



Category 5 hurricane proof

StormGuard

by NorDan

The only truly unique window in the world



www.nordan.co.uk



The only truly unique window in the world

The 7 wonders of a NorDan Ntech Security window



"Hurricane proof – NorDan timber windows are tested to x5 times the UK requirements for severe weather exposure"

"Removable handle for student safety for high rise apartment blocks"

"Minimal maintenance bills – Over 5 million windows in use with minimum call backs"

"60 year life expectancy"

"Achieves as low as 0.7 u value"

"Surpasses UK security requirements"

"Fit it and forget it!"



From generation to generation... a history we are very proud of

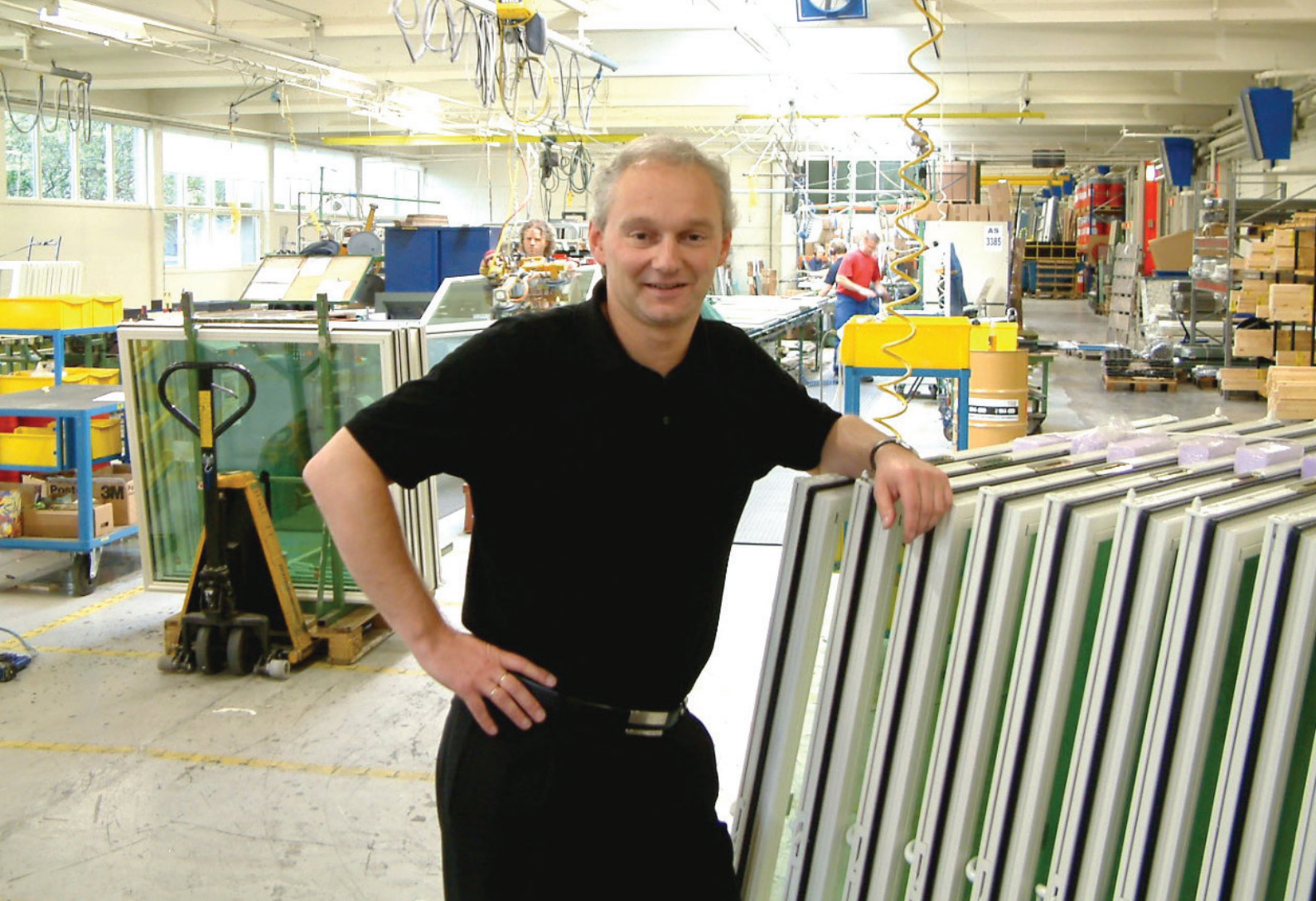


NorDan developed the three handled window with its ball bearing mechanism and no hinges, way back in 1960. The first units were on sale in 1962. It was called the NorDan Perfekt window. Here is an advertisement that was used to promote the new window at that time. Since then we have sold over 5 million units across Europe, with minimal call backs.



1926 - 2016





NorDan windows and doors are manufactured in Norway by NorDan AS. The company was founded in 1926 by Johannes Rasmussen, grandfather of the current managing director Tore Rasmussen.

NorDan is a leading manufacturer in Europe and one of the most financially stable in the industry. NorDan windows and doors are mainly exported to Sweden, Denmark, Germany, Russia, Holland and the UK, countries that often suffer from harsh weather conditions. NorDan has established a unique reputation amongst architects and specifiers in the UK. With their exceptional quality, real value for money especially in life cycle analysis, even over a 60 year period.

NorDan AS has the capacity to produce 2200 windows/doors daily. This makes the firm a major world exporter. Producing from eight large factories, the workforce is in excess of 1400, with state of the art computer controlled production lines. This enables the firm to manufacture in high volumes to satisfy the largest projects, whilst remaining competitively priced. Factories in Norway are in Moi, head office, Otta, Egersund, in Sweden they are located at Bor and Tanum and Keillsfors, and Wolsztyn and Powodowo in Poland.

A policy of continuous R&D ensures that NorDan products are always at the forefront of technology for safety, security and longevity. Regular testing under ISO 9001 guarantees the quality of each product.

The Friendly window: NorDan products are not only exceptionally user friendly, but also environmentally friendly. The design and construction guarantee high performance, low maintenance and long life expectancy. All products are manufactured from top quality Nordic pine, sourced from sustainably managed forests, widely recognised as being ideal for window and door construction.

The traditional choice –Timber has always been the traditional choice for windows and doors throughout the world. NorDan's superior products will last generations.



NorDan provided windows to the Commonwealth Games Village Glasgow 2014



Here **for you...**

NorDan has 6 project management offices across the UK to be closer to you the customer

**NorDan major exporter from Scandinavia
and one of the most financially stable**

We are the largest supplier of aluminium-clad timber windows to the UK affordable housing market. Our top of the range windows require absolutely minimal maintenance and will last a life time, as well as giving high performance with very good u-values. This is important if you are installing or living at the fourteenth storey of a high rise block.

You will read about some examples of how this is working in the UK in this brochure. These facts should give those commissioning large projects some comfort, combined with the fact that we are one of the most financially stable firms in Europe.

You can be assured that as a company we are in the UK for the long term, having invested heavily across all parts of our business and here to help you achieve the standard of buildings you are creating or refurbishing for the future.



