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Title:

The Fire Resistance Performance Of Timber Or Mineral Composite Based Insulated Doorsets When Fitted With 'HOPPE' and 'ARRONE' Pull Handles

Report No:

WF No. 347094

Prepared for:

HOPPE (UK) Limited

Gailey Park, Gravelly Way
Standeford
Wolverhampton
WV10 7GW

Date:

2nd December 2014

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Executive Summary

Objective	This report presents an appraisal of the fire resistance performance of timber or mineral composite based doorsets when fitted with 'HOPPE' and 'ARRONE' pull handles, if tested in accordance with BS EN 1634-1.
Report Sponsor	HOPPE (UK) Limited
Address	Gailey Park, Gravelly Way Standeford Wolverhampton WV10 7GW
Summary of Conclusions	Timber or mineral composite based doorsets that have previously been successfully fire tested by a UKAS accredited laboratory (or assessed by Exova Warringtonfire) which have achieved up to 60 minutes integrity as discussed in this report, may be fitted with 'HOPPE' and 'ARRONE' pull handles, without detracting from the overall performance of the doorset.
Valid until	1 st December 2019

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Introduction

This report presents an appraisal of the fire resistance performance of single-acting insulated (timber or mineral composite) doorsets when fitted with 'HOPPE' and 'ARRONE' pull handles. The doorset, onto which the proposed hardware is to be fitted, may be of single-leaf or double-leaf configuration.

The proposed doorsets will be constructed of timber or mineral composite and are required to provide a fire resistance performance of up to 60 minutes integrity with respect to BS EN 1634-1.

FTSG

The data referred to in the supporting data section has been considered for the purpose of this appraisal which has been prepared in accordance with the Fire Test Study Group Resolution No. 82: 2001.

Assumptions

It is assumed that the 'HOPPE' and 'ARRONE' pull handles will be fitted to a doorset which has also been previously shown to be capable of providing the required fire resistance performance when tested in accordance with BS EN 1634-1 in the proposed configuration i.e. single-leaf or double-leaf.

Supporting wall

It is also assumed that the construction of the wall, which supports the proposed doorsets, will have been the subject of a separate test and the performance of the wall is such that it will not influence the performance of the doorset for the required period.

Clearance gaps

Door leaf to frame clearance gaps can have a significant effect on the overall fire performance of a doorset. It is therefore assumed that the leaf to leaf and leaf to frame clearance gaps will not exceed those measured for the relevant fire tested doorset. In addition, it is assumed that the door leaves will be in the closed position.

Proposals

It is proposed that 'HOPPE' and 'ARRONE' pull handles may be fitted onto a previously tested (in accordance with BS EN 1634-1) insulated timber or mineral composite based doorset which has been shown to be capable of providing up to 60 minutes integrity in the same configuration as that proposed i.e. single-leaf or double-leaf.

The range of handles considered by this report comprises aluminium based, stainless steel based, Nylon based and composite Nylon/steel based handles of various designs and includes bolt through, back to back, concealed fixing and surface fixed mounting options.

Basic Test Evidence

WF No. 345070

The test referenced WF No. 345070 included two single-acting, single-leaf timber based doorsets, one of a 30 minute fire resisting design and the other of a 60 minute fire resisting design. The doorsets were each fitted with various items of hardware including pull handle sets.

Both doorsets were fitted with pull handles detailed as follows:

- AR3616/300BF-SSS with AR324A-SSS stainless steel push plate
- AR203/H/300BF-SAA with AR224C-SAA aluminium push plate
- AR3616/150BB-SSS
- AR204/H/150BB-SAA

The doorsets achieved 34 and 56 minutes integrity performances, for the 30 and 60 minute doorsets respectively. The test was discontinued after 65 minutes.

Assessed Performance

General

It is proposed that previously fire tested (or assessed by Exova Warringtonfire) timber or mineral composite based insulated doorset may be fitted with 'HOPPE' and 'ARRONE' pull handles in order to provide up to 60 minutes integrity, without detracting from the performance of the doorset.

