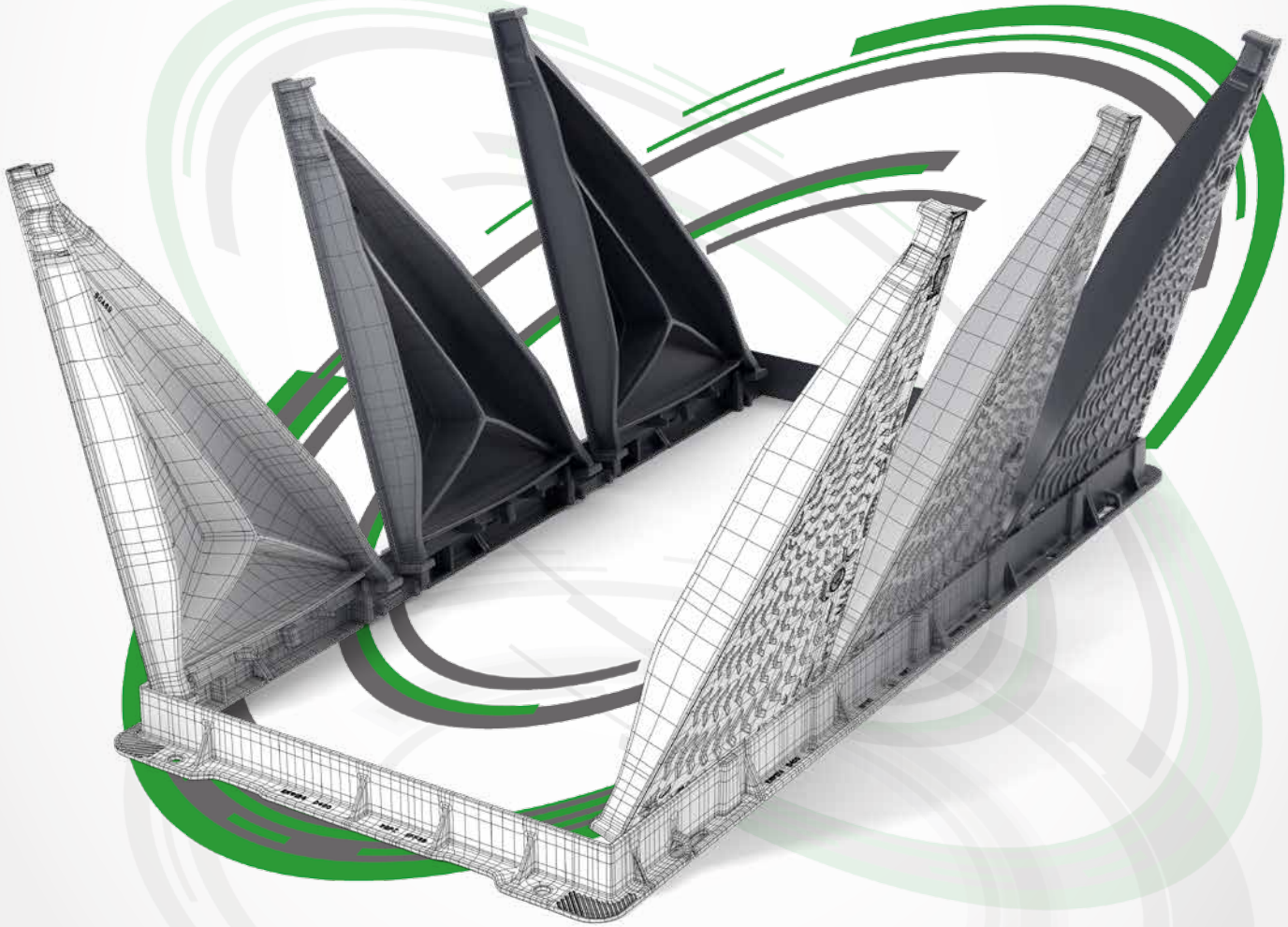
2016 EDITION

Ductile Iron Access Covers and Gratings

PRODUCT SELECTION & SPECIFICATION GUIDE



SAINT-GOBAIN

As the world leader in designing, manufacturing and distributing construction materials, Saint-Gobain is committed to helping build a more sustainable future. Together our companies can provide innovative, high performing solutions for a wide variety of construction and infrastructure projects, helping create more energy efficient and comfortable living & working environments. Saint-Gobain construction products cover a wide spectrum, from architectural glass and thermal & acoustic insulation systems to building product distribution, plasterboard products and infrastructure solutions.

In the UK & Ireland, some of the best known and respected companies in the construction materials sector are part of the group, including British Gypsum, Isover, Glass Solutions, Weber, Ecophon, Jewson and Saint-Gobain PAM UK.

Saint-Gobain PAM UK is the primary supplier of ductile and cast iron products to the UK's key utilities, telecoms, highways, civil engineering, construction and housing sectors, including:

- Cast iron soil and drain and rainwater systems
- Ductile iron water and sewer pipes, fittings, valves and couplings and adaptors
- Ductile iron access covers, gratings and surface boxes.

Together with its international parent company, Saint-Gobain PAM, Saint-Gobain PAM UK have supplied products to countless major construction projects across the world. With access to worldwide technical excellence and a large portfolio of products, Saint-Gobain PAM UK is able to combine the benefits of a global presence with the ability to develop and offer products to satisfy local requirements. With the Saint-Gobain PAM UK and PAM range of products you are assured of the highest standards of quality, innovation and technical expertise and all times.

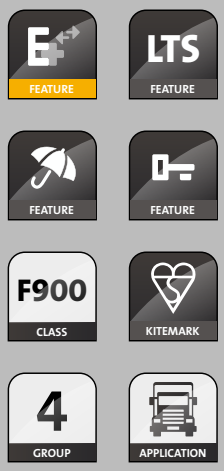
SAINT-GOBAIN

Contents

The PAM range of highway products is manufactured in accordance with the relevant European or British Standard performance specification BS EN 124 for access covers and gully grates, and BS 5834 and BS 750 for surface boxes.

The symbols detailed below are those incorporated in the selection box in the 'At a glance' section, indicating recommended applications and allowing appropriate product selection.

At a glance



The PAM selection box in the 'At a glance' section of the product pages is a quick reference guide to product selection and enables important performance and product specification criteria to be assessed quickly and conveniently.

The gold and silver indicators identify the added level of benefit each product provides.

(For access covers only)

Includes a feature(s) that offers improved skid and slip resistance.

At a glance

Suitable for use in domestic areas with occasional light vehicular access.

Suitable for use in car parks and areas of slow-moving access to cars and light commercial vehicles.

Suitable for use in conditions of heavy traffic, eg. main city streets and roads.

Suitable for use where continuous high levels of fast-moving heavy traffic are present.

Suitable for areas subject to slow-moving heavy loadings, eg. industrial premises.

Suitable for areas subject to very heavy wheel loads such as aircraft pavements and container areas.

Includes the Load Transfer System (LTS) feature for optimum installation and durability.

Includes an infiltration feature which drastically reduces surface water ingress.

Includes integrated anti-fall protection.

(For gully gratings only)

Includes a specially designed grating for use in pedestrian areas.

Includes an ergonomically positive opening feature.

Gold indicates a fully ergonomic opening system. Silver indicates a semi-ergonomic inspection system.

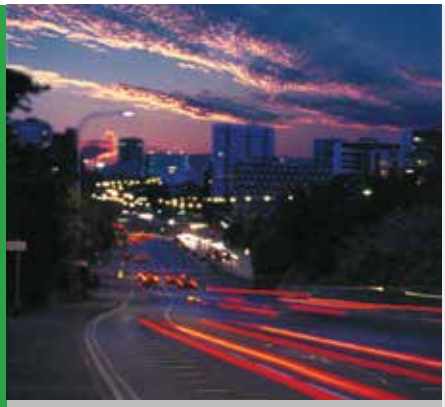
Includes a security feature to deter unauthorised access ranging from high security (gold) to lesser locking levels.

(For gully gratings only)

Indicates the level of absorption efficiency of a grating ranging from high (gold) to lesser levels.

(For access covers only)

Includes a feature which reduces egress of unwanted odour ranging from high resistance (gold) to lesser levels.



LTS FEATURE

Range of products

With an aim in contributing to the reduction of whole life costs associated with the installation, operation and maintenance of municipal castings, Saint-Gobain PAM UK offer a comprehensive range of products that are designed and engineered to include standard features to help improve durability, operator safety, asset security and overall performance.

Developed through a deep understanding of the markets we serve, our range of products focus on delivering tangible benefits to meet and exceed the needs of clients, specifiers, installers and operators.

Safety

The development of a comprehensive range of hinged access covers and gully grates that help minimise the risk of injury through static lifting of ironwork. Studies have demonstrated that by using hinged solutions the required lifting effort is reduced by up to 50%.

Security

Through the provision of flexible security solutions to act as a deterrent against theft, unauthorised access or vandalism. Security locking can be provided by the use of a standard feature such as a spring bar, or captive hinge, factory fitted security bolts and screws or by providing the facility to enable a locking kit to be fitted retrospectively.

Durability

Research lead by Nottingham University into how ironwork interacts with the road construction, determined that critical features such as the seating contact areas, the thickness of the frame and flanges and controlled manufacturing tolerances when designed, engineered and manufactured correctly combine to ensure and enhance optimum performance.

Saint-Gobain PAM UK has used the results of this research to develop the Load Transfer System (LTS). This system has become a standard feature across our core ranges giving peace of mind that products are stronger, more resilient and even more durable. Products when installed using high performance resin based bedding mortars, LTS has been proven to reduce the dynamic loads subjected to the casting and the underlying structure and bedding by 50% increasing the life of the installation thus avoiding the need for frequent reinstatement.

Commitment to Quality

Saint-Gobain PAM UK is committed to offering products of the highest quality and performance. As a basis for this objective the company is committed to operating strict manufacturing and quality systems. It also recognises the responsibility of the companies' workforce in meeting these quality objectives and seeks to continually improve their awareness, training and development needs.

The BSI Kitemark is the worlds most recognisable 3rd party product certification mark. The majority of the products within this guide are certified by British Standards and bear the Kitemark* logo, giving reassurance that the product is in full compliance with the requirements of the standard under which it is designed, manufactured, tested and inspected. This internationally respected symbol of product quality accredits the following standards relevant to access covers, gratings, channel gratings and surface boxes manufactured in the UK.

BS EN 124
Gully tops and manhole tops for vehicular and pedestrian areas.

BS 5834 Pt 2 2011
Specification for small surface boxes.

ISO 9001: 2008
ISO 9001 is the most widely used international standard that provides and effective framework for an effective Quality Management System. The quality systems that govern the manufacture of the products featured in this guide are kitemarked in accordance with the requirements of BS EN IS0 9000: 2008 Registration Number FM12908.

UVDB Verify
The UVDB Verify scheme was developed to assist companies in the selection and pre-qualification of suppliers and certifies a companies' level of performance against key criteria such as Health & Safety, Environmental controls & procedures and Quality. Saint-Gobain PAM UK has achieved Category A status.

CE Marking
The proposed revision of EN 124 includes a requirement for CE marking as it is anticipated that once published it will become a harmonised standard which is in accordance with the Construction Products Regulations.

NF Mark
The French equivalent of the Kitemark. The NF Mark attests to the compliance of products and services with the relevant standards, and is enhanced with additional specifications, to match the market's expectations as closely as possible.

**Please note that some products are NF certified. (French Standards Authority).*

Incorporating sustainability

Saint-Gobain PAM UK at its Holwell foundry near Melton Mowbray remains at the forefront of manufacturing access covers and gratings in the UK. With a focus on continuous improvement we combine our technical expertise, process control, and innovative designs to offer solutions of the highest performance to meet the needs of all stakeholders.

In the manufacture of our products Saint-Gobain PAM UK is a major recycler of ferrous scrap and wherever possible, source other raw materials that are themselves the by-product of other industrial processes. By doing this we minimise our impact on the environment and usage of the worlds finite resources. Products manufactured at Holwell contain 98% recycled materials and are themselves 100% recyclable.

Saint-Gobain PAM UK has a long term commitment to safeguard the future of our local environment and to this end are audited and kitemarked in accordance with the stringent requirements of IS0 14001 Environmental Management Systems. Saint-Gobain PAM UK has also been awarded certification to the world class ISO accredited CEMARS standard which confirms our commitment to measuring, managing and reducing greenhouse gas emissions in a robust and credible way and that we undertake our assessments in compliance with ISO 14064-1 2006.

Another of our aims is to continually improve our manufacturing performance, World Class Manufacturing is a comprehensive management system to improve performance by eliminating losses. The structured operating excellence method has proven effective in key areas such as safety, quality and productivity. The Holwell plant has achieved Bronze status and is well on its way to achieving silver in the near future.

Our commitment to the environment is also matched by our commitment to the safety and well being of our workforce. Our ambition is to have zero occupational health incidents and by deploying effective resources and standards we have significantly reduced the frequency of work related accidents. Key to maintaining and improving our performance is engaging with all employees and through a focus on education and communication develop a culture to identify, reduce and avoid risks in the workplace.

Certified Emissions Measurement And Reduction Scheme
CEMARS

WCMM

BSI
ISO 14001

SUPPLY CHAIN SUSTAINABILITY SCHOOL SILVER

BES 6001
Responsible Sourcing
www.greenbooklive.com

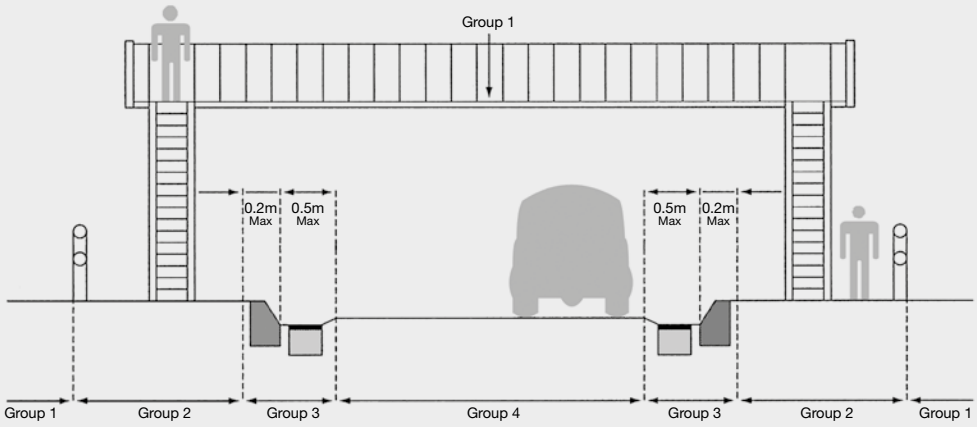
BRE Global Verified EPD

Standard classification BS EN 124

Access covers and gully grates installed in the UK should meet the requirements of the European Standard BS EN 124. This applies to all situations, on and off-road and to all materials. Products designed to BS EN 124 are grouped and classified depending on their place of installation. It is the responsibility of the engineer to ensure that the correct product is specified. The appropriate class of manhole top or gully top to be used depends upon the place of installation. The selection of the appropriate class is the responsibility of the designer. Where there is any doubt the stronger class should be selected.

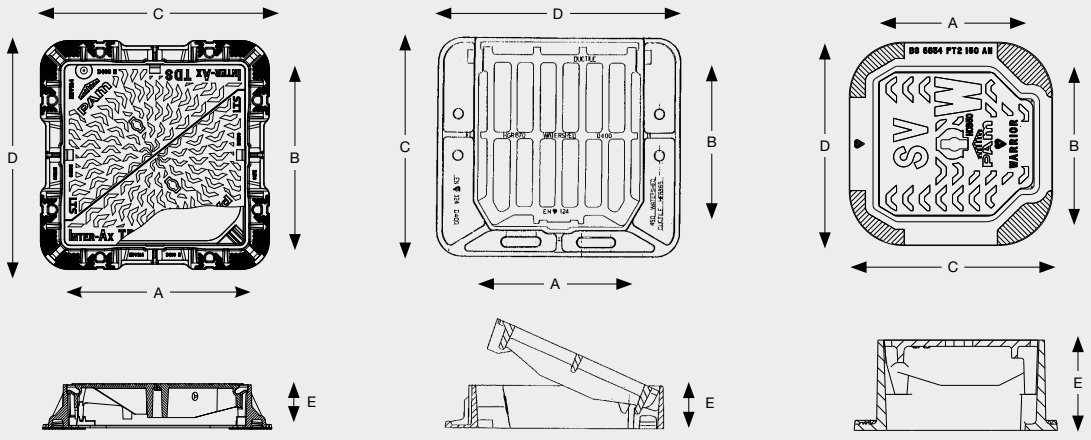
Clause 5 BS EN 124

Fig No.2 – EN 124 applications



Loading	BS 497 grade	BS 497 test load	BS EN 124 class	BS EN 124 test load
Areas imposing particularly high wheel loads – Group 6	—	—	F900	900kN
Areas imposing high wheel loads – Group 5	—	—	E600	600kN
Carriageways of roads (heavy duty) – Group 4	D A	400kN 350kN	D400	400kN
Gully tops in kerbside channels of roads – Group 3	—	—	C250	250kN
Footways, pedestrian areas etc – Group 2	B	150kN	B125	125kN
Areas inaccessible to motor vehicles – Group 1	C	10kN	A15	15kN

Municipal castings are often specified by their clear opening dimensions (A x B) and frame depth (E) as indicated on these drawing examples. Additional reference can also be made to the total overall size or overbase (C x D)



Product selector

1 GROUP

Class A15

Access covers and gratings capable of withstanding a 1.5 tonnes test load. For use in areas where only pedestrians have access.