Alex Brown
Managing Director
NorDan UK Ltd



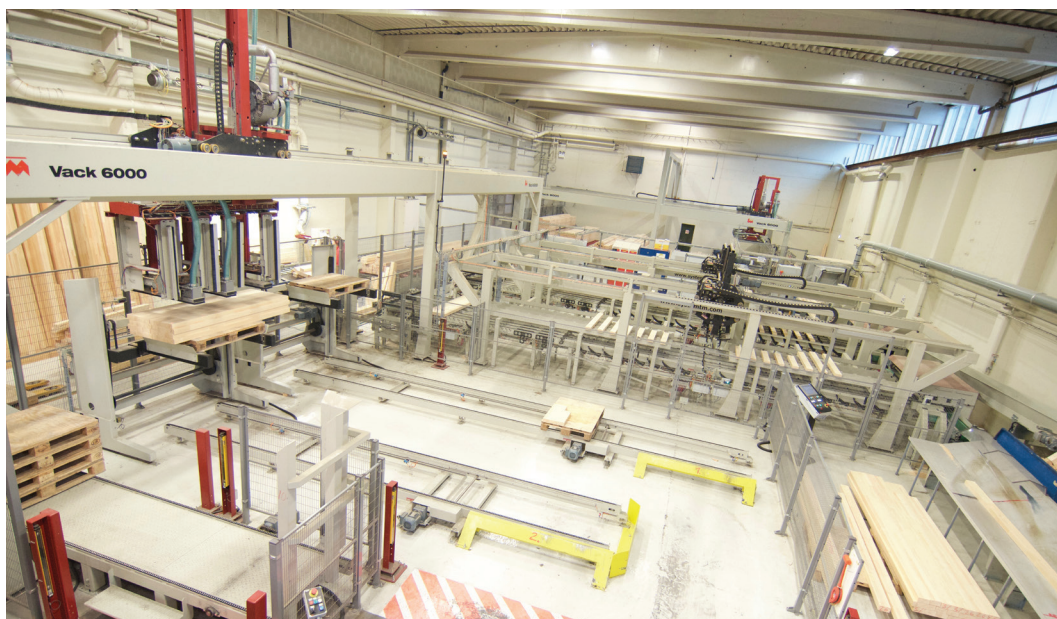
Moi Factory

Moi in Norway is the location of NorDan's headquarters, in the southern part of Rogaland, and where the company was founded in 1926.

In 2016, NorDan is celebrating its 90th anniversary, going from strength to strength as one of Europe's leading manufacturers in the Construction industry. NorDan has eight production factories in Europe giving it enormous strength to deliver to the UK market.

The firm employs 1400 people across Europe and has an annual turnover in the region of 1.6 billion Norwegian Krone. The factories are the cornerstones in their communities and NorDan is an important employer in Norway, Sweden and Poland.



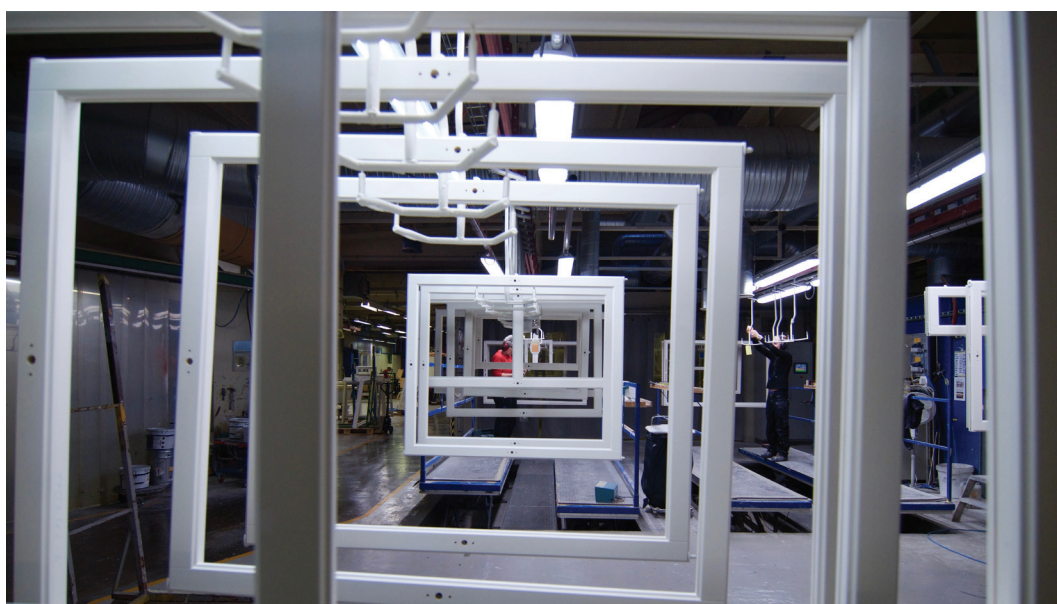


The three handled window we feature in this brochure was designed and developed and is manufactured in the plant at Moi, Norway.

It was created in 1960 by Johannes and Kare Rasmussen, son of the founder. In 1962 a prototype of what was called the NorDan Perfekt window – using a ball bearing mechanism instead of typical hinges, was produced.

The NorDan Moi factory is 16,000m². The firm operates continuous improvement and that has been the case for the last 56 years. A strict environmental policy in place and several generations of local families work together in the factory in Moi. It's a small place with a highly skilled workforce.

Over 5 million ND92 windows have been produced since it was invented. It is such a robust product, with its simple shoot bolt mechanism, that it requires very little maintenance or call backs. The high quality timber is treated before its made into profiles for window manufacture.



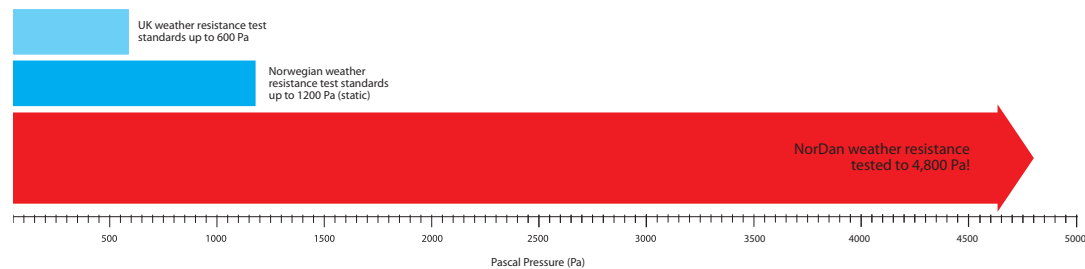
Weather ratings

Air tightness is critical, and weather performance is key to maintaining a consistent environment within a building. This helps achieve low heating bills, and a healthy environment to live in.

Our windows are designed and tested to meet and far exceed British Standards for weather performance. No surprise given the products were originally designed for the Norwegian market where severe winters are normal, excessive wind and rain is frequent and a hot summer is normal too.