Aluminium and stainless steel handle models

The handles included in the test are considered to be representative of the majority of the ranges of handles included in this appraisal and were chosen in terms of material and fixing methods. All aluminium and stainless steel pull handles are hollow tube in diameters ranging from 19 to 22 mm and available in a range of sizes including 150 mm, 225 mm, 300 mm, 425 mm and 600 mm.

All of the HOPPE and ARRONE aluminium and stainless steel pull handles using the back to back or bolt through fixing methods require two holes to be drilled through the thickness of the door leaf to allow M8 fixing bolts to either secure or connect the handles.

Review of the test report cited in support of the proposal shows that, in the case of both 30 and 60 minute doorsets, the two material types and fixing methods did not detract from the performances of the doorset for the required periods. The 30 minute doorset achieved an integrity performance of 34 minutes and not instance of integrity failure associated with any of the pull handle assemblies fitted to that doorset occurred in the total test duration of 43 minutes at which point the doorset was sealed off.

Although the 60 minute doorset suffered from a premature failure after 56 minutes, this was not as a consequence of the installation of any of the pull handles fitted. Further examination of the observations taken during the test confirms that no instance of integrity failure associated with the pull handle assemblies fitted to the doorset occurred during the test duration of 65 minutes.

Based on the performances of the various handle models included in the test, the bolt through and back to back fixing methods are deemed to have satisfactorily demonstrated that they do not detract from the required performance of timber based doorsets for 30 and 60 minute fire resistance performances.

Concealed fix option

The concealed fixing option is essentially the same method as bolt through using two M8 bolts, but includes the addition of a rose at the base of the pull handle. This minor difference is not considered to have any negative influence on the likely performance of those models using the concealed fixing method, therefore their performance can be confidently assessed as equal to that of the tested bolt through models.

Plate mounted handles

A further option is for pull handles mounted on plates in 150 mm, 225 mm or 300 mm high versions. For these models the handle is not through bolted to the door leaf; instead the mounting plate is surface fixed via wood screws.

In this case the handle assembly is a wholly surface mounted item and considered to be less onerous than the tested models. The positive assessment of the plate mounted pull handles can therefore be positively appraised for the proposed applications.

Nylon pull handles

The 'HOPPE' Nylon pull handles considered by this report comprise a range of steel cored, Nylon coated or solid Nylon handles. They vary in fixing centres from 150 mm to 300 mm (solid Nylon), with the largest two sizes being 425 mm and 600 mm (steel cored).

The pull handles come in three fixing option; concealed fix, bolt fix or back to back. All fixing methods require a mounting bolt to pass through the thickness of the door leaf to secure the handle or connect it to the opposite handle.

The securing bolts used are relatively small in diameter at 8-10 mm and by themselves are unlikely to cause a significant thermal path through the door leaf which could result in a localised integrity failure. All sizes below 425 mm are a solid Nylon construction and so would burn and fall away from the exposed side of the door leaf during the first few minutes of exposure to the heating conditions of the test leaving only the fixing bolt in place.

For the two larger sizes, the Nylon material would again burn away, but this would expose the steel core. Whilst the exposure of the steel core could be considered as a path to the transfer heat into the door leaf, thereby causing local erosion of the timber material around the through fixing bolt, the direct evidence provided by the stainless steel handles included in the test referenced WF No. 345070 has demonstrated that the same fixing methods, have been utilised successfully on both 30 and 60 minute doorset constructions.

The HOPPE Nylon pull handles may therefore be positively appraised.

Based on the preceding discussion, the ARRONE and HOPPE ranges of pull handles listed within Annex A are deemed acceptable.

Proposed Doorsets

As stated in this report, the doorset, in the required configuration, will be previously tested (or assessed by Exova Warringtonfire) and its performance is therefore not in doubt.

