

Environmental Product Declaration



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Forza FD30 Flush Solid Core Timber Door 2040x926x44mm



Programme:	The International EPD® System, www.environdec.com
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 v1.2.5 and C-PCR-007 Version: 2020-04-09
PCR review was conducted by: The committee of IVL Swedish Environmental Research Institute and Secretariat of the International EPD® System
Life Cycle Assessment (LCA)
LCA accountability: Mark Dowling and Robert Holdway - Giraffe Innovation Ltd
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: <input checked="" type="checkbox"/> EPD verification by individual verifier Third-party verifier: Chris Foster, EuGeos Limited. Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: Forza Doors Ltd.
 24a / 24c Star Road
 Partridge Green
 Horsham
 West Sussex RH13 8RA

This address is also the manufacturing site.

Website: www.forza-doors.com

Contact: Tel: 01403 711 126. Email: Info@Forza-doors.com.

Description of the organisation:

Forza Doors Ltd is a UK based manufacturer of high-quality bespoke joinery products. We are specialists in the preparation of wood veneers and timber utilised in the production of our doors, frames, panels, fire screens and associated joinery products.

The Forza product range satisfies the demands and standards required by the UK construction interior fit-out industry encompassing the office, education, health, hotel, residential and retail sectors.

We provide a first-class service that recognises project lead times as crucial and where site events compress the completion schedule, we are ready and able to support your fast-track requirements.

All Forza Fire performance products are assured by independent UKAS accredited and internationally recognised providers of third-party certification schemes. These are underpinned with robust and extensive primary and secondary test evidence and under our scheme arrangements we receive regular and ongoing factory process and product audit checks which provide assurance that our products are always supplied as originally tested and fully in accordance with our scheme arrangements. Furthermore, these products are future proofed by our on-going investment in rigorous programmes of performance testing under UK National and European testing standards and relevant certification. Forza maintain active involvement with trade association bodies such as the GAI, FIS & SBD. Technically and professionally we never stand still.

Forza doors and frames are also tested to determine structural performance and achieve the rating of Severe Duty.

The directors, management and staff of Forza Doors remain committed to on-going environmental, social, and sustainability improvements and constantly seek new innovations in our manufacturing processes, training schemes and supply chains that will make a positive difference in these areas. Our policies on these subjects and evidential information of our accreditations can be found on our website www.forza-doors.com or by following the specific link <https://www.forza-doors.com/about-us/our-certification.aspx>

The manufacturing site is accredited to ISO 9001, 14001, 45001. Forza holds IFCC Fire Certificate Number FRTD497, FSC ® Licence Code FSC-C104313

Forza Certifications and Accreditations.



FSC® certified products available on request.



Product information

Product name and identification: Forza FD30 Flush Solid Core Timber Door, 2040x926x44mm

Product description: Forza FD30 Timber solid graduated density chipboard (GDC) core door. Dimensioned 2040 x 926 x 44mm. Oak Hardwood lipped all round, UV lacquered over White Oak Veneer, and supplied with compliant Intumescent strips. All hardwood lippings have a minimum density of 450kgs/m³.

Forza's FD30 Solid Core Timber Door is suitable for and very typically used in the commercial interior construction market, encompassing office, education, health, hotel, residential and retail sectors. The door satisfies the demands and standards required by the UK Interior Fit-Out construction industry.

More specifically, Forza Doors Ltd Field of Application Report (PAR/10321/01) produced by International Fire Consultants Ltd, certifies Forza FD30 doors in timber, aluminium and steel frames in supporting constructions of demountable Steel stud & timber stud plasterboard clad partitions, brickwork, block work or concrete walls.

It is reasonable to expect a life span of more than 25 years in normal conditions.

The product documented within this EPD contains no substances in the REACH Candidate list of substances of very high concern.

Door manufacturing process overview:

Dependant on required specification, door cores are selected and cut to size on beam saws.

Edge band machines apply a hotmelt PUR resin to selected hardwood lippings, affixing these to all four edges of the door.

Dimensional accuracy of the flat substrate panel is critical to the finished quality of the door. This accuracy is provided by a wide belt/three head calibration sander.

Veneer layons or pre-primed paper (for over painting) are fully prepared in-house to the specific door specification.

Application of the veneer layons or pre-primed paper sheets to the core substrate is carried out in a single heated process on a through feed hot press using specific suitable bonding products.

At this point in the production process multi-axis CNC machine centre clean and arris the door edges, cut vision panel apertures and router for the hinge, lock and intumescent preparation in one programmed function.