The graph below illustrates the dramatic extent to which our windows will resist harsh weather conditions. Our NorDan tilt and turn windows do not leak at a pressure almost three times the Norwegian test standard.

In the UK, our Building regulations for insulation are less stringent than in Norway. The climate in Norway is harsher and products need to be fit for purpose.



Pascals

600 Pa equiv to	69 mph
900 Pa	85 mph
1200 Pa	98.9 mph
4800 Pa equiv to	almost 200 mph

Hurricanes

Cat 1	74 – 95 mph
Cat 2	96-110 mph
Cat 4	130mph – 156mph
Cat 5 (Max)	156 mph and over

"To be classified as a hurricane a tropical cyclone must have max windspeed of at least 74mph." [Wikipedia](#)





Accreditation and **certification**



Secured by Design

NorDan has a wide range of products that are tested and approved to Secured by Design standards: the Police Crime Prevention Initiative to design out crime.



British Board of Agrément

The British Board of Agrément (BBA) is the UK's major authority offering approval of construction products, systems and installers. NorDan has a number of products tested to the most rigorous of standards.



PEFC

NorDan uses timber from internationally recognised PEFC & FSC sources, (the Programme for the Endorsement of Forest Certification) and has Chain of Custody certification, giving you peace of mind that our raw material is responsibly sourced from managed forests.



CE Marking

NorDan has CE marking declarations for all products exported into EU countries. The marking denotes the fact that NorDan's products meet all the appropriate provisions of the relevant European Directives legislation.



Achilles

Achilles Building Confidence is designed to meet the increasingly demanding legislative and risk management needs of construction clients. Achilles Building Confidence community is managed by an industry Steering Group comprising of members from across the sector to drive industry best practice.



ISO 9001

NorDan has had direct ISO 9001 certification since 1991 which is important in satisfying quality controls and operations. The Standard is recognised worldwide and ensures the quality of our products giving customers peace of mind.



CHAS

NorDan is a member of CHAS- the Contractors Health and Safety Assessment Scheme, giving you peace of mind that any of our teams who visit your site are fully trained in site safety.



Swan mark

Product with the 'Swan mark' Nordic eco label is produced with minimal energy, and low greenhouse gas emissions. There are requirements for including raw material extraction, manufacturing, energy efficiency, chemical stress, environmentally sound treatment and recycling potential.





Weather Performance

Wind pressure tested beyond 197mph, the StormGuard window is Category 5 hurricane force weather resistant. Our windows are tested above and beyond industry standards. The design of the sealing within the frame ensures no gaps or cold air can penetrate. With an expected service life of over 60 years, the StormGuard window is the perfect solution for your high rise building project.



Child Safety

Safety is important, but safety is much more than just keeping intruders out. Given the design of this window, opening inwards and tilting inwards, the design itself gives protection to small children at risk of falling out at height. The option to remove the bottom handle and only have the window tilting inwards for ventilation adds to this child safety feature.



Security

Stormguard window from NorDan offers the best safety protection for your home on the market. The seven point lock system is a challenge to potential burglary – making it extremely difficult to break in to. It is impossible to remove the glazed unit from its frame from the outside, due to the design of the construction of the profiles. Our testing and certification ensures that this window will resist break in and keep you and your family safe as well as warm.



Low Maintenance

Spend your free time doing what you want to do. Sit back, relax, and let NorDan do the work. The factory painted finish on a NorDan window ensures you don't have to do any maintenance work for a very long time. Added aluminium cladding enhances this giving near lifetime protection to the timber, and easily replaced in pieces if necessary. Aluminium cladding is powder coated in a range of RAL colours.

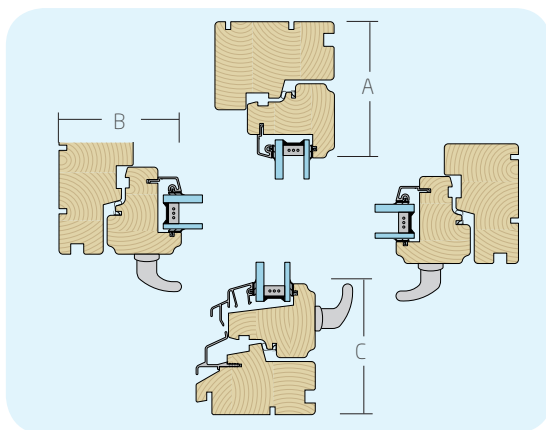


StormGuard

Inward opening

Advanced and easy to use, the StormGuard (3 handled tilt & turn) window tilts for everyday ventilation and turns to allow access to the outside glass for easy cleaning safely from inside. The advanced mechanism is the result of many years of product development. The window has three handles and seven solid locking points. All ironmongery is located safely behind the weather seal gasket for better weather performance.

Frame width	92 mm or 105 mm (Timber), 100 mm or 113mm (Aluminium clad timber)
Width	Min: 388 mm / 488 mm Max: 2088 mm
Height	Min: 388 mm / 488 mm Max: 2388 mm
Width + Height	Max: 3400 mm
Sash weight	Max: 90 kg



Dimensions: A: 94 mm, B: 94 mm, C: 101 mm



Product features

Energy saving	0.7 W/m²K to 1.2 W/m²K
Cleaning	Cleaning from inside
Sound reduction	Rw 37dB Rw+Ctr 33 as standard
Fire resistance availability	EI 30 (depending on size)
Weather performance	Class 9A, EN 12208
Passive availability	Yes