2 GROUP

Class B125

Access covers and gratings capable of withstanding a 12.5 tonnes test load. For use in car parks and pedestrian areas where occasional vehicular access is likely.

3 GROUP

Class C250

Access covers and gratings capable of withstanding a 25 tonnes test load. For use in areas where not extending more than 500mm from the kerb face into the carriageway.

4 GROUP

Class D400

Access covers and gratings capable of withstanding a 40 tonnes test load. For use in areas where cars and lorries have access, including carriageways, hard shoulders and pedestrian areas. All units to be either non-rock or silent in operation.

5 GROUP

Class E600

Access covers and gratings capable of withstanding a 60 tonnes test load. For use in areas where heavy wheel loads are imposed such as loading areas, docks or aircraft pavements.

6 GROUP

Class F900

Access covers and gratings capable of withstanding a 90 tonnes test load. For use in areas where very heavy wheel loads are imposed such as aircraft pavements.

Specifying products under BS EN 124

Interactive technical advisory service

As the UK's leading manufacturer of access covers and gratings, PAM offers specifiers, users, contractors and merchants a comprehensive technical advisory service.

This service is provided free of charge by a team of highly qualified professionals who are fully trained to advise on PAM's full range of products. This can include telephone assistance, written technical guidance, specifications and site visits to advise on use and installation as required.

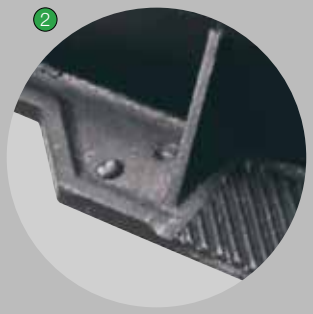
Telephone: +44 (0)1664 814 014
Facsimile: +44 (0)1664 814 025
E-mail: technical.covers.uk.pam@saint-gobain.com

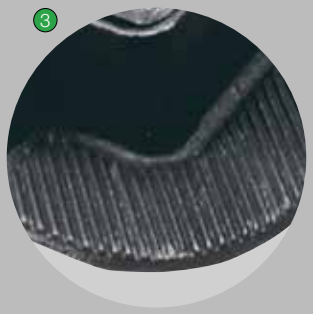
Iron Interaction in the Highway

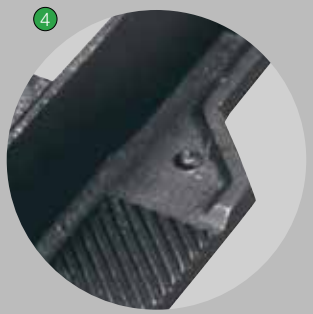
PAM has invested in two lengthy independent research programmes at Nottingham and Salford Universities. This has resulted in a range of products that incorporate the distinctive 'Load Transfer System' (LTS) and the 'Ergonomically Positive' (E+) design feature. These features combine to create a product portfolio that conforms with the legislative requirements and allows for a more accurate product specification within any given installation or environment.

LTS FEATURE

For products that have the LTS feature, the trademark is detailed in the 'At a glance' section of the product pages.







Load Transfer System

The Nottingham University research gave us an understanding of the transfer of dynamic loads from traffic onto the access cover and subsequently from the access frame to the chamber structure. It was found that in conventional designs the load is concentrated at the corners of the casting creating excess strain on specific areas of the bedding material. The new LTS feature (Load Transfer System) was designed specifically to reduce this strain in the mortar thereby reducing the risk of cracking which can cause premature failure.

The system comprises the following four features:

1. Corner webs

The shape of the flange has been optimised so that there is an increased area where the load is concentrated. This minimises the strain in the bedding and will give a reduction of measurable strain between 30% to 50%. The design increases the 'Pressure Bearing Area' where the load is concentrated and provides excellent seating for good installation. The reduction of flange width between the corners has the effect of reducing torsional stiffness whilst retaining the necessary bending stiffness thus avoiding vertical deformation of the casting and the resultant strain in the mortar.

2. Rib positioning

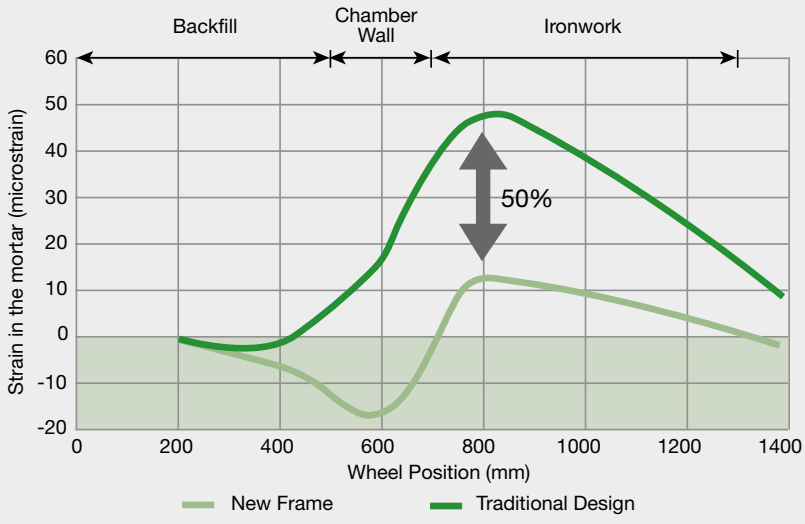
The positioning of the ribs plays a critical role in reducing the risk of cracking the bedding material due to frame deflection. The position opposite the cover seating areas reduces the risk of deformation and ensures that impact to the surrounding materials is limited.

3. Bonding ribs

The increased contact area provided by the rib design significantly improves the bonding of the casting to the bedding material creating a greater resistance to lateral shift. The improved bonding helps to avoid early separation and cracking of the bedding material which can cause premature failure.

4. Flange stiffness

The thickness of the flange at the corners prevents bending caused by dynamic loading from the wheel. The prevention of bending in this area reduces the disturbance of the bedding material.



As traffic speed and frequency increases, greater emphasis is being placed on the smooth running of the national and local road network. To help ensure this, it is important that the need to reinstate ironwork is avoided but this can only be achieved if the work practices materials, solutions and the specification that govern them evolve and adapt.

Re-work caused by poor workmanship or through a lack of understanding of the correct use of materials is estimated to cost c. £200m per year, a cost that can be reduced significantly if simple rules are followed.

As part of its research and development programme Saint-Gobain PAM UK focused on arriving at a solution that will promote a right first time approach to installation. Its key aim to provide a system that will reduce the time taken while enabling efficient use of bedding and reinstatement materials that will ultimately reduce the whole life cost.

The result of this is the development of the Install Plus Frame Levelling System which is engineered to help eliminate the issues faced when installing carriageway access cover and gratings. There are a number of key elements that combine and are key in guaranteeing the durability and long term performance of the installation;

Depth of the bedding material

Is assured by 4 nylon inserts which are located on the underside of the frame flange which are pre-set to allow for a minimum and consistent depth of bedding mortar of 15mm

Enveloping of the flange

Using a flowable bedding material creates a homogenous layer with the material below the flange. By using the bedding indicator on the top of the insert this ensures the mortar is to the recommended minimum depth of 20mm above the flange

Frame height, level and gradient

It is important that the top of the frame is flush with the surrounding surface. To accommodate changes in gradient and camber further adjustment can be made by rotating 4 nylon bolts clockwise to raise the frame to the required finished level. The bolts have a range of adjustment of 15mm to 50mm

Install Plus is available across a variety of our access covers and gratings products.

For further information please contact us on our Access Covers and Gratings Technical Enquiries and Assistance hotline on 01664 814014 or email technical.covers.uk.pam@saint-gobain.com

Section 1
Access Covers

Section 1
Contents

LTS FEATURE | F900 CLASS | >70 PSRV | APPLICATION | 6 GROUP | KITEMARK

Briton

Code	SAP code	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
BK90 1	234849	F900	602 x 602	802 x 802	150	86*	141
BK91 1	230598	F900	678 x 678	878 x 878	150	99*	159
BK92 1	221195	F900	1223 x 690	1423 x 890	150	110*	295
BK93 1	233039	F900	1842 x 690	2042 x 890	150	110*	445

Features
- Double triangular
- Non-rock design
- Frame lifting points
- LTS installation and durability features

Options
- Badging
- Security locking

Recommended for use in areas that are subjected to very heavy wheel loads such as aircraft pavements, container ports and docksides.

*Cover mass per pair.

LTS FEATURE | E600 CLASS | >70 PSRV | APPLICATION | 5 GROUP | KITEMARK

Briton

Code	SAP code	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
Open Keyways							
BK01 1	185941	E600	610 x 610	815 x 815	150	78*	127
Closed Keyways							
BK21 1	185948	E600	610 x 610	815 x 815	150	80*	129

Features
- Double triangular
- Non-rock design
- Frame lifting points
- LTS installation and durability features
- HA 104/09 compliant
- Sewers for Adoption 7 compliant

Options
- Badging options

Recommended for use in trunk roads carrying fast-moving traffic and industrial areas subject to exceptionally heavy traffic eg. dual carriageways, docks and container areas.

*Cover mass per pair.
Use loop handled lifting keys.

GRIPTOP™ Ductile iron and mineral technology for extra safety

Also available as GripTop variant.

E600 CLASS

>60 PSRV

APPLICATION

5 GROUP

KITEMARK

Silent Knight

Code	SAP code	Code safety grids	SAP Code safety grids	Code security screws	SAP code sec. screws	Code safety grid & sec. screws	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
Open Keyways												
CJ56 1	186103	CJ56 1/AP	186104	CJ56 1/BL	186105	CJ56 1/BN	E600	1210 x 685	1375 x 850	150	82*	265
CJ66 1	186108	CJ66 1/AP	186109	CJ66 1/BR	186110	CJ66 1/BP	E600	1825 x 689	1985 x 849	150	82*	390
Closed Keyways												
CJ76 1	186114	CJ76 1/AP	186115	CJ76 1/BL	TBA	CJ76 1/BN	E600	1210 x 685	1375 x 850	150	83*	260
CJ86 1	186122	CJ86 1/AP	186123	CJ86 1/BR	TBA	CJ86 1/BP	E600	1825 x 685	1985 x 850	150	83*	383

Features

- Double triangular
- Non-rock design
- HA 104/09 compliant
- Sewers for Adoption 7 compliant

Options

- Badging options
- Security locking option

Recommended for use in trunk roads carrying fast-moving traffic and industrial areas subject to exceptionally heavy traffic eg. dual carriageways, docks and container areas.

* Cover mass per pair.

Safety grids can be ordered separately on HMA7 0 (187118). For 1210 x 685 clear opening, two grids are required. For 1825 x 685 clear opening, three grids are required.

Use loop handled lifting keys.

Please visit our website:
www.pamline.co.uk
to download electronic versions or to request hard copies of any of our brochures.

GRIPTOP™

Ductile iron and mineral technology for extra safety

LTS FEATURE

For products that have the LTS feature, the trademark is detailed in the 'At a glance' section of the product pages.

GripTop range

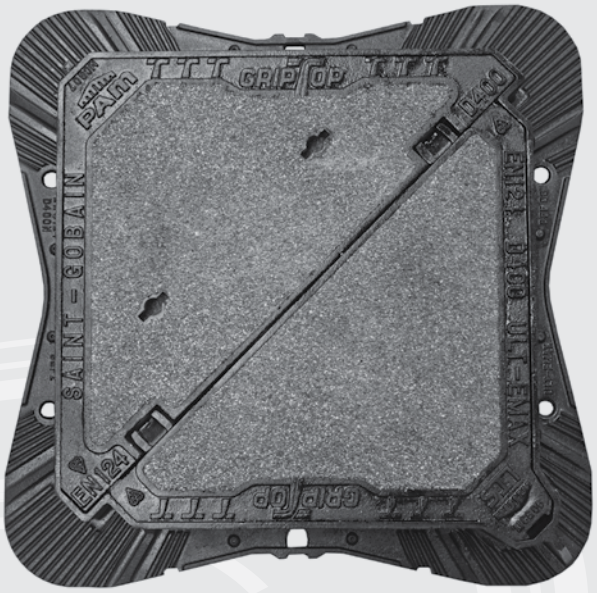
On British roads today there are many factors which can contribute to increasing the risk of skidding to two and four wheel vehicles. One of these factors is access covers which have been worn and polished over decades of being trafficked, that when also wet can increase the risk of skidding.

A strategy established by the Department of Transport is to create a safer infrastructure as a means to improve road safety, key elements include:

- A recognition that good engineering and design reduces the risk of accidents
- A focus on proactive or planned maintenance of national roads

At Saint-Gobain PAM UK we recognise our role in contributing to road safety and the importance in providing durable long term solutions. Through an exhaustive new product development programme we have been able to achieve a major breakthrough that has resulted in the development of GripTop. Fully compliant and kitemarked with the requirements of BS EN 124 GripTop features a patented factory applied maintenance free top surface which brings together high performance bonding agents and bauxite aggregate on a recessed ductile iron substrate.

In partnership with Bristol City Council, large scale testing has been carried out across the city centre at regular intervals over a 5 year period. Located around the inner ring road which is subjected to continuous heavy traffic a selection of installations were independently tested to determine any degradation in the skid resistance. The results have proven the long term performance of GripTop with a industry leading PSRV (Polished Skid Resistance Value) of >75 on average.



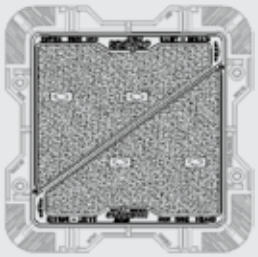
GRIPTOP™

Ductile iron and mineral technology for extra safety

Available in E600 & D400 load classes, Inter-Ax, Briton, Opt-Emax or Ult-Emax variants and a wide range of clear opening sizes, GripTop offers a permanent high friction solution for where the road design or configuration require long-lasting grip performance such as traffic lights, pedestrian crossings and roundabouts.

In addition, GripTop exceeds the requirements of Highways Agency Guidance Note HA 104/09 Chamber Tops and Gully Tops for Road Drainage and Services; Chapter 3 Design Considerations for Chamber Tops in which it specifies that areas identified as high risk a product that can demonstrate a minimum PSRV of 60 should be used.

- Proven in service durability
- Industry leading PSRV (Polished Skid Resistance Value)
- Available in D400 or E600 load classifications
- Wide range of clear openings
- BSI Kitemark certified to BS EN 124



LTS FEATURE | E600 CLASS | >80 PSRV | APPLICATION | 5 GROUP | KITEMARK

GripTop Briton

SAP code	BS EN 124 loading class	Description	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
234110	E600	GripTop Briton	610 x 610	815 x 815	150	80*	129
234964	E600	GripTop Briton	1220 x 685	1425 x 890	150	92*	264
236615	E600	GripTop Briton	1870 x 690	1985 x 890	150	92*	388

Features
- Double triangular
- Non-rock design
- Frame lifting points
- LTS installation and durability features

Options
- Badging

Recommended for use in areas that are subjected to very heavy wheel loads such as aircraft pavements, container ports and docksides.

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*Cover mass per pair.