CNC de-nib and finishing sanders, in-line with roller coat lacquer applicators and UV drying lamps produce a full grain silk finish to veneered doors.

All doors are then Fire Rating Certificated (in the case of Fire Rated doors), labelled and then packed into pre-formed cardboard boxes.

Further technical information can be obtained on Forza Doors website www.forza-doors.com

UN CPC code: 31600: Builders' joinery and carpentry of wood.

Geographical scope: United Kingdom.

LCA information

Declared unit: The declared unit is 1m² of a door measuring Height 2040mm/ Width 926mm, Thickness 44mm with a graduated density chipboard (GDC) core and veneer finish. This excludes any ironmongery such as door handles, hinges and closures. The size chosen is one of the most commonly purchased sizes in the UK and it is a common size used by other manufacturers across

Europe. Data would not be available on the installation of the door if the sizes in the EN17213 were reported on.



Figure 1: Dimensions of door and required door frame

Reference service life: Not declared.

Time representativeness: Covers one year from 1st January 2022 to 31st December 2022

Database(s) and LCA software used: Ecoinvent 3.9.1 and SimaPro 9.5.0.1

Description of system boundaries:

Cradle to gate (A1-A3) with modules A4, A5, C1–C4 and module D (A1–A3 +A4+ A5+ C + D).

This covers all the raw materials and production of the door and the following:

- Delivery of the door from the factory to the end user installation site (A4) and the actions required for the manufacturers correct prescribed installation method to hang it into a hardwood timber doorframe.
- The installers journey to site, the use of electric tools and sundry items required to correctly hang the door, and fit the minimum compliant ironmongery consisting of hinges, lock case, cylinder lock, door handle, escutcheons, and overhead door closer (A5)
- Recovery of the door at end of life and its disposal.

It does not include the impact of the ironmongery.

The following (Table 1) gives further information on the product transport to warehouse and customer site and installation.

Scenario information	Unit
Vehicle used	3.5t van Euro 6 (75%) ,18t Euro 6 lorry (25%) of journeys
Fuel type	Diesel
Distance to warehouse	22.3km
Capacity utilisation to warehouse	50%
Average distance to customer	68.2km
Capacity utilisation to customer	100%
Bulk density to warehouse	Varies per delivery - impact calculated as tkm
Installation energy	0.4kWh

Table 1: Transport to warehouse and customer’s site and installation (A4 and A5)

System Diagram

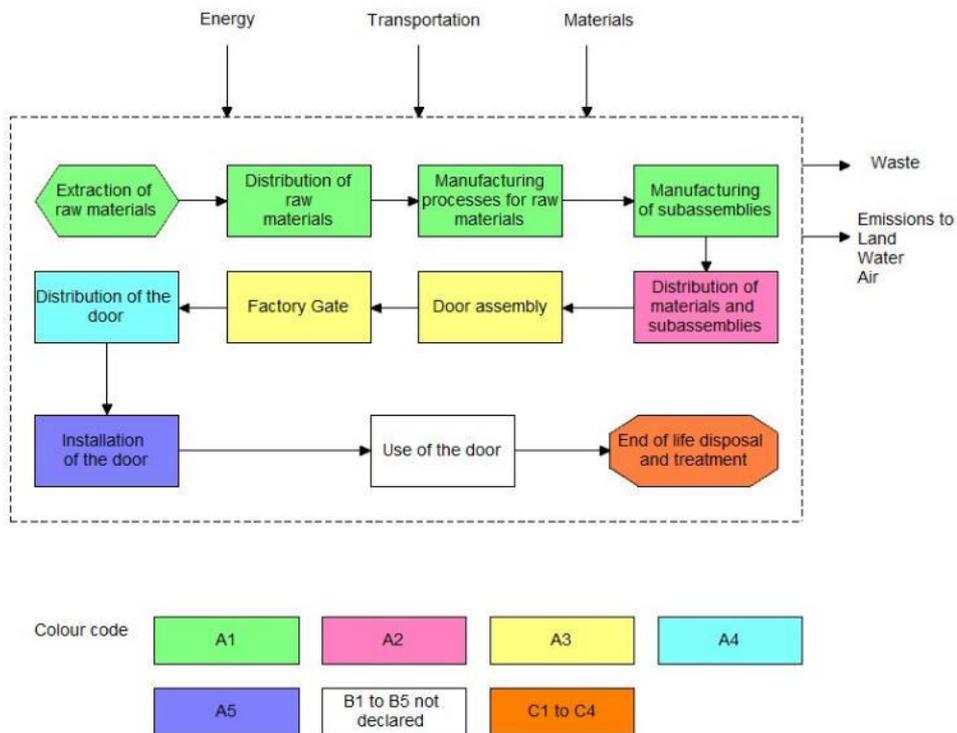


Figure 2: System boundary

End of life scenarios

For C1 it was assumed that power tools are used to remove the door and that this required 10% of the installation energy, which equates to 0.04kWh.