To enable the use of the hardware on a range of doorsets, it is necessary to address the available information on the proposed doorset. As this appraisal is intended to be used on a general basis and not restricted to any particular manufacturer of fire resisting doorsets, the following points are given to enable the hardware to be used safely:

- a) The doorset shall carry valid certification or the doorset, including the door frame and associated ironmongery should have achieved up to 60 minutes integrity when tested by a UKAS approved laboratory (or assessed by Exova Warringtonfire) to BS EN 1634-1.
- b) Bolt through pull handles shall always be fitted in conjunction with the associated push plate fitted to the opposite face of the door leaf.
- c) If the proposed doorset is to be used in double-leaf configuration the test or assessment evidence should be applicable to double-leaf configurations.

Conclusions

Doorsets that have previously been successfully fire tested by a UKAS accredited laboratory (or assessed by Exova Warringtonfire) which have achieved up to 60 minutes integrity, as discussed in this report, may be fitted with 'HOPPE' or 'ARRONE' pull handles without detracting from the overall performance of the doorset.

Validity

This assessment is issued on the basis of test data and information available at the time of issue. If contradictory evidence becomes available to Exova Warringtonfire the assessment will be unconditionally withdrawn and Hoppe (UK) Limited will be notified in writing. Similarly the assessment is invalidated if the assessed construction is subsequently tested because actual test data is deemed to take precedence over an expressed opinion. The assessment is valid initially for a period of five years i.e. until 1st December 2019, after which time it is recommended that it be returned for re-appraisal.

The appraisal is only valid provided that no other modifications are made to the tested construction other than those described in this report.

Summary of Primary Supporting Data

WF No. 345070 Test report relating to the performance of two fully insulated, single-acting, single-leaf, timber doorsets incorporating various items of building hardware, when subjected to a test in accordance with BS EN 1634-1: 2014 to determine their fire resistance performance.

For the purpose of the test the doorsets were referenced Doorset A and Doorset B.

Doorset A had overall nominal dimensions 2085 mm high by 1003 mm wide incorporating a door leaf with overall dimensions 2040 mm high by 932 mm wide by 44 mm thick. The door leaf was of a solid graduated density chipboard construction, with 8 mm hardwood lippings to the vertical edges and was hung within a softwood frame on three stainless steel hinges. Doorset B had overall nominal dimensions 2085 mm high by 1009 mm wide incorporating a door leaf with overall dimensions 2040 mm high by 932 mm wide by 54 mm thick. The door leaf was of a solid graduated density chipboard construction, with 8 mm hardwood lippings to the vertical edges and was hung within a hardwood frame on three stainless steel hinges.

Both doorsets incorporated a surface mounted overhead closer, two bolt-through pull handles on the exposed face, referenced AR3616/300BF-SS and AR203/H/300BF-SSA with corresponding push plates on the unexposed face referenced AR324A-SSS and AR224C-SSA, two additional back to back pull handles referenced AR3616/150BB-SSA and AR204/H/150BB-SSA were also fitted to the leaf.

The doorsets were installed such that they opened towards the heating conditions of the test.

The specimens satisfied the test requirements for the following periods:

Test Results:		Doorset A	Doorset B
Integrity performance	Sustained flaming	43 minutes	56 minutes
	Gap gauge	40 minutes	65 minutes*
	Cotton Pad	34 minutes	56 minutes
Insulation performance	Insulation	34 minutes	56 minutes

*The test duration. The test was discontinued after a period of 65 minutes.

Test date : 29th September 2014

Test sponsor : HOPPE (UK) Limited

Declaration by HOPPE (UK) Limited

We the undersigned confirm that we have read and complied with the obligations placed on us by the UK Fire Test Study Group Resolution No. 82: 2001.

We confirm that the component or element of structure, which is the subject of this assessment, has not to our knowledge been subjected to a fire test to the Standard against which the assessment is being made.

We agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test to the Standard against which this assessment is being made.


We are not aware of any information that could adversely affect the conclusions of this assessment.

If we subsequently become aware of any such information we agree to cease using the assessment and ask Exova Warringtonfire to withdraw the assessment.

