the first jurisdiction. At this point, the complainant did not pursue the matter further.
- An electrical safety switch/ circuit breaker (RCBO) was tested by an independent NATA laboratory and found to be non-conforming with the electrical safety standard for the device. A complaint was raised to a state electrical safety regulator and this product continued to be sold for more than 2 years before a 2 month batch of the products was recalled, leaving the previously sold and installed products still in place.

Building regulation:

An electrical lift manufacturer is unsure who to complain to in regard to non-conformance with the NCC requirements for electrical lifts (inadequate fire protection of lift doors and inadequate internal dimensions of lifts installed in nursing homes).

FINDING 2b – In some cases there are gaps and weaknesses in the electrical building products conformance framework that result in lack of clarity about how and where to report non-conforming product.

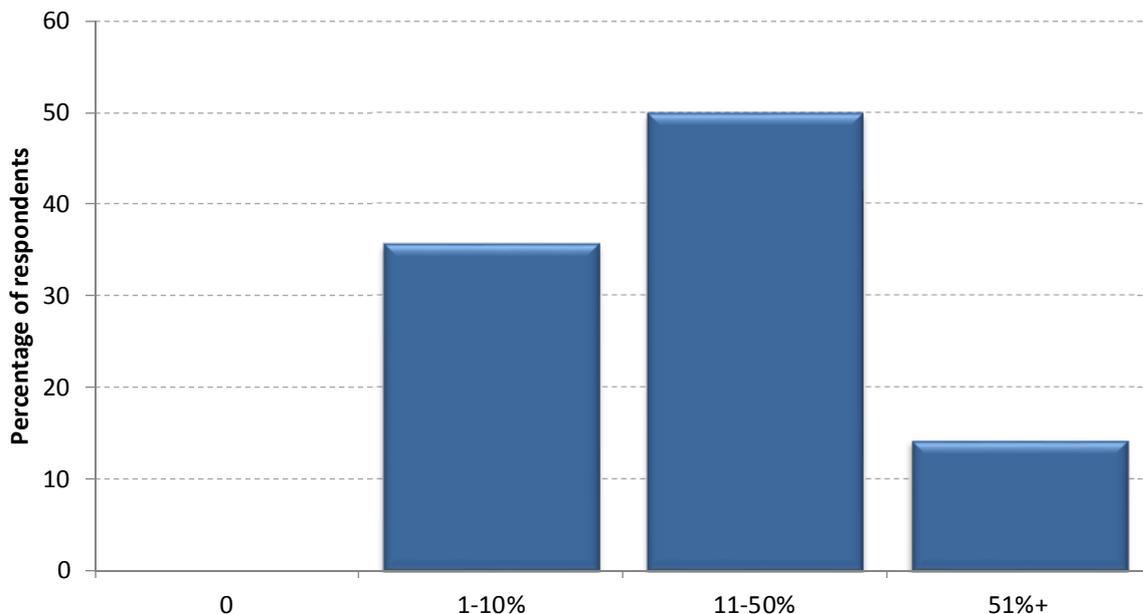
Non-conforming product

Existence

100% of respondents in the **Electrical product** sector report NCP in their market area.

50% indicated that NCP market penetration lay between **11%** and **50%**. Interviews indicate that the percentage of NCP varies by sector with the incidence of NCP reported to be relatively high in the LED lighting market and lower in other market areas.

Figure 6 - Percentage of products estimated to be non - conforming in the Electrical product sector



Source – Ai Group

82% of online survey respondents indicate that some of their evidence is based on failures or visual inspections of products on site. Additionally, **43%** of respondents have conducted their own testing of competitor products and found failures.

93% of respondents to the online survey agree that non-conforming products do not meet regulatory, Australian or industry standards. Additionally, **82%** of respondents believe that NCP contain false or misleading claims or do not meet performance claims.

This report has been provided with various levels of evidence of non-conforming electrical products and electrical installations from NATA accredited test reports to competitor test results and anecdotal reports. The types of non-conformances are relevant to various regulators and market areas:

- Non-conforming electrical accessories in the residential and commercial markets (do not meet the safety standards for electrical cable, wall switches and socket outlets). The failures involve both immediate electrical safety issues and failures to perform their intended function over time (endurance tests); and
- Counterfeit commercial / industrial electrical accessories and lighting products. Some of the legitimate products are patented, but *“now they have been copied and are being sold online direct from overseas as well, even using the same catalogue numbers and capturing around 30% of the market.”* It is reported that the counterfeit products have a high failure rate and this is tarnishing the reputations of the legitimate product suppliers.
- Non-conforming electrical lighting equipment, especially LED equipment:
 - *“Some 240V products have electrical safety issues.”*
 - *“Many, including extra low voltage lighting, do not meet claimed lighting performance levels.”*

- “Golden samples are used to pass initial certification testing but they then skimp on including important and expensive components like fire retardants in plastic housings during production manufacturing. A sample power supply we found was completely different to the product that had been initially approved.”
- “Test laboratories are acting in areas out of their scope and not applying Conformity Assessment Body (CAB) logos to test reports.”
- “Quality control measures and production methods on counterfeit products are lacking resulting in immediately failing products that should normally be picked up by the most basic quality control testing procedures. This indicates a lack of quality control measures at the manufacturing facilities.”
- Electrical Lifts – “Parts 15, 16 & 18 of AS 1735 Lifts, escalators and moving walks apply to disabled applications in homes and small community buildings. The scope of these standards limits the applicable buildings these lifts should be installed into, however some competitors are pushing these products into commercial buildings without being questioned or pulled up by an inspector or regulator.”

FINDING (1b) – There are gaps and weaknesses in the electrical building products conformity framework resulting from inadequate surveillance, audit checks, testing, enforcement and first party certification

FINDING (1c) - There are gaps and weaknesses in regard to electrical product conformance with NCC requirements resulting from too much responsibility placed on building certifiers by the current conformance framework and inadequate clarity of their role.

FINDING (3) - There is significant non-conforming product penetration in the Electrical product sector.

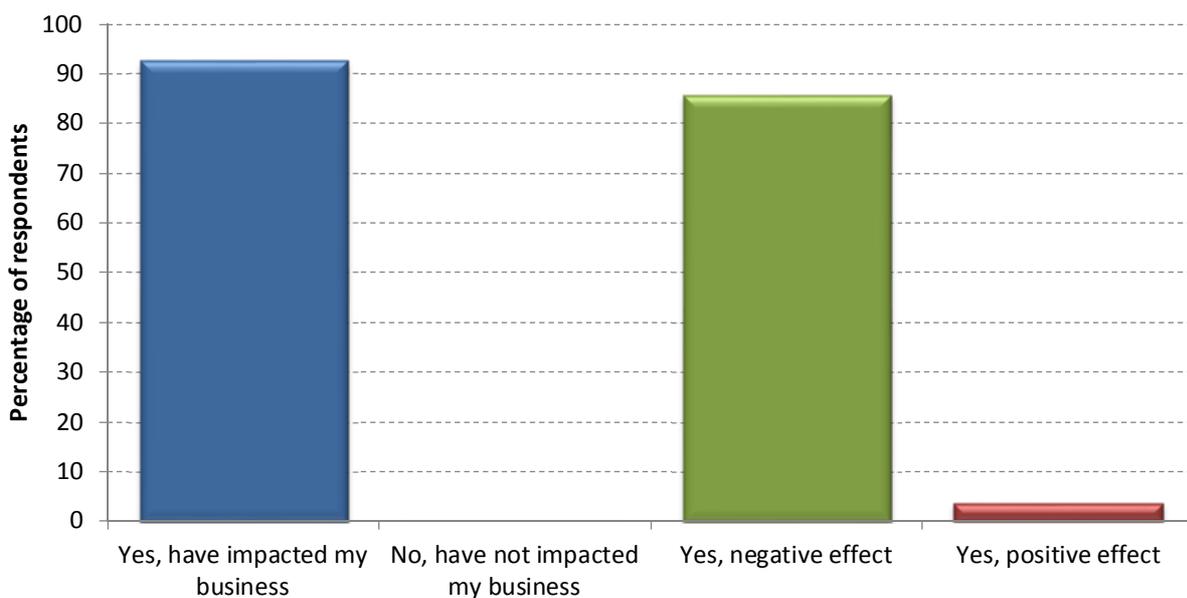
Business impact

86% of **Electrical product** respondents believe NCP has negatively affected their business. **71%** of these respondents indicate they have lost revenue, margin and employment because of NCP.

Interviewees also add that their businesses are being impacted by NCP.

“The market has grown, but our market share has dropped. We’ve suffered massive decreases in our margins and needed to retrench nearly 30% of our workforce over the past year. Lost opportunity is the main issue with NCP. The threat is that the market keeps demanding lower prices which is impacting on our margins, employment numbers, technical support capabilities, R&D and product innovation. Electrical accessories in the U.S. and Europe now have no innovation because margins are so low.

Figure 7 – Has non-conforming product impacted your business in the Electrical product sector



Source – Ai Group

Another company in a similar market segment has reduced work hours by 20% to a 4 day working week.

Other interviewed companies state that their market share decline is due to a number of issues and NCP is one of the major issues involved.

Conforming product suppliers report spending tens of thousands of dollars to obtain electrical safety test reports for each of their product ranges. This cost is not undertaken by non-conforming product suppliers or counterfeit suppliers.

"We need to comply with standards and regulations and our competitors should do the same. We are just seeking an even market".

"The whole supply chain is looking for an even market. All parts of the supply chain are being negatively affected. Electrical contractors are desperately seeking assistance in terms of product pricing, information about NCP and getting NCP off the market".

FINDING (4) – Non-conforming product has negatively impacted Australian businesses in the Electrical products sector.

Safety impact

Companies pointed to a wide range of safety risks from no / low safety risk to potential immediate safety risks and safety risks that may emerge over time.

For example, it was reported that electrical wall switches that fail endurance testing can be a fire risk if the resulting electrical contacts are high resistance. Also, the mandatory recall of cable by NSW Fair Trading states, "While there is no immediate safety threat, testing of the cables has shown that deterioration of the insulation over time can cause wires to become exposed and potentially result in an electrical shock or fire".

Companies report the potential for fire protection inadequacies and electrical safety risks in areas like electrical lifts,

"The industry has been very lucky that there have been no serious accidents lately. In the past, the industry was very safety conscious. So that previous safety culture may be protecting the market until now. But there is a slow erosion of safety. The technical people within the product supply market are still safety conscious, however the sales and marketing people within competitors are pushing to reduce costs and hence reduce safety levels. There is potential for the safety standards to keep slipping caused by an erosion of price, products manufactured to lower specifications, unclear legislation, watered down regulations and greatly reduced regulatory resourcing."

