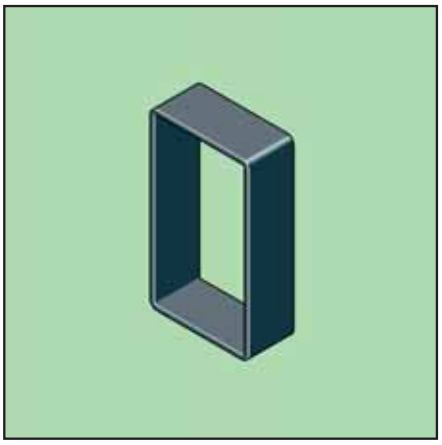
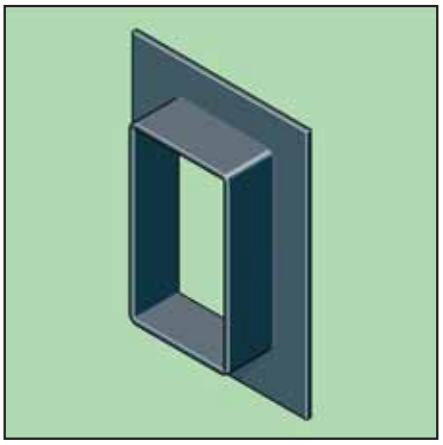
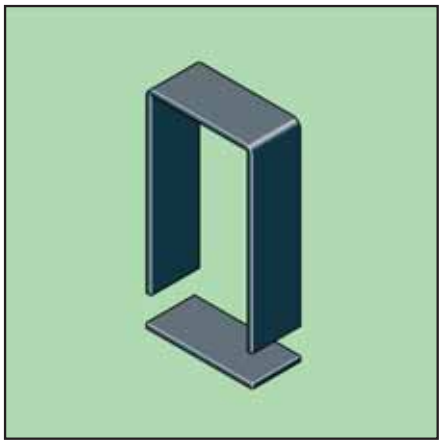


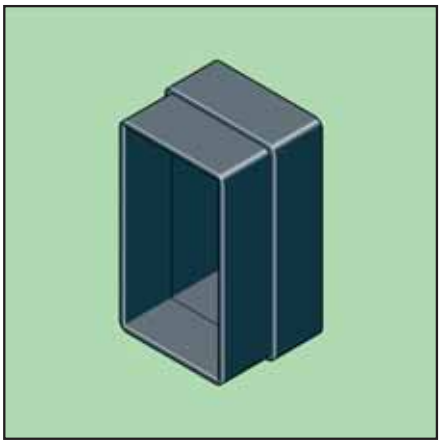
The HMX Frame
For general use. A Hawke compression tool (Ref.981) is required for use with all `x`designated frames.



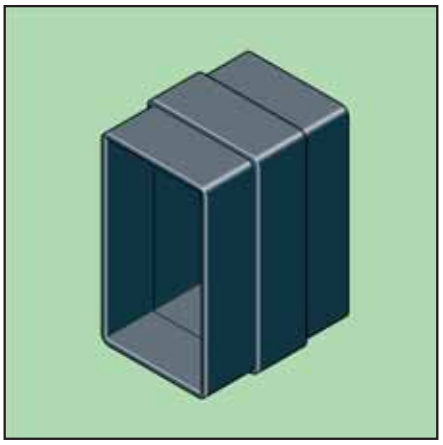
The HMFX Frame
Has a 60mm wide flange and is available in the same materials and finishes as HMX frames. For overall dimensions of HMFX frames add 120mm (allowance for flange) to those given for standard HMX frames.



The HMOX Frame
A removable end allows the frame to be installed around existing cables and pipes.

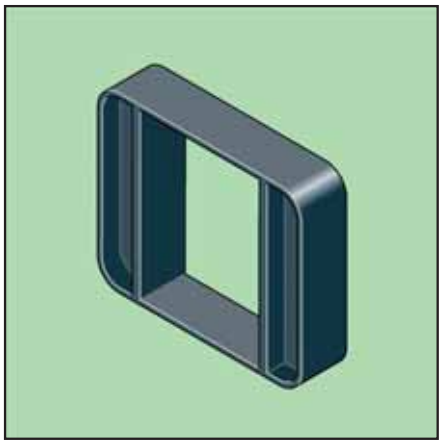


The HMEX Frame
A standard HMX frame extended using a welded collar.For use in corrugated bulkheads or to fit the frame above deck level. For overall dimensions of HMEX frames add 20mm to external measurements of Standard HMX frames.



The HMBX Frame
For sealing cable routes in uninsulated HO rated areas or similar applications. Add 20mm to external dimensions of standard HMX frames to determine overall width and height.

Also used in 2 hour Jet Fire applications



The HMRX Frame
For stressed area applications, end fillet pieces with radius corners are added to the HMX frame.