For C2 it was assumed that a local contractor removes the door, and it travels 50 km for end-of-life treatment and disposal.

For C3 it was assumed that metal parts are removed from the door and the wood that is to be incinerated is chipped.

For end of life the materials in the door and the packaging, 44.4% is assumed incinerated and 55.6% landfilled in Module C4, reflecting UK practice. Approximately 66% of waste incineration in the UK

includes energy recovery; the efficiency of this is assumed to be 60%, and the resulting energy output reported as “Exported Energy” (EE) in module C4.

In theory, the entire door could be processed through a fully automated materials recovery facility to remove all recyclable materials. Metals could then be sent directly to metal merchants and plastics bailed prior to going to specialist plastic pre-processors. The biomass materials could then be finely shredded and screened to remove any additional metals before being fed into a fully automated and closely monitored process, to generate super-heated steam which drives high-pressure turbines which, in turn, drive a generator to produce electricity.

The ash produced could be recycled into an aggregate called 6F, which is also composed of crushed concrete, brick and mortar.

Cut off rules

When building a life cycle inventory (LCI), it is typical to exclude items considered to have a negligible contribution to results. To do this in a robust manner there must be confidence that the exclusion is fair and reasonable. Therefore, cut-off criteria are defined, which allow items to be neglected if they meet the criteria. In this study exclusions could be made if they were expected to be within the below criteria:

- Mass: if a flow is anticipated to be less than 1% of the mass of the product it may be neglected;
- Energy: if a flow is anticipated to be less than 1% of the cumulative energy it may be neglected;
- Environmental significance: if a flow is anticipated to be less than 1% of the key impact categories it may be excluded.
- If an item meets one of the criteria but is expected to be significant to one of the other criteria, then it shall not be neglected. For example, if a chemical is small in mass but is expected to have a notable contribution to the environmental results then it may not be excluded.

No omissions were made based upon the above criteria.

Data quality indicators (DQIs)

To ensure data quality, checks were completed on key data parameters using data quality indicators (DQIs) which are applied to key data parameters to ensure fit for purpose. Key data parameters are assessed against a data quality matrix. The data quality matrix used in this study is shown (Table 3) and the scoring for the data is highlighted in grey.

Score	Very good	Good	Fair	Poor	Very poor
Reliability of the source	Verified data based on measurements	Verified data partly based on assumptions or unverified data based on measurements	Non-verified data partly based on assumptions	Qualified estimate (e.g., by industrial expert)	Non-qualified estimate
Representative	Representative data from sufficient sample of sites over an adequate period to even out normal fluctuations	Representative data from a smaller number of sites but for adequate periods	Representative data from an adequate number of sites but from shorter periods	Representative data but from a smaller number of sites and shorter periods or incomplete data from an adequate number of sites and periods	Representativeness unknown or incomplete data from a smaller number of sites and/or from shorter periods
Temporal correlation	Less than three years of difference to year of study	Less than six years of difference	Less than 10 years of difference	Less than 15 years of difference	Age of data unknown or more than 15 years of difference
Geographical correlation	Data from area under study	Average data from larger area in which the area under study is included	Data from area with similar production conditions	Data from area with slightly similar production conditions	Data from unknown area or area with very different production conditions
Technological correlation	Data from enterprises, processes and materials under study	Data from processes and materials under study but from different enterprises	Data from processes and materials under study but from different technology	Data on related processes or materials but same technology	Data on related processes or materials but different technology

Table 2: Data quality indicators

Life cycle stages that have been omitted from the scope of the study include the following:

- Human energy inputs to processes;
- Infrastructure and capital goods;
- Transport of employees to and from their normal place of work.