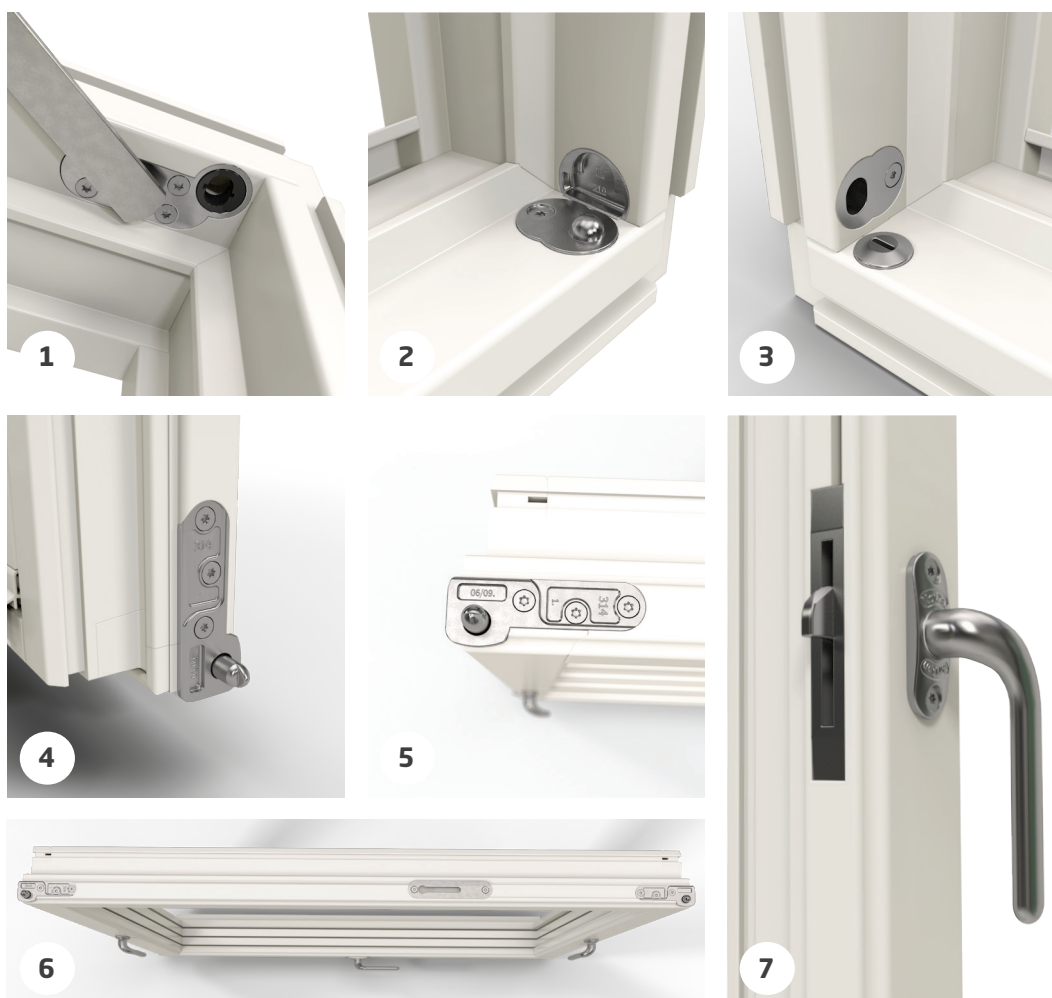
Technical specification

Glass	6-16G-ES4 (double) 4ES-16G-4-16G-ES4 (triple)
Exterior material	Timber / Aluminium clad timber
Interior material	Timber
Child safety	Yes
Escape route	Yes, size permitting
Ventilation	Yes
Burglar resistance	Yes, Secured by design accredited
Timber protection	Yes, vacuum impregnated
Ironmongery	NorDan



Unique **seven point locking**

The StormGuard window's operating mechanism



1 & 6: HEAD RESTRICTOR ARM

The window opens to 67 degrees on this restrictor arm and will restrict the window in the tilt position to approx 100mm for ventilation purposes. The head restrictor arm (1) is located into the strike plate (6) in the sash.

2: BALL PIVOT

A cup plate in the sash sits on top of the ball allowing the sash to pivot in the turn side (side hung) mode. This can take a sash weight of up to 90kg.

3: ADJUSTMENT DOME

For tolerance purposes, simply use a flat head screwdriver to ensure that the sash is guided into position within the frame.

4, 5 & 7: SHOOT BOLT & LOCKING CLUTCH

The individual shoot bolts locate into the frame ensuring constant compression of the gasket, therefore provides superior weather and security performance.

Key Features



- **CATEGORY 5 HURRICANE FORCE WEATHER RESISTANCE** – has been tested up to 4800 Pascals which is approximately 200mph windspeed.
- **UNIQUE 3 HANDLED OPERATION** – the 3 handled tilt & turn has 7 independent locking points to maintain a consistent compression on the weather gasket therefore ensuring superior weather performance and security is achieved
- **SAFE** – opens inwards which helps prevent people falling out when cleaning from inside.
- **MINIMAL MAINTENANCE** – due to the simplistic mechanism i.e. each handle operating a latch, shootbolt and bullet, the 3 handled tilt & turn requires very little maintenance.
- **IRONMONGERY LONGEVITY** – the weather seal gasket is positioned in front of the ironmongery to protect it against the weather elements.
- **FLUSH SASH WITH NO HINGES** – the 3 handled tilt & turn has a flush sash with no hinges which is not only aesthetically pleasing but also reduces the need for maintenance.
- **VERSATILE** – the bottom handle can be removed or changed to enable tilt only function for requirements such as child safety restriction/student accommodation/high rise developments.
- **SIMPLE MECHANISM** – sashes remove easily for re-glazing from inside without need for scaffold platforms on multi storey blocks
- **TAKES UP TO 90kg SASH WEIGHT** – allows flexibility in the design of the windows i.e. ability to manufacture large sashes without compromising performance.
- **RELIABLE** – has been in production for over 50 years and with over 5 million in use today it has had almost no call backs.
- **LONG SERVICE LIFE EXPECTANCY** – over 40 years for timber and over 60 years for aluminium clad.
- **COST EFFECTIVE** – the three handled tilt & turn costs significantly less to maintain especially if PPC aluminium cladding is applicable as this covers 50% of the window which will eliminate the requirement for external cyclical painting. You can repaint 3 windows for the cost of 2.



Most important handle

The handle located along the bottom of the sash in the frame controls the use of the window, and can be removed for safety.

OPTIONS

Removable handle

Lockable handle

Fix 805 / 811 spring loaded handle

- Keeps children safe in high rise
- Multiple occupancy buildings can be secure
- Caretaker controls opening for cleaning by adding in removable handle when required
- Secure hospitals, can keep people safe inside, but still open for vent
- Student accommodation – stairwells etc



Options and accessories

NorDan provides a wide variety of solid fittings with different functions for windows and doors. Contact our expert advisors for more information and advice on compatibility, function, colour and possible customisation for your particular project.

Window handles



1-3 - Handle options: Available in white, chrome and matt chrome effect. Available for all window types except the one handled tilt and turn window.



4-6 - Lockable handle: Available in white, chrome and matt chrome effect. Handle can be locked using the supplied key, or screwdriver. Available for all window types except the one handled tilt and turn window.



7-9 - Handle with child safety restrictor: Available in white, chrome and matt chrome effect. Additional child safety lever which must be operated to allow opening of the window. Available for all window types except the one handled tilt and turn window.

10 - Child restrictor (NP792): Available white, brown or black. The stay provides six ventilation positions and can be installed on the NorDan security window, side hung inward and outward opening windows. Supplied as standard on the bottom and side hung inward opening windows.

11 - Blanking plate: Available in white or chrome. When installed in the bottom of the three handled tilt & turn window, operation is restricted to ventilation position only. To access the cleaning position, the cover needs to be removed and a loose handle used (supplied separately).

12 - Movable blanking plate for loose handles: Available in white, chrome and matt chrome effect. When installed in the bottom of the window, operation is restricted to ventilation position. When installed on the opening side of the window, operation is fully restricted. To open the window, simply move the blanking plate and use a removable handle. Recommended primarily for inward opening windows.

13 - Loose handle: Chrome. Used in conjunction with blanking plates that require a loose handle for operation.

14 - Spring loaded handle mount (FIX 805): For inward opening windows where additional safety requirements are required. Installed in the bottom of the three handled tilt & turn window, operation is limited to the ventilation position. Opening the window to the cleaning positions can only be carried out with the appropriate handle. Spring loaded handle (FIX 811) is available in matt grey, available separately.