From the electrical accessories market area,

"This will be an ongoing safety issue. One issue we flag now is the potential for electrical vehicle re-charging to highlight safety issues. Many non-conforming 10A rated socket outlets are currently only subject to intermittent use at reduced load. Electric Vehicle charging will subject socket outlets to repeated daily full load duties over periods of 8 hours per day. Our experience tells us that the contact types used by some non-conforming products are not reliable and will not cope over time with those loads. There is potential for electrical fires, increased maintenance requirements and reduced product life."

In regard to impacts on building performance, comments received indicate a lack of conformance to the lighting performance aspects of the NCC (e.g. luminaries are not meeting their claimed lumens output for energy input) can affect safety and building functionality. Extreme cases may affect work, health and safety outcomes for employees when low lighting levels create dangerous work environments.

The 2009 ERAC EESS Regulatory Impact Statement highlighted recent increases in electrical related fires, "unsafe electrical equipment can cause fires which can result in fatalities, serious injuries and extensive damage to property. These fires are serious incidents and are costly to the Australian economy."

FINDING (5) – Non-conforming electrical product can increase safety risks to employees and the public

Long term asset value impact

The reports of non-conforming products raised indicate there is potential for asset values to be affected over time due to products like electrical lighting, electrical accessories and electrical cable needing to be replaced before their design life. Apart from the risk to the assets from fire, comments received pointed to a need for increased maintenance due to the high failure rates of non-conforming electrical products. For example, the cost to replace non-conforming electrical cables is estimated to be high as access can be difficult.

The claimed lifetime hours of LED lamps is also a *“significant unknown and will be a big issue in years to come. The lifetime claims do not stack up under engineering analysis and claims of 100 000 hours lifetime are simply not verifiable as it would take too long to test. This area has the highest rate of non-conformance in the electrical lighting market.”*

FINDING (6) – Non-conforming electrical products can affect the long term value of assets

Potential solutions

Respondents in the electrical sector suggest the following potential solutions:

- *“A system or process to verify the performance requirements of the NCC is required. Education of building certifiers and actual testing of installations against the NCC commercial lighting requirements should be required. The move away from using engineers in the sign off of designs over the last few years has resulted in declining building lighting performance”;*
- *“All states should align their electrical safety regulations. The ERAC EESS registration requirements should help to quickly identify relevant importers. Additional regulatory funding should provide for additional market surveillance and the ability to audit specific problem areas”;*
- *“Electrical safety regulators could further alert electrical contractors and builders that if they import electrical equipment, they will be regarded as the “Responsible suppliers” and would need to provide product conformity and certification information if asked by the supply chain or an electrical safety regulator”;*
- *“Importers should be encouraged to do their own testing here and not rely on some of these manufacturers test reports”;*
- More regulatory focus may need to be applied in the commercial and industrial electrical product markets. Comments received indicated a lack of regulatory participation in these market areas;
- *“Alignment of regulatory actions including enforcement and product recalls”;*
- *“Harmonisation of product certification is required to reduce “shopping” amongst certifiers”;*
- *“Industry education campaigns such as “Does it Comply” help to educate the market”;*
- *“Australian Customs should play a part in compliance as happens in other economies. e.g. United Arab Emirates.”;*
and
- *“More could be done in the area of market education regarding the roles and responsibilities of regulators and conformity assessment bodies. Also, clarity of all complaints pathways, knowledge of the complaints information required by regulators and the actions able to be taken by regulators is needed.”*

5. Glass and aluminium product

Survey

Of the online survey respondents in the **Glass product** sector, **91%** indicated that they were manufacturers/fabricators. As noted in Chapter 1 Introduction, the **Glass product** and **Aluminium product** sectors are being analysed together as **Glass and aluminium product** due to overlap in product definitions of relevance for this study.

Market

The market for **Glass and aluminium product** is diverse and covers a wide variety of industrial, commercial and domestic applications. Of note, there is one glass producer in Australia. The largest section of this market is for windows and doors in the domestic and commercial market. The estimated Australian market for aluminium doors and windows is \$4 Billion³² in the FY2013.

The high Australian dollar has put pressure on glass and aluminium manufactures and fabricators. Respondents advised that the market for doors and windows became undersupplied leading up to the Global Financial Crisis in 2008. This resulted in mid and top tier builders increasingly sourcing overseas manufactured products. Given that windows in high rise buildings do not usually vary in dimensions when compared level to level, they can be ordered in high volumes for single large projects. These factors have led to the market for high rise office windows (curtain wall windows) to be dominated by imports from Asia. These imports are mainly fully assembled products.

Respondents report that aluminium extrusions have been affected by dumping. Duties have been imposed by Australian Customs and this may have resulted in higher volumes of finished fabricated products being imported as they are not subjected to the same duties.

Glass installers have been particularly hard hit by imports with the Glass and Glazing Association of Victoria (AGGA) reporting that there were 11,000 installers in Australia in 2010 but by 2012 this had fallen to 7000. This is attributed to the down turn in building and construction activity and an increasing number of installations by builders and domestic DIY operators.

Decreasing margins have been reported in this sector. Respondents describe the market as very competitive and “cut throat with low margins”.

Aluminium extrusions are also used in the fabrication of glass windows and glass doors and are considered in this context below.

Regulation

Regulatory structure

Requirements on window and door manufacturers are stipulated in the National Construction Code (NCC), as administered by the Australian Building Code Board (see the Section 3 *Regulation and Conformance Assessment*). State building legislation requires compliance with the NCC.

The NCC requires that windows comply with AS 2047-1999 *Windows in buildings - Selection and installation* along with energy efficiency requirements. Testing is required to Australian Standards for deflection, operating force, air infiltration, water penetration and ultimate strength. Additionally if the construction is in a bushfire zone then the NCC require compliance with AS 3959 Construction of buildings in bushfire-prone areas.

Obtaining and installing conforming windows and doors is the responsibility of the builder. Verifying conformance to the NCC and the required standards is the responsibility of building certifiers.

³² IBISWorld: www.ibisworld.com.au, *Aluminium Door and Window Manufacturing in Australia: Market Research Report*

Failure points

Respondents pointed to the lack of a visible and available regulator as contributing to the presence of NCP in the **Glass and aluminium product** sector. The industry perceives that a regulator is needed to act as the “policemen” and without such there is a drift to non-conformance:

“In Australian culture there is only compliance when there is a policeman”

“Building regulator is not visible. I don’t know who this is”

“Policing in Australia is weak – third party (conformity assessment) is not compulsory”

Comments received also pointed to new market entrants lacking sufficient technical knowledge of standards, codes and regulation as an area of concern. This is particularly relevant to small and medium sized businesses.

Respondents agree the conformance outcome of the existing building certification system is poor. The reliance of the certification system on first-party certification, the difficulties of inspecting finished windows and doors prior to installation and building certifiers not verifying claims, means the system is open to possible penetration by NCP.

“(The) building inspector only embarks on a paper collection exercise rather than a compliance exercise.”

“Paper checking exercise and no auditing”

“The manufacturer gives a letter to the builder to say that the product is compliant. This is a paper collection exercise”

Other respondents were more sympathetic:

“(The) geographic stretch in Australia with a wide variation in product requirements across the regions makes it a complex task for the inspector to know all of the requirements”

“The inspection process is done at a price that does not allow inspectors enough time to properly inspect all components”

The certification system breaks down when fraudulent third-party certificates are used:

“The AWA is receiving a growing number of requests by Australian surveyors and state and territory building authorities for the validation of window and doors products that come with international certificates. The fact that many products have certificates isn’t enough to ensure that the products are actually fit for their purpose. They may not have been tested correctly or even at all. Fraudulent documents are showing up regularly.”

Case study: Australian Windows Association Third Party Accreditation scheme

The Australian Window Association (AWA) has members who are manufacturers of doors, windows, curtain walls etc and supply into the Australian market. The AWA run the Window and Door Performance Accreditation Scheme - a third party certification program and are an accredited NATA inspection agency. This scheme was established in 2000 at a time when the industry was reliant on self-certification. The scheme provides certification to AS 2047 *Windows in buildings - selection and installation* and AS 1288 *Glass in buildings - selection and installation*. Products are required to pass deflection, operation force, air infiltration, water penetration and ultimate strength tests.

The scheme involves auditing manufacturers and fabricators annually to ensure the systems being imported or manufactured in Australia are in accordance the original type test results.

The AWA operates a market surveillance scheme called ‘Dob-in-a-Site’. Individuals are encouraged to report on a confidential basis if they believe a builder is installing non-conforming doors/window systems. When non-conformance is found, the AWA notifies the responsible builder or building certifier and requests proof of compliance be provided for door/window products on site. Those who do not co-operate are advised that all information in the AWA’s possession on the alleged non-conforming product will be made available to the relevant authority in the event of an incident during or post installation.

Complaints to regulator

Nearly half of **Glass and aluminium product** sector respondents (**44%**) stated that they had not complained to a regulator when NCP was found in the market. Of those who had not complained, **36%** indicated that they did not know who to complain to or had complained in the past, nothing was done and so would not be complaining again.

Many companies interviewed indicated that they raise issues of NCP to the Australian Windows Association (AWA). Other respondents commented:

“There is no authority that I can think of to go to”

“I’ve got no idea who we could approach, no one is doing audits (and) no warning alerts (are) issued.”

“Window fabricators can still purchase non-conforming glass and use this in their window making. The issue is who is going to ‘police’?”

FINDING (1a) - There is confusion in the Glass and aluminium products sector about the identity, roles and responsibilities of building regulators and lack of knowledge of the conformity framework.

FINDING (1c) - There is inadequate clarity on the role of building certifiers in the Glass and aluminium products sector.

FINDING (2a) - Due to weaknesses in the building conformance framework for the Glass and aluminium products sector, the industry body has established a third party certification scheme and an industry surveillance mechanism.

FINDING (2b) - There is confusion in the Glass and aluminium products sector about how and where to report non-conforming product.