* Mass of two half covers loosely coupled together

LTS FEATURE | E FEATURE | D400 CLASS | >80 PSRV | APPLICATION | 4 GROUP | KITEMARK

GripTop Ult-Emax

SAP code	BS EN 124 loading class	Description	Clear Opening AXB (mm)	Over Base CXD (mm)	Depth E (mm)	Cover Mass (kg)	Total Mass (kg)
212933	D400	GripTop Ult-Emax	600 x 600	806 x 806	100	20.0/26.0	81.8
212935	D400	GripTop Ult-Emax	600 x 600	806 x 806	150	20.0/26.0	91.7
212934	D400	GripTop Ult-Emax	675 x 675	880 x 830	100	26.4/35.0	98.1
212936	D400	GripTop Ult-Emax	675 x 675	880 x 830	150	26.4/65.0	109.3

Features
- Double triangular
- Non-rock design
- Frame lifting points
- LTS installation and durability features

Options
- Badging

Recommended for use in areas that are subjected to very heavy wheel loads such as aircraft pavements, container ports and docksides.

GRIPTOP™ Ductile iron and mineral technology for extra safety

*Cover mass per pair.

LTS FEATURE | E FEATURE | D400 CLASS | >80 PSRV | APPLICATION | 4 GROUP | KITEMARK

GripTop Opt-Emax

SAP code	BS EN 124 loading class	Description	Clear Opening AXB (mm)	Over Base CXD (mm)	Depth E (mm)	Cover Mass (kg)	Total Mass (kg)
212925	D400	GripTop Opt-Emax	606 x 606	802 x 802	100	28	89
212929	D400	GripTop Opt-Emax	606 x 606	802 x 802	150	28	101
212926	D400	GripTop Opt-Emax	675 x 675	875 x 875	100	38	120
212930	D400	GripTop Opt-Emax	675 x 675	875 x 875	150	38	142
TBC	D400	GripTop Opt-Emax	750 x 600	940 x 746	100	39	121
212927	D400	GripTop Opt-Emax	906 x 606	1102 x 802	101	24.5/36.5	127.5
212931	D400	GripTop Opt-Emax	906 x 606	1102 x 802	151	24.5/36.6	143
TBA	D400	GripTop Opt-Emax	1200 x 750	1350 x 945	100	39	218
212928	D400	GripTop Opt-Emax	1220 x 685	1380 x 885	100	38	214
212932	D400	GripTop Opt-Emax	1220 x 685	1380 x 885	150	38	249
TBA	D400	GripTop Opt-Emax	1800 x 750	1955 x 940	100	39	317
222259	D400	GripTop Opt-Emax	1830 x 685	2000 x 885	150	39	354

Features
- Double triangular
- Non-rock design
- Frame lifting points
- LTS installation and durability features

Options
- Badging
- Security locking

Recommended for use in areas that are subjected to very heavy wheel loads such as aircraft pavements, container ports and docksides.

GRIPTOP™ Ductile iron and mineral technology for extra safety

LTS FEATURE | D400 CLASS | >80 PSRV | APPLICATION | 4 GROUP | KITEMARK

GripTop Inter-Ax

SAP code	BS EN 124 loading class	Description	Clear Opening AXB (mm)	Over Base CXD (mm)	Depth E (mm)	Cover Mass (kg)	Total Mass (kg)
212937	D400	GripTop Inter-Ax	600 x 600	803 x 803	101	44.1	72
212939	D400	GripTop Inter-Ax	600 x 600	803 x 803	151	44.1	82.5
212938	D400	GripTop Inter-Ax	675 x 675	880 x 830	101	59	88
212940	D400	GripTop Inter-Ax	675 x 675	880 x 830	151	59	100

Features
- Double triangular
- Non-rock design
- LTS installation and durability features
- HA 104/09 compliant
- Sewers for Adoption 7 compliant

Options
- Safety grid option on certain units

Use loop handled lifting keys.

GRIPTOP™ Ductile iron and mineral technology for extra safety

*Cover mass per pair.

Opt-Emax range

The Opt-Emax range has been specifically developed to offer quicker, easier and safer access to underground services. Opt-Emax hinged covers offer many benefits over traditional lift-out covers, without compromising performance – thanks to the LTS feature within the design of the frame.

The Opt-Emax range is ergonomically positive and offers all the benefits associated with the E+ feature.

OPT-EMAX

Opening

Step 1 – halves of cover lift separately in sequence as marked.

Step 2 – each cover opens to 100° for maximum access.

STEP 3 – cover is securely held at 90° to prevent accidental closing. Cover cannot be closed unless correct procedure is followed.

FEATURE

For products that have the E+ feature, the trademark is detailed in the 'At a glance' section of the product pages.

Opt-Emax range

Closing

Step 1 – move cover to 90°.

Step 2 – tilt cover to side (using hinge under apex of cover as a pivot point.)

STEP 3 – lower cover to close (units close in reverse sequence to opening).

STEP 4 – lock covers in place after closing.

Removal

STEP 5 – Move cover to 90° and walk out.

Ergonomically positive (E+)

Effective upkeep of today's networks demands a regular checking and maintenance programme. This has an effect on the number of access covers the operative has to remove in any working day.

It is the regularity associated with traditional access cover removal that can expose the operative to the possibility of a repetitive strain injury (RSI), which can result in physical impairment or even permanent disability over a period of time.

Reduced risk of injury

The hinged mechanism greatly reduces the risk of back injury thanks to the reduced effort required to open the covers.

Closing

To close, simply move the cover to the 90° position, tilt using the hinge under the apex as the pivot point and lower.

Simple removal

To allow safe access to the chamber, each cover can be easily lifted out when moved to the 90° position. (See column to left: Removal.)

Other Opt–Emax features

Locking option

Opt-Emax can be locked if required and locks can be fitted retrospectively.

Three-point seating

Three-point suspension seating design gives long-term performance and stability in today's traffic conditions.

Lifting key for safe and efficient access.

Unique hinge design for easy removal and safe operation.

With differing hinge widths covers cannot be replaced in wrong location on single units.

Certain sizes now available with the patented T-LOK security system option.

Developed following close collaboration with a wide stakeholder group, the T-LOK access cover locking system offers enhanced levels of security compared to other traditional locking options. Designed to be used in conjunction with the Opt-Emax range, T-LOK is manufactured from durable stainless steel components ensuring long term trouble free performance.

A growing number of specifiers have recognised the benefits in selecting T-LOK as the preferred locking solution; these include several capital road building projects such as the M62, M18, M1 and M60. The system is fully compliant and certified in accordance with SR3 of LPCB LPS 1175 issue 7 and is independently audited and verified by the Physical Security Certification Team of the BRE.

For further information please contact us on our Access Covers and Gratings Technical Enquiries and Assistance hotline on 01664 814014 or email technical.covers.uk.pam@saint-gobain.com

LTS FEATURE | E FEATURE | FEATURE | D400 CLASS

>70 PSRV | APPLICATION | 4 GROUP | KITEMARK

Opt-Emax

Code	SAP code	BS EN 124 Loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
BA02 1	185719	D400	606 x 456	802 x 652	101	24†	77
BA06 1	172472	D400	606 x 606	802 x 802	100	28.5†	91
BA14 1	211029	D400	606 x 606	802 x 802	151	25†	103
BA22 1	CDOP67MK	D400	680 x 680	876 x 876	101	39†	116.5
BA30 1	211563	D400	678 x 678	880 x 880	151	39†	144
H524 1	186787	D400	750 x 600	940 x 745	100	39†	121
H525 1	242791	D400	750 x 700	950 x 825	100	43.5†	139.5
H510 1	186785	D400	750 x 748	910 x 940.5	101	43.5†	129
BA54 1	185735	D400	906 x 906	1102 x 802	100	25 & 37.5†	128
BA60 1	211032	D400	906 x 606	1102 x 802	151	25 & 37.5†	143.5
BA66 1	228735	D400	912.5 x 905	1163 x 1155	125	68.5†	211
H530 1	186789	D400	1060 x 700	1210 x 850	100	33 & 51.5†	172
BA78 1	185744	D400	1220 x 685	1380 x 885	100	39†	217
BA84 1	211562	D400	1224 x 685	1385 x 883	151	39†	332
H564 1	205457	D400	1200 x 750	1350 x 945	100	39†	218
BA88 1	230384	D400	1340 x 900	1500 x 1060	100	53†	278
H571 1	CDOP19GK	D400	1500 x 750	1660 x 940	100	43†	242
H584 1	186795	D400	1800 x 750	1955 x 940	100	39†	317
BA96 1	215590	D400	1841 x 685	2001 x 883	151	39†	290
BA98 1	230385	D400	2010 x 900	2170 x 1060	100	53†	406.5
H591 1	230108	D400	2250 x 750	2420 x 940	100	43†	355

Safety grids for Opt-Emax

Opt-Emax code	Opt-Emax SAP code	Cattle grid safety grid code	SAP cattle grid safety grid code	Number of grids required
H510 1	186785	HM211 0	187091	1
H571 1	CDOP19GK	HM211 0	187091	2
BA54 1	185735	HM213 0	196073	1
BA78 1	185744	HM216 0	187093	2
H530 1	186789	HM223 0	187094	1

Features

- Hinge cover design
- Non-rock design
- Frame lifting points
- LTS installation and durability features
- HA 104/09 compliant
- Sewers for Adoption 7 compliant

Options

- Retro-fit security locking option (including high security version)
- Badging options
- Safety grid options
- Certain sizes available in GripTop

Recommended for use in city roads where hinged security is required.

† Heaviest hinged cover:

HM401 0 (187097) – Opt-Emax locking kit with key.
HM400 0 (187096) – Opt-Emax locking kit without key.
RMA41 0 (190664) – M12 socketed key.

GRIPTOP™
Ductile iron and mineral technology for extra safety

Use loop handled lifting keys.

*Cover mass per pair.

Safety grids must be ordered as separate items.

Selected sizes available as GripTop variant.

Pamrex range

Designed to withstand the rigors of modern traffic conditions, Pamrex is capable of withstanding loads in excess of the EN 124 D400 requirement.

This is achieved in silence thanks to its unique elastomer gasket. More recent enhancements included improved ergonomic and security features.

Infiltration

To dramatically reduce the amount of surface water entering the sewer system, engineers at Saint-Gobain PAM UK have developed an innovative plug for the hinge housing. The 'dual wiper' plug reduces the amount of water entering the network while at the same time enabling debris to be easily removed from the hinge housing.

- The factory fitted plug is standard on all Pamrex designs and is identified with a red sticker featuring a black umbrella logo
- A secondary seal is also available to reduce water infiltration still further.

Safety

Protecting field personnel from the risk of injury and the below-ground networks from catastrophic failure are two of the primary concerns facing today's engineers and municipal administrators.

- Hinge incorporates a 90° blocking feature to prevent accidental closure. Personnel must ensure that the hinge housing is kept free of debris and that the 90° blocking has properly activated before entering into the chamber
- Self-centering design of the gasket eliminates the need to guide the cover into position when closing
- The design of the cover lifting points ensures easy insertion and removal of tools
- Lifting loops in the frame assists safe offloading and installation with appropriate and safe equipment
- The cover is designed to open and release the pressure if the sewer becomes surcharged (provided that no additional lock has been fitted and that the frame has been securely anchored to the top of the chamber)
- The cover opens to 130° to allow uninterrupted access. It can also be completely removed if deemed necessary.

Design

Improved ergonomics

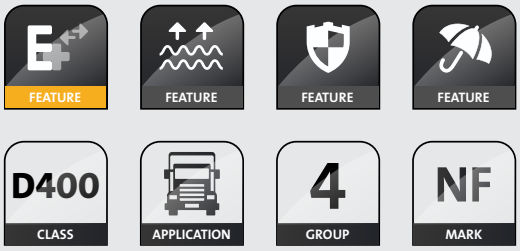
- Hinges reduce the physical effort by 50%
- Hinges allow the operator to move in a straight line thereby avoiding damaging spinal rotation
- Hinges minimise the duration of the lift, the hinge also retains the cover in a safe and controlled way during and after the lift
- Lifting points in the cover are designed for use with standard tools (pickaxe/hook/bar).

Stability and durability

- Gasket rings absorb damaging traffic shock and help to prevent the breakdown of frame bedding materials. Therefore structural failure that can lead to more serious problems like frame instability is significantly reduced. Scientific analysis has clearly shown that new gaskets absorb 64% of the shock and even after many years of service continue to absorb over 50% of the shock
- Gasket rings ensure cover stability regardless of traffic conditions.

E+ FEATURE

For products that have the E+ feature, the trademark is detailed in the 'At a glance' section of the product pages.



Pamrex

Code	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth (mm)	Cover mass (kg)	Total mass (kg)
CDPA60MFX26	D400	600 dia	840 x 840	100	55	97
CDPA70MFX26	D400	700 dia	940 x 940	100	71	118
CDPA80KFX26	D400	800 dia	1000 x 1000	125	73	122

Features

- Non-rock design
- Elastomer seating gasket
- Hinged cover design
- Infiltration plugs
- Frame lifting points

Options

- Security locking option
- Secondary gasket

sales.uk.pam@saint-gobain.com

Ult-Emax range

Specifically designed to combine ease of use and durability with greater security and value for money, the Ult-Emax range of access covers incorporates a semi-ergonomic hinging system, making it ideal for one -man inspection operations with the master cover hinging open along the diagonal axis, the second traditional lift-out cover can be used as a working platform for activities such as jetting or CCTV surveys.

Ult-Emax features

Enhanced operator safety

Weighing only 20 kilograms, the small master cover requires minimum effort to open, allowing for quick and easy inspection of the chamber below. The cover's hinging mechanism vastly reduces the risk of operator injury, while maintaining optimum stability and durability. The master cover can be easily removed through a vertical lift once it has been hinged open.

At 25 kilograms the larger slave cover also falls within health and safety guidelines and is one-man operable.

Increased security

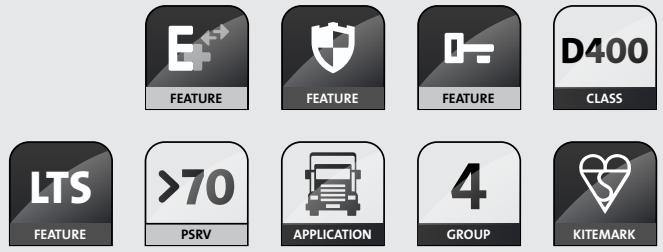
Drawing on our in-depth knowledge of ductile iron and its unique properties, the Ult-Emax range also has as standard a spring locking system that firmly locks the covers in place once they are closed. This unique technology employs ductile iron's elasticity in areas where the components interact and allows for the locking of the cover within the frame without the use of a mechanical locking device.

E+ FEATURE

For products that have the E+ feature, the trademark is detailed in the 'At a glance' section of the product pages.

Ult-Emax range

Ult-Emax range



Ult-Emax

Code	SAP Code	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
BG06 1	205763	D400	600 x 600	806 x 806	101	27.3/20.7	82
BG14 1	205765	D400	600 x 600	806 x 806	151	35.5/26.2	92
BG22 1	211605	D400	676 x 675	880 x 830	101	27.3/20.7	98
BG30 1	211606	D400	675 x 675	880 x 830	151	35.5/26.2	109

Features

- Non-rock design
- Automatic cover security locking
- Semi-ergonomic hinging design
- LTS installation and durability features
- HA 104/09 compliant
- Sewers for Adoption 7 compliant

Options

- Badging options
- Available as GripTop

▲ Heaviest Cover Section.
Use loop handled lifting keys.

GRIPTOP™
Ductile iron and mineral technology for extra safety

All sizes available as GripTop variant.

Inter-Ax range

University research

The Inter-Ax product range was developed following an extensive three year research programme. The research was conducted by the University of Nottingham in conjunction with The Department for Transport (DfT), Scott Wilson Pavement Limited and Saint-Gobain PAM.

Objectives

The objectives were 'to fully understand the mechanism of failure of ironwork installations' and to determine what actions could be taken to remedy them.

The research consisted of three main elements:

- Real life installations
- Laboratory trials using a purpose-built test-rig
- Finite element analysis.

Conclusions

The research concluded that the road ironwork installations failed prematurely because of the following:

- Traditional cementitious bedding mortar being unsuitable for ironwork installations
- Movement of access cover frame under dynamic loading
- Wrong products being specified and selected.

Product features

The Inter-Ax range of traditional lift covers has been developed with the research conclusions in mind and incorporates the new LTS feature.

The Inter-Ax range has been specifically engineered to cope with all the varying traffic loadings encountered on today's busy highways.

Inter-Ax also features a fibre-optic 'point of drilling' hole in the cover, avoiding the underside cover webs to provide access into the sewer for fibre-optic cameras.