Paint finishes

Deep, rich and long lasting, these are just some of the words that describe NorDan colours. From subtle earth tones to bold, eye-catching red and blue, and an almost endless variety of custom colours to choose from. NorDan's window surface stands out as much for its beauty as it does for its legendary durability.

Choosing the perfect colour for your windows is not simply black and white. There are also shades of beige, brown, grey, red, green and blue. Aesthetically pleasing colours that give you lots of design options. Of course you can still choose from our standard colours. In NorDan it's all about choice.

Aluminium cladding

NorDan's virtually maintenance free, aluminium clad wooden windows have an extruded aluminium exterior, which can be powder coated with industrial strength paint for superior resistance to fading and flaking.

Uncoated products

NorDan's products can be supplied uncoated if required.



Special colours

RAL-colours - NorDan can supply most RAL colours applied directly to the treated timber and polyester powder coated onto the aluminium surfaces at an additional cost and longer delivery times.

NCS-colours - NorDan can supply most NCS colours in paint for timber products and powder coating for the aluminium. However, because of the huge number of NCS colours that are available, cost and delivery times may vary.

For any questions regarding colour, please contact your nearest NorDan UK regional office or your local dealer.

Popular colours

As an alternative to our standard white (0502-Y), we offer a wide range of other colours from a standardised palette. These colours are carefully selected based on the most popular choices both nationally and internationally. The colours are available both for timber and aluminium application:



The above colour samples are for illustrative purposes only and may differ from the original colour. For best results, always use an approved colour swatch for accuracy.

Optional aluminium cladding

NorDan Products can be produced with an optional aluminium cladding. Aluminium cladding is the covering of the exterior surface of the timber window with aluminium profiles for better protection against weathering. The cladding is a system of aluminium extrusions (approx. 2mm thick) fitted to the exterior surface of the window frame with a proprietary clip system.

A gap of about 6mm is maintained between the cladding and timber surface to allow for optimum drainage and ventilation of the wood. Aluminium cladding on timber windows provides these advantages:

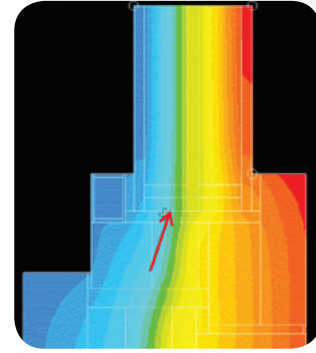
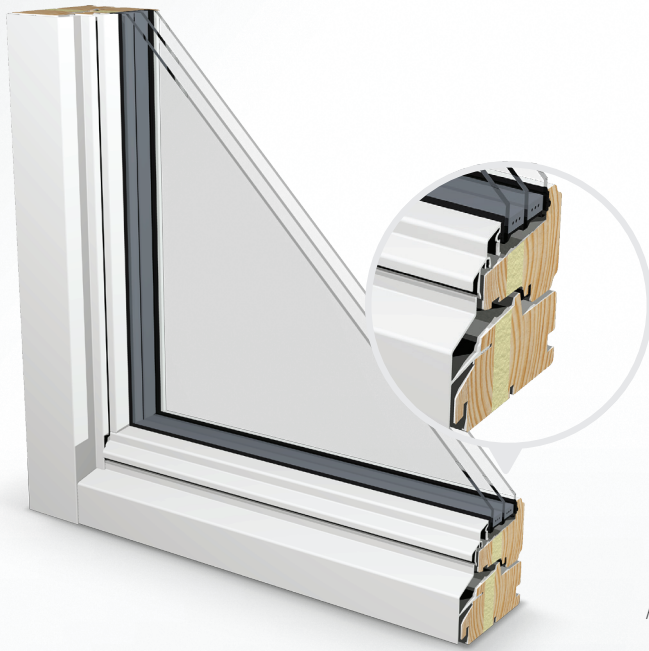
- Helps increase the overall service life of the window by protecting the wood underneath from environmental degradation factors
- Reduces maintenance costs of the window
- Aesthetically pleasing –available in a wide range of colours

Alu-clad timber windows are the standard choice of many affordable housing providers improving life span and reducing maintenance requirements. Because aluminium cladding is an effective rain screen barrier, fully drained and ventilated, the solution is particularly suitable for coastal areas or where the weather or pollution is most demanding. Sliding doors, double doors, single doors and all windows either opening or fixed (apart from the sash and case look alike) can be supplied with aluminium cladding.

The advantages are:

- Virtually zero maintenance
- Drain and ventilated design
- Proven design
- Easily replaceable
- Huge range of colours
- Stays attractive
- Identical thermal performance to the timber variation





TRIPLE GLAZED SEALED UNIT

Improved energy saving unit contains low emissivity glass and Argon filled cavities: ES4mm +16mm Argon + 4mm +16mm Argon + ES4mm

INSULATED FRAME AND SASH

A layer of insulation is laminated into all four sides of the 105mm deep frame and sash to greatly enhance energy saving.

Plus points for **high rise** buildings

Our StormGuard window has extremely good weather resistance – it's been tested to 4,800 pascals – above and above and beyond category 5 Hurricane force!

STUDENT SAFETY is paramount – using the FIX 805/811 sprung handle. Is ideal for child safety – the handle cannot be left in the lock when the window is closed, so a child cannot open this window by accident.

The window can be fitted with a hidden blow back restrictor to allow for safe cleaning in windy weather.

Opening inwards, allows for safer cleaning, and minimal risk of falling out of a tall building.

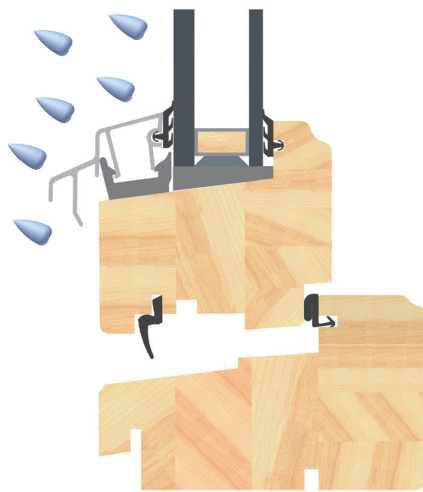
Sash is easily replaced if necessary, or reglazed, from INSIDE the building.



Good Norwegian window design

What sets NorDan windows apart

We have developed windows through almost 90 years of intense and committed Research and Development in Norway. European Standards set higher levels for window performance than the UK so our windows have amazing properties.



It is NorDan's belief that the key principles of good window design are

- The shape of the profile of the window
- The position of the weather seal
- Drain and ventilated design principles
- Glazing construction
- Surface treatment
- Preservative treatment

NorDan uses "two step tightening" in the design of a window frame to allow water drainage in bad weather. When rain hits a window, the resulting thin film of water forms an airtight barrier, but it has no mechanical strength. So any break in the surface tension results in the breakdown of that thin barrier and the wind will push through causing water to be forced through the gap in a pumping action.

Where a window has been designed with one step tightening and if there is the slightest crack in the surface finish, then with no secondary barrier, "pumping" will occur which will drive the water through the window into the building.