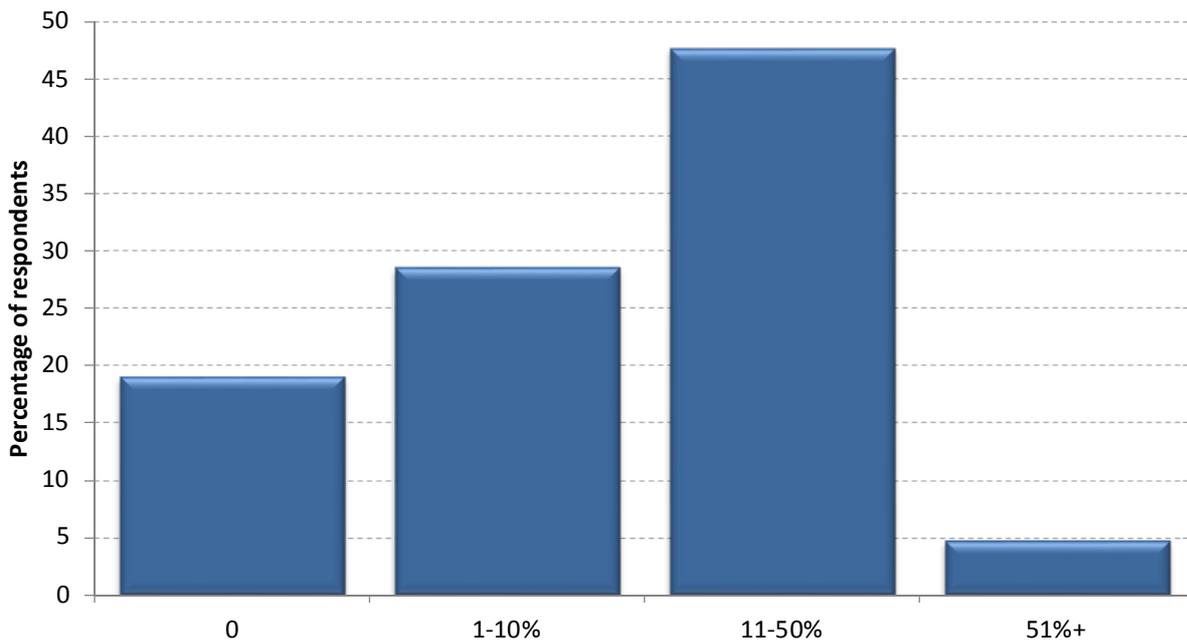
Non-conforming product

Existence

On average **81%** of respondents in this category reported that they had non-conforming product in their supply chain. **70%** stated that this had been evidenced from on-site product failures or visual inspections. Nearly half (**48%**) of all respondents indicated that NCP had penetrated the market by between **11% and 50%**.

Respondents from the aluminium extrusion industry stated that product dumping was more prevalent than NCP, although interviews indicate that the coatings applied to aluminium extrusions (powder coating and anodising) had non-conformance problems.

Figure 8 - Percentage of products estimated to be non-conforming in the Glass and aluminium product sector



Source – Ai Group

Respondents noted that NCP is more prevalent in the high rise residential and office market as windows and doors for those building tend to be consistent dimensions through all the levels lending this market to high volume importation on a per project basis by builders and import suppliers. A common issue cited by respondents who had been exposed to imported product was that overseas manufacturers tended to change product specification without notice to the customer and “quality fade” and component substitution occurred over time. This led some companies to place their own product manufacturing inspectors within overseas factories.

Respondents did not indicate in interviews that that they were downgrading quality to compete however the comment below is insightful regarding the pressure to do so.

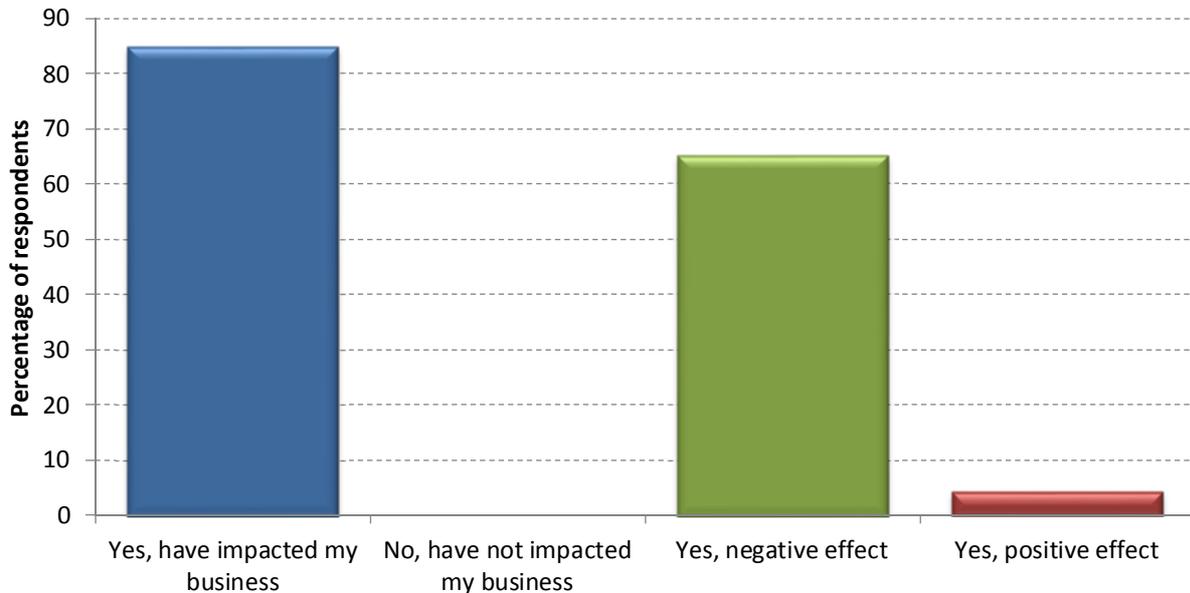
“(Our manager) ... continually grapples with the conflict between safety compliance and winning a project (when competing against companies who supply) NCP.”

Business impact

65% of Glass and aluminium sector respondents stated that they were negatively affected by NCP by lost revenue/margin and reduced employee numbers.

Based on feedback during interviews, the 4% of respondents who reported a positive effect from NCP indicated that this is due to refit/rectification work opportunities to remedy NCP. Steel fabricators also identified this trend (See Chapter 3 Steel product).

Figure 9 -Have NCPs had an impact on your business in the Glass and aluminium product sector



Source – Ai Group

Some companies are starting to question their research and development expenditure. They noted that this may impede innovation in the windows/ doors market as such low margins cannot support research and development.

“Why do we bother developing ... products when the market fails to achieve compliance in this area”

One respondent had made a significant capital outlay to exploit an innovation but was not making a return due to NCP in the market.

Companies reported deliberately quoting to make a loss on projects to prevent their customers from purchasing NCP.

Other respondents held out hope that customers would return to them after they experienced the negative consequences of NCP.

“Australian manufacturers are hanging on until the cowboys cause enough pain and customers come back to reliable sources”

Not only is there the direct business loss from NCP eroding margins but there are also adverse consequences from damaged relationships. Respondents report that where awareness of NCP has been brought to regulators attention by manufacturers/fabricators, there had been retaliatory action toward them with boycotting of their product. This results in reluctance to report NCPs when found in the market.

FINDING (3) – Non-conforming product exists in the Glass and aluminium products market with 81% of respondents indicating evidence of it in their supply chains. The aluminium extrusion market segment has minimal non-conforming product but has been harmed by dumping.

FINDING (4) – In the Glass and aluminium products sector, a high proportion of businesses (65%) have been negatively affected by non-conforming product with a loss of margin, revenue and reduced employee numbers.

Safety impact

Glass breakage is a potential risk to employees and the public. The current Australian Standard for glass has evolved testing regimes that address strength, deflection and breakage characteristics.

Respondents highlighted thin, weak glass as a potential safety risk. If windows do not minimise deflection in high wind situations then shattering can occur. Homes in cyclone prone areas were highlighted as being particularly vulnerable if the windows do not meet the wind rating requirements of the NCC.

Designated human impact zones are regulated for glass in windows and doors. These require conformance and labelling to the safety glass manufacturing standard (AS/NZS 2208). Evidence of imported labelled glass not meeting the safety standard is growing and this has the potential to cause significant injury or death.

There have been published cases of glass panels shattering and falling from high rise buildings in Australia (See Annexure B). So far no-one has been injured, however these cases illustrate the potential risk to the public from non-conforming glass that is installed at height and is not fit-for-purpose.

FINDING (5) – Non-conforming glass and aluminium products can increase the risk of injury to the public.

Long term asset values

Companies noted that UV stabilisers lacking in seals was reported as potentially creating water ingress problems in the long term. There is a 6 year statutory replacement period for low rise domestic construction and contractual obligations apply for other building types.

The AWA reported (See Appendix B) the case of a million dollar plus home requiring remedial work estimated at \$800,000 (including all glass doors, windows and other building components). No glass doors or windows complied with the relevant Australian Standards.

Appendix B references cases where assets have had very public failures of window systems. A respondent opined:

“Customers are not receiving the installation that was specified. The installations are not performing to the original design or regulatory requirements”

A number of respondents questioned the quality of Australia’s building stock in coming years. A common theme was the likely need to be retrofitting due to failures of window systems. The AWA summed up the issue:

“The AWA expresses deep concern regarding extent of the NCP products in the industry and questions the resulting impact on SME manufacturers and the contribution to the worst building stock in the country. What level of failure is required before someone does something”

FINDING (6) – Non-conforming product in the glass and aluminium products sector can reduce the value of building assets due to the need to remediate.

Potential solutions

The key theme from respondents was the need for market oversight/surveillance by an authority able to act.

“In Australian culture there is only compliance when there is a policeman”

“Window fabricators can still purchase non-conforming glass and use in their window making. The issue is who is going to ‘police’”

“Building culture here is we won’t do anything unless told to”

“Gradual deterioration of the market – no one pushes back”

Third party testing of products was mentioned by respondents as a possible solution.

“In the United States, testing must be done in the US and a rigorous third party certification scheme in place”

Others stated that responsibility should be either on the product supplier (See Appendix C – HIA Building Products Register) or the builder.

“...responsibility (should be) placed on product suppliers and not the builder or inspector”

“The builder (should) agree to use conforming products and there should be an impact on a builder’s license as an outcome of NCP use”

An acknowledgement was made that regulation should not be increased but the current regulations and Building Code requires enforcement.