The LTS design eliminates the traditional 'grouting hole' which was found to increase the strain in the mortar if positioned incorrectly. Holes are provided in non-critical areas to aid lifting or provide bolt holes to secure the frame to the manhole chamber.

LTS FEATURE

For products that have the LTS feature, the trademark is detailed in the 'At a glance' section of the product pages.

H INTENSITY | LTS FEATURE | FEATURE | FEATURE
D400 CLASS | >70 PSRV | APPLICATION | 4 GROUP | KITEMARK

Inter-Ax D400 TDS

Code	SAP code	Code with lock	SAP code with lock	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
BH60 1	217442	BH60 1/BK	TBA	D400H	600 x 600	805 x 805	150	61*	123

Features
- Double triangular
- Non-rock design
- Reduced infiltration features
- Seal plate compatible
- LTS features
- HA 104/09 compliant
- Sewers for Adoption 7 compliant

Options
- Security locking option
- Badging options

Use loop handled lifting keys.

*Cover mass per pair.

H INTENSITY | LTS FEATURE | D400 CLASS
>70 PSRV | APPLICATION | 4 GROUP | KITEMARK

Inter–Ax D400-H

Code	SAP code	Code with lock	SAP code with lock	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
BH14 1	185928	BH14 1/BK	185929	D400H	604 x 604	805 x 805	151	55*	103
BH16 1●	185935	BH16 1/BK●	185936	D400H	600 x 600	800 x 800	150	54*	103

Features
- Double triangular
- Non-rock design
- LTS features
- HA 104/09 compliant
- Sewers for Adoption 7 compliant

Options
- Security locking option
- Ventilated option
- Badging options

*Cover mass per pair. ● Ventilated.

Note: Safety grids to fit BH14 1 and BH16 1 can be ordered separately HMA2 0 (187106).

Use loop handled lifting keys.

N INTENSITY | LTS FEATURE | D400 CLASS | >70 PSRV | APPLICATION | 4 GROUP | KITEMARK

Inter-Ax D400-N – 150mm deep units

Code	SAP code	Code safety grids	SAP code safety grids	Code with lock	SAP code with lock	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
BD14 1	185904	BC14 1/AP	TBA	BC14 1/BK	185807	D400N	600 x 600	803 x 803	151	45*	85.5
BC16 1●	185810	BC16 1/AP●	TBA	BC16 1/BK●	206901	D400N	600 x 600	820 x 770	150	45*	92
BC18 1	185811	–	–	BC18 1/BK	TBA	D400N	600 dia	820 x 770	150	50*	97
BD30 1	211604	–	–	BC30 1/BK	TBA	D400N	675 x 675	878 x 828	151	58*	102
BC32 1●	185834	–	–	BC32 1/BK	199736	D400N	678 x 678	875 x 825	151	69*	120
BC42 1▼	185842	–	–	BC42 1/BK	185843	D400N	757 x 607	961 x 811	150	70*	120

Inter-Ax D400-N – 100mm deep units

Code	SAP code	Code safety grids	SAP code safety grids	Code with lock	SAP code with lock	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
BC00 1	CD1A45MF	–	–	BC00 1/BK	185770	D400N	457 x 457	600 x 600	101	32*	50
BC02 1	185775	–	–	BC02 1/BK	185776	D400N	608 x 458	775 x 652	101	42*	67
BD06 1	185892	BC06 1/AP	185788	BC06 1/BK	185789	D400N	600 x 600	803 x 803	101	50*	75
BC08 1●	185796	BC08 1/APl	TBA	BC08 1/BKl	185797	D400N	607 x 607	802 x 802	100	49*	78
BC10 1	185799	BC10 1/AP	TBA	BC10 1/BK	185801	D400N	600 dia	802 x 802	100	50*	85
BC12 1●	185806	BC12 1/AP	TBA	BC12 1/BK●	TBA	D400N	600 dia	800 x 800	100	49*	82
BD22 1	211603	–	–	–	–	D400N	675 x 675	878 x 828	100	58*	91
BC24 1●	185821	–	–	BC24 1/BKl	185822	D400N	678 x 678	830 x 850	101	69*	102
BC26 1	206826	–	–	BC26 1/BK	211988	D400N	675 dia	830 x 856	100	70*	108
BC28 1●	TBA	–	–	BC28 1/BK●	TBA	D400N	675 dia	830 x 856	100	69*	107
BC38 1	185836	–	–	BC38 1/BK	185837	D400N	757 x 607	950 x 800	101	70*	105
BC46▼	185847	–	–	BC46 1/BK	185848	D400N	754 x 754	1004 x 1004	101	48	142
BC48 1●▼	185854	–	–	BC48 1/BK●	185855	D400N	754 x 754	1004 x 1004	101	47	140
BC54 1▼	185857	–	–	BC54 1/BK	185858	D400N	904 x 603	1099 x 800	100	44	131
BC57 1●▼	185867	–	–	BC57 1/BK●	185868	D400N	904 x 603	1099 x 800	100	43	129
BC66 1▼	185870	–	–	BC66 1/BK	185871	D400N	912.5 x 905	1163 x 1155	125	74	273
BC78 1	185874	BC78 1/AP	185875	BC78 1/BL	185876	D400N	1250 x 678	1500 x 878	100	70*	198
BC81 1●	185889	BC81 1/AP	TBA	BC81 1/BL●	185890	D400N	1250 x 678	1500 x 878	100	69*	195
BC82	215534	TBA	–	–	–	D400N	1310 x 678	1500 x 878	100	70	197

Features

- Double triangular
- Non-rock design
- LTS installation and durability features
- HA 104/09 compliant
- Sewers for Adoption 7 compliant

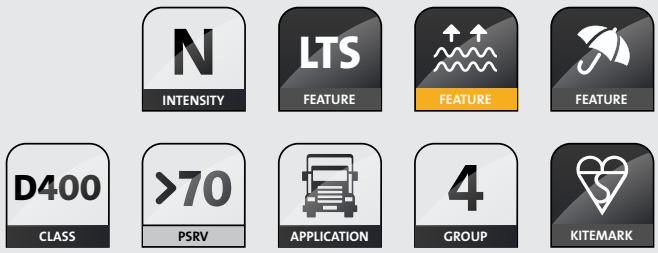
Options

- Security locking option
- Ventilated option
- Safety grid option on certain units

Recommended for use in city roads carrying heavy traffic.

* Cover mass per pair.

● Ventilated. ▼ Covers not coupled and cover mass is for single half cover.
Use loop handled lifting keys.



Inter-Ax D400-N Sealed

Code	SAP code	Code with lock & seal	SAP code with lock & seal	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
BC10 1/AG	185800	BC10 1/CC	185802	D400	600 dia	802 x 802	100	50*	85
BE06 1	185910	–	–	D400	600 x 600	817 x 768	100	58*	93
BE38 1	185925	–	–	D400	757 x 608	960 x 820	100	75*	111
BE38 1/BK	208323	–	–	D400	757 x 608	960 x 820	100	75*	111

Features

- Double triangular
- Non-rock design
- Push-fit seal plate compatible frame design
- LTS installation and durability features

Options

- Seal plate options
- Badging options

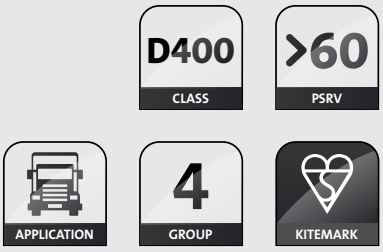
Recommended for use in city roads carrying heavy traffic.

* Cover mass per pair.

AG = complete with MSG bolt-down seal plate (0.5 bar pressure) – recommended that frame is bolted to chamber.

For BE06 1 or BE38 1, if sealed product is required, seal plate must be ordered separately HM125 0 (187079), HM124 0 (187078) respectively.

Use loop handled lifting keys.



Silent Knight

Code	SAP code	Code with safety grid	SAP Code safety grids	Code with sec. screws	SAP code sec. screws	grid & sec. screws & sec. screws	SAP code safety grid & sec. screws	BS EN 124 Loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
Open Keyways													
CJ14 1	186072	CJ14 1/AP	186073	CJ14 1/BL	TBA	CJ14 1/BN	TBA	D400N	1210 x 685	1375 x 850	100	72*	207
CJ24 1	186079	CJ24 1/AP	TBA	CJ24 1/BR	186080	CJ24 1/BP	TBA	D400N	1825 x 685	1985 x 850	100	72*	306
CJ16 1	186074	CJ16 1/AP	186075	CJ16 1/BL	186076	CJ16 1/BN	TBA	D400N	1210 x 685	1375 x 850	150	72*	238
CJ26 1	186082	CJ26 1/AP	186083	CJ26 1/BR	186085	CJ26 1/BP	186084	D400N	1825 x 688.5	1985 x 848.5	150	72*	350
Closed Keyways													
CJ34 1	186086	CJ34 1/AP	186087	CJ34 1/BL	206866	CJ34 1/BN	TBA	D400N	1210 x 685	1375 x 850	100	72*	209
CJ44 1	186097	CJ44 1/AP	TBA	CJ44 1/BR	186098	CJ44 1/BP	TBA	D400N	1825 x 685	1985 x 850	100	72*	308
CJ36 1	186091	CJ36 1/AP	186092	CJ36 1/BL	186093	CJ36 1/BN	TBA	D400N	1210 x 685	1375 x 850	150	72*	239
CJ46 1	186100	CJ46 1/AP	186101	CJ46 1/BR	TBA	CJ46 1/BP	TBA	D400N	1825 x 688.5	1985 x 848.5	150	72*	351

Features

- Double triangular
- Non-rock design
- HA 104/09 compliant
- Sewers for Adoption 7 compliant

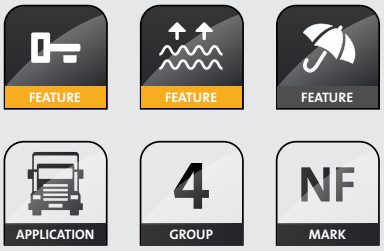
Options

- Badging options
- Security locking option
- Safety grid options available

Recommended for use in city roads carrying heavy traffic.

* Cover mass per pair.

Use loop handled lifting keys.



Pamtight

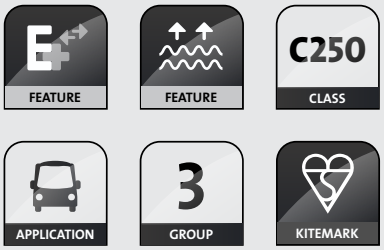
Code	SAP code	BS EN 124 loading class	Clear Opening	Over Base	Depth	Cover mass (kg)	Total mass (kg)
RE 61 R1FD	CDPE60AF	D400N	600 dia	850 dia	100	53	100

Features

- Two rings – polyethylene
  – elastomer seating
- Fastened by six bolts and clamping claws
- Resistant to one bar pressure

Recommended for use in city roads where pressure tight sealing is required.

Recommended that frame is bolted to chamber.



Valiant C250-40T

Code	SAP code	Code 2 sec. screws	SAP code 2 sec. screws	Code 4 sec. screws	SAP code sec. screw	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
C5144	CCVA76HK	C5144/L2	186022	C5144/L4	186023	C250-40T	605 x 455	760 x 610	100	57	89
C5145	CCVA77HK	C5145/L2	204166	C5145/L4	212358	C250-40T	605 x 606	760 x 762	101	71	108
C5146	186025	C5146/L2	186026	C5146/L4	TBA	C250-40T	755 x 605	910 x 765	101	85	130
C5148	172789	C5148/L2	186028	C5148/L4	186029	C250-40T	905 x 905	1060 x 760	100	100	147

Features

- Tested to D400 loading
- Single-piece cover
- Slide-out cover design
- Single seal

Options

- Security locking option
- Badging options

Medium duty, cover and frame in ductile iron.

Use loop handled lifting keys.

Trojan

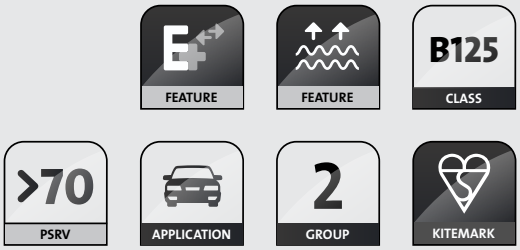
Code	SAP code	Code 2 sec. screws	SAP code 2 sec. screws	Code with 4 sec. screws	SAP code 4 sec. screws	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
BE30 1	185919	BE30 1/AA	185920	BE30 1/AC	218215	C250	603 x 603	804 x 804	76	86	125.5

Features
- Single-piece cover
- Double seal

Options
- Security locking option
- Badging options

Recommended for use inside industrial buildings where a double sealed unit is essential to meet building regulations.

Use loop handled lifting keys.



Valiant

Code	SAP code	Code 2 sec. screws	SAP code 2 sec. screws	Code 4 sec. screws	SAP code 4 sec. screws	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
BM02 1	185949	BM02 1/AA	199553	BM02 1/AC	223926	B125	602 x 452	752 x 602	75	33	53
BM06 1	185959	BM06 1/AA	185960	BM06 1/AC	211345	B125	602 x 620	752 x 752	75	41	63
BM54 1	185964	BM54 1/AA	204852	BM54 1/AC	TBA	B125	902 x 602	1068 x 768	75	59	89

Features
- Single-piece cover
- Slide-out cover design
- Single seal

Options
- Security locking options
- Badging options
- Ventilated options

Medium duty, cover and frame in ductile iron.

Use loop handled lifting keys.

FEATURE | B125 CLASS | >70 PSRV | APPLICATION | 2 GROUP | KITEMARK

Trojan Seal Plate Compatible

Code	SAP code	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
BE32 1	185922	B125	752 x 602	934 x 784	75	53	87
BE32 1/AA	TBA	B125	752 x 602	934 x 784	75	53	87
BE32 1/AC	TBA	B125	752 x 602	934 x 784	75	53	87

Features

- Single-piece cover
- Push-fit seal plate compatible

Options

- Security locking option
- Badging options

Medium duty cover and frame in ductile iron.

Use loop handled lifting keys.

FEATURE | B125 CLASS | >70 PSRV | APPLICATION | 2 GROUP | KITEMARK

Rapide Slide Out

Code	SAP code	SAP Code c/w screw down locking option	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
H018 1	186464	–	B125	382 x 232	482 x 332	40	9	14
H020 1	186466	–	B125	552 x 327	652 x 427	40	17	25
H036 1	186535	205338	B125	452 x 452	552 x 552	40	16	24
H041 1	CBRA75GK	205339	B125	602 x 452	702 x 552	40	22	31
H042 1	CBRA70CK	186548	B125	602 x 602	702 x 702	40	29	39
H043 1	186551	186552	B125	752 x 602	852 x 702	40	37	49
H050 1	CBRA17GK	–	B125	902 x 602	1002 x 702	50	27	68
H055 1	CBRA18GK	–	B125	1002 x 677	1102 x 777	50	32	82
H060 1	186557	–	B125	1312 x 612	1412 x 712	50	36	90

Features

- Single-piece cover (except H050 1/H055 1/H060 1)
- Slide-out cover design

Options

- Badging options

Recommended for use in pavements and pedestrian areas.

Use T-handled lifting key.

FEATURE · FEATURE · B125 CLASS · APPLICATION · 2 GROUP · KITEMARK

Ductile Light Duty

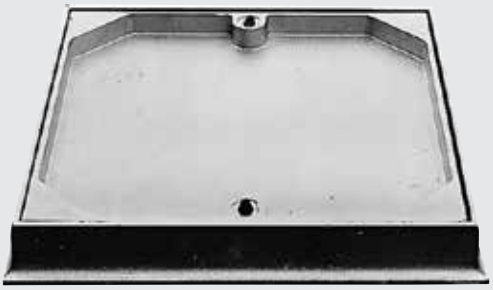
Code	SAP code	Code 2 sec. screws	SAP code 2 sec. screws	Code with 4 sec. screws	SAP code 4 sec. screws	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
Single Seal											
HA02 1	186870	HA02 1/AA	TBA	HA02 1/AC	186871	B125	602 x 452	706 x 556	41	26	40
HA03 1	186874	HA03 1/AA	186875	HA03 1/AC	186876	B125	607 x 607	713 x 713	44	34	52
Double Seal											
HA08 1	186884	HA08 1/AA	186885	HA08 1/AC	186886	B125	606 x 454	776 x 624	41	30	53
HA09 1	186889	HA09 1/AA	186890	HA09 1/AC	186891	B125	605 x 605	776 x 776	44	49	79

Features
- Single-piece cover
- Single or double seal

Options
- Security locking options

Recommended for use in areas where vehicular trafficking is not expected and where a single or double seal is required.