Signed:

For and on behalf of:

Signatories


Responsible Officer
D. Forshaw* - Principle Certification Engineer


Approved
A. Kearns* - Technical Manager

* For and on behalf of Exova Warringtonfire.

Report Issued: 2 nd December 2014
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The assessment report is not valid unless it incorporates the declaration duly signed by the applicant.

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Annex A – Permitted Hardware

Aluminium Pull Handles		
Reference	Fixing type	Description
AR204/150BB	Back-to-Back Fix Pull Handle	19mm & 20mm Diameter, 150mm Centres, SAA & GAA Finishes
AR204/225BB	Back-to-Back Fix Pull Handle	19mm & 20mm Diameter, 225mm Centres, SAA & GAA Finishes
AR204/300BB	Back-to-Back Fix Pull Handle	19mm & 20mm Diameter, 300mm Centres, SAA & GAA Finishes
AR204/425BB	Back-to-Back Fix Pull Handle	19mm & 20mm Diameter, 425mm Centres, SAA & GAA Finishes
AR204/600BB	Back-to-Back Fix Pull Handle	19mm & 20mm Diameter, 600mm Centres, SAA & GAA Finishes
AR224/300BB	Back-to-Back Fix Pull Handle	22mm Diameter, 300mm Centres, SAA Finish
AR224/425BB	Back-to-Back Fix Pull Handle	22mm Diameter, 425mm Centres, SAA Finish
AR203/150BF	Bolt Through Fix Pull Handle	19mm & 20mm Diameter, 150mm Centres, SAA & GAA Finishes
AR203/225BF	Bolt Through Fix Pull Handle	19mm & 20mm Diameter, 225mm Centres, SAA & GAA Finishes
AR203/300BF	Bolt Through Fix Pull Handle	19mm & 20mm Diameter, 300mm Centres, SAA & GAA Finishes
AR203/425BF	Bolt Through Fix Pull Handle	19mm & 20mm Diameter, 425mm Centres, SAA & GAA Finishes
AR203/600BF	Bolt Through Fix Pull Handle	19mm & 20mm Diameter, 600mm Centres, SAA & GAA Finishes
AR223/300BF	Bolt Through Fix Pull Handle	22mm Diameter, 300mm Centres, SAA Finish
AR223/425BF	Bolt Through Fix Pull Handle	22mm Diameter, 425mm Centres, SAA Finish
AR202/150CF	Concealed Fix Pull Handle	19mm & 20mm Diameter, 150mm Centres, SAA & GAA Finishes
AR202/225CF	Concealed Fix Pull Handle	19mm & 20mm Diameter, 225mm Centres, SAA & GAA Finishes
AR202/300CF	Concealed Fix Pull Handle	19mm & 20mm Diameter, 300mm Centres, SAA & GAA Finishes
AR202/425CF	Concealed Fix Pull Handle	19mm & 20mm Diameter, 425mm Centres, SAA & GAA Finishes
AR202/600CF	Concealed Fix Pull Handle	19mm & 20mm Diameter, 600mm Centres, SAA & GAA Finishes
AR222/300CF	Concealed Fix Pull Handle	22mm Diameter, 300mm Centres, SAA Finish
AR222/425CF	Concealed Fix Pull Handle	22mm Diameter, 425mm Centres, SAA Finish
AR2023/150CF/BF	150mm C.Fix/B.Fix Pull Handle	19mm & 20mm Diameter, 150mm Centres, SAA & GAA Finishes
AR2023/225CF/BF	225mm C.Fix/B.Fix Pull Handle	19mm & 20mm Diameter, 225mm Centres, SAA & GAA Finishes
AR2023/300CF/BF	300mm C.Fix/B.Fix Pull Handle	19mm & 20mm Diameter, 300mm Centres, SAA & GAA Finishes
AR2023/425CF/BF	425mm C.Fix/B.Fix Pull Handle	19mm & 20mm Diameter, 425mm Centres, SAA & GAA Finishes
AR2023/600CF/BF	600mm C.Fix/B.Fix Pull Handle	19mm & 20mm Diameter, 600mm Centres, SAA & GAA Finishes
AR205/150FF-P	Face Fix Pull Handle on Plate	19mm & 20mm Diameter, 150mm Centres, 225mm Plate, SAA & GAA Finishes
AR205/225FF-P	Face Fix Pull Handle on Plate	19mm & 20mm Diameter, 225mm Centres, 300mm Plate, SAA & GAA Finishes
AR205/300FF-P	Face Fix Pull Handle on Plate	19mm & 20mm Diameter, 300mm Centres, 375mm Plate, SAA & GAA Finishes