Marine Frames

Weld Removal

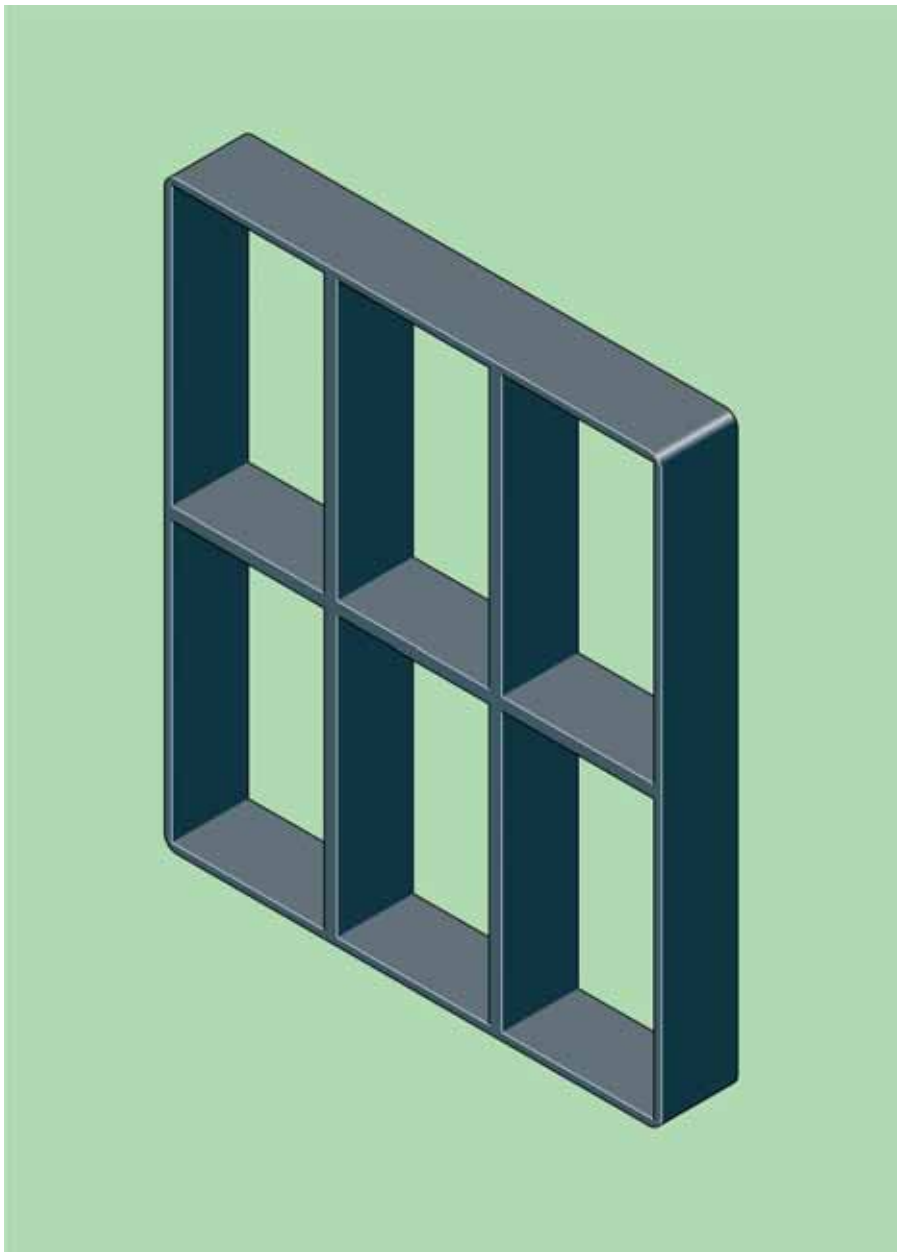
Where aesthetic considerations or specific mounting conditions are a requirement all protruding welds can be ground flush, this process alters standard manufacturing techniques and must be requested when ordering frames. Standard frames should not be modified on site as this could potentially weaken welding joints.

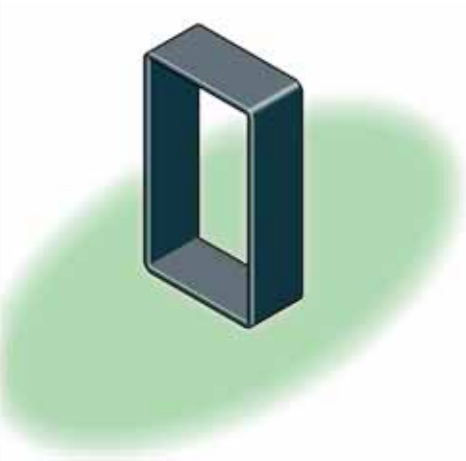
NOMINAL FRAME DIMENSIONS

MARINE FRAME	INSTALLATION AREA MM	OVERALL HEIGHT MM	OVERALL WIDTH MM	DEPTH MM	THICKNESS MM
HMX2	60x120	120	140	60	10
HMX4	120X120	180	140	60	10
HMX6	180X120	240	140	60	10
HMX8	240X120	300	140	60	10

YSTEM FRAME SIZES

Hawke
Marine Transit System





Hawke Marine Transit Frames

- Available in Mild Steel, Stainless Steel and Aluminium
- Fully certified for Marine applications
- Easily installed using standard welding techniques
- Unique Hawke Compression Tool for ease and speed of installation
- Extraction Tool enables blocks to be removed for cabling modifications

MARINE MULTIPLE FRAMES

Frame Materials

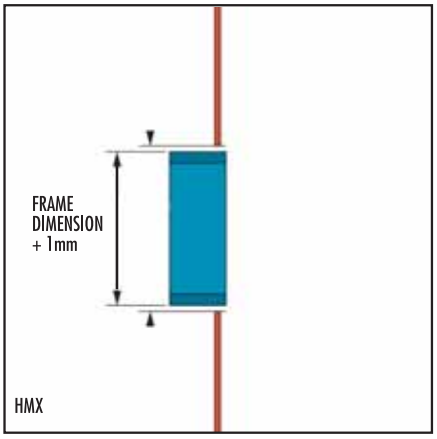
Hawke Transit Frames are available in Mild Steel, stainless steel and aluminium. For specialist applications frames can be manufactured to suit customers specific requirements.

Eddy Currents

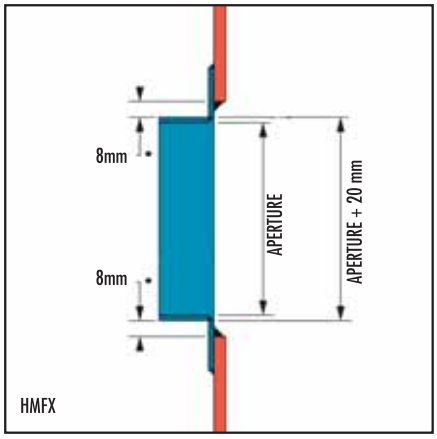
Where there is a possibility of eddy currents being induced into the transit frames causing the frame to heat up, frames can be manufactured with non magnetic inserts to reduce the effects.

MARINE FRAME INSTALLATION INSTRUCTIONS

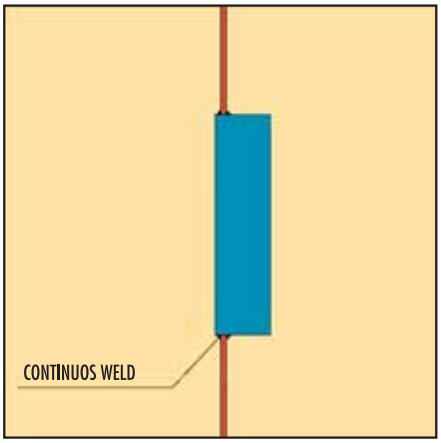
Installation Methods
A choice of Hawke Marine Frames is available to meet the varied criteria given by each situation.
Examples of frame installations are as follows, each method giving an inspectable professional finish to any cable penetration.