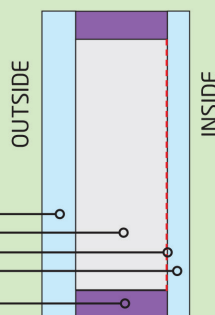
Two step tightening is a principle where the two barriers are kept apart so that any breach of the rain barrier on the outside face is counterbalanced by the decompression zone and the internal wind barrier.

Glazing Units

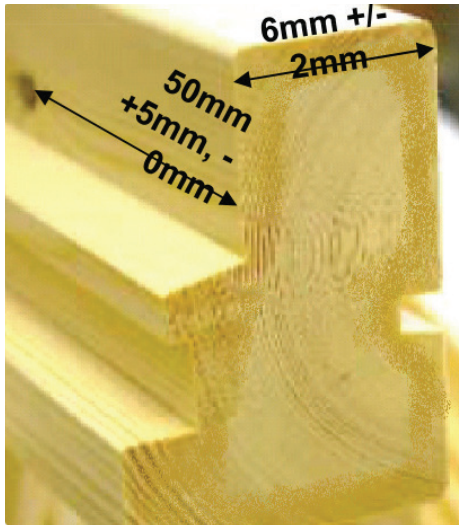
The largest component in a window is, almost always, the glazing unit. In our case, we usually supply windows with double-glazing as standard, although triple glazing will become more common as insulation standards increase.

How is it made up?

- Float glass (6mm)
- Argon cavity (16mm)
- Low emissivity coating
- Float glass (4mm)
- Warm edge spacer bar all round







Preserving the timber from decay

NorDan's vacuum impregnation process extends life of timber to 60 years plus

Unless constructed from 100% heartwood or high durability species, preservative treatment of softwood is vital. Vacuum impregnation of frame timbers sets our products apart for longevity.

NorDan sources its timber from sustainable forests. The raw timber is then processed into laminated lengths for machining. Following all profiling and machining the timber is then treated by pressure/vacuum impregnation with Protim P11, an organic solvent, which preserves the timbers from fungal growth and decay. NorDan uses a pressure/vacuum impregnation process.

How do we do this?

A chamber containing the machined profiles is filled with a liquid preservative solution and then pressurised to force the liquid deep into the timber. The pressure is released and the liquid solution drained from the chamber.

A vacuum is then applied to remove any residual liquid. This process results in circa 6mm surface and 50mm end-grain penetration.

Previously, routine maintenance during the window's lifetime, could remove any surface treatment from manufacture. NorDan's penetrative process complies with BS 8417:2011

requirements for a minimum expected durability of 60 years in contrast to the 15-30 year expected durability for superficial treatment processes.

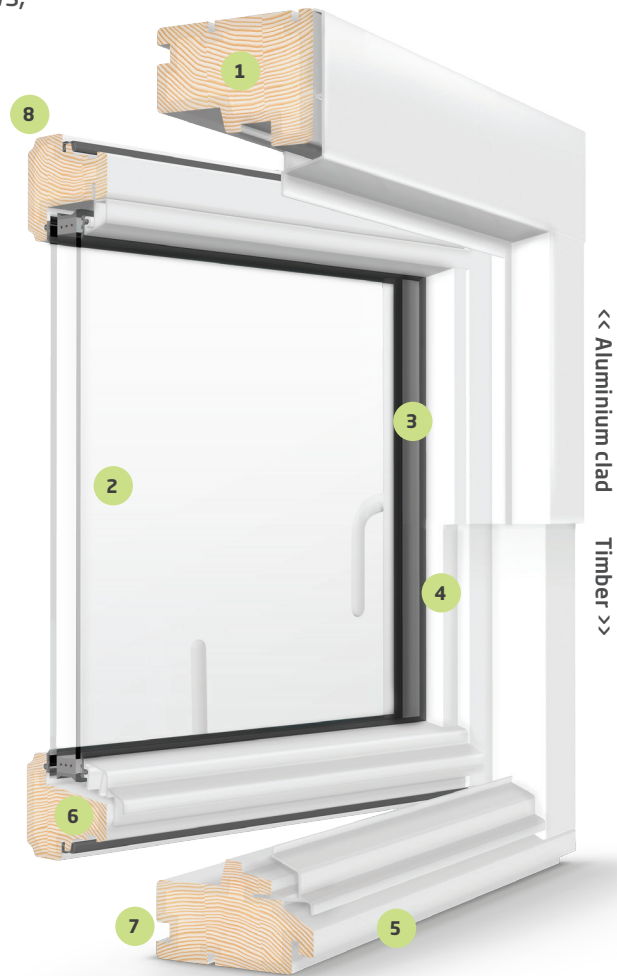
The treated timbers still need a finishing product such as paint or stain to protect the timber from weathering. At NorDan we use microporous finishes, the timber under the finish can breathe and there is a better adhesion between the timber and finish. RAL Classic colour range and selected NCS colours are available. The combined paint thickness is about 100 microns and this finish allows for easy maintenance.

We have a gang of electronic robots, "Wilma", "Betty", "Fred", and "Barney" who carry out the surface treatment in sealed painting areas of the factory. At Moi they paint the smaller sash and frames. At Otta we have the newest robots who paint the majority of production with the exception of the largest frames. The first of these four is called Malena which means "paint alone" because she is tucked away. This is all part of our endeavours to manufacture with the utmost attention to health and safety.

NorDan NTech

Energy-saving, inward opening windows,
with U-values down to 0.7

1. Frame and sash construction uses vacuum impregnated pine, protected against rot, fungal and insect attack. Engineered timber to improve strength and stability.
2. Double pane acoustic glazing unit with energy coated glass and filled with Argon gas
3. Insulating warm edge spacer bar for glazing
4. External glazing bead fitted with concealed fixings
5. Groove for aluminium extension sill to drive moisture away from the building
6. Profile design to promote removal of moisture through self draining and ventilating.
7. Internal lining board groove (optional)
8. Soft and rounded profiles to provide optimal paint adhesion



NTech: Windows

Material - Construction

Products are made from pressure impregnated engineered pine, with optional external aluminium cladding being available. Windows and doors are available either double or triple glazed and with two frame width options.

Standard construction

- **NTech 0.7** has a 105mm frame and 80mm sash.
Glass: Triple glazed with thermal break in the frame.
- **NTech 0.8** has a 105mm frame and 80mm sash.
Glass: Triple glazed.
- **NTech 1.0** has a 92mm frame and 67mm sash.
Glass: Triple glazed
- **NTech 1.2** has a 92mm frame and 67mm sash.
Glass: Double glazed.

Aluminium clad products incorporate an additional 8mm frame and sash width. All products are painted white (NCS S0502 - Y) as standard other colours are available to order.

Vacuum impregnation

All timber components in NorDan products are vacuum impregnated with Protim PVAc 11 and in accordance with EN 351-1 Class NP3. Impregnating the wood increases the product's longevity and protects it from insect attack, fungi and rot. In addition, wood is more dimensionally stable in that it does not twist or warp.