Use T-handled lifting key.



FEATURE · FEATURE · B125 CLASS · APPLICATION · 2 GROUP · KITEMARK

Ductile Light Duty Recessed

Code	SAP code	Code 2 sec. screws	SAP code 2 sec. screws	Code with 4 sec. screws	SAP code 4 sec. screws	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
Single Seal											
HA05 1	186879	HA05 1/AA	TBA	HA05 1/AC	186880	B125	600 x 450	711 x 559	70	30	50
HA06 1	186881	HA06 1/AA	186882	HA06 1/AC	186883	B125	608 x 608	711 x 711	69	32	54
Double Seal											
HA11 1	186894	HA11 1/AA	186895	HA11 1/AC	186896	B125	607 x 455	776 x 624	72	39	65
HA12 1	186899	HA12 1/AA	186900	HA12 1/AC	186901	B125	606 x 606	776 x 776	72	52	82

Features
- 30mm recessed single-piece cover
- Single or double seal

Options
- Security locking options

Recommended for use in domestic applications eg. driveways, patio areas and featuring recessed cover for infill.

Use T-handled lifting key.

BriPave DI

Code	SAP code	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Cover mass (kg)	Total mass (kg)
HA24 1	CBHY56QK	B125	450 x 450	558 x 558	100	27	49
HA26 1	CBHY71QK	B125	600 x 600	711 x 711	100	38	68

Features

- 75mm recessed single-piece cover
- Single seal
- Four corner lifting points

Recommended for use in domestic applications eg. driveways, patio areas and featuring recessed cover for infill.

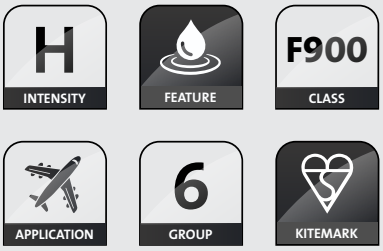
Use loop lifting key.

Access Covers and Gratings Technical Enquiries and Assistance

Tel: +44 (0)1664 814014
Fax: +44 (0)1664 814025
Email: technical.covers.uk.pam@saint-gobain.com

Section 2
Gully Grates

Section 2
Contents



Briflo

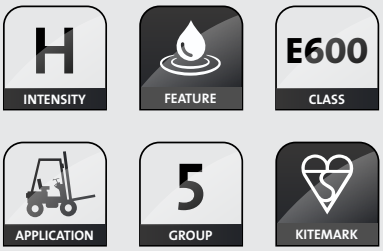
Code	SAP code	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm^2)	HA102 reference	Grating mass (kg)	Total mass (kg)
BZ490 1	234216	F900	465 x 465	620 x 573	140	872	R	50*	97

Features

- Double triangular
- Non-rock design

Recommended for use in trunk roads carrying fast-moving traffic or industrial areas subject to exceptionally heavy traffic.

* Grating mass per pair.



Briflo

Code	SAP code	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm^2)	HA102 reference	Grating mass (kg)	Total mass (kg)
BZ460 1	185973	E600	465 x 465	620 x 573	140	880	R	47.2*	94.5

Features

- Double triangular
- Non-rock design

Recommended for use in trunk roads carrying fast-moving traffic or industrial areas subject to exceptionally heavy traffic.

* Grating mass per pair.

High Performance Gratings

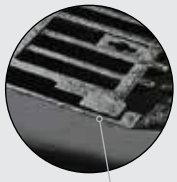
Growth in traffic speed and intensity coupled with ever changing climatic conditions is placing greater emphasis on the importance of installing high performance problem free, durable drainage solutions. This has led to Saint-Gobain PAM UK developing a range of gratings that include standard features that when combined aid in the reduction of future maintenance or replacement costs.

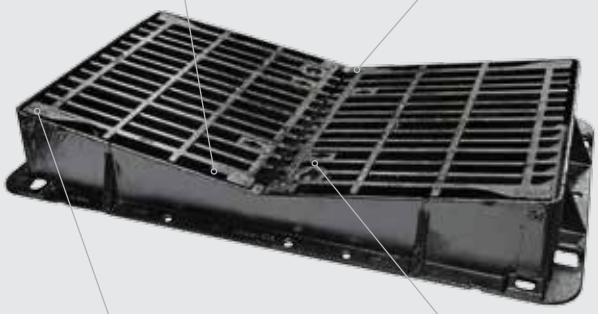
Designed with the needs of the client and operator in mind the AquaVantage and Aqua-Max gratings combines high efficiency with the additional functional benefits of operator safety and asset security.

For products that have the E+ feature, the trademark is detailed in the 'At a glance' section of the product pages.

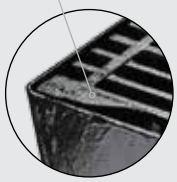
Increased safety
- Grating lever points

Increased security
- Automatic spring arm locking device





Improved durability
- Wedge seating arrangement



Increased security
- Retro-fit locking device option

Increased safety
- Captive hinge with integral hinge pins

Increased security
- Automatic spring arm locking device

Improved efficiency
- Highly efficient grating design

AQUA-MAX

LTS FEATURE | E FEATURE | FEATURE | FEATURE

D400 CLASS | APPLICATION | 4 GROUP | KITEMARK

Aqua-Max

Code	SAP code	Description	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm²)	HA102 reference	Total mass (kg)
BY34 1	205864	Kerb	D400	450x450	660x550	100	1240	R	48
BY35 1	205865	Kerb	D400	450x450	660x550	150	1240	R	53
BY36 1	252124	Left Hand	D400	450x450	625x550	100	1220	R	42
BY36 1/CZ*	252358	Left Hand	D400	450x450	625x550	100	1220	R	42
BY37 1	252104	Left Hand	D400	450x450	625x550	150	1220	R	50.6
BY37 1/CZ*	252359	Left Hand	D400	450x450	625x550	150	1220	R	50.6

Features

- Captive hinged grating
- Non-rock design
- Single-piece grating
- LTS installation and durability features
- Automatic grating security locking
- Wedge seating
- HA 102 & 104/09 compliant
- Sewers for Adoption 7 compliant

Options

- Additional security locking option

Recommended for use in city roads carrying continuous heavy traffic where efficient water removal is required – with the addition of a captive hinge for ease of maintenance.

*Units fitted with Install Plus Levelling System

AQUAVANTAGE

FEATURE | E FEATURE | FEATURE

D400 CLASS | APPLICATION | 4 GROUP | KITEMARK

AquaVantage

Code	SAP code	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm²)	HA102 reference	Total mass (kg)
HV15 1	242564	D400	600 x 600	738 x 742	150	2000	P	81
HV66 1	241255	D400	900 x 900	1050 x 1020	180	5250	P	175
HV84 1	251830	D400	675 x 1200	830 x 1355	150	4880	P	188
HV86 1	251829	D400	1200 x 675	1356 x 809	200	5110	P	TBC

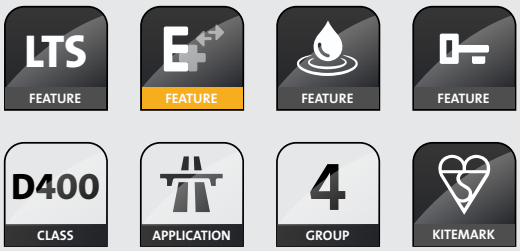
Features

- Captive hinged grating
- Non-rock design
- Single-piece grating
- Automatic grating security locking
- Wedge seating
- HA 102 & 104/09 compliant

Options

- Additional security locking option

Recommended for use in carriageway surface water drainage channels with a 1:5 V shaped profile.



Rexus

Code	SAP code	Description	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm²)	HA102 reference	Total mass (kg)
H466R	211607	Right hand opening	D400	600 x 600	800 x 714	100	1870	Q	85
H466L	211608	Left hand opening	D400	600 x 600	800 x 714	100	1870	Q	85
H465	211145	Four flanged	D400	600 x 600	800 x 800	100	1870	N/A	88

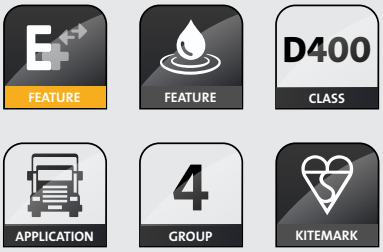
Features

- Non-rock design
- Single-piece grating
- LTS installation and durability features
- Automatic grating security locking
- Multi-directional water deflectors
- Wedge seating

Options

- Additional security locking option

Recommended for use in city roads carrying continuous heavy traffic where efficient water removal is required – with the addition of a captive hinge for ease of maintenance.



Ax-S 400

Code	SAP code	Description	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm²)	Total mass (kg)
RH62 M4KA	EDAX60DKX12	Hinged opening	D400	600 dia	850 x 850	100	1190	58

Features

- Removable hinged grating
- Non-rock design
- Single piece grating
- Multi-directional water deflectors
- Large frame load bearing area

For city roads where a hinged and lockable grating is required.

Large wedge seatings

Captive hinge

Prising slot

Wedge seat principle

Watershed

The Watershed gully grate has been developed to meet the needs of engineers and the rigors of today's traffic loadings.

Watershed offers ease of maintenance with its prising slot for quick opening and hinged action.

Watershed combines the benefits of both double triangular and hinged grates in one unit. Thanks to its wedge seating, Watershed provides non -rock performance and the captive hinge allows fast and easy access.

Large wedge seatings
Give the Watershed enhanced stability and long-term performance in the most arduous traffic conditions.

Captive hinge
For easy access with added security.

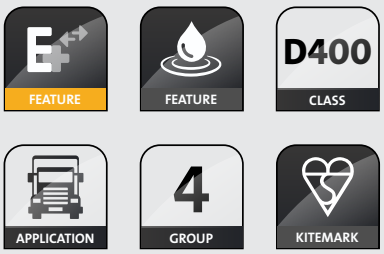
Single-piece unit
Hinged for easy access.

Prising slot
For easy opening.

Large water area
Watershed has a large water area to help clear surface water quickly from roads.

Manufactured from ductile iron, the Watershed utilises the wedge seat principle.

The Watershed wedge seating operates in two directions to ensure the security and location of the grate within the frame.



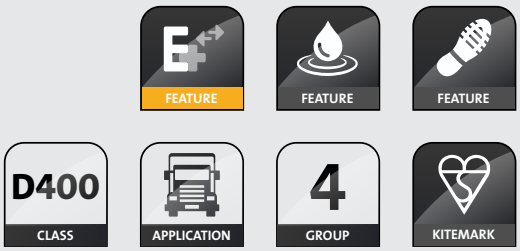
Watershed

Code	SAP code	Description	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm^2)	HA102 reference	Total mass (kg)
EDWS43EK	HR865 1	Kerb Hinging	D400	371 x 431	585 x 525	100	980	R	36
187136	HR863 1	Kerb Hinging	D400	473 x 431	625 x 575	100	980	R	48
220325	HR876 1	Left hand opening	D400	373 x 433	575 x 525	100	1090	R	35
220324	HQ876 1	Right hand opening	D400	373 x 433	575 x 525	100	1090	R	35
249438	HR811	Left hand opening	D400	370x310	525x400	100	810	S	28
241109	HR815	Left hand opening	D400	510x360	664x454	100	1225	R	40.4
239857	HR840	Left hand opening	D400	600x450	750x540	100	1850	Q	53
239858	HR840	Right hand opening	D400	600x450	750x540	100	1850	Q	53
244030	HR840 L 1W	Left hand opening	D400	600x450	750x540	100	1850	Q	53

Features
- Captive hinged grating
- Non-rock design
- Single-piece grating

Options
- Security locking option

Recommended for use in city roads carrying continuous heavy traffic, with the addition of captive hinge for ease of maintenance.



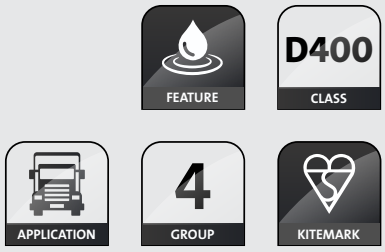
Watershed Meshed

Code	SAP code	Description	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm²)	HA102 reference	Total mass (kg)
HR853 1	228026	Kerb Hinging	D400	400 x 445	550 x 535	100	946	R	42

Features

- Captive hinged grating
- Non-rock design
- Single-piece grating
- Pedestrian/cyclist safe mesh grating

For use in heavy and medium duty applications.



Torrent

Code	SAP code	Description	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm²)	Grating mass (kg)	Total mass (kg)
BZT14 1	185981	Double triangular	D400	1210 x 685	1385 x 850	100	4500	70*	203
BZT24 1	185982	Double triangular	D400	1825 x 685	1985 x 850	100	6750	70*	300

Features

- Double triangular grating
- Non-rock design
- Large waterway area

Recommended for use in trunk and city roads carrying heavy traffic where efficient water removal is required.

* Grating mass per pair.

LTS FEATURE | FEATURE | D400 CLASS | APPLICATION | 4 GROUP | KITEMARK

Waterway 1200

Code	SAP	Description	BS EN 124	Clear opening	Over base	Depth	Waterway	HA102	Grating	Total
BZ32 1	185972	Double triangular	D400	435 x 435	587 x 525	100	1200	Q	25*	43

*Grating mass per pair

Features

- Double triangular grating
- Non-rock design
- LTS installation and durability features

Recommended for use in trunk and city roads carrying continuous heavy traffic and in areas prone to excessive traffic clipping.

LTS FEATURE | FEATURE | D400 CLASS | APPLICATION | 4 GROUP | KITEMARK

Waterway 2000

Code	SAP code	Description	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm²)	HA102 reference	Grating mass (kg)	Total mass (kg)
BZ48 1	185976	Double Triangular	D400	607 x 607	802 x 802	100	2000	–	57*	86
BZ50 1■	185978	Double Triangular	D400	607 x 607	802 x 720	100	2000	P	57*	84
BZ51	240126	Double Triangular	D400	600 x 600	705 x 820	150	2000	P	57	96
BZ52	185979	Double Triangular	D400	600 Dia	802 x 802	100	2000	–	57	90
BZ54 1	185980	Double Triangular	D400	607 x 607	820 x 780	150	2000	–	57*	96

* Grating mass per pair.
■ Three flanged frame.

Features

- Double triangular grating
- Non-rock design
- Large waterway area
- LTS installation and durability features

Options

- Three or four flanged frame option

Large waterway area provides efficient water removal in areas subject to high water run-off eg. catchpits, motorway verges, between verges and valleys, cuttings etc.

LTS FEATURE | FEATURE | D400 CLASS | APPLICATION | 4 GROUP | KITEMARK

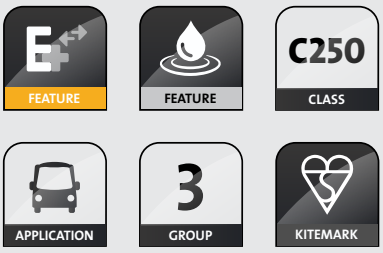
Waterway 2400

Code	SAP code	Description	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm²)	HA102 reference	Total mass (kg)
211234	BZ82 1	Double Triangular	D400	425 x 415 (x2)	1036 x 525	101	2400	P	84

Features

- Large waterway area
- Non-rock design
- LTS durability feature
- Multiple double triangular design

Recommended for use in areas subjected to high water run-off including catchpits, motorway verges, cuttings and between verges and valleys.



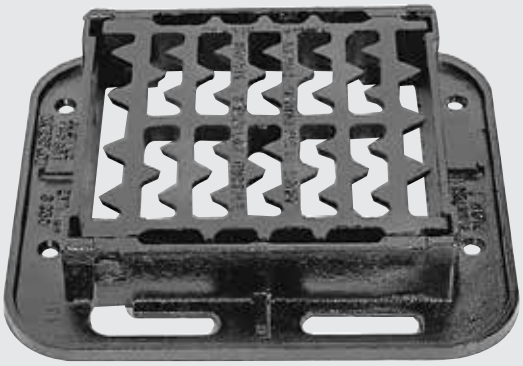
Watershed

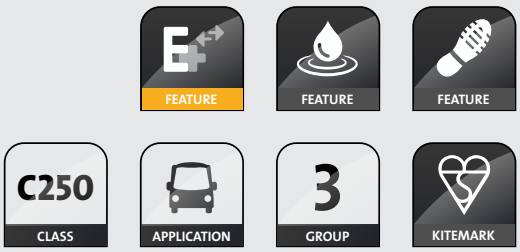
Code	SAP code	Description	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm^2)	HA102 reference	Total mass (kg)
HR880 1	187140	Kerb hinging	C250	380 x 400	525 x 487	76	940	S	28

Features

- Captive hinged grating
- Non-rock design
- Single-piece grating

Recommended for use in local access roads carrying continuous traffic, where hinged access is required.