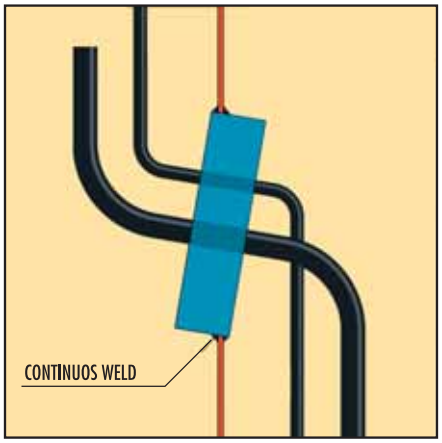
For HMX Frames.
Bulkhead aperture diameter must be Frame size plus 1mm.See table on page 26.



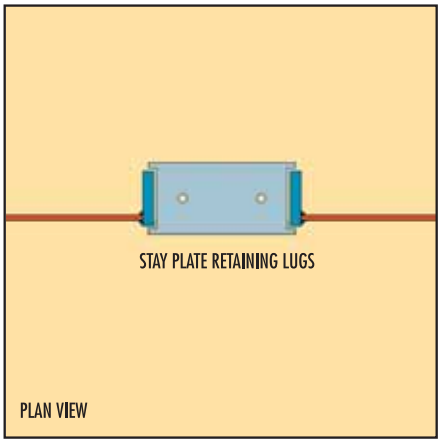
For HMFX Frames.
A minimum clearance of 16 mm is required to both height and width dimensions as shown.



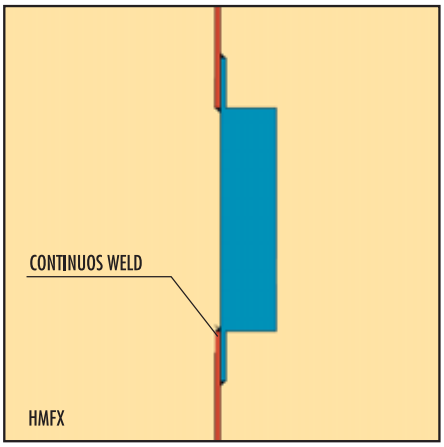
Hawke Marine Frames should be welded from both sides.

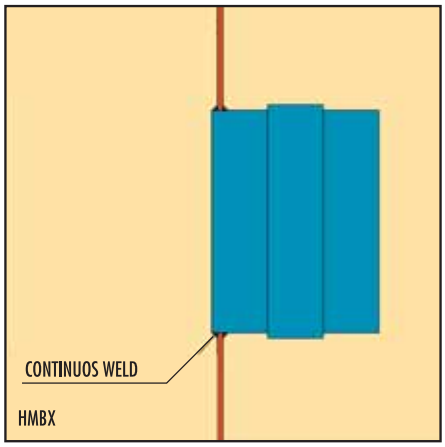


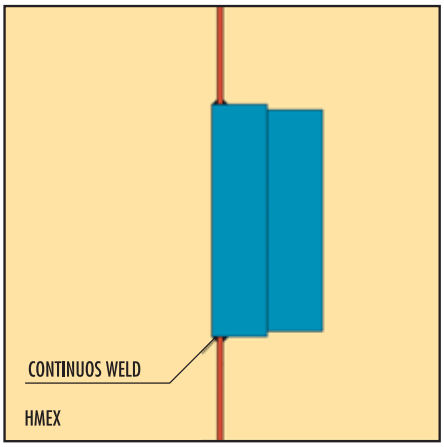
Hawke Marine Frames can be offset from the horizontal or vertical to reduce the bending radius on cables passing through them.



Note: When installing Marine Frames ensure the edges of the frame are free of weld which could interfere with retaining lugs on stay and compression plates.