U - value calculations

All NorDan offers and order confirmations show the exact U-value for each product and the average U-value for all the products in offer in the specified delivery. U-values of NorDan products are calculated according to EN ISO 10077-1 and EN ISO 10077-2.

Glazing beads

All standard products have powder coated aluminium glazing beads.

Window and balcony door packaging

NorDan can offer a selection of our windows and doors packaged per unit by pallet delivered direct to site.



8



Maryhill Locks

Phase 2

Maryhill Locks in Glasgow – is one of eight Transformational Regeneration Areas in the city. And one of eleven projects to be granted Scottish Sustainable Community status by the Scottish Government, described as ‘...creating places which are ambitious and inspiring, and which raise standards in design, architecture and sustainable construction...’

Designed by Glasgow architects Hypostyle, the development of 125 new homes of varying sizes sits along the Forth & Clyde Canal in a dramatic location on a sloping site. Apartments have great views given their clever design nestling into the slope and created for some balconies, and glazed “sun spaces” which also act as thermal buffers and can be used to pre-heat incoming fresh air.

Reduced energy consumption is achieved with high insulation including the thermal properties of the NorDan windows, maximizing airtightness, and the choice of other materials included masonry finishes of facing brick and render and rainscreen cladding using fibre cement slate, weatherboard and sheet cladding and zinc.

Photovoltaic panels have also been installed on 19 of the properties.



Photography : Mehul Ruparel



Takes **90kg** sash weight

Quatermile - views to **Edinburgh Castle**

A stunning design from Richard Murphy Architects, the £23m development of affordable housing for Hillcrest Housing Association showcases the full range of NorDan window products at QUARTERMILE in Edinburgh. On the site of the old Royal infirmary, the Hillcrest HA flats are arranged around a spectacular octagonal central courtyard rising initially to 5 storeys and in separate corner towers, which then elevate to a tenth storey on the north east corner.

This layout maximises daylight into what is of necessity a relatively densely designed scheme, but by creating the central courtyard makes a social heart to the scheme. It's based on models of similar sized city blocks in Europe, especially Berlin.

The project also uses NorDan's Secured by Design certified sliding patio doorsets in courtyard areas. Each zone has windows assembled in a "window walling" fashion where the outward opening windows are being utilised as automatic opening vents.

The 19 acre development sees the restoration of Victorian listed buildings, complemented by new structures from steel and glass.

Quatermile Ventures is the principal contractor, with Sir Robert McAlpine as the main contractor.



No need for scaffolding or platforms

NorDan's unique StormGuard windows were chosen for the refurbishment of nine high rise blocks at Dalmuir Court, Clydebank Glasgow for West Dunbartonshire Council. Refurbishment was done; x5 at Dalmuir, x3 at Littleholm, x1 at Kilbowie Court. This project was funded through the Community Energy Saving Programme Scheme (CESP) government funding.

This window product has a high spec for weather performance, resisting water penetration and standing up to high winds in bad winters. Openable NorDan windows have been tested to 4,800 Pascals, which is x5 times more than the UK standard for water penetration.

NorDan regularly supplies replacement windows for large refurbishment programmes where residents remain in their homes while the work is carried out.





Scape

student living London

A sound reduction of – 50 dB Rw, was key to the spec of the NorDan StormGuard aluminium clad timber windows for an innovative new concept in student accommodation in Central London.

"Scape Student Living" provides affordable "aspirational" student living spaces designed to appeal to the younger audience, and Mile End Scape East in London includes 588 studios, 30,000 sq ft of educational and common space including a gym and two restaurants.

Beside a busy, noisy, arterial route, sound reduction wasn't the only challenge for NorDan in supplying the windows for this project. Delivering products into a tight site, in central London at rush hour, required expert logistics. Stopping traffic and hoisting the products off the back of a truck up into the new building were all part of the service.

Timber windows play an important part in considering the asset value and the management of the life cycle of a building with this use.

Nick Campfield, Project Director at HG Construction says: "A timber product was in the planning requirements but we had no doubt about whose product we wanted for this development as soon as we saw the sample product from NorDan. The simple uncomplicated design, the easy to operate mechanism, from a tried and trusted manufacturer, left us in no doubt. We've been really, really happy with the NorDan product with no faults at all reported."

A report was commissioned by NorDan from the Sound Research Labs (SRL) for this project.



Fettes College Edinburgh

Page & Park Architects specified NorDan's timber StormGuard windows for a new build accommodation block at Fettes College Edinburgh, the school of former Prime Minister Tony Blair.

The architects sought to maximise the light in the study bedrooms for students and needed large screens as well as large scale opening lights.

The NorDan StormGuard easily accommodates the large sashes, with our unique 7 independent locking points. This allows the flexibility on the operation of the window in which ventilation can be achieved, without compromising the turn function by utilising a special spring loaded removable handle on the bottom handle. Special louvres fitted in front of the opening windows maximise the ventilation but also act as a barrier.

The £2.2 million project was completed with Will Rudd Davidson, Harley Haddow, Thomas and Adamson and DCA Landscape. Contractors for this project were Thomas Johnston.



Charlemont Farm for Sandwell Metropolitan Borough and contractor Lovell Partnerships

The StormGuard window features in an £8m major tower block refurbishment just completed by Sandwell Metropolitan Borough Council at West Bromwich. Main contractors Lovell Partnerships. Already tenants in 136 flats have seen a dramatic drop in heating bills.

The window replacement is part of an envelope improvement including re-cladding with insulated render. NorDan's energy efficient alu clad timber windows replaced steel single glazed windows. Councillor Paul Moore, Sandwell's cabinet member for regeneration, visiting the blocks, said the work had transformed the look of the Charlemont Farm area.

"These improvements have made a massive impact on both the external and internal appearances of the blocks. The much-improved insulation provided by the eye-catching external cladding and the new energy-efficient windows will help tenants in lowering their fuel bills."

Carl Yale, partnering manager for Lovell in the Midlands, said: "The results look fantastic. The scale of the works, inside and outside, was such that it took careful project management and constant communication with residents.

"We certainly faced some challenges along the way but working closely with the Sandwell Council's urban design high-rise team, together we were able to complete a project that has made a real positive change to the lives of the residents."



Multi award winning block for **Cumming and Co**, Aberdeen

403 King street Aberdeen is a new block of student accommodation built by Ogilvie Construction for Ardmuir, the private operator. It is a multi award winning project for architects Cumming and Co. the principal architect on this project was director Nicola Forsyth. 77 units provide private flatted accommodation for students attending one of Scotland's oldest universities. The project won a Civic Award and the Aberdeen Society for Architects Award for the quality of its design.

NorDan's aluminium clad timber windows were specified for this project. A range of different products feature. Full height StormGuard windows, fixed lights, and balcony doors are included. They were factory finished externally in RAL 7016 grey. King Street is not far from the famous Aberdeen Beach Boulevard walkway and sea retaining wall, so weather conditions include salty air and potentially severe winters. NorDan alu clad timber window products are ideally suited.