Grade 316 Stainless Steel Pull Handles		
D- Shaped Pull Handles		
Reference	Fixing type	Description
AR3616/150BB	Back-to-Back Fix Pull Handle	19mm & 22mm Diameter, 150mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/225BB	Back-to-Back Fix Pull Handle	19mm & 22mm Diameter, 225mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/300BB	Back-to-Back Fix Pull Handle	19mm & 22mm Diameter, 300mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/425BB	Back-to-Back Fix Pull Handle	19mm & 22mm Diameter, 425mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/600BB	Back-to-Back Fix Pull Handle	19mm & 22mm Diameter, 600mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/150BF	Bolt Through Fix Pull Handle	19mm & 22mm Diameter, 150mm Centres, SSS & PSS Finishes
AR3616/225BF	Bolt Through Fix Pull Handle	19mm & 22mm Diameter, 225mm Centres, SSS & PSS Finishes
AR3616/300BF	Bolt Through Fix Pull Handle	19mm & 22mm Diameter, 300mm Centres, SSS & PSS Finishes
AR3616/425BF	Bolt Through Fix Pull Handle	19mm & 22mm Diameter, 425mm Centres, SSS & PSS Finishes
AR3616/600BF	Bolt Through Fix Pull Handle	19mm & 22mm Diameter, 600mm Centres, SSS & PSS Finishes
AR3616/150CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 150mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/225CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 225mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/300CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 300mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/425CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 425mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/600CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 600mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/150CF/BF	150mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 150mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/225CF/BF	225mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 225mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/300CF/BF	300mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 300mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/425CF/BF	425mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 425mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3616/600CF/BF	600mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 600mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes

Grade 316 Stainless Steel Pull Handles		
T-Bar Shaped Pull Handles		
Reference	Fixing type	Description
AR3617/150BB	19mm Dia T Bar Pull Handle	19mm & 22mm Diameter, 150mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/225BB	19mm Dia T Bar Pull Handle	19mm & 22mm Diameter, 225mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/300BB	19mm Dia T Bar Pull Handle	19mm & 22mm Diameter, 300mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/425BB	19mm Dia T Bar Pull Handle	19mm & 22mm Diameter, 425mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/600BB	19mm Dia T Bar Pull Handle	19mm & 22mm Diameter, 600mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/150BF	19mm Dia T-Bar Pull Handle	19mm & 22mm Diameter, 150mm Centres, SSS & PSS Finishes
AR3617/225BF	19mm Dia T-Bar Pull Handle	19mm & 22mm Diameter, 225mm Centres, SSS & PSS Finishes
AR3617/300BF	19mm Dia T-Bar Pull Handle	19mm & 22mm Diameter, 300mm Centres, SSS & PSS Finishes
AR3617/425BF	19mm Dia T Bar Pull Handle	19mm & 22mm Diameter, 425mm Centres, SSS & PSS Finishes
AR3617/600BF	19mm Dia T Bar Pull Handle	19mm & 22mm Diameter, 600mm Centres, SSS & PSS Finishes
AR3617/150CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 150mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/225CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 225mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/300CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 300mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/425CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 425mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/600CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 600mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/150CF/BF	150mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 150mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/225CF/BF	225mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 225mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/300CF/BF	300mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 300mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/425CF/BF	425mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 425mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR3617/600CF/BF	600mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 600mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes