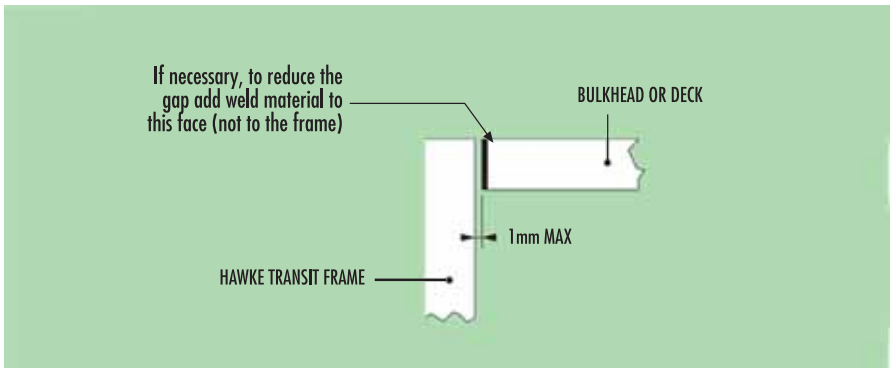




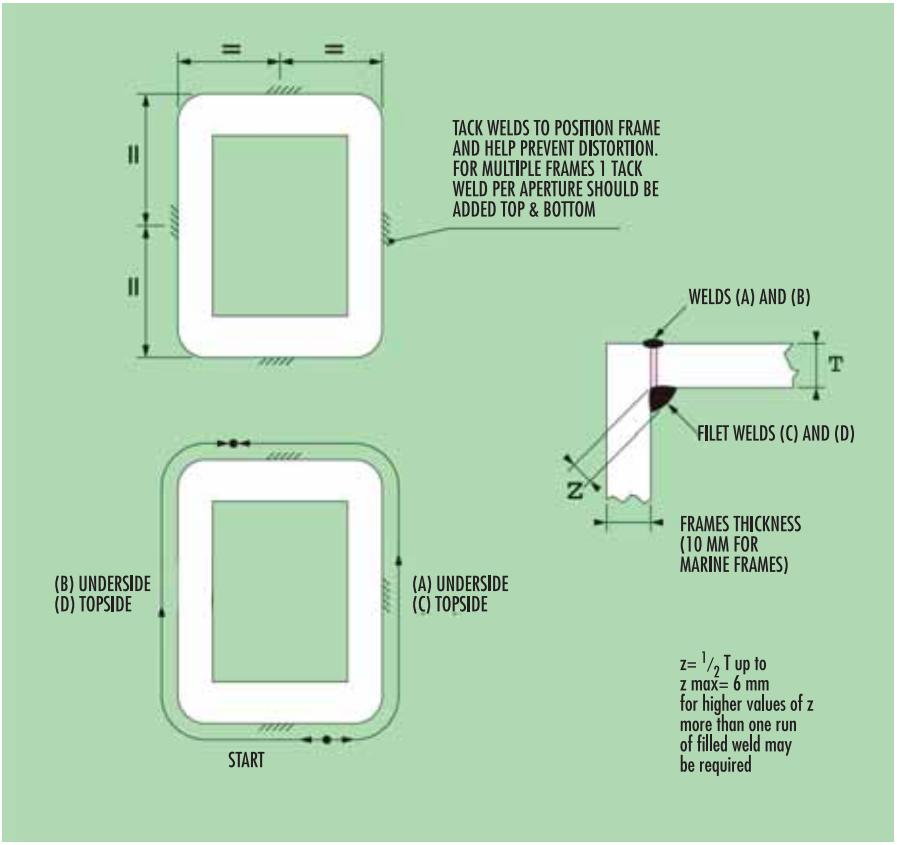


FRAME WELDING INSTRUCTIONS

Hawke
Marine Transit System



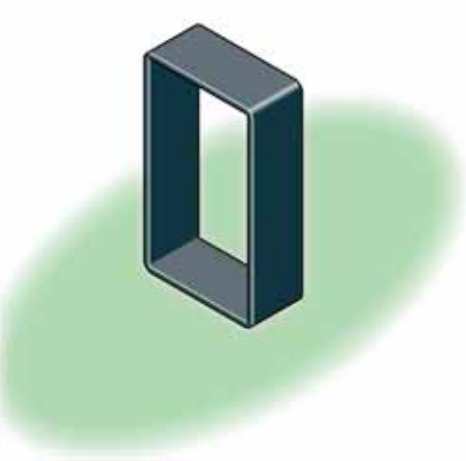
The aperture in the bulkhead/deck should be cut out such that the gap surrounding the frame 1mm.
If gap is in excess of 1mm weld material may be added to the bulkhead/deck cut face to reduce the gap. The bulkhead/deck should then be dressed and prepared as previously stated.



Prior to completing welds on either side of the bulkhead the frame should be tacked into position as in the sketch above. The tack welds reducing the amount of distortion in the parent metals.
The frame must be welded from both sides of the bulkhead.

Welding Sequence
1st (A) underside, 2nd (B) underside,3rd (C) topside, 4th (D) topside

Note: Allow adequate time for cooling to prescribed levels to prevent cracking between each weld run. Weld runs should not start or stop at a tack weld but should run over a tack.



Welding Instructions for Mild and Stainless Steel Frames

Prior to any welding process the joint and surrounding area should be prepared. The area must be clean, dry and free from any oil, grease, scale or oxide and any other debris/contaminates that may affect weld performance
e.g. protective coatings and primers.

FRAME SIZE CHART - MULTIPLE WIDTH x SINGLE HEIGHT

FRAME SIZE/ COMBINATION	OVERALL HEIGHT EXTERNAL	OVERALL WIDTH EXTERNAL									
		X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
	MM	MM	MM	MM	MM	MM	MM	MM	MM	MM	MM
HMX-2X	121	140	270	400	530	660	790	920	1050	1180	1310
HMX-4X	179.5	140	270	400	530	660	790	920	1050	1180	1310
HMX-6X	238	140	270	400	530	660	790	920	1050	1180	1310
HMX-8X	296.5	140	270	400	530	660	790	920	1050	1180	1310

FRAME SIZE CHART - SINGLE WIDTH x MULTIPLE HEIGHT

HMX-2+2X	232	140
HMX-2+4X	290.5	140
HMX-2+6X	349	140
HMX-2+8X	407.5	140
HMX-4+4X	349	140
HMX-4+6X	407.5	140
HMX-4+8X	466	140
HMX-6+6X	466	140
HMX-6+8X	524.5	140
HMX-8+8X	583	140

FOR SINGLE APERTURE STACK FRAMES ONLY

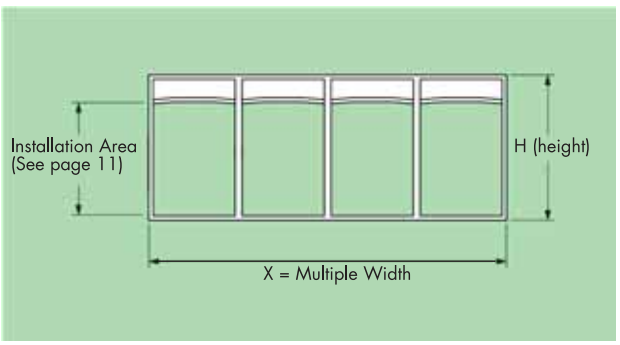
FRAME SIZE CHART - MULTIPLE WIDTH x SINGLE HEIGHT

HMX-2+2X	242	-	270	400	530	660	790	920	1050	1180	1310
HMX-2+4X	300.5	-	270	400	530	660	790	920	1050	1180	1310
HMX-2+6X	359	-	270	400	530	660	790	920	1050	1180	1310
HMX-2+8X	417.5	-	270	400	530	660	790	920	1050	1180	1310
HMX-4+4X	359	-	270	400	530	660	790	920	1050	1180	1310
HMX-4+6X	417.5	-	270	400	530	660	790	920	1050	1180	1310
HMX-4+8X	476	-	270	400	530	660	790	920	1050	1180	1310
HMX-6+6X	476	-	270	400	530	660	790	920	1050	1180	1310
HMX-6+8X	534.5	-	270	400	530	660	790	920	1050	1180	1310
HMX-8+8X	593	-	270	400	530	660	790	920	1050	1180	1310