Pedestrian

Code	SAP code	Code with spring locking	SAP code with spring locking	Description	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm^2)	HA102 reference	Total mass (kg)
HP893 1	187126	H893L 1	186862	Left hand opening	C250	324 x 312	476 x 401	76	655	S	23
HY813 1	187161	H813L 1	186854	Left hand opening	C250	370 x 430	525 x 525	100	830	S	38

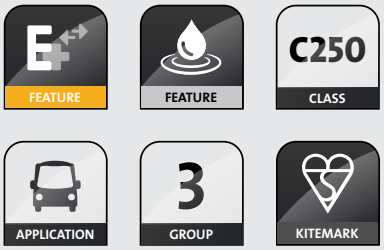
Features

- Captive hinged grating
- Single-piece grating
- Pedestrian/cyclist safe grating design

Options

- Security locking option

For use in pedestrianised areas and areas of slow-moving traffic.



Waterflow

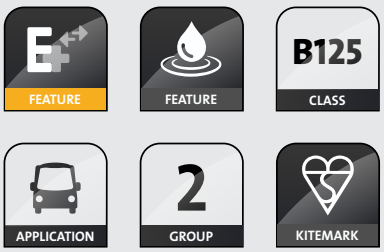
Code	SAP code	Code with spring locking	SAP code with spring locking	Description	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm^2)	HA102 reference	Total mass (kg)
HP894 1	187127	H894L	186863	Left Hand Opening	C250	324 x 312	477 x 401	76	787	T	22
HP895 1	187130	H895L	186864	Left Hand Opening	C250	324 x 438.5	476 x 526.5	76	933	S	28
HP897 1	187132	H897L	186865	Left Hand Opening	C250	401 x 435	553 x 533	76	1128	R	33
–	186856	H820S 1	186856	Left Hand Opening	C250	370 x 310	520 x 400	75	786	T	25
–	186858	H822S 1	186858	Left Hand Opening*	C250	370 x 310	520 x 400	75	786	T	25

Features
- Captive hinged grating
- Single-piece grating

Options
- Security locking option

For use in city and estate roads where regular access for cleaning is required.

*Dished grating profile

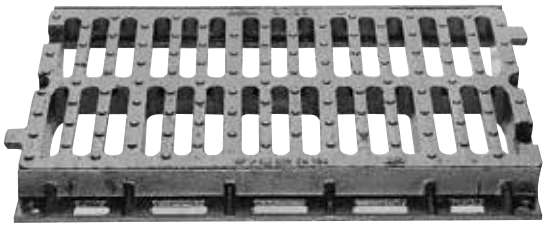


Aquaflo

Code	SAP code	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Waterway area (cm^2)	Total mass (kg)
C6062R	176019	B125	230 x 225	300 x 300	60	300	9
C6064R	186039	B125	300 x 300	375 x 375	60	575	13

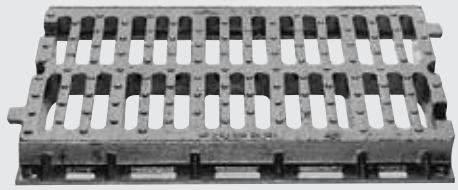
Features
- Captive hinged grating
- Single-piece grating
- Dished grating profile

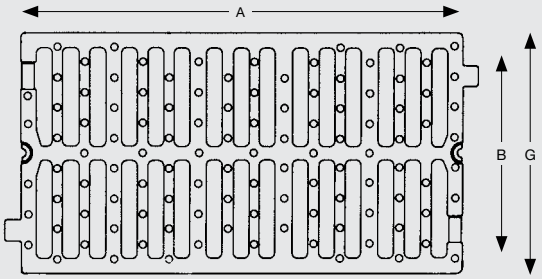
Concave grating for use in pedestrian precinct areas.

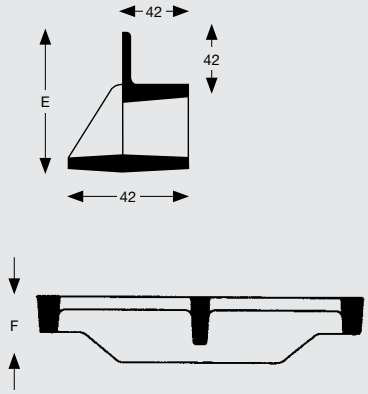


Section 3
Channel Gratings

Section 3
Contents

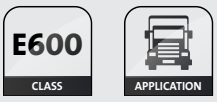






Translinea

Code	SAP code	BS EN 124 loading class	Grating width G (mm)	Length A (mm)	Duct width B (mm)	Grating thickness F (mm)	Bearer bar depth E (mm)	Waterway area (cm^2)	Waterway area (cm^2)
RH40 T6HD	EETL40PF	E600	400	750	350	35	–	1290	46
RH40 T4HD	EDTL40PF	D400	400	750	350	35	–	1290	47
Bearer bar									
RH40 T6GR	E7	E600/D400	–	750	–	–	100	–	10
RH40 T6GS	E8	E600/D400	–	800	–	–	100	–	10.6
End Piece									
RH40 T6AD	E10	E600/D400	–	–	–	–	–	–	4.4
Connecting Piece									
RH40 H8ED	E9	E600/D400	–	–	–	–	–	–	0.5

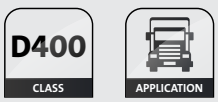


E600

Features

- Modular/linear formation
- Bolt-down grate
- Interlocking
- Suitable for crosswise traffic when secured appropriately

All areas subject to high axle loads such as aircraft and port areas, industrial sites etc.

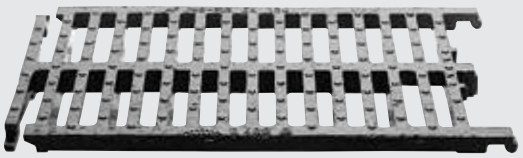


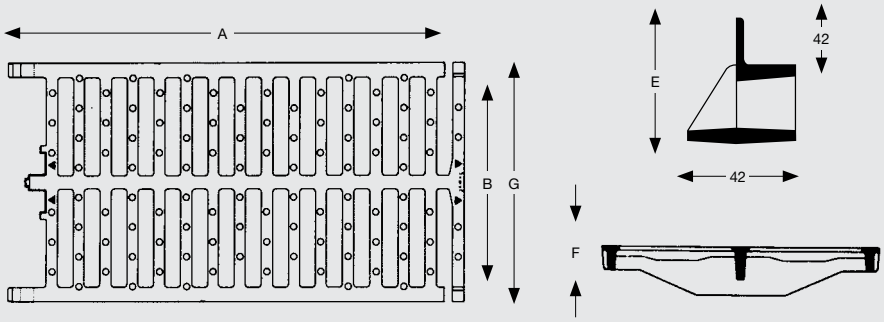
D400

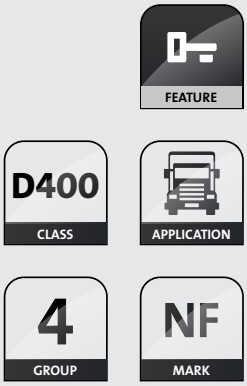
Features

- Modular/linear formation
- Bolt-down grate
- Interlocking
- Suitable for crosswise traffic when secured appropriately

Kerbside of roads carrying intense traffic including points which may be subject to crosswise traffic eg. lay-bys, breaks in central reservations, crossroads etc.







Autolinea

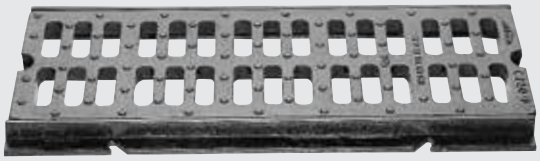
Code	SAP code	BS EN 124 loading class	Grating width G (mm)	Length A (mm)	Duct width B (mm)	Grating thickness F (mm)	Bearer bar depth E (mm)	Waterway area (cm^2)	Waterway area (cm^2)
RE30 H9HD	EDAL30PF	D400	300	750	250	35	–	1080	22.9
RE40 H9HD	EDAL40PF	D400	400	750	350	35	–	1500	33
RE50 H9HD	EDAL50PF	D400	500	750	450	35	–	2000	43
Bearer bar									
RH40 T6GR	E7	D400	–	75	–	–	100	–	10

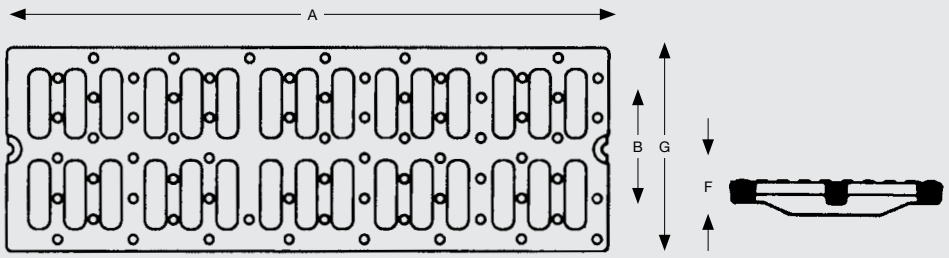
Features

- Modular/linear formation
- Spring-bar grate interlocking

For areas of high surface water run-off suitable for longitudinal drainage channels carrying light traffic only.

Not recommended for areas susceptible to turning traffic.





C250 CLASS

APPLICATION

3 GROUP

NF MARK

C250 – Mecalinea

Code	SAP code	BS EN 124 loading class	Grating width G (mm)	Length A (mm)	Duct width B (mm)	Grating thickness F (mm)	Bearer bar depth E (mm)	Waterway area (cm^2)	Waterway area (cm^2)
Grating (with slots)									
HG420 1	ECML20PF	C250	200	750	140	27	–	580	16
HG425 1	ECML25PF	C250	250	750	190	27	–	680	22.5
HG430 1	ECML30PF	C250	300	750	240	27	–	900	27
RE35 H3HD	ECML35PF	C250	350	750	290	27	–	1020	30
HG440 1	ECML40PF	C250	400	750	340	27	–	1290	36
HG450 1	ECML50PF	C250	500	750	440	27	–	1590	43
RE60 H3HD	ECML60PF	C250	600	750	540	27	–	1890	54
RE70 H3GD	ECML70PF	C250	700	750	640	27	–	2180	67
Bearer bar									
RE30 H3GD	E5	C250	–	750	–	27	36	–	4
Connecting Piece									
RE30 H3ED	E6	C250	–	–	–	–	–	–	0.5

Features

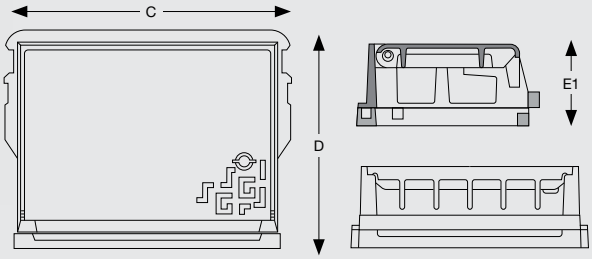
- Modular/linear formation

For areas of high surface run-off not subject to fast-moving through traffic eg. kerbside of town roads and streets, including crossing points subject to slow-moving traffic where connecting pieces must be used – car parks etc.

Not recommended for areas susceptible to turning traffic.

Section 4
Kerb Drainage

Section 4
Contents



FEATURE

D400 CLASS

APPLICATION

4 GROUP

KITEMARK

Aquakerb

Code	SAP code	BS EN 124 loading class	Kerb profile	Over base C x D (mm)	Depth E1 (mm)	Waterway area (cm^2)	Total mass (kg)
C6100A	186040	D400	Half batter	558 x 400	150	468	49
C6101A	186042	D400	45° splay	558 x 400	150	425	47

Features

- Single unit
- Half batter/45° splay
- Locked as standard

Options

- Sub frame available
- Road retaining bar

C6100 BSFZ (186041) – sub frame to suit C6100A and C6101A. HMA74 1 (187120) – road retaining bar.

Selecta range

The result of intense collaboration with road drainage engineers, the Selecta kerb gully drainage unit in ductile iron with opening top and grating for optimum access, is the professionals' solution to the problem of draining rainwater. Available in two sizes with two kerb profiles: Selecta 'Maxi' and Selecta '500', Selecta kerb drainage units have been designed to ensure excellent drainage performance whilst maximising safety.

Screening of debris
The presence of a raised bar prevents access into the gully for debris of too large a size and keeps certain solid objects carried by run-off water out of the sewer system.

Anti-obstruction
The surfaces of the bars are equipped with facets that are oriented in such a way as to prevent leaves or litter from blocking the drain.

Drainage
In the lower section of the gutter, the bars are arranged longitudinally in order to maximise water drainage.

Simulations carried out on a test bench show increases of between 10% and 15% in absorption, in certain circumstances, compared with a traditional design consisting of a rectangular grating and a gully.

Safety for cyclists
On the carriageway, the bars are perpendicular to the direction of the traffic in order to ensure safety for cyclists.

Safety for pedestrians
On the pavement side, the elimination of clearance on the hinge system and of any roughness on the surface of the cover ensure safety for pedestrians (high heels, walking sticks, crutches, etc.)

Height adjustability
Three bolts allow the height adjustment (up to 50mm) of the cover frame with respect to the kerb.

Height adjustability is only available on the Maxi.

Operation
Full opening with two flaps provides a wide unobstructed clear opening area (550 x 450mm) which facilitates access to the sewer system. In particular, the Selecta inlet is well suited to the insertion of cleaning and inspection equipment.

Opening
Both Selecta 'Maxi' and Selecta '500' kerb gratings and covers features vandal resistant ductile iron spring-bars to prevent unauthorised entry.

Grating and covers can be opened separately using a crow bar or pick axe as illustrated or both together to obtain full uninterrupted access.

Closing
Following routine maintenance both the cover and grating can be closed. Applying a little pressure to the top of the cover or grating will ensure that the spring-bar activates and again provides an effective barrier against unauthorised access.

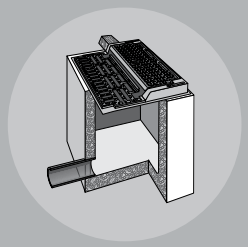
E+ FEATURE

For products that have the E+ feature, the trademark is detailed in the 'At a glance' section of the product pages.

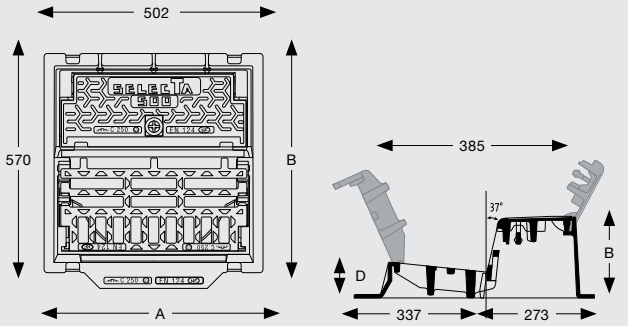
Features

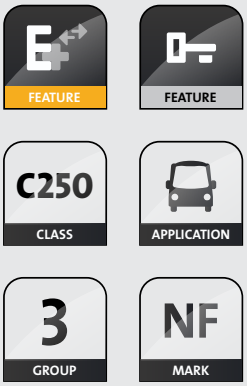
Slot orientation maximises flow capacity and road user safety.

Studding on grating prevents leaves sticking to the grate and maximises flow capacity.



In the kerbline.