“Don’t increase regulation but enforce what we have”

6. Other product

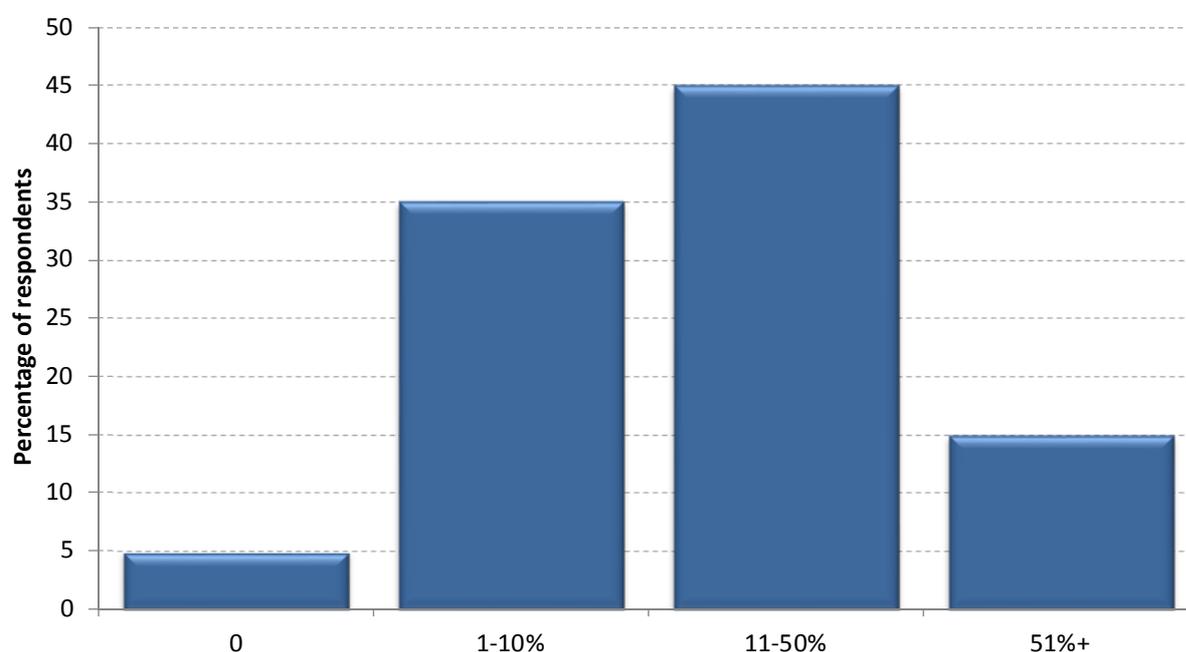
Of the online survey respondents in the **Other product** sector, **65%** indicated that they were manufacturers / fabricators, and **20%** product wholesaler / supplier / importer / distributors with the remain ungrouped.

Other product respondents indicated that they produce a range of construction related items including:

- Polymer products (specifically paint and adhesives)
- Wood products (specifically plywood and other engineered wood products)
- Heating, cooling, ventilation or compressor equipment; and
- Other non-categorised product sectors.

Of the **Other product** respondents, **95%** indicated that non-conforming product had penetrated their market. Nearly half (**45%**) of respondents said that NCP made up **11% to 50%** of their market.

Figure 10 - Percentage of products estimated to be non-conforming in the Other product sector

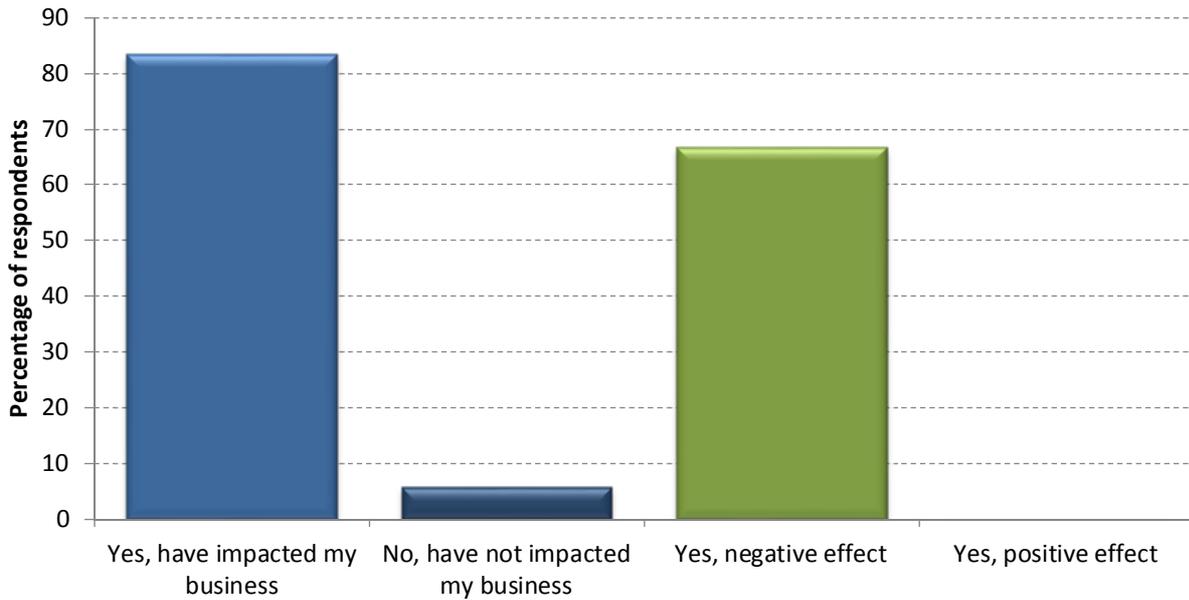


Source – Ai Group

Half of the respondents (**52%**), from the **Other product** sector indicated that their identification of NCP was supported by evidence from onsite failures or visual inspections.

83% of respondents said that they had been impacted by NCP and **67%** indicated that these were negative. Unlike the **Steel** and **Glass and aluminum product** sectors that have downstream fabrication potentially benefiting from NCP rework projects, there were no organisations in the **Other product** sector that reported a benefit.

Figure 11 - Percentage of products estimated to be non-conforming in the Other product sector



Source – Ai Group

Of those organizations reporting a negative NCP impact, **77%** of respondents had lost revenue / margin and reduced employee numbers.

One third of companies indicated that they had not complained to a regulator and another **third** stated that they had. Of those not complaining, **33%** thought that it would lead to a vexatious claim on their business. Of interest, there were no responses indicating that companies did not know who to complain to or how to make a complaint.

Engineered wood product

Market

The Engineered Wood Products Associations of Australasia (EWPAA) estimates that the market in Australia (and New Zealand) for engineered wood products is \$2 Billion annually. Respondents report that the market trend has been downward in terms of volumes and price. This is attributed to the slowing building and construction sector, high dollar and increasing import product market share. Respondents indicated that the latter is due to surplus capacity from overseas mills being redirected to the Australian market.

Data from Industry Edge ³³ shows imports of engineered wood products (plywood) from Malaysia, Indonesia, China, Chile and Brazil.

Engineered wood products divide into the categories of: plywood, medium density fibre (MDF) board, particle board and laminated veneered lumber (LVL). The low value end of the market is particle board and MDF. The high end of the market is structural plywood and LVL. Structural plywood is used in bracing, flooring and concrete formwork (“formply”). MDF is used in doors and cabinets and flat pack applications. Particle board is found in flooring and LVL is used in composite beams.

³³ Forest & Wood Strategic Review 2013, pg 143

Regulation

The Australian Standard AS 3610 *Formwork for concrete* references AS/NZS 2269 *Plywood – Structural* and AS/NZS 2271:2004 *Plywood and blockboard for exterior use*. AS 3610 is also referenced in various WHS codes of practice in the jurisdictions (e.g. QLD³⁴ and NSW³⁵). The standard is also referenced in the draft Safe Work Australia Code of Practice for Formwork and False Work (Available as a draft from the Safe Work Australia website).

In NSW, AS 3610 had been previously called up in the Occupational Health and Safety Regulation 2001. This was repealed with the Work Health and Safety Act 2011 (WHS Act) and the Work Health and Safety Regulation 2011 (WHS Regulation). The Engineered Wood Products Association of Australasia (EWPAA) reported the status of AS 3610 (previously mandatory under the 2001 Regulation) is now less clear with the 2011 Regulation³⁶ noting that the standard is referenced by the NSW Formwork Code of Practice³⁷.

Respondents have advised that government regulatory agencies (ACCC and state WHS regulators) have historically been involved in enforcement and compliance activities in the “formply” market. Other entities involved in surveillance activities include the CFMEU and the EWPAA.

The ACCC has previously written to importers of plywood asking that they comply with voluntary standards. The WHS authorities have closed building sites and released safety alerts when non-conforming “formply” has been detected. Notwithstanding these previous regulatory initiatives respondents expressed concerns with the current role of regulators:

“... you have to put stuff on a platter for them .. (they) are very hard to engage – I’m not aware that they have ever pursued anyone”

“No government agencies (have done) testing in last 15 yrs”

“Australian Standards are not enforced by Federal Government authorities ...”

“Building commissions, workcover authorities and the competition regulator are theoretically responsible but no agency does anything, at most (they) issue an alert”

“All rules are in place but no-one checks”

“... importing NCP is too easy, the barrier is gone, there is no regulator, only industry surveillance”

Respondents indicated that they believed that market surveillance was a regulatory function however in recent times the only surveillance that they had observed was carried out was by the EWPAA (at point-of-sale – see case study below) and the CFMEU (at point-of-installation) on construction sites. The CFMEU has run campaigns against non-complying formwork ply and educate their members to identify non-conforming “formply” on worksites.

The EWPAA summarised the situation:

“There is a total lack of enforcement. The system is there however regulators are not resourced and lack the will to act. The situation of non-compliant product is not taken seriously and regulators do not act on complaints nor impose penalties”.

³⁴ Department of Justice and Attorney General, Workplace Health and Safety Queensland, Formwork Code of Practice 2006

³⁵ WorkCover NSW, Formwork Code of Practice 1998

³⁶ NSW Government, Work Health and Safety Regulation 2011

³⁷ WorkCover NSW, Formwork Code of Practice 1998

Case study: EWPAA Certification Scheme

The Engineered Wood Products Association of Australasia (EWPAA) has members with manufacturing plants in Australia, New Zealand, PNG and Fiji. The EWPAA run the JAS-ANZ accredited Plywood and LVL Certification Scheme Register. This scheme provides certification against AS 2269 (Parts 1, 2 & 3) *Plywood – structural*, AS 6669 *Plywood – formwork* and AS/NZS 4357.0- *Structural Laminated Veneer Lumber*. This scheme is available to all manufacturers of Engineered Wood Product with manufacturing operations in Australia, New Zealand, Fiji and PNG. All testing is done at the EWPAA's NATA accredited laboratory.