Grade 304 Stainless Steel Pull Handles		
D- Shaped Pull Handles		
Reference	Fixing type	Description
AR9616/150BB	Back-to-Back Fix Pull Handle	19mm & 22mm Diameter, 150mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR9616/225BB	Back-to-Back Fix Pull Handle	19mm & 22mm Diameter, 225mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR9616/300BB	Back-to-Back Fix Pull Handle	19mm & 22mm Diameter, 300mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR9616/425BB	Back-to-Back Fix Pull Handle	19mm & 22mm Diameter, 425mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR9616/600BB	Back-to-Back Fix Pull Handle	19mm & 22mm Diameter, 600mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR404/225BB	Back-to-Back Fix Pull Handle	19mm Diameter, 225mm Centres, PB PVB Finish
AR404/300BB	Back-to-Back Fix Pull Handle	19mm Diameter, 300mm Centres, PB PVB Finish
AR404/425BB	Back-to-Back Fix Pull Handle	19mm Diameter, 425mm Centres, PB PVB Finish
AR9616/150BF	Bolt Through Fix Pull Handle	19mm & 22mm Diameter, 150mm Centres, SSS & PSS Finishes
AR9616/225BF	Bolt Through Fix Pull Handle	19mm & 22mm Diameter, 225mm Centres, SSS & PSS Finishes
AR9616/300BF	Bolt Through Fix Pull Handle	19mm & 22mm Diameter, 300mm Centres, SSS & PSS Finishes
AR9616/425BF	Bolt Through Fix Pull Handle	19mm & 22mm Diameter, 425mm Centres, SSS & PSS Finishes
AR9616/600BF	Bolt Through Fix Pull Handle	19mm & 22mm Diameter, 600mm Centres, SSS & PSS Finishes
AR403/150BF	Bolt Through Fix Pull Handle	19mm Diameter, 150mm Centres, PB PVB Finish
AR403/225BF	Bolt Through Fix Pull Handle	19mm Diameter, 225mm Centres, PB PVB Finish
AR403/300BF	Bolt Through Fix Pull Handle	19mm Diameter, 300mm Centres, PB PVB Finish
AR403/425BF	Bolt Through Fix Pull Handle	19mm Diameter, 425mm Centres, PB PVB Finish
AR403/600BF	Bolt Through Fix Pull Handle	19mm Diameter, 600mm Centres, PB PVB Finish
AR9616/150CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 150mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR9616/225CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 225mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR9616/300CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 300mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR9616/425CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 425mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR9616/600CF	Concealed Fix Pull Handle	19mm & 22mm Diameter, 600mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR402/225CF	Concealed Fix Pull Handle	19mm Diameter, 225mm Centres, PB PVB Finish
AR402/300CF	Concealed Fix Pull Handle	19mm Diameter, 300mm Centres, PB PVB Finish
AR402/425CF	Concealed Fix Pull Handle	19mm Diameter, 425mm Centres, PB PVB Finish
AR402/600CF	Concealed Fix Pull Handle	19mm Diameter, 600mm Centres, PB PVB Finish
AR9616/150CF/BF	150mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 150mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR9616/225CF/BF	225mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 225mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR9616/300CF/BF	300mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 300mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR9616/425CF/BF	425mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 425mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes
AR9616/600CF/BF	600mm C.Fix/B.Fix Pull Handle	19mm & 22mm Diameter, 600mm Centres, 6mm & 8mm Depth Rose, SSS & PSS Finishes

HOPPE Nylon Pull Handles

Reference	Description
AR602 – Straight pull handle	Concealed fix, bolt fix & back to back
AR603 – Cranked pull handle	Concealed fix, bolt fix & back to back
AR604 – 'V' shaped pull handle	Concealed fix, bolt fix & back to back
AR605 – Semi-circular pull handle	Concealed fix, bolt fix & back to back

Available finishes: Diamond white, Viridian Green, Black, Sienna Brown, Flint Grey, Manhattan Grey, Midnight Blue, Rouge Red, Claret Red and Golden Yellow.