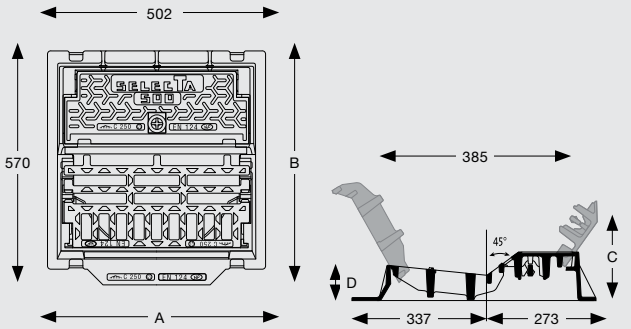
Selecta 500 Urban Profile (T)

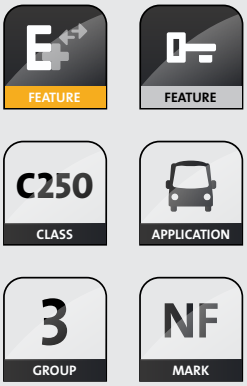
Code	SAP code	BS EN 124 loading class	Over frame A x B (mm)	Frame depth C (mm)	Grate depth D (mm)	Kerb profile	Total mass (kg)
RH50 E2TS	ECSE61TF	C250	570 x 610	205	90	37	56.5

Features

- Hinged
- Spring-bar lock
- Single unit
- Debris bar
- For urban applications

Kerb drainage unit for use in pavement kerbs adjacent to highways in urban applications.





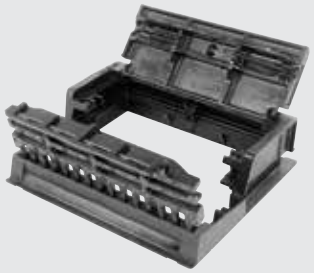
Selecta 500 Rural Profile (A)

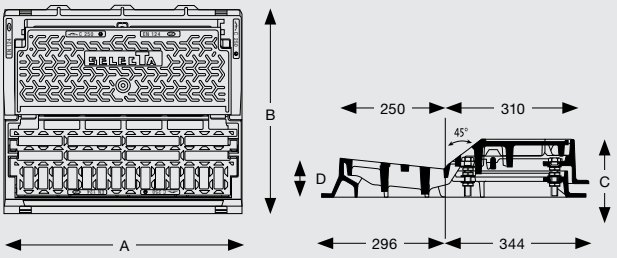
Code	SAP code	BS EN 124 loading class	Over frame A x B (mm)	Frame depth C (mm)	Grate depth D (mm)	Kerb profile	Total mass (kg)
RH50 E2AS	ECSE61SF	C250	570 x 610	125	90	45	51

Features

- Hinged
- Spring-bar lock
- Single unit
- Debris bar
- For rural applications

Kerb drainage unit for use in pavement kerbs adjacent to highways in rural applications.





FEATURE FEATURE C250 CLASS APPLICATION 3 GROUP NF MARK

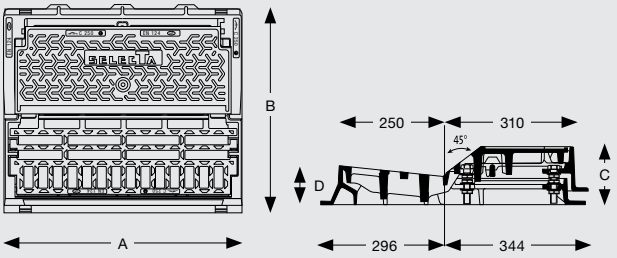
Selecta Maxi Urban Profile (T)

Code	SAP code	BS EN 124 loading class	Over frame A x B (mm)	Frame depth C (mm)	Grate depth D (mm)	Kerb profile	Total mass (kg)
RH75 E1FD	ECSE75UFX11	C250	750 x 640	175-225	90	37	94

Features

- Hinged
- Spring-bar lock
- Single unit
- Height adjustable
- Debris bar

Kerb drainage unit for use in pavement kerbs adjacent to highways in urban applications where height adjustment is desired.



FEATURE FEATURE C250 CLASS APPLICATION 3 GROUP NF MARK

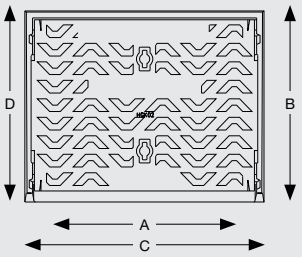
Selecta Maxi Rural Profile (A)

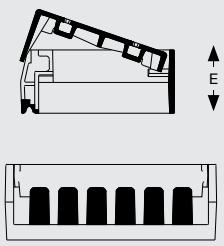
Code	SAP code	BS EN 124 loading class	Over frame A x B (mm)	Frame depth C (mm)	Grate depth D (mm)	Kerb profile	Total mass (kg)
RH75 E2FD	ECSE75SFX11	C250	750 x 640	135-155	90	45	92

Features

- Hinged
- Spring-bar lock
- Single unit
- Height adjustable
- Debris bar

Kerb drainage unit for use in pavement kerbs adjacent to highways in rural applications where height adjustment is desired.





FEATURE

C250 CLASS

APPLICATION

3 GROUP

KITEMARK

Waterfall

Code	SAP code	BS EN 124 loading class	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Road retaining bar	Debris grid (cm^2)	Total mass (kg)
HK03 1	187067	C250	450/410 x 295	550/480 x 362	190	Yes	No	38.5
HK11 1◆	187068	Heavy Duty	532 x 405	556 x 464	205	Extra	Yes	63
HK02 1◆	187066	Heavy Duty	532 x 405	556 x 464	205	Extra	No	63

Features

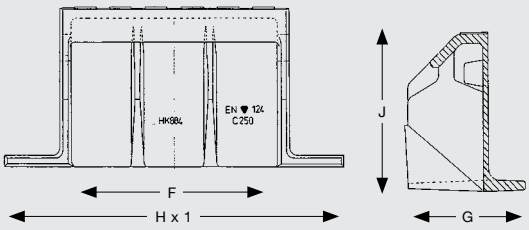
- Hinged
- Half batter
- Single unit

Options

- Road retaining bar

Kerb drainage unit for use in pavement kerbs adjacent to highways.

◆Not kitemarked. HMA74 1 (187120) – road retaining bar.



C250 CLASS

APPLICATION

3 GROUP

KITEMARK

Watergate Kerb

Code	SAP code	BS EN 124 loading class	Clear opening F x G (mm)	Base size H x I (mm)	Depth J (mm)	Batter	Total mass (kg)
HK872 1	187070	C250	340 x 122	540 x 190	245	12.5	25
HK884 1	187071	C250	340 x 122	540 x 190	245	45	20

Features

- Half batter/45° splay

Kerb hood which, used with Watergate gratings, gives a traditional combination of road grating and kerb drainage unit.

Section 5
Surface Boxes

Section 5
Contents

Warrior range

The Warrior surface box has been specifically designed to offer fast and easy access to emergency and below-ground services.

Manufactured from ductile iron and incorporating the large wedge seating principle, the Warrior surface box offers long-term stability and performance.

Conformity
The Warrior range of Grade A surface boxes fully meets the requirements of BS 5834 Part 2, 2011 and the performance requirements of BS 750, 2012 and is certified by the BSI Kitemark for quality.

Badging
A range of standard badged variants such as FH, SV, WO and AV are available. Please contact us for individual badging requirements.

Security
Safety chains can be fitted for added security.

Single-piece unit
Non-rock, heavy duty design.

Large wedge seatings
Offer non-rock performance and greater stability under heavy traffic loading.

Prising slots
Located at both front and rear of unit for easy opening and fast access to services.

Bonding ribs
To increase adhesion between the frame and bedding mortar. High-performance Polyester LTS Bedding Mortar is recommended for installation of this unit.

Positive register
A register is designed into the wedge seat for positive locating each time the cover is closed.

Wedge seat principle
The Warrior wedge seating operates in two directions and has seats to ensure the security and location of the cover within the frame.

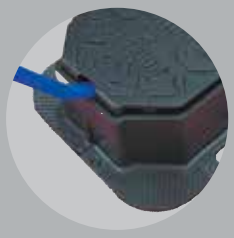
LTS FEATURE

For products that have the LTS feature, the trademark is detailed in the 'At a glance' section of the product pages.

Large wedge seatings

Bonding ribs

Single-piece unit



Prising slots

Warrior

Code	SAP code	Code with security chain	SAP code security chain	BS5834 grade	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Total mass (kg)
HB50 1	FSWA15CK	HB50 1/AT	186963	A	153 x 148	225 x 225	100	7.3
HB80 1	186986	HB80 1/AT	186987	A	148 x 153	262 x 250	225	13.2
HB54 1	186972	HB54 1/AT	186973	A	229 x 227	325 x 325	100	13.3
HB58 1	186980	HB58 1/AT	186981	A	303 x 301	400 x 400	100	20.2
HB40 1	FSWA32EK	HB40 1/AT	168303	A	383 x 233	505 x 355	125	24.7

Features:

- Non-rock design
- Single-piece cover
- Badging options
- Security chain option

Recommended for use in city and roads carrying heavy traffic.

Use T-handled lifting key on all units except HB40 1 (FSWA32EK) where a loop handled lifting key is required.

Warrior – Wide Flange

Code	SAP code	Code with security chain	SAP code security chain	BS5834 grade	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Total mass (kg)
HB36 1	186935	HB36 1/AT	186936	A	383 x 233	530 x 380	125	26.5

Features

- Wider flange to prevent lateral movement
- Non-rock design
- Single-piece cover
- Badging options
- Security chain option

Recommended for use in city and roads carrying heavy traffic.

A GRADE

>70 PSRV

APPLICATION

Double Triangular

Code	SAP code	Code with security chain	SAP code security chain	BS5834 grade	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Total mass (kg)
HB07 1	168306	HB07 1/AT	186921	A	432 x 282	552 x 402	102	38

Features

- Double triangular
- Non-rock design
- Badging options
- Security chain option

Traditional double triangular design for use in city roads carrying heavy traffic.

Use loop handled lifting keys.

A GRADE

APPLICATION

KITEMARK

Solid Top

Code	SAP code	Code with security chain	SAP code security chain	BS5834 grade	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Total mass (kg)
HB20 1	168304	HB20 1/AT	186932	A	100 x 100	190 x 190	100	6
HB16 1	186926	TBC	TBC	A	430 x 280	550 x 400	100	33.5

Features

- Solid top cover

Recommended for use in areas subject to heavy loading but not subject to fast-moving through traffic.

Use loop handled lifting keys.

Hinged Pavement

Code	SAP code	BS 5834 grade	Clear opening A x B (mm)	Over base C x D (mm)	Depth E (mm)	Spigot I/D	Total mass (kg)
HH90 1	187022	Medium	135 x 125	210 dia	75	–	30.7
HH96 1	187032	Medium	185 dia	275 x 275	61	–	7.7
HH94 1 ✣	187029	Medium	185 dia	240 x 240	111	202	7.9
HH93E ✣ ✪ ❄	187028	Medium	185 dia	240 x 240	111	202	7.7
HH97 E ❄	205341	Medium	205 x 205	260 x 260	75		8.1

Features

- Single-piece cover
- Hinged
- Badging options

Recommended for use in pavements and other pedestrian areas where hinged access is required.

✣ Spigot base
✪ 40mm hole in cover for encoded meter application
❄ Badged water

Section 6
Installation

Cover, grating & surface box

Reinstatement at existing site

Site assessment

Stage 1

Before beginning any reinstatement work it is recommended that a site assessment is carried out. This can often save considerable time on site through improved planning. The assessment should identify:

1. Type of reinstatement required
2. Whether a new cover or grating is required. If so, the size and type of unit should be identified, including the frame depth of the existing unit as it is more cost effective to replace the unit with one of equivalent frame depth.
3. The extent of work required. This should include any repairs required to the brick chamber, the urgency of the work required, whether a short-term emergency repair is required and an estimate of how long the work will take.

Material selection

Stage 2

The selection of the appropriate bedding and reinstatement materials is critical in ensuring optimum durability. It has long been acknowledged that the performance of the installation is directly attributed to the interaction between all the key components.

Consideration should be given to:

- The design of the casting
- The road type
- The chamber type and material used whether concrete, brick, composite or plastic

We recommend that the guidance contained within Section 6 Bedding Materials of the Highways England Guidance Document HA104/09 is adopted prior to selecting the appropriate bedding and reinstatement materials.

Chamber tops and gully tops should be bedded upon bedding material which has the following properties:

(a) the material should be non-shrink;

(b) the material should have a minimum workable life of 15 minutes;

(c) the compressive strength of the material should exceed 30N/mm2 in 3 hours;

(d) the tensile strength of the material should exceed 5N/mm2 in 3 hours;

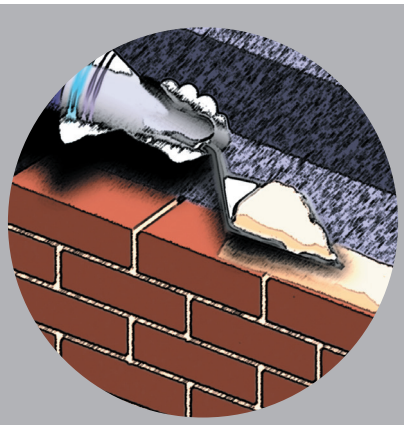
(e) notwithstanding the above requirements, the use of proprietary bedding components to different specifications may be permitted subject to appropriate certification and approval from the Overseeing Organisation.

This specification is for a rapid-hardening material which could, for example, be achieved by a suitable resin based material. The use of alternative bedding compounds to different specifications is not necessarily precluded where they form part of an alternative proprietary support system which has the approval of the Overseeing Department.

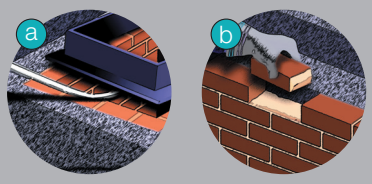
Bedding materials should be laid strictly in accordance with manufacturers' recommendations.

Materials manufactured for use in different temperature conditions must be selected as appropriate to suit site conditions at the time of mixing and application.

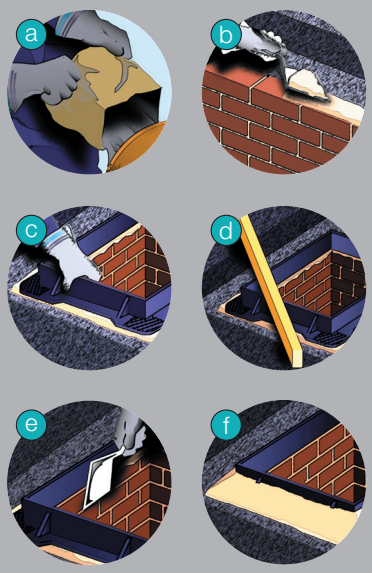
Consideration should also be given to the use of a flowable type material to ensure full encapsulation of the frame flange.



Preparation
Stage 3



Installation
Stage 4



Cover, grating & surface box

Preparation
Stage 3

a. Excavate ironwork

Remove all failed reinstatement as recommended within SROH which defines the trim back area as **'flange width of the frame + compactor sole plate width + 50mm'.**

The marked area is saw cut and excavated to uncover the flange of the existing cover and frame. The existing cover and frame are removed using a suitable lifting device, taking care to avoid dropping loose materials into the shaft.

All existing bedding mortar is removed and the supporting structure/ chamber cut back until a sound base is achieved. The newly-exposed substrate must be clean and structurally sound prior to commencing refurbishment work

Installation
Stage 4

a. Mix material

Ensure the material is mixed correctly following the manufacturer's instructions. It is recommended that a mechanical mixer is used to ensure full mixing and to reduce time taken.

b. Bedding layer

The depth of bedding materials needed to install the frame and cover level to the road surface is determined, taking into account the depth of the frame. It is recommended that a minimum depth of mortar below the flange is no less than 10mm.

c. Seat casting

Position casting frame over the access chamber and tamp down to ensure that the mortar keys to the casting. For optimum performance units are designed to be supported under the entire flange area, up to the edge of the clear opening. Failure to provide bedding over this area will detrimentally affect the performance and longevity of the unit.

d. Level casting

Ensure that the casting is level with the road surface by placing a straight edge across the corners of the casting onto the road. The frame can be made level by tamping the frame into the bedding material.

e. Check gaps under flange

Voids below the flange must be completely filled with bedding material to ensure full support of the frame. Exposed surfaces of the bedding mortar around the frame are float finished and textured to create a key, ensuring any voids or loose material are removed and the inside surface pointed to a smooth finish.

f. Envelope flange

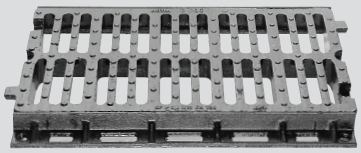
Any holes within the frame are in filled and the flanges of the frame enveloped by a minimum thickness of 10mm as per HA 104/09 however 20mm is recommended as this is viewed as best industry practice for bedding mortar. The bedding material must also extend beyond the flange to a minimum distance of 50mm.

g. Backfill

Check that the bedding material has hardened, then backfill with asphalt. Ensure that the asphalt is properly compacted.