The scheme involves auditing all factories twice yearly plus ongoing sample testing (daily) of product from the plant. The testing that is done includes: machine stress grading, modulus of elasticity, bending strength, bond quality, branding and veneer jointing. Members that fulfil the requirements of the scheme are entitled to use the "PAA Engineered Wood" mark.

The EWPAA also conducts market surveillance both reactively (based on complaints) and also proactively (at point of sale). This scheme was commenced to test/verify market claims. This surveillance involves product purchase and testing to relevant standards. When non-conforming product is detected, the EWPAA either approaches the supplier concerned, raises the failure with the relevant regulatory body or undertakes legal action. The EWPAA reports that they take product from the market once to twice a month for testing. They advise that the total amount spent on surveillance including product purchase and testing is in the order of \$40,000 annually. Sampling is targeted based on a range of market indicators.

Non – conforming product

Non-conforming product issues reported from respondents included (See Appendix B):

- lack of testing to Australian standards even though contracts may require it;
- formaldehyde used in resin systems;
- watered down resins;
- lack of or incorrect labelling which in some cases is fraudulent; and
- failing of bond strength resulting in de-lamination.

EWPAA information indicates that all domestic producers of structural plywood are third-party certified, regularly audited and the incidence of non-conforming product from domestic supply is very low to non-existent.

EWPAA market surveillance in the last 12 months showed that approximately 70% of structural ply samples taken at point of sale failed. The failures mainly occurred with imported structural plywood however respondents indicated that this varied depending on the country of origin and importer. The Australian Timber Importers Federation has stated that:

"Many plywood importers are certified against the relevant Australian standards by organisations such as SAI Global and other certifiers and are responsible operators who are also concerned about non-conforming product."

Domestic manufacturers of plywood indicated that there has been significant impact on their businesses of non-conforming product and they were not confident in the outlook for the industry – a range of comments typified this view:

"... since the GFC the market has been getting worse – customers are more budget conscious ..."

"(We are on) an equal playing field (only) 50% of the time"

“NCP is growing... volumes are increasing... number of players are increasing ... NCP used to be a couple of examples per year now NCP is weekly”

“Can’t make money out of manufacturing; cannot invest ... this cannot keep happening. NCP is grabbing the market”

“ NCP has taken volume from the market”

“Future is dire for Australian manufacturing”

FINDING (3) - The engineered wood product market has non-conforming product penetration.

FINDING (4) - Non-conforming product is adversely impacting Australian engineered wood product manufacturers.

“Formply” is used in high risk applications exposed to substantial forces from reinforcing steel and concrete during pouring. Failure of “formply” can have substantial detrimental WHS consequences for personnel.

Respondents involved in structural ply manufacture had awareness of the significant safety issues particularly with “formply”. Responses like the following were typical:

“There has been many collapses of formwork and there has been deaths”

The most commonly quoted case of “formply” failure was the Tuggerah fatality. In this case there was failure of concrete formwork plywood attributed to misrepresentation of stress grades and this resulted in loss of life on a bridge job site in Tuggerah NSW 1986.³⁸ The EWPA noted other formwork collapses believed to be non-conforming product that had resulted in minor injuries.

FINDING (5) - Non-conforming product, particularly with formwork applications, carries a notable risk to employees.

Solutions

Many companies believed that the problem would be solved if building regulators did their job. Some believed that a licensing scheme was needed for importers. Others took the view that it was an industry problem and hence industry should solve it. Overwhelmingly respondents believed that a system of surveillance and compliance in the market would reduce the incidence of NCP and level the playing field.

“(We are on) an equal playing field (only) 50% of the time”

“In Australia there is no capacity to oversight the situation”

“More rigour around compliance testing – industry to take the initiative”

“(There is) not much risk when breaking the rules – (you) are not held accountable”

Paint products

Market

According to the Australian Paint Manufacturers Federation (APMF) architectural and decorative paints sales in 2013 were over 130 million litres. Architectural and decorative paints occupy approximately 50% of the protective coatings market that is worth \$2.7 billion annually in 2013.

The Australian paint market is described by respondents as “aggressive” and dominated by four main manufacturers with Australian production comprising around 90% of the total market. Sales to “trades” purchasers prioritise price, speed of application and quality whereas domestic sales tend to prioritise brand loyalty first. Manufacturers highlighted that they run strong advertising campaigns using significant marketing budgets.

Companies indicated that most paint sold in Australia is water based with a trend away from solvent based. Water is the most significant component of water based paints leading to business models that work best with local manufacturing infrastructure because of the high relative cost to transport water. As a result of this natural barrier imported paints are typically confined to the niche, high margin market segments.

³⁸ *Concerns over unbranded and potentially unsafe formply in use in Victoria*, EWPA 26 February 2004

Australian paint manufacturers argue they produce the highest quality paints globally out of necessity to cope with the harsh extremes of the Australian environment. Adding to this is an active consumer advocate that regularly run comparisons on paint performance. Paint manufacturers indicate they actively watch their competitors to test and analyse each other's products.

Regulation

Australian manufacturers either directly or indirectly fall under the regulatory schemes of the National Industrial Chemicals Notification and Assessment Scheme (NICNAS), the Therapeutic Goods Administration (TGA), the Australian Pesticides and Veterinary Medicines Authority (APVMA) and the state environmental protection authorities.

The CSIRO's Australian Paint Approval Scheme (APAS) tests for paint performance and certification to this scheme gives paint manufacturers access to Government contracts in defence, roads and housing as well as the credibility that comes with certification.

Australian paint manufacturers all agree that the poor actions of one may have an effect on them all. The APMF commented:

"APMF members are committed to sustainability and to producing world class surface coatings. The APMF also maintains strong relationships with the various regulators to ensure compliance across the industry."

Manufacturers do not wish for further regulatory intervention and work hard to self regulate on issues such as volatile organic compounds (VOC) through the APAS scheme. This has resulted in the industry embracing water based technologies for paint and setting targets for the reduction of solvent based paints. The success of self regulation through this scheme was acknowledged in the Environment Protection Council's report³⁹ on VOC's.

Non-conforming product

No evidence was reported by survey respondents regarding significant amounts of non-complying product in the architectural and decorative paint sector.

FINDING - There was minimal evidence reported by respondents of non-conforming product in the architectural and decorative paint market. This is due to a number of factors including:

- **High brand loyalty that creates a barrier for market entry;**
- **Product characteristics that favoured local production;**
- **Aggressive competition amongst manufacturers who are also cognisant of the common good issues and hence self regulate well on issues such as VOCs; and**
- **A widely embraced third party certification scheme.**

Plastic pipes and fittings

Market

The Plastics Industry Pipe Association (PIPA) have advised that plastic pipes and fittings are a key part of the pipe market in Australia that is worth in excess of \$2 Billion. Plastic pipes and fittings have major applications in water and wastewater infrastructure, gas, mining, irrigation and plumbing pipe in the building and construction sector. The two most common plastic pipe materials are PVC and Polyethylene (PE). The PVC and PE pipe and fittings market comprise both Australian and imported products.

³⁹ VOCs from Surface Coatings –Assessment of the Categorisation, VOC Content and Sales Volumes of Coating Products Sold in Australia, Environment Protection Heritage Council, 2009, p172

Regulatory structure

The WaterMark⁴⁰ Certification Scheme (the Scheme) is a mandatory certification scheme to ensure that plumbing and drainage materials and products are fit for purpose and appropriately authorised for use in plumbing installations. The National Construction Code Volume 3 (also known as the Plumbing Code of Australia - PCA) requires certain plumbing and drainage materials and products to be certified and authorised for use in a plumbing or drainage installation

The Australian Building Codes Board (ABCB) took responsibility for the management and administration of the Scheme on 25 February 2013. The Scheme is referenced in the National Construction Code Volume Three (referenced in State and Territory building regulation). The ABCB enforces the correct use of the WaterMark certification trademark on certified products via accredited conformity assessment bodies evaluating and certify plumbing and drainage products. The Scheme uses a contract chain approach to enforcement.

PVC and PE pipes and fittings are covered by established Australian and International Standards and the Scheme, or are specified as mandatory requirements by infrastructure agencies.

Respondents pointed to weaknesses in the conformance framework:

- No ongoing surveillance of the supply chain particularly at point of sale.
- Variation in the consistency of certification. One company noted:

“The system puts faith in certifiers – there are variations in terms of the rigour applied”

- Long response times in addressing NCP issues

“There is a missing link where we cannot take timely action to prevent NCP from being sold”

Case study⁴¹: Non-conforming product in PVC pipes

PVC products are specifically designed for installation within buildings and subject to the National Construction Code Volume 3. This application is covered by state based regulation and subject to the requirements of AS/NZS3500 where product certification via the WaterMark Certification scheme is mandatory.

A plumbing product bearing the WaterMark label, was purchased and taken for independent testing by the industry association Plastics Industry Pipe Association (PIPA). This product was found to be non-conforming as it contained lead based stabilisers.

The relevant conformance assessment body (CAB) was approached and they confirmed non-compliance of product through their own testing and as a result the manufacturing facility was re-audited. The factory passed the audit and the WaterMark licence remained in place.

The state plumbing regulator was contacted by PIPA and they advised that they could only take action at point-of-installation as their jurisdiction did not include point-of-sale enforcement. The plumbing regulator referred PIPA to the Australian Building Codes Board (ABCB).

The state fair trading agency was also contacted by PIPA however they advised that as PIPA was not a “consumer” and the product was not a “consumer product” (this plumbing product is classified as a “building product”), they had no jurisdiction and also referred PIPA to the ABCB.

Subsequent communication by PIPA with the ABCB confirmed that, as the WaterMark scheme administrator, it does not have jurisdiction for oversight of products at point of sale or post installation.

The case study highlights the difficulty stakeholders can face in knowing which regulator to approach in the building construction sector when NCP is encountered. It also shows that point-of-installation / post installation conformance schemes are ineffectual in addressing NCP identified at point-of-sale.

⁴⁰ Responsibility and administration of the WaterMark Certification Scheme transferred to the Australian Building Codes Board on 25 February 2013. A full review of the Scheme has commenced and a draft report will be released for public comment in late 2013.

⁴¹ The events in this case study occurred during the transition of the administration of the WaterMark scheme from Standards Australia to the Australian Building Codes Board.

Non-conforming product

Respondents report instances of non-conforming product where lead stabilisers have been used in the manufacture of PVC fittings (see case study). The Australian PVC pipe industry has committed⁴² to product stewardship and extended producer responsibility to remove lead from the supply chain. The use of lead based stabilisers in non-conforming product also results in a cost advantage over conforming stabiliser systems.