John Moore's University Liverpool

Liverpool's John Moores University invested £3.4m in a façade upgrade programme on two multi storey buildings at the James Parsons Building. Over the 45 week programme insulated aluminium rainscreen cladding was attached to the building over 7 and 10 storeys tall. The total transformation of the building not only brought it up to date in the surrounding area but significantly extended the life of the building which has enormous sustainability benefits.

NorDan regularly works in partnership with cladding experts to supply the replacement window solutions which dovetail in with specialist curtain walling designs which transform the outward appearance of an ageing building. The result is sustainable refurbishment of unappealing energy inefficient buildings into contemporary accommodation. In this case, our StormGuard windows with an average u value of 1.3W/m²K were specified. Finished with aluminium cladding to extend the life of the timbers on the outside, they were factory finished white on the internal finish.

An external overcladding specialist used their unique approach to extending the useable life of large buildings. This dramatically enhancing their appearance. Often projects are undertaken whilst buildings remain in normal use, with minimal disruption to students and higher education professionals.



Aberdeen College North East

NorDan completed a £6m contract to refurbish the North East Scotland College at Gallowgate, Aberdeen.

The building was completely regenerated extending its usable life to that equivalent of a new building. This was achieved by installing an aluminium rain screen system, with integral high performance energy efficient aluminium clad timber windows from NorDan. As well as a dramatic transformation in appearance, the building is now eco-efficient, surpassing current regulations and slashing heating energy costs by up to 70%.

Heating energy saving alone will pay for the project in 15 years and the building is set to last for future generations without the need for periodic maintenance.

NorDan's unique StormGuard windows achieve a 1.2 w/m²K u value, which is 30% lower than current Building Regs demand. This gives a fine energy efficient solution and delivers on carbon emissions considerations too. The product has been developed in Norway since 1961 with little change to the standard design but improvements to the performance over the years.



Burnbrae

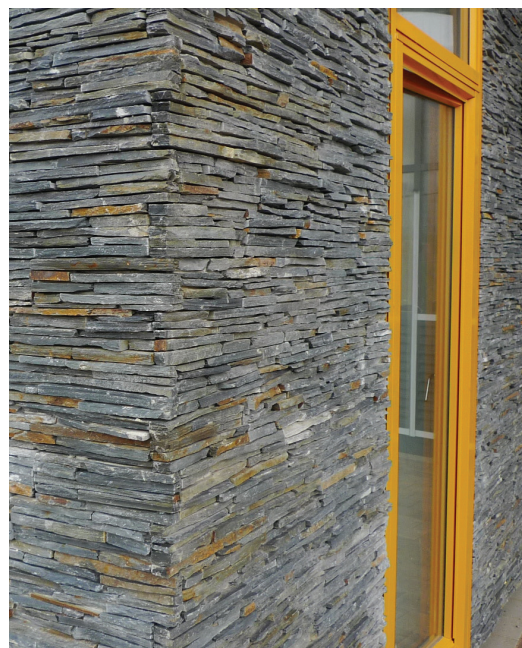
Primary School

Aedas Architects

A new £5.9m build school in Bonnyrigg outside Edinburgh, Burnbrae Primary School replaces the former Hopefield PS to accommodate 200 local pupils. It has the capacity to accommodate 480 pupils in the 15 new classrooms, nursery and an Autistic Spectrum Disorder Provision.

The building achieved a BREEAM VERY GOOD rating and has an energy performance of B+ making it one of the most environmentally friendly in the school estate. Main contractors were Taylor Wimpey, client Midlothian Council in partnership with Ashleigh Scotland Ltd. Architects Aedas.

Dramatic use of colour against natural stone detail created an attractive school building with NorDan windows.





St Xavier's

Patna Ayrshire

Austin Smith Lord architects working for East Ayrshire Council in Scotland created St Xavier's new Primary School. The dramatic design provides separate canopy covered pupil entrances providing covered external play space and all classrooms have access onto external classroom space in enclosed courtyards.

For maximum energy efficiency and quality of life, high levels of daylight are encouraged into the building through large expanses of glass, reducing the need for energy for lighting, which is daylight controlled. Each classroom has a section of floor to ceiling glazed screens from NorDan giving physical and visual links to external play space. Black aluminium clad timber windows contrast with red structural columns in a stunning design.

Natural timber finishes to the insides of the windows create a child friendly warm interior.



Commonwealth Games athletes accommodation

A unique mass accommodation project was the Athletes Village for the 2014 Commonwealth Games in Glasgow, which housed 6500 participants during the event. It was transformed afterwards into mixed used residential accommodation as part of the regeneration of the East End of Glasgow. NorDan's windows were specified across much of the site including the Raitkenhead glazing panels on the end blocks.





Life Expectancy

60 years

This tower block of residential accommodation owned by the City of Dundee Council, was originally constructed to provide affordable housing in 1962. The Council refurbished the block in 1994, putting in NorDan timber windows and new external cladding. Proof that our windows stand the test of time. The Council today has been quoted as saying in the last 20 years they have had no difficulties with their NorDan windows. This product works well on high rise blocks which have a lot of weather exposure to deal with, extensive wind and rain and on a sea estuary.





William Simpsons Care Home

William Simpsons Residential Care Home in Plein Stirlingshire, is a brand new build care home for 64 residents, ex servicemen, many suffering from ARBI. The building is adjacent to an existing B listed Care home. It was designed with NorDan's StormGuard timber window product throughout, which you can see here. The architect was Liz Fuggle, from BPA Architecture. The interior delivers a homely and inviting environment for the residents, and importantly creates different moods to reinforce sense of public or private space.

Key to the design was the wide connecting "street" which linked the individual flats of 8 bedrooms. Each flat was designed to be easily distinguished, achieved through the careful choice of colours and fittings to give a different identity despite the identical plan form.

Set in 7 acres of well maintained private grounds including a wonderful walled garden, flower displays and arbours and seating areas, all visible through the large expanses of floor to ceiling windows on the ground floor areas.

Our high performance timber windows are ideal for an application like this, which gives a product with a very long life cycle, and minimal maintenance requirements.



Twechar regeneration

A range of energy efficient timber windows providing framed views of nearby countryside were designed in to the Twechar Regeneration project by Glasgow architects Cooper Cromar. This is a new street – with emphasis on front and back doors in the community layout. Places for People and East Dunbartonshire Council have formed a Regeneration Partnership to improve the way of life for the Twechar Community. Located adjacent to the Forth and Clyde Canals, and sited within the boundary of the Roman Empire (the Antonine wall) – poor quality existing housing on a steeply sloping site was demolished to make way for the new development.

A variety of house types cater for a mixed community from one bedroomed flats to 3 bedroomed family homes and special needs bungalows.

“The windows are designed to maximise solar gain also through the house orientation and maximising airtightness with the NorDan windows and doors was important to make the commitment to Low Carbon and sustainability and minimal life time costs for residents.” says David McMahon from Cooper Cromar.



Photography : David McMahon, Cooper Cromar



NorDan UK Ltd
96 Kirk Road
Wishaw
North Lanarkshire
ML2 7NS
Tel: 01698 376922

info@nordan.co.uk
www.nordan.co.uk