Installation in new roads

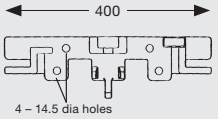
When installing covers in new roads, where the road surface has not yet been applied, embedment is made easier. Simply follow Stage 2: Material selection and Stage 4: Installation.



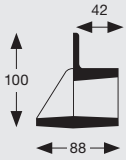
Channel grating

Translinea installation

Components



End pieces
RH 40 T6 AD
E10



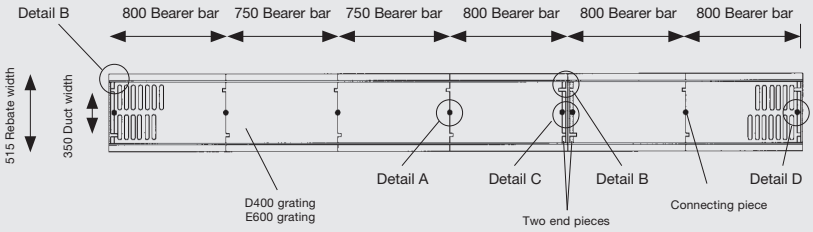
Bearer bar
RH 40 T6 GR (750 long)
E7
RH 40 T6 GS (800 long)
E8

Connecting piece
RE 40 H8 ED
E9

Installation

Translinea grates should be installed using the specifically designed bearer bars and with the gratings joined together using the connecting pieces.

Translinea grates should be connected to both the frame and to each other in heavily trafficked and high security areas and cross carriageway locations at least every fourth grating (see detail C).

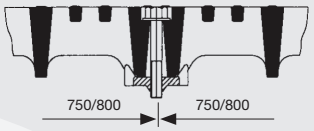


Important notice

In all areas where there is extensive manouvering of HGV's or other heavy vehicles, (for example in docks, loading yards, HGV parking areas), consideration should be given to bolting down every three or four gratings. If other types of 'T' section or angle section frames are used it must be ensured that their dimensions, security and embedment are suitable for the loading and stresses to which they will be subjected.

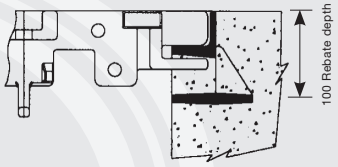
Detail A

Grating connected to grating.



Detail B

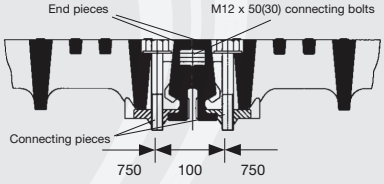
Interlocking of bearer bar and end piece.



Detail C

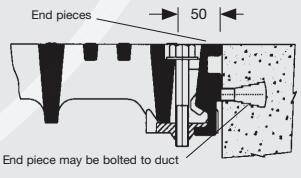
Grating connected to grating using two end pieces.

Use every fourth grating for heavy traffic and high security situations.



Detail D

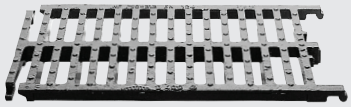
Grating and end piece.

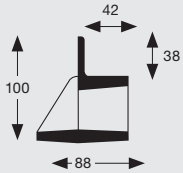


Channel grating

Autolinea installation

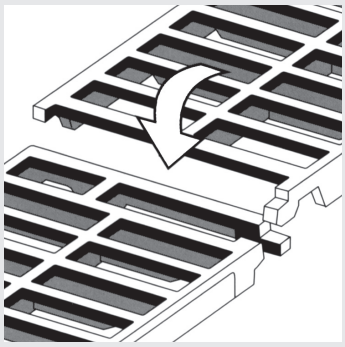
Components





Bearer bar
RH 40 T6 GR (750 long)
E7

Installation and operation



Simple

Easy to install.

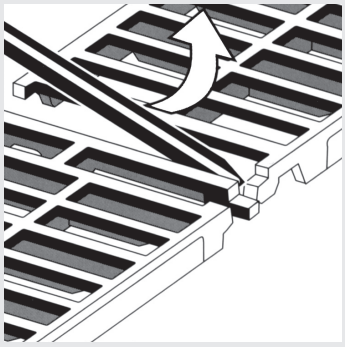
Gratings are simply snapped into place through a ductile spring lock.

With Autolinea, no accessories are needed.

Safe

Autolinea provides safety in service:

- No danger of accidental displacement
- Limited vandalism
- Anti-dilation effects.



Quick

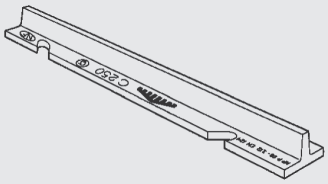
Removal by professionals is instantaneous, using a crowbar as a lever.

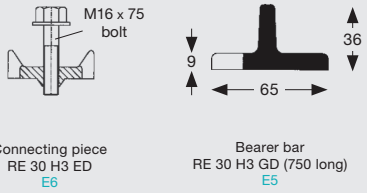
Autolinea is suitable for use at the side of highways carrying intense traffic. It should not be used in areas subject to cross traffic manouvering vehicles.

Channel grating

Mecalinea installation

Components





Connecting piece
RE 30 H3 ED
E6

Bearer bar
RE 30 H3 GD (750 long)
E5

Installation

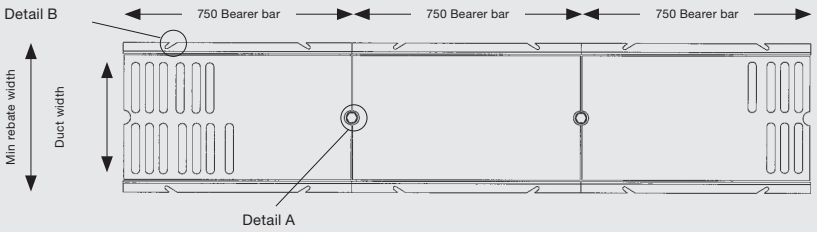
Mecalinea grates should preferably be installed using the specially designed bearer bars and with the gratings joined together using the connecting pieces where used in cross traffic areas. Typical layout for heavy use and areas subject to slow-moving traffic.

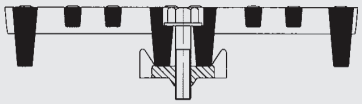
Detail A

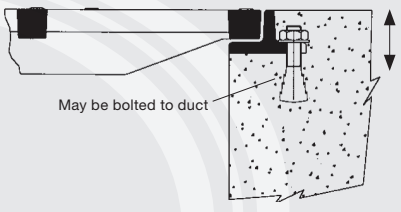
Grating connected to grating (must be used if subject to cross traffic).

Detail B

Bearer bar seating.



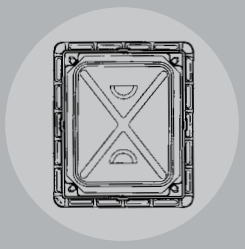


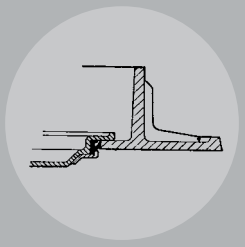


Section 7
Accessories

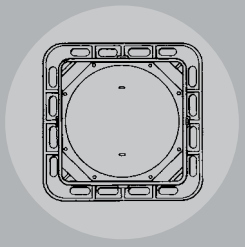
- Seal plates
- Safety grids
- Badging options
- Lifting/opening keys.

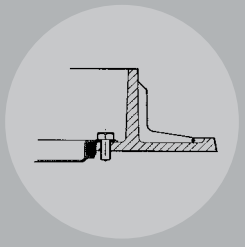
Push-fit





Bolt-down





Seal plates and safety grids

A comprehensive range of product accessories is available to enhance, protect and increase safety.

The accessories include:

- Seal plates
  – mild steel galvanised
  – GRP
- Safety grids
- Lifting keys.

Bolt-down mild steel galvanised (MSG) seal plates

Under surge conditions, pressure concentration in access shafts can lead to covers being forced out of access covers. In situations where this may occur, Saint-Gobain PAM UK offers a bolt-down MSG seal plate for added security.

MSG seal plates are fixed inside the access frame and secured using eight set screws. MSG seal plates are specially designed to overcome problems of back pressure experienced in sewer shafts up to 0.5 bar (equivalent to pressure of five metres head of water).

Installation (MSG)

When installing the access frame it is important that the bedding mortar does not interfere with the bolt holes used to retain the seal plate. Before installing the seal plate, ensure the sealing gasket and surface of the frame in contact with the gasket are lubricated using a soft soap (the lubricant used for Tyton pipe gaskets is also suitable). Washers should be placed under each set screw head. Set screws, wrapped with thread sealing tape, should then be tightened evenly to avoid possible distortion of the seal plate. We recommend bolting the frame to the chamber.

Note: Bolt-down MSG seal plates cannot be retrospectively fitted.

Push-fit glass reinforced plastic (GRP) seal plates

GRP seal plates act as a protective barrier against the egress of odours and the corrosive properties of sewer gases, notably in countries where the ambient temperature is high. They are also effective in reducing water infiltration.

GRP push-fit seal plates are not capable of performing under conditions of back pressure.

Installation (GRP)

Push-fit GRP seal plates can be easily installed with the frame in-situ, and are readily removable allowing fast access to shafts.

Note: Push-fit GRP seal plates may be retrospectively fitted in appropriate frames.

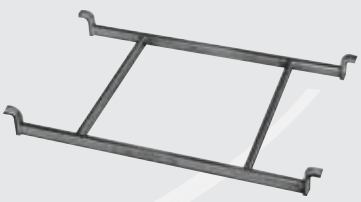
Safety grids

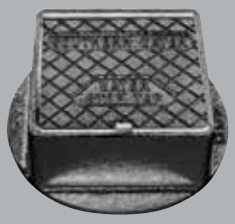
Specially designed MSG safety grids rest on the frame's internal lip and are designed to prevent the entry of objects into the sewer shaft when work is being carried out.

Safety grids are of drop-in design for ease of location in access frames and can be fitted retrospectively to appropriate frames.

Bar type and mesh type are available for appropriate frames.

Bar





Badging, coatings, keys, irons

Badging

The standard badges for manhole and access covers are ‘FW’ (foul water) or ‘SW’ (surface water). Not available on all items.

Special badging

Special badging of castings to individual customer requirements is also available, dependent on specific order quantities and suitability of particular designs. Please consult our sales department.

Standard badges

Access covers.
Not available on all items.

Service	Standard badge
Foul water	FW
Surface water	SW

Ductile iron product coating

Saint-Gobain PAM UK access covers and gratings are supplied coated with water-based black bitumen as standard. Castings may be supplied uncoated on request (fine cast).

Bitumen acts to protect casting surfaces whilst in transit and on the stockground. In situations where castings are subjected to regular vehicular traffic, the coating on the top surface of the casting will become worn. This has no adverse effect on the casting’s performance.

Step irons (malleable/ galvanised iron)

Code	SAP code	Shank
RM115 0	190662	115mm
RM230 0	190663	230mm

Lifting keys

Lifting keys are available, individually tailored to suit specific requirements.

Loop-handled keys

Suitable for use with E600, D400 and C250 castings and some surface boxes. See individual product pages. Available in 152mm (6”), 381mm (15”), 457mm (18”) and 610mm (24”). The longer lifting keys give ergonomic benefits when lifting heavier covers.

Code	SAP code	Design	Use	Length
RMA62 0	C50	Loop	Heavy duty	153mm
RMA55 0	190666	Loop	Heavy duty	380mm
RMA56 0	190667	Loop	Heavy duty	460mm
RMA57 0	190668	Loop	Heavy duty	610mm
RMA63 0	C51	Tee	Light duty	120mm

‘T’ handled keys

Suitable for use with B125 covers and some surface boxes. See individual product pages.

Locking/lifting keys

Locking kit comprises assembly instructions; steel hole-punch; turnbuckle lock (plus locking lifting key if required).

Code	SAP code	Keys
RMA41 0	190664	M12 Locking/lifting keys

D400

CLASS

Section 8

Product Selection Guide

Access Covers	Loading class			Health and safety			Installation and durability	Network security		Infiltration	Odour/egress			Protection or Barrier	Ventilation	Silent in use
		>70 PSRV	>80 PSRV			Traditional lift-out	LTS									
Briton	F900		I			I	I									I
Briton	E600		I			I	I									I
Briton GripTop	E600	I				I	I									I
Silent Knight	E600					I			O					O		I
Opt-Emax	D400N		I	I			I	O	O					I		I
Opt-Emax GripTop	D400N	I		I			I	O	O					I		I
Pamrex	D400N			I			I	O	O	I		I		I		I
Ult-Emax	D400N		I		I		I	O	I					I		I
Ult-Emax GripTop	D400N	I			I		I	O	I					I		I
Inter-Ax D400-H TDS	D400H		I			I	I		O	I			I			I
Inter-Ax D400-H	D400H		I			I	I		O						O	I
Inter-Ax D400-N	D400N		I			I	I		O					O	O	I
Inter-Ax GripTop	D400N	I				I	I		O					O	O	I
Inter-Ax D400-N Sealed	D400N		I			I	I		O	I	I					I
Silent Knight	D400N					I			O					O		I
Pamtight	D400N		I			I			I	I	I					I
Valiant	C250-40T		I		I			O	O			I				
Trojan	C250		I			I		O	O		I					
Valiant	B125		I		I			O	O			I				
Trojan Seal Plate Compatible	B125		I			I		O	O	O	O	I				
Rapide	B125		I		I											
Ductile Light Duty	B125					I		O	O		O	I				
Ductile Light Duty Recessed	B125					I		O	O		O	I				
BriPave DI	B125					I						I				

Key: I = Standard on product. O = Optional extra.

Channel Gratings	Loading Class	Security		Suitable for cross trafficking	Modular linear design
Translinea	E600	O		I	I
Translinea	D400	O		I	I
Autolinea	D400		I		I
Mecalinea	C250	O			I

Kerb Drainage	Loading class	Health and safety		Security	
Aquakerb	D400	I			I
Selecta 500 Urban Profile (T)	C250	I			I
Selecta 500 Rural Profile (A)	C250	I			I
Selecta 500 Maxi Urban Profile (T)	C250	I			I
Selecta 500 Maxi Rural Profile (A)	C250	I			I
Waterfall	C250	I			
Watergate Kerb	C250				

Surface Boxes	Grade	Health and safety			Installation and durability	Network security	Rapid access single piece cover
				Traditional lift-out	LTS		
Warrior	A			I	I	O	I
Double Triangular	A			I		O	
Solid Top	A			I			I
Hinged Pavement	B	I					I

Key: I = Standard on product. O = Optional extra.

Gully Grates	Loading class	Health and safety			Installation and durability	Network security		Absorption efficiency			Silent in use	Pedestrian friendly
				Traditional lift-out								
Briflo	F900			I						I	I	
Briflo	E600		I							I	I	
AquaVantage	D400	I				O	I	I			I	
Aqua-Max	D400	I			I	O	I	I			I	
Rexus	D400	I			I	O	I	I			I	
Watershed	D400	I					O		I		I	
Watershed Meshed	D400	I							I		I	I
Ax-S 400	D400	I							I		I	
Torrent	D400			I				I			I	
Waterway 2000	D400			I	I			I			I	
Waterway 1200	D400			I	I			I			I	
Watershed	C250	I							I			
Pedestrian	C250	I					O			I		I
Watergate	C250	I					O			I		
Waterflow	C250	I					O			I		
Aquaflo	B125	I								I		

Key: I = Standard on product. O = Optional extra.

SAINT-GOBAIN

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www.pamline.co.uk
to download electronic versions or to request hard copies of any of our brochures.

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Other products and services available from Saint-Gobain PAM UK:

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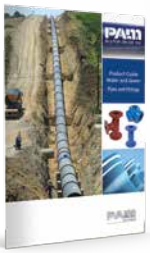
Market leading cast iron above and below ground drainage system kitemarked to BS EN 877 for commercial, residential and public buildings.

Classical Rainwater

Traditional range of cast iron rainwater and gutter systems to BS 460.

VortX Floor Drainage

A new generation of roof and floor drainage products designed in accordance with BS EN 1253.



Water and Sewer

Ductile iron pipes & fittings for potable water and sewerage applications.

Blutop

Innovative ductile iron pipeline system dedicated to small diameter potable water distribution.

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Valves, hydrants couplings and adaptors for potable water and sewerage applications.

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