Respondents indicated that at this stage non-conforming products were an “irritant” and had not yet penetrated a significant portion of the plastic pipes and fittings supply chain. Concern was expressed that the current level of penetration, whilst small, was potentially the “thin end of the wedge” and that the industry needed to act on NCP before it gained a significant foot hold in the supply chain.

PIPA expressed concern that the reputation of the industry would suffer if there was an increase in lead stabilisers in plastic piping. PIPA also observed that:

“We have a system that places stringent conditions on some parts of the system and then leaves the door wide open in other parts. This systemic problem therefore undermines community confidence in the regulatory framework and the resolve of compliant manufacturers to continue to operate in an environment where the regulatory system places their compliance at a commercial disadvantage. Even in regulated applications with established product standards and independent product certification the lack of effective surveillance and enforcement at point of sale permits NCP to enter the market”

FINDINGS (1b) - There are weaknesses and gaps in the conformance framework not allowing surveillance and enforcement on the supply chain at point-of-sale.

FINDING (3) – Non-conforming product is present in the plastic pipe industry but not yet in quantities to significantly impact manufacturers commercially.

⁴² Source www.pipa.com.au

7. Potential economic impact

Australia's Construction Industry – Size and significance⁴³

The Australian construction industry is a significant driver of economic activity, representing the third largest contributor to Gross Domestic Product (GDP). It produces the buildings and infrastructure essential for the operation of other industries and the prosperity of the nation. It comprises over 200,000 businesses nationwide and employs one of the largest workforces in the country. Demand for, and supply of construction activity and services is driven by economic factors including population growth, consumer sentiment, interest rates and inflation. Government policies affecting residential building and infrastructure building demand also have an influence. The availability of resources, including labour, building materials and equipment are other key determinants of growth in the industry. The supply chain network is complex and strongly interrelated, encompassing manufacturing (materials, equipment, components), services (engineering, design, surveying, consulting, lease management) and traditional construction trades.

In 2012-13, the industry contributed 7.3% of Australia's Gross Domestic Product in chain volume, gross value added terms. Total construction activity in 2012-13 was valued at \$25.7 billion (chain volume terms). Engineering construction is the dominant sector (accounting for 60.7% of the value of all activity in 2012-13) followed by residential building (23.2%) and non-residential building (16.1%).

Approximately 210,000 businesses operate across the industry (2011-12 ABS data) including project based businesses (major builders and contractors, designers, engineers, project managers); property sector businesses (organisations that develop, commission, own, manage and lease buildings and other infrastructure) and; the traditional construction trades (concreting, bricklaying, structural steel and carpentry services).

The industry is also characterised by a low level of concentration (see table 3). Businesses with employment of less than 20 (97.8% of all businesses) account for slightly less than half of total income and expenses, and just over one half of total industry value added. In comparison, large businesses of 200 or more employees (0.1% of all businesses) have control over a relatively high proportion of the industry's income (27.3%), expenses (29.5%) and account for one quarter (25.4%) of industry value added.

The construction industry in Australia comprises one of the largest workforces in the country, with 1.07 million employed in the industry as at May 2013 (see chart 3). This represents 8.6% all employment and compares with 7.6% of all employment a decade ago.

In 2011-12, construction businesses on aggregate generated \$29.9 billion in operating profit, representing 8.2% of the profit of all industries. In the two years to 2011-12, total construction industry profits declined by 16% driven by declines in operating profit in heavy and civil engineering construction (-67.8%) and building construction (-34.5%) which coincided with a narrowing in profit margins for both sectors. Construction industry profits (particularly in the heavy/civil engineering sector) have come under pressure in recent years from supply constraints with respect to skilled labour, materials and equipment. This has led to rising input costs and a narrowing of profit margins. Project cancellations and delays have also impacted on profits as these circumstances can result in businesses taking on work that delivers little or no profit in order to keep their labour and capital resources employed and to maintain cash flow. Strong competition for building sector work and a corresponding lack of pricing freedom are other factors which have directly impacted on profits.

The building and construction supply network is a complex chain of interrelated operations encompassing suppliers of raw materials and primary products through to manufacturing and project based businesses supplying complex products, systems and services as well as the wholesale/retail sector. Due to the industry's important linkages with other sectors, its impacts on the economy go well beyond the direct contribution of construction activities.

Approximately 30% of all intermediate inputs demanded by the domestic construction sector are sourced from the manufacturing sector, including 24% from the domestic manufacturing sector (the remaining 6 per cent is imported from overseas manufacturers).

⁴³ Ai Group

The various manufacturing industries in Australia are highly dependent on the domestic construction sector. The degree of this dependence is evident in Figure 12 which shows the percentage of each manufacturing industry's output that is used by the construction sector (as an intermediate input) when taking into account all uses of that industry's output (for example, the output of a manufacturing industry may be used as an intermediate input or may be consumed by households or government or be exported).

Figure 12 - Relative dependence of manufacturing industries on the construction sector

Manufacturing industry:	Per cent of output used by construction sector
Other non-metallic mineral products	59.3
Wood and products of wood and cork	38.1
Fabricated metal products except machinery and equipment	32.1
Rubber and plastics products	13.4
Electrical machinery and apparatus n.e.c	11.1
Machinery and equipment n.e.c	10.0
Manufacturing n.e.c; recycling	9.6
Chemicals and chemical products	6.1
Basic metals	6.0

Source: OECD input-output tables, 2004-05, basic prices, ISIC 3 digit industry classifications.

The construction industry continues to represent a major sector in the Australian economy. The industry both drives and is driven by levels of aggregate economic growth. There is a wide diversity in activities undertaken and the supply chain network is complex and strongly interrelated. The industry is dominated by small size businesses employing less than 20 persons and has a low level of concentration. Businesses employing 200 or more persons contribute a disproportionate share of total industry income and value added. Although the industry's share of GDP decreased slightly 2012-13, it has generally trended higher over the last decade. Moreover, the industry's workforce remains one of the nation's largest at 8.6% of total employment.

Large investment in engineering construction projects has driven solid growth in the value of work done in recent years, helping to offset subdued conditions across the residential and non-residential building sectors. As a result, the share of engineering construction in total construction has risen while the share of building work has declined. Despite the overall growth in the value of work done, profits and margins have come under increasing pressure in recent years highlighting a tender pricing environment that remains highly competitive.

Non-conforming products and re-work

In terms of an overall view on the impact of non-conforming products on the building and construction industry interviews were conducted with Tier 1 Australian builders/ constructors to determine the percentage of overall contract value taken up by the need to re-work projects due to non-conforming materials/ equipment/ structures/ components.

One builder/constructor estimated the percentage of overall contract value resulting in re-work due to NCP needing to be replaced/ rectified at between 0.25% - 2.5% of overall contract value.

Cost components involved in the rectification work include additional: Labour; machinery; fuel; liquidated damages. Worker safety issues are also exacerbated when rectification work is done due to exposing workers to the additional work and additional safety issues due to rectification sometimes needing to be done after works are commissioned (lane closures, access to areas controlled by other parties (e.g. electrical sub-stations)).

Another builder/ constructor gave examples of non-conforming products causing a financial impact on their industry. The industry is characterised by profit margins between 3 – 12% and company insurance doesn't cover product failure (it only covers the damage caused by non-conforming products and not the costs of replacing the failed products).

On one project valued overall at \$150million (with 5 – 8% profit margin), an issue of non-conforming plastic pipe will cost around \$3 million in total to rectify (2% of overall contract value).

Another example of non-conforming glass windows highlighted that product suppliers will sometimes only offer the original cost of the products as compensation years after the original products are purchased.

The Australian Constructors Association linked the issue of NCP and project life expectancy:

“The activities of the construction industry, be it the construction of infrastructure (e.g. roads, railways or ports), resource projects (mining, oil and gas), public buildings, commercial buildings or residential accommodation, has a significant impact on Australia’s ability to maintain a sustainable economy, sustainable communities and a sustainable approach to environmental targets.

The construction of projects incorporating energy efficiencies, reduced operational costs and maximising the overall whole of life expectancy for the specific project cannot be met without the use of construction products that are, and are capable of being, fit for their intended purpose and able to perform their function in accordance with the requirements of the relevant standard.

Non-conforming products have the potential to cause significant expense in construction projects, not just in terms of delays while they are returned or replaced, but in the context of the downstream impact they may have on the viability or life expectancy of the particular project in which they are installed. This has implications for users of those completed projects as well as for those responsible for paying for their development and ultimate replacement.

The cost of infrastructure construction is currently the subject of a reference by the Federal Government to the Productivity Commission. The issue of the impact of non-compliant products on the cost of construction is a significant matter for that Inquiry.”

Case Studies: New Zealand “leaky homes” & British Columbia’s Condominium Construction

- The leaky homes crisis in New Zealand is an ongoing construction and legal crisis due to weather tightness problems causing decay of timber framed buildings constructed during 1994 to 2005. Extreme cases made buildings structurally unsound whilst other buildings became unhealthy to live in due to mould within the damp timber framing. The repairs and replacement cost was estimated to be \$6⁴⁴ - \$11.3 billion⁴⁵ in 2009. The factors and causes that led to this crisis are attributed to a move to performance based building standards, weak building inspections (insufficient documentation), a decrease in construction industry skills and careless (or faulty) construction techniques. Whilst not attributable to non-conforming products, this case demonstrates the possible scale of issues that can result when large scale rectification work is required. Media reports indicate that many builders and architects have wound up their businesses to remove themselves from liability, leaving council authorities and homeowners to pay for repairs.
- British Columbia had a very similar issue to the New Zealand leaky building syndrome from 1983 through 1998. The 1998 Commission of Inquiry into the Quality of Condominium Construction in British Columbia⁴⁶ concluded (amongst other findings) that the failures resulted from: ineffectual regulation regarding responsibility and accountability at each stage of the construction process; an inability...to ensure inspectors play a meaningful role in maintaining building standards and in enforcing building codes; a lack of monitoring to ensure accurate interpretation of the building code as well as performance requirements; and a lack of developer, builder and general contractor responsibility.

Gerry Fanaken, an official of Vancouver Condominium Services commented to the Commission:

“It turns out that our world class city is, in fact a world class disaster when it comes to the design and construction of condominium strata corporations. With shame, we must all admit it is a world class disgrace.”

⁴⁴ The New Zealand Herald 19 Sept, 2009, “Leaky homes throw up \$6bn repair bill”

⁴⁵ The New Zealand Herald 22 Dec 2009, “Leaky homes will cost \$11.3b to fix – report”.