X= number of frames wide. Material thickness is 10 mm

MAXIMUM NUMBER OF CABLES/PIPES

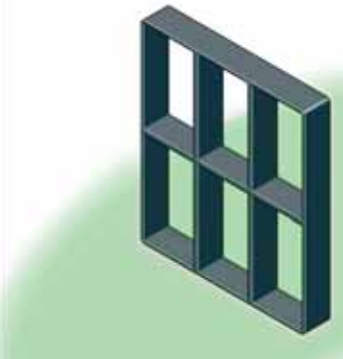
	MODULAR SIZE						
MM	15	20	30	40	60	90	120
FRAME SIZE	MAXIMUM NUMBER OF CABLES/PIPES						
HMX-2	32	18	8	3	2	-	-
HMX-4	64	36	16	9	4	1	1
HMX-6	96	54	24	12	6	2	1
HMX-8	127	72	32	18	8	2	2



I C A T I O N D A T A

WEIGHT CHART IN KILOGRAMS							
MATERIAL	FRAME SIZE/ COMBINATION	X1 KGS	X2 KGS	X3 KGS	X4 KGS	X5 KGS	X6 KGS
MILD STEEL	2	2.2	3.7	5.3	7.6	9.6	11.3
	4	2.8	4.8	6.4	8.5	10.6	12.6
	6	3.4	5.6	7.8	10.0	12.3	14.7
	8	3.7	6.1	8.6	11.0	13.5	16.1
	2+2	3.8	8.3	12.0	15.9	19.9	23.7
	2+4	4.3	9.0	12.9	16.9	21.1	25.0
	2+6	1.9	9.4	13.7	18.0	22.3	26.4
	2+8	5.6	10.5	14.8	19.3	23.9	28.3
	4+4	4.9	9.4	13.5	16.8	22.3	26.4
	4+6	5.5	10.5	14.8	19.3	23.9	28.3
	4+8	6.0	11.3	15.9	20.7	25.5	30.2
	6+6	5.7	11.2	15.9	20.7	25.5	28.0
	6+8	6.4	12.2	17.1	22.3	27.5	32.5
	8+8	7.0	13.1	17.0	23.9	29.5	34.9
STAINLESS STEEL	2	3.0	4.0	5.9	7.7	9.5	11.3
	4	2.8	4.9	6.8	8.7	10.7	12.7
	6	3.3	5.5	7.7	10.3	12.3	14.6
	8	3.9	6.6	9.2	11.8	14.4	17.0
	2+2	3.8	8.4	12.3	16.2	20.1	24.0
	2+4	4.2	8.9	13.0	17.0	21.1	25.1
	2+6	5.0	9.8	14.1	18.3	22.6	26.8
	2+8	5.5	10.5	15.0	19.5	24.0	28.5
	4+4	5.0	9.8	14.1	18.3	22.6	26.8
	4+6	5.5	10.5	15.0	19.5	24.0	28.5
	4+8	5.9	11.5	16.3	21.1	25.9	30.7
	6+6	6.8	11.2	15.9	20.8	25.6	30.4
	6+8	6.8	12.4	17.6	22.7	27.9	33.0
	8+8	7.5	13.1	18.9	24.2	30.0	35.3
ALUMINIUM	2	0.8	1.3	2.1	2.7	3.3	3.9
	4	1.0	1.7	2.2	2.9	3.5	4.2
	6	2.0	1.9	2.8	3.5	4.2	5.1
	8	1.4	2.1	3.0	3.9	4.8	5.7
	2+2	1.4	2.9	4.3	5.6	7.0	8.3
	2+4	1.4	3.0	4.4	5.8	7.1	8.5
	2+6	1.8	3.4	4.9	6.3	7.8	9.2
	2+8	1.8	3.5	5.1	6.6	8.2	9.7
	4+4	1.8	3.4	4.9	6.3	7.8	9.2
	4+6	1.8	3.5	5.1	6.6	8.2	9.7
	4+8	2.2	4.0	5.6	7.3	8.9	10.5
	6+6	2.1	3.9	5.6	7.3	8.9	10.5
	6+8	2.4	4.3	5.9	7.6	9.4	11.1
	8+8	2.4	4.4	6.5	8.4	10.3	12.2

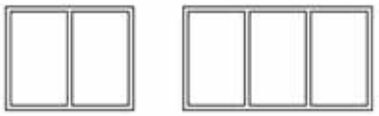
Hawke
Marine Transit System



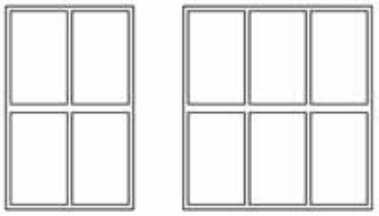
Marine Multiple Frames

Multiple frames consist of two or more apertures arranged either horizontally, vertically or a combination of both.
When specifying multiple frames a '+' sign signifies that the apertures are stacked in a vertical row e.g. one on top of the other.
A 'x' sign means that the apertures are arranged side by side in an horizontal row.

Examples:



HMX6 x 2 HMX6x3



HMX6 +6 x2 HMX6+ 6 x 3

MARINE FRAME - DIMENSIONAL DATA

NOMINAL BULKHEAD/DECK APERTURE DIMENSIONS PRIOR TO FRAME INSTALLATION/WELDING

	MULTIPLE									
Frame Type	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
	MM	MM	MM	MM	MM	MM	MM	MM	MM	MM
HMX 2	(h)122	122	122	122	122	122	122	122	122	122
HMOX 2	x	x	x	x	x	x	x	x	x	x
HMBX 2	(w)141	271	401	531	661	791	921	1051	1181	1311
HMX 4	180.5	180.5	180.5	180.5	180.5	180.5	180.5	180.5	180.5	180.5
HMOX 4	x	x	x	x	x	x	x	x	x	x
HMBX 4	141	271	401	531	661	791	921	1051	1181	1311
HMX 6	239	239	239	239	239	239	239	239	239	239
HMOX 6	x	x	x	x	x	x	x	x	x	x
HMBX 6	141	271	401	531	661	791	921	1051	1181	1311
HMX 8	297.5	297.5	297.5	297.5	297.5	297.5	297.5	297.5	297.5	297.5
HMOX 8	x	x	x	x	x	x	x	x	x	x
HMBX 8	141	271	401	531	661	791	921	1051	1181	1311
HMX 2+2	233	243	243	243	243	243	243	243	243	243
HMOX 2+2	x	x	x	x	x	x	x	x	x	x
HMBX 2+2	141	271	401	531	661	791	921	1051	1181	1311
HMX 2+4	291.5	301.5	301.5	301.5	301.5	301.5	301.5	301.5	301.5	301.5
HMOX 2+4	x	x	x	x	x	x	x	x	x	x
HMBX 2+4	141	271	401	531	661	791	921	1051	1181	1311
HMX 2+6	350	360	360	360	360	360	360	360	360	360
HMOX 2+6	x	x	x	x	x	x	x	x	x	x
HMBX 2+6	141	271	401	531	661	791	921	1051	1181	1311
HMX 2+8	408.5	418.5	418.5	418.5	418.5	418.5	418.5	418.5	418.5	418.5
HMOX 2+8	x	x	x	x	x	x	x	x	x	x
HMBX 2+8	141	271	401	531	661	791	921	1051	1181	1311
HMX 4+4	350	360	360	360	360	360	360	360	360	360
HMOX 4+4	x	x	x	x	x	x	x	x	x	x
HMBX 4+4	141	271	401	531	661	791	921	1051	1181	1311
HMX 4+6	408.5	418.5	418.5	418.5	418.5	418.5	418.5	418.5	418.5	418.5
HMOX 4+6	x	x	x	x	x	x	x	x	x	x
HMBX 4+6	141	271	401	531	661	791	921	1051	1181	1311
HMX 4+8	467	477	477	477	477	477	477	477	477	477
HMOX 4+8	x	x	x	x	x	x	x	x	x	x
HMBX 4+8	141	271	401	531	661	791	921	1051	1181	1311
HMX 6+6	467	477	477	477	477	477	477	477	477	477
HMOX 6+6	x	x	x	x	x	x	x	x	x	x
HMBX 6+6	141	271	401	531	661	791	921	1051	1181	1311
HMX 6+8	525.5	535.5	535.5	535.5	535.5	535.5	535.5	535.5	535.5	535.5
HMOX 6+8	x	x	x	x	x	x	x	x	x	x
HMBX 6+8	141	271	401	531	661	791	921	1051	1181	1311
HMX 8+8	584	594	594	594	594	594	594	594	594	594
HMOX 8+8	x	x	x	x	x	x	x	x	x	x
HMBX 8+8	141	271	401	531	661	791	921	1051	1181	1311

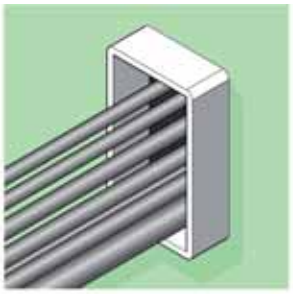
For HMEX Frames add 20mm to both height and width-dimensions.
To establish minimum aperture dimensions for HMFX Frames add 15mm to both height and width dimensions in above table.
For HMRX apertures contact Hawke Technical Department

TRANSIT INSTALLATION GUIDE

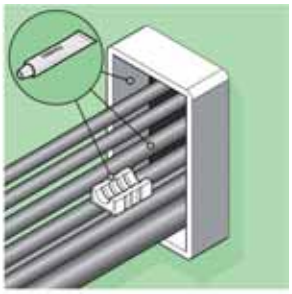
Civil and Marine Transit System

The following diagrams explain step by step how easy it is to install Hawke cable/pipe tolerant blocks into Civil or Marine Transit frames.

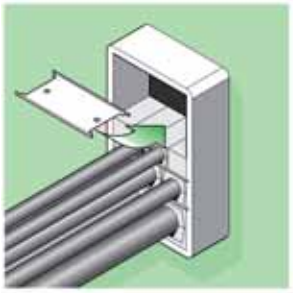
1 Draw up a Hawke Design Template to determine your cable/pipe layout.



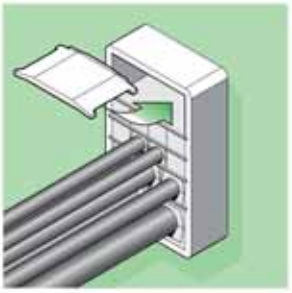
2 Make sure the frame is clean, then pull cables or pipes through, placing the largest at the bottom. (Note: Use open ended frame to fit around existing cables/pipes).



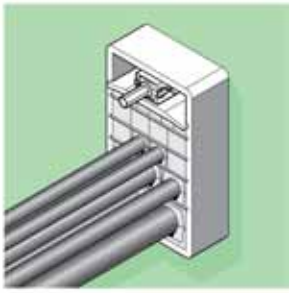
3 Lubricate the inside of the frame and all the insert blocks.



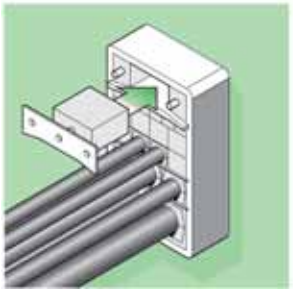
4 Begin packing the frame. A stayplate is inserted between each layer of insert blocks.



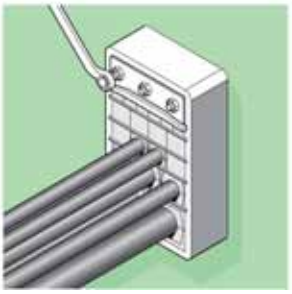
5 Insert the compression plate before the last row of blocks or earlier if required with additional stayplates.



6 Pack the last row, insert the compression tool and tighten until there is sufficient room to fit the tapered end packers.



7 Insert two outside packing pieces then remove tool before fitting centre block.



8 Tighten the nuts on the endpacking to compress and complete the seal. Approximately 10mm of thread should protrude on each bolt.

9 Hawke's unique colour coding system enables the installation to be visually inspected after completion and ensures correct matching of the block halves.