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	GB	GB	GB	ND	ND	ND	ND	ND	ND	ND	GB	GB	GB	GB	GB
Specific data used	51%			-	-	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-
Variation – products	0			0	0	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	0
Variation – sites	0			0	0	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	0

X included in LCA - ND: module not declared - NR: module not relevant

Table 3: Modules declared

Product and packaging content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C
Wood Particle Board	56.2	0	91%, 25.57kg
Wood Veneer	1.7	0	100%, 0.871kg
Glue Thread	<0.1	0	0
Oak lipping	2.60	0	100%, 1.28kg
Adhesive	0.4	0	0
Sealer	0.1	0	0
Intumescent strip	0.6	0	0
Total	61.6		
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C
Tape	0.01	0.02	0
PE wrap	0.03	0.06	0
Paper and card	1.15	1.87	100%, 0.575kg
TOTAL	1.20	1.95	

Table 4: Product and packaging content information

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	1.83E+01	1.45E+00	7.19E-01	1.43E-03	3.54E-01	5.64E-01	9.23E-01	-8.28E+00
GWP-biogenic	kg CO ₂ eq.	-1.21E+01	4.66E-03	4.66E-02	4.35E-03	3.42E-04	3.35E-02	1.73E+01	1.88E-01
GWP-luluc	kg CO ₂ eq.	4.83E-02	8.22E-04	5.74E-04	1.40E-05	1.68E-04	3.16E-03	9.09E-05	-1.54E-02
GWP-total	kg CO ₂ eq.	6.28E+00	1.46E+00	7.66E-01	5.80E-03	3.55E-01	6.01E-01	1.82E+01	-8.11E+00
ODP	kg CFC 11 eq.	6.55E-07	3.08E-08	1.56E-08	1.11E-10	7.99E-08	9.60E-08	1.89E-08	-7.30E-07
AP	mol H ⁺ eq.	1.12E-01	3.01E-03	3.46E-03	2.43E-05	1.00E-03	3.22E-03	2.61E-03	-1.67E-02
EP-freshwater	kg P eq.	5.89E-03	1.18E-04	1.01E-04	8.91E-07	2.67E-05	6.63E-05	1.02E-04	-8.33E-04
EP-marine	kg N eq.	3.18E-02	7.07E-04	1.13E-03	5.23E-06	1.96E-04	1.13E-03	1.94E-03	-3.97E-03
EP-terrestrial	mol N eq.	3.48E-01	7.16E-03	1.25E-02	8.08E-05	2.13E-03	1.22E-02	1.28E-02	-3.93E-02
POCP	kg NMVOC eq.	1.31E-01	4.48E-03	4.73E-03	1.61E-05	8.19E-04	3.45E-03	3.36E-03	-1.10E-02
ADP-minerals&metals*	kg Sb eq.	1.55E-04	6.01E-06	6.56E-06	9.50E-08	1.62E-06	2.04E-06	6.25E-07	-1.65E-05
ADP-fossil*	MJ	3.22E+02	1.99E+01	9.86E+00	1.79E-02	5.31E+00	9.27E+00	2.23E+00	-1.52E+02
WDP*	m ³	1.19E+01	8.34E-02	5.29E-02	5.62E-04	1.76E-02	1.33E-02	-1.45E-01	-1.02E+00

Acronyms

GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals and metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Table 5: Results of mandatory environmental performance indicators

Additional mandatory and voluntary impact category indicators

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	1.70E+01	1.45E+00	7.20E-01	1.45E-03	3.54E-01	5.67E-01	9.23E-01	-8.30E+00
Ionising radiation*	kBq U-235 eq	1.89E+00	3.84E-02	3.01E-02	1.93E-04	2.82E-02	1.18E-01	5.72E-03	-2.34E+00
Particulate matter	disease inc.	1.81E-06	6.32E-08	6.65E-08	2.54E-10	2.42E-08	5.57E-08	2.77E-08	-8.66E-08
Human toxicity, non-cancer**	CTUh	4.97E-07	1.77E-08	1.49E-08	1.63E-10	4.19E-09	7.53E-09	3.49E-08	-4.11E-08
Human toxicity, cancer**	CTUh	1.54E-07	7.10E-10	1.08E-09	3.79E-12	1.56E-10	4.20E-10	1.45E-09	-2.08E-09
Ecotoxicity freshwater**	CTUe	1.49E+02	1.09E+01	4.91E+00	1.90E-02	4.33E+00	7.81E+00	5.79E+00	-8.05E+01
Land use	Pt	1.84E+03	8.63E+00	7.45E+00	3.52E-01	3.14E+00	7.30E+00	1.06E+00	-4.79E+01

Table 6: Results of additional environmental performance indicator

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Disclaimers

*This impact category deals mainly with the eventual impact of low dosing ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure, nor due to radiative waste in underground facilities. Potential ionizing radiation from soil, from radon and from some materials is also not measured by this indicator.