⁴⁶“Commission of Inquiry into the Quality of Condominium Construction in British Columbia”, June 1998. <http://www.qp.gov.bc.ca/condo/>

Other economic considerations

Supply chain and economic conditions that may have led to an increase in non-conforming products include an increase in the percentage of imported products made to other standards or in factories lacking a quality and conformance culture. The increase in imported products is thought to be due to a massive supply side increase of cheaper products and the recent high value of the Australian dollar.

The Electrical Regulatory Authorities Council surmises on the current state of the electrical equipment supply industry:⁴⁷

“The growth in the number of electrical appliances and the importation of many of them from emerging economies rather than being manufactured in Australia has also resulted in issues of quality control (e.g. change of manufacture process or components used) that impinge upon safety aspects of the equipment. This is illustrated in the recent example where global toy company Mattel recalled over 10 million toys worldwide. These toys were manufactured in China and contained lead paint and/or tiny magnets that could be swallowed. This case illustrates the risks in a global economy where goods manufactured in an emerging economy may not necessarily meet the safety requirements of developed nations.”

⁴⁷ ERAC Regulatory Impact statement on the Proposed Electrical Equipment Safety System, 2009. <http://www.erac.gov.au/>

Appendix A – Survey questions

Survey of non-conforming products

Q1. What type of service does your business mainly provide?

Please choose **only one** of the following:

- Product manufacturer / fabricator
- Product wholesaler / supplier / importer / distributor
- Product installer (e.g. installation of products not requiring a licence)
- Construction industry head contractor
- Construction industry design, engineering or site services
- Construction trades contractor or sub-contractor (licenced trades eg. Electrical contractors etc).
- Other

Q1.a What type of product does your business mainly provide?

Please choose **only one** of the following:

- Aluminium products
- Electrical equipment (e.g. lighting, cabling, accessories)
- Glass products (e.g. glass windows and doors)
- Heating, cooling, ventilation or compressor equipment
- Polymer products (specifically paint and adhesives)
- Steel or iron products (e.g. structural steel or steel sheeting)
- Wood products (specifically plywood and other engineered wood products)
- Other

Q2. What was your approximate annual turnover in 2012/2013?

Please write your answer here:

Q3. Approximately how many people do you employ? (Full time equivalent)

Please write your answer here:

Q4. Please rank the following product attributes most valued by customers in your industry/supply chain (Australian and overseas). (Click on an item in the list on the left, starting with your highest ranking item, moving through to your lowest ranking item)

Please number each box in order of preference from 1 to 6

- | | |
|----------------------|-------------------------------|
| <input type="text"/> | Product quality & reliability |
| <input type="text"/> | Product cost (purchase price) |
| <input type="text"/> | Product compliance |
| <input type="text"/> | Product availability |
| <input type="text"/> | Product consistency |
| <input type="text"/> | Other (Please specify) |

If other, please specify

Please write your answer here:

Q5. What percentage of products in your industry/supply chain (Australian and overseas) area do you estimate are non-conforming products?

Please write your answer here:

Q5.a. If non-conforming products appear in your industry/supply chain (Australia and overseas), please estimate the proportion of such that were manufactured in Australia?

Please write your answer here:

Q6. What indication do you have of non-conforming products in your industry/supply chain (Australia and overseas)? (check any that apply)

Please choose **all** that apply:

- Anecdotal
- On-site product failure or visual inspection
- Own testing
- Notification by supplier, industry or regulator (e.g. recall)
- Other: please specify:

Q7. If non-conforming products appear in your industry/supply chain (Australia and overseas), how would you categorise the non-conformance? (check any that apply)

Please choose **all** that apply:

- Products do not meet regulatory, Australian or industry standards whether intentionally or not
- Products are not fit for their intended purpose, are defectively made or not of acceptable quality
- Products contain false or misleading claims or do not meet performance claims (whether intentionally or not)
- Products are intentionally counterfeit
- Other: please specify:

Q8. If there are non-conforming products in your industry/supply chain (Australia and overseas), have you ever lodged a complaint?

Please choose **only one** of the following:

- Yes
- No

If no, please select reasons for not complaining

Only answer this question if the following conditions are met:

* Answer was 'No' at question (Q8. If there are non-conforming products in your industry/supply chain (Australia and overseas), have you ever lodged a complaint?)

Please choose **only one** of the following:

- We did not know who to complain to or how to make a complaint
- We have complained in the past and nothing was done so won't waste time again
- No time to complain
- The regulator has other priorities
- We thought complaining would result in added expense to our business
- We thought complaining may result in vexatious claims against our business
- Other

If yes, who did you lodge complaints with and were you satisfied with the response?

Only answer this question if the following conditions are met:

* Answer was 'Y' at question (Q8. If there are non-conforming products in your industry/supply chain (Australia and overseas), have you ever lodged a complaint?)

Please write your answer here:

Q9. If non-conforming products and components appear in your industry/supply chain (Australia and overseas), have they had an impact on your business? (Choose one of the following answers)

Please choose **only one** of the following:

- Yes
- No
- Don't know

Q9.a If non-conforming products and components appear in your industry/supply chain, how has it impacted your business? (check any that apply)

Only answer this question if the following conditions are met:

* Answer was 'Yes' at question (Q9. If non-conforming products and components appear in your industry/supply chain (Australia and overseas), have they had an impact on your business? (Choose one of the following answers)

Please choose **all** that apply:

- Non-conforming products have negatively impacted my business
- Non-conforming products have positively impacted my business

If you have had a negative impact, please rank the 3 most significant negative impacts (click on an item in the list on the left, starting with your highest ranking item, moving through to your lowest ranking item).

Only answer this question if the following conditions are met:

* Answer was 'Y' at question (Q9.a If non-conforming products and components appear in your industry/supply chain, how has it impacted your business? (check any that apply)

Please number each box in order of preference from 1 to 6

- Lost revenue/margin/reduced employment numbers
- Exposure to safety risks for staff and customers
- Downgrading our quality and service offer to compete
- Increased costs due to down time/penalties/re-work etc
- Delays due to refused certification/approval
- Loss of business reputation

If positive effect, please outline reason

Only answer this question if the following conditions are met:

⁹ Answer was Y at question (Q9.a If non-conforming products and components appear in your industry/supply chain, how has it impacted your business..? (check any that apply))

Please write your answer here:

If you would like to receive a copy of the completed report please supply an email address

Please write your answer here:

Appendix B – The evidence of non-conforming product

The following are a selection of references to either photographs (P), test certificates (T), media articles (M) or industry reports (R) sighted by Ai Group during the course of this project that point to the existence of non-conforming product.

Steel

(M) *Faulty bolts blamed for Fairbairn site accident* – bolts failed when tested to the Australian Standard – source Canberra Times 1/4/12

(R,P) *Report by the Australian Steel Institute on the compliance requirements for delivery of the structural steel component for projects* - Collapsed sign on busy highway due to bolt failure, poor galvanising due to steel chemistry, non-conforming steel beam due to steel defects in hot rolled beam, and silicon welds painted grey – source Australian Steel Institute (ASI)

(R,P) *Report by the Australian Steel Institute on the compliance requirements for delivery of the structural steel component for projects* - Imported steel fabrication for a glass sound barrier truss, deflected after erection. Report highlighted split join of main/cross chords oversized bolt holes, diagonal chords filled with water, bottom chords bent, poor paint finish, cracks on section, use of sleeves instead of butt welds – source ASI

(M,P,T) *Shoddy steel road risk*. Article describes issues with roadside guard rails that are not up to standard – source Herald Sun 3/11/2007

(note additional material provided by the ASI including photos and a test report that point to under thickness issue)

(R) *Commercial retail distribution centre*. Non –conforming steel fabrication including: a deficient compliance regime; workshop drawings unable to be read - foreign language; Failed welds to AS/NZS 1554; End plates not square. Link made between NCP and the WHS Act compliance- see “Questions Answered” at <http://steel.org.au/key-issues/compliance/whs-2011/> – source ASI

(R) *Theme park ride* (high ‘risk consequence’) non-conforming: AS/NZS 1163 (plate folded and hand welded instead of specific application and material properties suitable for structural application); sections joined instead of full length members used; deep rust pitting although relatively new structure - source ASI

(R) *Workshop Construction – Structural Steel Portal Frame Industrial Buildings* – Structural member failure (failed weld to AS/NZS 1554) during construction (high consequence WHS issue). The building is in a cyclone prone area (high wind loads are possible) and includes a gantry crane. Where structural members were too long to fit in a shipping container they were roughly cut using oxy acetylene and re-joined on-site by riggers (should have involved engineering advice and qualified practices) - source ASI

(R,P,T) *Report by Queensland Transport and Main Roads (November 2013) based on various projects* – Material substitution with lower grade materials; Galvanising coatings flaking off or under thickness due to high and low silicon content steel respectively; Non-conforming material test certificates (multiple certificates each showing multiple non-conformance); Fraudulent practices (silicon ‘welds’, bolt heads and nuts stuck in place instead of bolts); incorrect welding practices causing structural failures; under size class bolts and nuts; steel fabricators failing audit checks of their work quality, equipment conformity, materials conformity and safety practices as well as welding practices – source QLD Department of Transport and Main Roads

Aluminium / Glass

(M) *Imported windows behind Ararat prison site closure* – article refers to a large number of windows and doors arriving on site that did not fit and could not be installed – source CFMEU 17/5/12

(M) *ASIO building loses another glass panel* – article refers to an WorkSafe ACT investigation into the loss of a panel in the ASIO building that followed the loss of another 20 panels – source abc.net.au 5/10/12

(M) *Waterfront woes: glass plunges from 23rd floor* – article refers to the continuing saga of glass falling from Waterfront Place in Brisbane. This has been an issue since 1990 and required a pedestrian canopy to be built to shield pedestrians – source Brisbane Times 28/12/11

(M) *The Fight For Compliance* – article refers to a house was purchased and no window or door met the required Australian Standard. Remedial works were estimated at \$800,000. The article indicated that the owner of the project had imported windows and doors from China and organised installation. Prior to sale a building consultant had been contracted to do a pre-purchase assessment but did not pick up on non-conforming doors and windows – source Australian Windows Association (AWA), *Windows Winter 2012*

(M) *AWA Member makes good Perth commercial project* - A developer was constructing a 24 storey commercial building. At the time that windows had been installed to the 9th story it was found that they would not comply with wind and water requirements. All windows had to be removed and replaced with conforming product – source AWA, *Windows Autumn 2012*