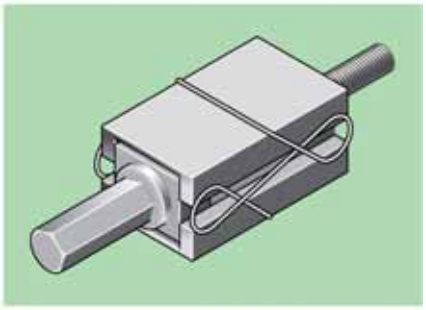
Note:
HF600 filler blocks must be installed with the faces moulded with 4 holes in vertical position

Hawke
Transit System

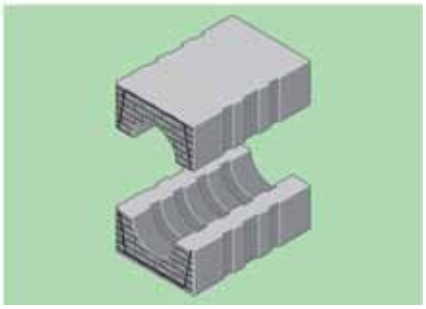
Hawke Cable/Pipe/Block Selection Gauge

1. Simply wrap the gauge tightly around the cable or pipe from the measurement line.
2. Reading along the measurement line will reveal the correct block size for the cable or pipe and identify it by colour code.
e.g. 4022 RED

Where there is an overlap between two block sizes e.g. 6052 or 9053, either size can be selected to best use the available space in the transit frame.



Hawke Compression Tool
Hawke's unique Compression Tool. Simplifies the process of compressing tolerant blocks within X type frames and speeds installation considerably when compared to competitors methods.



Hawke Cable/Pipe Tolerant Blocks
Hawke's unique inspectable colour coded blocks ensure that the top and bottom half of each block has been correctly matched for size.

Round Transit Frames

The system has been designed by Hawke to effectively seal cables and pipes passing through circular apertures, providing a barrier and pressure seal against fire, water and gas, etc. The seal is formed by tightening the compression bolts which expand the system radially.

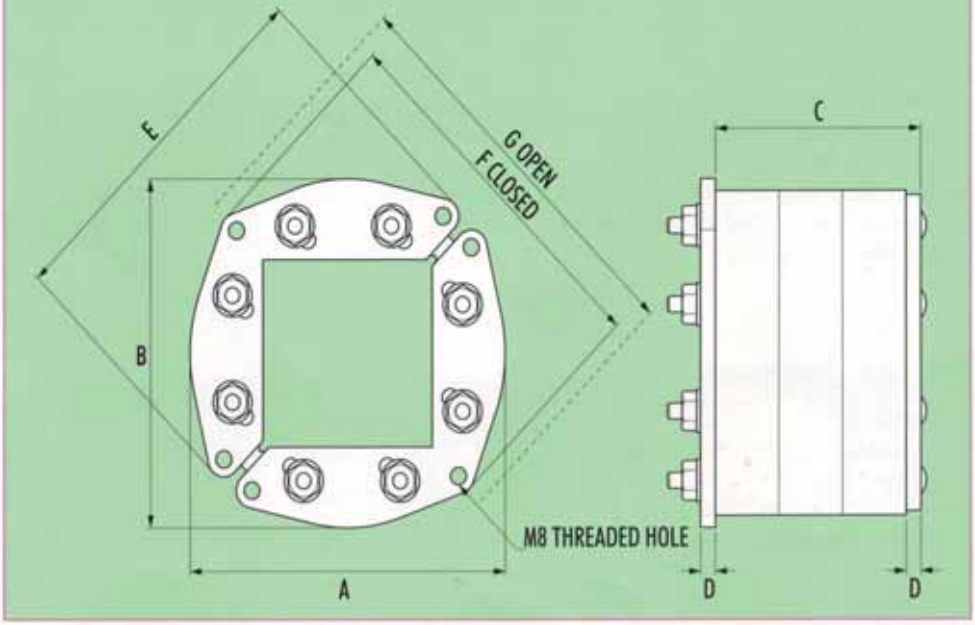
Easily installed without the need for specialised personnel.

Requires no special frame or tools for installation.

Integral extraction facility enables cabling to be modified

The system is designated by the letters **HRT** (or **HRTO** for the open versions). The compression plates are also available in stainless steel.

DIMENSIONS

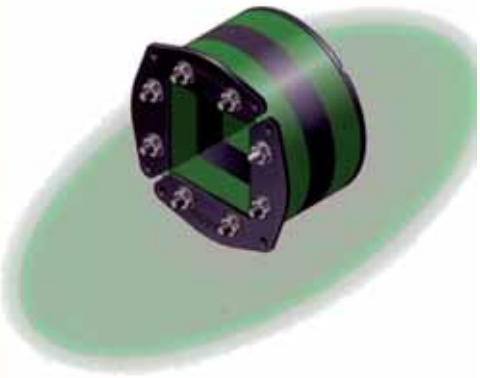


T E M F R A M E S I Z E S

FRAME DIMENSIONS								
CODE	BOLT SIZE	A MM	B MM	C MM	D MM	E MM	F MM	G MM
HRT 30	4XM5X70	32	32	64	4	32	-	-
HRT 40	4XM5X70	40	40	64	4	40	-	-
HRT 50	4XM5X70	50	50	64	4	50	-	-
HRT 70	4XM6X85	85	85	70	4	94	96	105
HRT 100	4XM6X85	108	108	70	4	124	126	137
HRT 150	8XM8X90	160	160	74	5	176	176	187
HRT 200	8XM8X90	210	210	74	5	226	226	237

HRT APPLICATION DATA						
CODE	WEIGHT STEEL	WEIGHT STAINLESS STEEL	NOMINAL	PIPE RANGE STANDARD HRT FRAME	PIPE RANGE OPEN HRTO FRAME	CABLE INSTALLATION AREA
	KGS	KGS	MM	MM	MM	MM
HRT 30	0.11	0.12	31	31-33	31-32	15x15
HRT 40	0.15	0.16	39	39-40	39-40	20x20
HRT 50	0.18	0.19	49	49-52	49-50	30x30
HRT 70	0.5	0.7	69	69-72	69-70	40x40
HRT 100	0.80	0.85	99	99-102	99-100	60x60
HRT 150	1.9	2.2	149	149-153	149-150	90x90
HRT 200	3.7	3.7	199	199-203	199-200	120X120

Hawke
Round Transit System



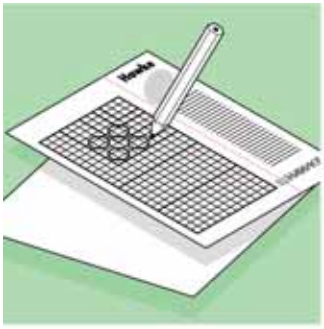
Hawke Round Transit Frames

- Certified for both Civil and Marine applications
- May be used to seal existing cable and pipes
- HRTO – open version available in all sizes for applications where cables/pipes are already in position
- Easily installed without the need for specialised personnel
- Requires no special frame or tools for installation
- Integral extraction facility enables cabling to be modified