** The results of these environmental impact indicators should be used with care as the uncertainties of these results are high or as there are limited experiences with the indicator.

Resource use indicators

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	-1.48E+02	4.21E-01	1.50E+00	1.22E-01	8.98E-02	5.98E-01	5.84E-02	-1.80E+01
PERM	MJ	5.21E+02	0.00E+00						
PERT	MJ	3.73E+02	4.21E-01	1.50E+00	1.22E-01	8.98E-02	5.98E-01	5.84E-02	-1.80E+01
PENRE	MJ	3.15E+02	2.12E+01	1.05E+01	1.91E-02	5.64E+00	9.85E+00	2.41E+00	-1.65E+02
PENRM	MJ	2.53E+01	0.00E+00						
PENRT	MJ	3.41E+02	2.12E+01	1.05E+01	1.91E-02	5.64E+00	9.85E+00	2.41E+00	-1.65E+02
SM	kg	0.00E+00							
RSF	MJ	0.00E+00							
NRSF	MJ	0.00E+00							
FW	m ³	7.00E-01	4.97E-04	9.88E-04	7.92E-05	6.72E-04	1.06E-03	-2.40E-03	-4.33E-02
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water								

Table 7: Resource use indicators

Waste indicators

Results declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	0.00E+00							
Non-hazardous waste disposed	kg	3.32E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.32E+01	0.00E+00
Radioactive waste disposed	kg	0.00E+00							

Table 8: Waste indicators

Output flow indicators

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00							
Material for recycling	kg	2.67E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E+00
Materials for energy recovery	kg	0.00E+00	3.24E+01						
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.69E+01	2.83E+01
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.92E+01	7.36E+01

Table 9: Output flow indicators

Additional environmental information

The directors, management and staff of Forza Doors remain committed to on-going environmental, social, and sustainability improvements and constantly seek new innovations in our manufacturing processes, training schemes and supply chains that will make a positive difference in these areas. Our policies on these subjects and evidential information of our accreditations can be found on our website www.forza-doors.com or by following the specific link <https://www.forza-doors.com/about-us/our-certification.aspx>

Transport: Our delivery to your site

When it comes to deliveries, we use our own fleet of Euro 6 compliant vehicles to transport more than 95% of our products directly to your site. This not only limits the potential for damage to our products but also allows us to minimise protective packaging and reduce our carbon footprint. Our FORS accredited drivers are trained in the most efficient driving methods and follow the most optimal routes to ensure timely and safe deliveries.

Maintenance and permitted repairs = Longer product life spans

With a keen eye towards the requirement for on-going fire door maintenance, Forza Doors Ltd has undertaken extensive testing in UKAS approved laboratories to enable us to determine robust and effective minor repair methods for our products. This enables our customers to provide fully tested repair solutions, negating the need to fully replace damaged fire doors or their frames in many instances. Details available here: ([FZD5136](#))

Installation of the door

To insure the correct installation of the door please follow the instruction at https://www.forza-doors.com/media/168306/forza_za_door_installation_guide_fd30-60_pdf.pdf



Figure 3: Section of tools required to fit a FD30 door.



Figure 4: Generic example of fitting the hinges



Figure 5: Generic example of fitting intumescent strip



Figure 6: Generic example of installing ironmongery

References

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EN 17213:2020. Windows and Door. Environmental product declaration. Product category rules for windows and pedestrian doorsets.

Windows and doors (EN 17213:2020) c-PCR to PCR 2019:14. C-PCR-007 (TO PCR 2019:14)
Version: 2020-04-09.

Construction Products PCR. 2019:14. VERSION 1.2.5. VALID UNTIL: 2024-12-20.

IFCC Fire Certificate Number FRTD497.

FSC[®] Licence Code FSC-C104313.

Glossary

FIS - The Finishes and Interiors Sector

FORS – Fleet Operators Recognition Scheme

GAI - The Guild of Architectural Ironmongers (GAI) is the voice of the architectural ironmongery sector.

Lipping - Lipping (or edge banding) is used to cover the cut edge of veneered materials such as MDF and plywood.

SBD - Secured by Design, is the official police security initiative that is owned by the UK Police Service with the specific aim to reduce crime and help people live more safely.

UKAS - United Kingdom Accreditation Service is the sole national accreditation body recognised by the British government to assess the competence of organisations that provide certification, testing, inspection, and calibration services.