Electrical

(M, R) *Mandatory Recall: Infinity brand electrical cable* - NSW Fair Trading Commissioner Rod Stowe has announced mandatory recall and prohibition notices for all Infinity branded TPS and “orange round” electrical cable. “...testing of the cables has shown that deterioration of the insulation over time can cause wires to become exposed and potentially result in an electrical shock or fire” – source www.fairtrading.nsw.gov.au 9 October, 2013

(R) *Counterfeit Electrical Industrial lighting* - Counterfeit lighting product using same model numbers to be found at <http://english.jr-lighting.com/pro/304.html> - source SHANGHAI JING RUI LIGHTING CO.,LTD

(T) *Non-conforming electrical cable to the Australian standard AS/NZS 5000* – The cable was independently tested by a NATA laboratory and the insulation was found to fail both the ageing test and minimum radial thickness - source Australian Cablemakers Association, 2012

(R) *Counterfeit electrical accessory* – Counterfeit electrical socket outlet found to be faulty and did not include any markings as required by standards and regulations. The electrician was fined and lost his license for using unsafe product – source Clipsal by Schneider Electric, 2013

(R) *Counterfeit electrical accessory* – Counterfeit industrial electrical products used by an electrical contractor for mines applications and known for product failure but the contractor continued to use as he considered he was still financially in front. The original equipment manufacturer found out about the practice when the contractor asked his wholesaler to start stocking the counterfeit products - source Clipsal by Schneider Electric

(R) *Unsafe electrical accessories* – Electrical switches and socket outlets with accessible metal screw heads able to become live if a cable was to touch the mounting accessory. Non-conforming with AS/NZS 3100 - source Clipsal by Schneider Electric

(R) *De-rated electrical plug* – an electrical plug was de-rated from 50A to 40A without changing the physical design of the product. The plug does not consequently fit 40A socket outlets as the standard requires that higher rated plugs are not able to be installed into lower rated sockets. Non-conforming with the plug standard – source Clipsal by Schneider Electric

(R) *Electrical switch accessory* – fails during endurance testing - source Clipsal by Schneider Electric. (R) *Electrical socket outlet* – not able to allow plug insertion indicating a fundamental lack of quality control procedures during manufacture - source Clipsal by Schneider Electric

Other products

Engineered Wood Products

(R) *EWPA Case Studies in Non-Certified Imported Plywood, Illegitimate use of JASANZ symbol on Chinese Formply plywood* – neither the manufacturer or certification body were JASANZ accredited and the certificate was false and failed tests for bonding, reliability and safety – source Engineered Wood Products Association of Australasia (EWPA)

(R) *EWPA Case Studies in Non-Certified Imported Plywood Site, Workcover Shuts Down Construction Site Using Imported Non-Conforming Formply* - “Formply” showed delaminating, bowing and twisting and was unbranded, testing resulted in a failure to all Australian Standards – source EWPA

(T) *Compliance Assessment Report on Four (4) Sheets of F17 Formwork Plywood Sheets Taken from the open market in the Northern Territory* – sheets did not meet F17 – source EWPA 28/6/13

(T) *Compliance Assessment Report on Four (4) 10.7 GPa Laminated Veneer Lumber Beams Purchased from the open West Australian Market* - LVL failed tests for bond quality and durability to AS 4357 - source EWPA 10/07/13

(T) *Compliance Assessment Report on 17mm “Formply” Imported and sold by ...* - plywood did not comply with Australian Standards - source EWPA September 2013

Plastic Pipes and Fittings

(T) Intertek *PROBE Analytical Report, Analysis of PVC Pipes* (dated 14 September 2012) - Lead stabilisers were found in PVC fittings bearing the Water Mark symbol of compliance - Source PIPA

Appendix C – Other industry non-conforming product initiatives

Approved Cable Initiative (ACI)

The Australian CABLEMAKERS Association introduced the Approved Cables Initiative to address the use of unsafe, non-conforming and counterfeit cable in the Australian marketplace.

With industry support, the ACI is taking a proactive and hard hitting approach to monitor and educate the Australian electrical industry supply chain – from manufacturers, importers, wholesalers and contractors to end users.

The main focus of the ACI is to ensure that electrical cables available in the Australian Market are fully conforming to the relevant Australian standards.

Any cable failing to comply with Australian Standards will be reported to the relevant State or Federal Authorities who have the power to act against these products in the interest of community safety.

In-order to help the Australian Electrical Industry supply chain to have confidence in the electrical cables that they are using, the ACA has introduced the ACI logo.

The presence of this logo on electric cable packaging gives the purchaser the following assurances:-

- The electrical cable is fully conforming to the relevant Australian Standards;
- The electrical cable has passed all the relevant electrical & mechanical testing;
- The cable has been manufactured in Australia; and
- The manufacturing facility complies with all Worker Health and Safety legislation.

ASI Structural Steelwork Compliance Certification Scheme - for fabricated product

There is a current heightened focus from both industry and Government based on awareness of field failures, and rework across the spectrum of a need for a tighter compliance regime for building materials, evidenced by the soon to be released Australasian Procurement Construction Council industry working group recommendations for best practice purchasing, which includes a set of guiding principles in part espousing the need for industry certification schemes and rigorous risk based assessment.

Reinforcing these initiatives, and taking them into the next step of implementation, the Australian Steel Institute (ASI) is in the process of developing a National Steelwork Compliance Certification Scheme, to commence in mid-2014. This Scheme is designed to address the deterioration in compliance to Australian Steel Standards in the opening up of Australian Fabricated Steelwork to the global economy. ASI recognise, as do many others in the industry, that our regulatory system is playing catch-up in the increasingly open markets, and stronger compliance schemes are critical to ensure the public are not exposed to heightened risk.

This scheme is designed around what is in place and working effectively in the UK based on CE Marking and in the USA through the American Institute of Steel Construction.

The Australian Steel Institute is seeking to set up an independently run Steelwork Compliance Authority to operate a prequalification system involving independent audits of steelwork fabricators capability to a range of construction categories.

The drafting of the COP is approximately 50% complete, the draft scheduled to be ready end February 2014 for industry review.

Basis of the Scheme

The scheme assesses a fabricator for demonstrable practices and procedures to deliver the level of quality proportionate to the assessed risk.

The components of the scheme are therefore:

1. On a project specific basis, assessment of risk and complexity of construction and categorise into 'Construction Categories'.
2. Development of mandatory Australian Standards requirements for steelwork construction.
3. Development of a conformance assessment framework and processes to demonstrate that the project has met those requirements.
4. Assessment of the capability of a fabricator or steel contractor to deliver to those risk categories through physical audits.

Australasian Procurement and Construction Council (APCC)

The APCC together with its technical group the Australian Technical Infrastructure Committee have recognized for many years that the responsibility to determine whether or not a construction product is fit for the intended purpose can have profound consequences if the product is defective.

In October 2012 the APCC hosted a workshop on interested industry stakeholders which resulted in the formation of the Construction Products Quality Working Group (CPQWG). The CPQWG agreed that the procurement of construction products has become increasingly complex and information and guidance to assist the procurement process is scarce.

To address this problem and as a 'first step' the CPQWG is developing a guide "Procurement of construction products: a Guide to achieving compliance" to assist architects building designers, specifiers, procurers, builders, contractors, sub-contractors, certifiers and ultimately consumers in the procurement process. This procurement Guide is designed to provide more informed understanding and better decision making in respect to the procurement of construction products.

Publication of the Guide is expected in February 2014.

NECA - Does it Comply?

The peak Australian electrical industry body, the National Electrical and Communications Association (NECA) and the electrical industry information portal Voltimum have joined forces in an effort to raise awareness and educate users of the dangers of using product that is not conforming to Australian Standards. The campaign was developed to complement the new registration scheme for electrical equipment, the Electrical Equipment Safety System (EESS) which began the planned rollout in Queensland and Victoria earlier this year.

One of the key objectives of this campaign is training and education. Voltimum and NECA will run online training programs throughout the year that will help users better understand the dangers, liabilities and implications of using non-conforming product, as well as assisting in identifying product which is non-conforming.

NECA and Voltimum through the "Does it Comply?" campaign have created an industry alliance consisting of ABB, Eye Lighting, Gerard Lighting, HPM Legrand, Nexans Olex, Prysmian Group, Thomas and Betts, Clipsal, Lighting Council Australia, MM Electrical Merchandising and Australian Cablemakers Association who have committed to respect the industry by manufacturing, importing, promoting, selling and using only conforming and genuine product.

Housing Industry Association – Building Product Register

HIA has been investigating the potential to establish an industry led Building Product Register which would supply necessary compliance information about building products in a single location. The purpose of the register would be to foster an environment in which builders, regulators and the community can have confidence in the compliance and fitness for purpose of all building products and materials used in the residential building industry in Australia.

To achieve this HIA has been seeking support to establish a public register of building products and materials used in residential construction that provides confidence that those included on the Register meet relevant building standards, provide documentation to support their claims, and that associated manufacturers and suppliers operate in a manner that ensures ongoing support for users of their products. The suggestion is that the Register have two components: registration of the manufacturer or supplier and registration of the individual products as nominated by the manufacturer or supplier.

Manufacturer Registration

Admission to the Register would be open to all manufacturers, suppliers and distributors domiciled in Australia subject to them satisfying pre-qualification eligibility criteria. Mandatory pre-qualification eligibility criteria could include matters such as financial viability, demonstrating an ability to adequately verify a product's compliance, demonstrating capacity to provide after-sales service including spare parts and providing a warranty to respond to any failures. Applicants would be required to agree to the terms of registration of their company and their products, and demonstrate a commitment to the supply of conforming building products.

Product Registration

Product registration is intended to be open to all products sold in Australia, whether locally produced or imported. Once a company is registered, they would be entitled to put forward products to be listed on the Register by supplying the relevant documentation for registration. Once listed, the company could be licensed to apply a 'mark' to those

individual products. Products would need to show that they have undertaken the necessary performance testing against the relevant Australian product standard and the BCA, supplying all relevant documentation. By applying the 'mark' participants would be warranting that the product performs to the minimum requirements and standards. In particular, that it is of merchantable quality, is fit for purpose and meets the description of the goods as per the product data sheet which is lodged with the Register. Companies will need to adhere to strict requirements regarding the application of the mark and meet the obligations of any service agreement regarding the use of the mark and product support. There will be a license agreement fee as well as a royalty remittance for each application of the mark to support the operation of the Register.



Ai GROUP OFFICES

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