Crane Authentication™

ID Solutions

The best passport protection against identity theft

The story behind the next generation polycarbonate passport data page for Australia

Staying ahead in the technology arms race

The recently launched 'R Series' Australian passport[1], released in September 2022, features an innovative polycarbonate data page that is based on technically advanced, highly secure, multi-layered polycarbonate plastic. The new data page continues the tradition of Australian citizens benefiting from having one of the most advanced, secure travel documents.

This article tells of the collaboration and innovation between Crane Authentication and Note Printing Australia (NPA) to develop a next generation polycarbonate passport data page.

The Australian passport is internationally respected and recognized as a highly secure passport. Its holders can access 185 destinations without a prior visa and the passport ranks among the top 10 of countries on the global mobility spectrum.[2] It is upgraded every 5-10 years, to align with international best practice and to stay ahead of what counterfeiters can simulate.

If your passport is due an upgrade this article highlights the type of technological expertise that can be applied to your next series. It also highlights the benefits of working with Crane Authentication and NPA as your partners.

1 Australia has a new passport | Australian Passport Office (passports.gov.au)
2 https://www.henleyglobal.com/passport-index/ranking [Accessed 2nd December 2022]

Selecting the best partners for your upgrade

Crane Authentication and Note Printing Australia (NPA) have a long history of mutual respect and productive partnerships, having developed and delivered highly secure products to governments and central banks around the world. The collaboration on the Australian passport was more than business-as-usual though – the original vision was to produce something far beyond what could be conceived at the time and to anticipate the future threats to document integrity.

The Australian Passport Office and NPA had an ambition to raise the bar with this development project - the 'P series' was due to undergo a complete redesign and reconstruction so that the 'R series' would be placed firmly at the leading edge of passport and polycarbonate technology.

Crane Authentication has decades of experience designing passports and security features for passports and was rapidly building deep expertise in this area. NPA also has extensive experience, having printed passport material since the 1990's and being among the first organisations to issue a full range of International Civil Aviation Organisation standard e-passports. Crane Authentication listened to the project needs and considered how to leverage its core competencies around product design and security feature development to unlock the ground-breaking innovation that was required.

"Crane Authentication helped drive real innovation throughout this project. They were an ideal partner who understood our vision for the development from the very start."

Malcolm McDowell CEO, NPA

Major Milestones

- Crane Authentication procured a polycarbonate manufacturing line
- NPA issued a tender for a partner in a development project to create a new polycarbonate passport data page
- Crane Authentication was awarded the contract to work with NPA on the development of the polycarbonate data page for the next generation Australian Passport
- Collaboration continued throughout the COVID pandemic The Australian Passport Office approved the final design and security feature selection for the new Australian passport
- Production trials for the final new polycarbonate data page began at Crane Authentication
- NPA awards Crane Authentication a 5 year contract for the sole supply of the polycarbonate data pages for Australian passports
- NPA began manufacturing the new R Series Australian passport book, incorporating Crane Authentication's polycarbonate data pages and Crane Fibre Hinge
- Australia's R series passport was issued and NPA extends Crane Authentication's contract by another 5 years to 2032 and Crane announces an investment to increase its polycarbonate production capacity
- Crane Authentication completes the expansion of its polycarbonate production capacity

From security feature evolution to concept design

Polycarbonate data pages are formed when several layers of polycarbonate film are laminated together at high heat and pressure. They become inseparably bonded, which gives them a significant advantage over standard data pages:

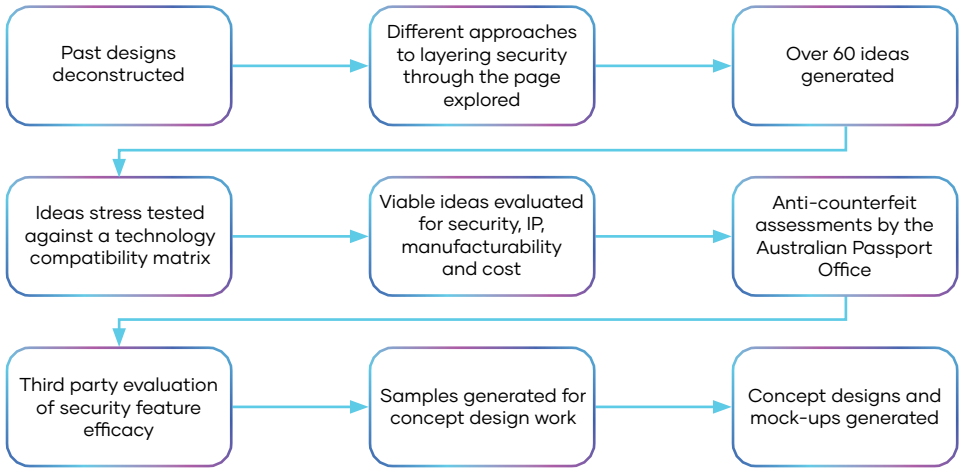
- Any attempt to gain access to the personalized data in the polycarbonate data page will cause damage.

- Features and secure design details can be locked into the polycarbonate data page in a modular way throughout the layers that become fused together.

- This approach allows for high levels of creativity whilst building in complex security in an engaging and intuitive way.

The development of security features for the Australian passport data page was a collaborative effort between Crane Authentication and NPA, with ongoing input from the Australian Passport Office and other relevant suppliers. This partnership persisted through the challenges of the pandemic, resulting in a highly secure and resilient solution.

Polycarbonate security feature development process



The product development was broken down into several individual workstreams that enabled innovative features to be incorporated, such as the integration of the optically variable material into the core which is subsequently revealed by novel edge cut technology.

As part of the process the Crane Authentication and NPA designers spent many hours at Crane Authentication Headquarters testing how the security features and the layers of the data page would work. Concepts were created and mock-ups were produced.

As the security features continued to break new ground Crane Authentication had to develop and build additional modules for feeding, registration optimisation and inspection to incorporate the novel windows shapes and edge cuts into the layered construction of the data-page.

> " We developed 3 new machines and added new modules and camera registration units to enable the complex layered construction to be produced."
>
> Simon Quainton, Lead Scientist, Crane Authentication

The next generation polycarbonate passport data page

The features selected for the R Series of the Australian passport were the result of a real partnership. The project represented five years of effort and the final result is due to an ongoing drive to progress ideas and innovate.

Upgrading your passport to include a next generation polycarbonate data page

For passport issuing authorities looking to upgrade to their next series Crane Authentication and NPA are a proven partnership to enable a unique and highly secure, polycarbonate data page. When Crane Authentication security features are protected within a polycarbonate data page they represent the ultimate protection for any security document. Here are examples of the type of technological and design expertise that can be completely re-imagined for a bespoke solution:

Novel window shapes and edge cuts

- The window technology used for the R series is the next generation solution compared to the standard punched windows used for current polycarbonate data pages which are restrictive from a design and security aspect.
- More free-form windows and different edge cuts are now available, building in additional security, engaging features and visual intrigue that aids authentication.
- One feature of note is the 'double glazing' feature which incorporates a window within another window for complexity and security.

Tactility

- The Australian data page contains a three-dimensional profile of Australia – this initially appears as a nice simple design detail but blocks access to the portrait and would be obviously damaged if the portrait was accessed via it. This type of raised 3D effect could be adapted for entirely different shapes or images.

Fibre hinge

- The unique woven hinge is much more than it initially appears. If page removal is attempted it will unravel and be immediately tamper evident.
- Under normal usage the Crane Fibre Hinge remains durable and flexible throughout the lifetime of the passport.
- UV threads and threads of virtually any color can be included in the woven design – this allows the hinge to match the print design of the passport book and data page.

Ink and metallic features

- A range of matt, gloss tactile features, and UV inks are available to build complexity through the layers, enhance the aesthetic detail and enrich the security of the product through design detail that aids authentication. The specialized secure print patterns and tightly registered details are challenging to counterfeit.
- Innovation continues in this area. Passport Issuing Authorities considering their future polycarbonate passport data pages could also include enhanced GEMINI™ inks, which appears in one color under normal light but appear in perfect register in two colors under UV light.
- For future passport designs Passport Issuing Authorities may also be interested in discussing novel metallic design features, which are currently under development.

Let us help you

Please visit craneauthentication.com for further information and to discover a solution perfectly tailored to your needs.

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