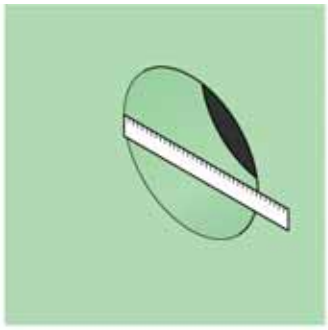
HTS HAWKE TRANSIT SYSTEM

Round Transit System

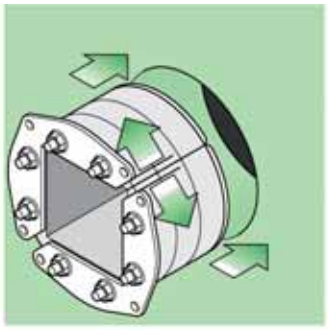
The following diagrams explain step by step how easy it is to install Hawke cable/pipe tolerant blocks into Round Transit frames.



1 Draw up a Hawke Design Template to determine your cable/pipe layout.



2 Measure the inside of pipe or aperture to ensure that it is within the tolerance of the Round Transit Frame to be used.



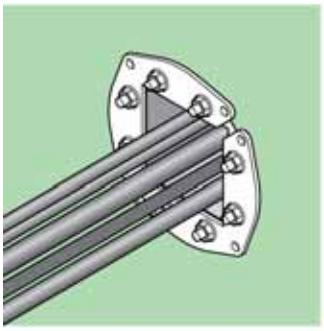
3 Insert the Round Transit Frame and open the two front plate*. No lubricant should be applied to the aperture or outside of the frame

Hawke Cable/Pipe/Block Selection Gauge

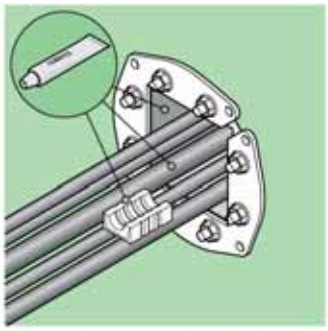
1. Simply wrap the gauge tightly around the cable or pipe from the measurement line.

2. Reading along the measurement line will reveal the correct block size for the cable or pipe and identify it by colour code.

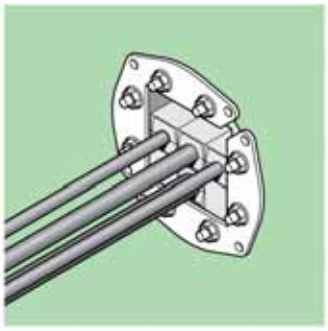
e.g. 4022 RED
Where there is an overlap between two block sizes e.g. 6052 or 9053, either size can be selected to best use the available space in the transit frame.



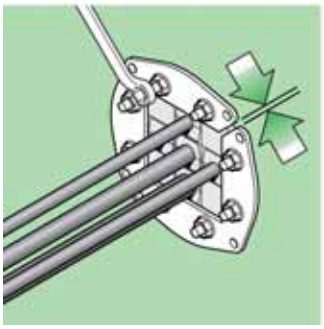
4 Pull the cables or pipes through the frame. (Note: Use open ended Round Transit to fit around existing cables/pipes).



5 Lubricate the inside of the frame and each of the insert blocks.

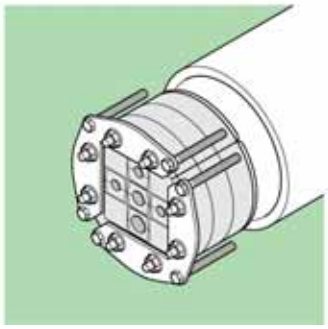


6 Begin packing the transit frame starting at the bottom and finishing at the top. Ensure that the blocks are pushed firmly against the rear retaining lip.

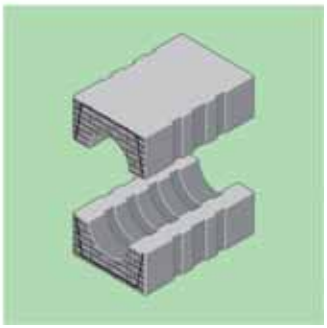


7 Slide the two front plates together and tighten the nuts 2mm each time, applying equal pressure to both plates*. The bolts should be tightened until the cables/pipes are sealed. A minimum of 10mm of thread should protrude on each bolt.

8 Hawke's unique colour coding system enables the installation to be visually inspected after completion and ensures the correct matching of the block halves.



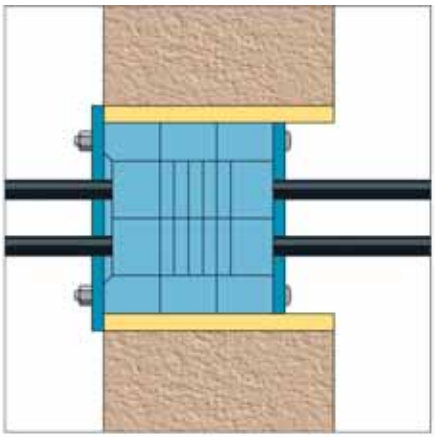
9 EXTRACTION OF SYSTEM
Extraction is achieved by releasing the compression, i.e. by reversing steps 5 and 6 and screwing M8 bolts(not supplied) into the threaded holes at each corner of the front plates. This releases the assembly from the aperture and allows the system to be disassembled.



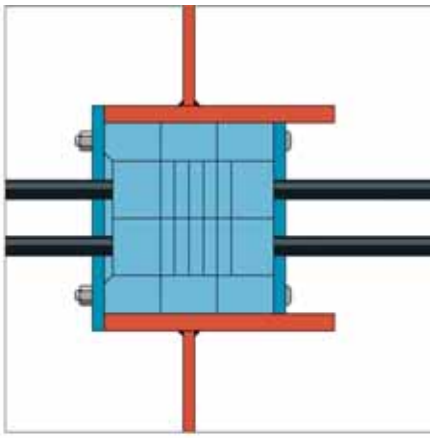
Hawke Cable/Pipe Tolerant Blocks
Hawke's unique inspectable colour coded blocks ensure that the top and bottom half of each block has been correctly matched for size.

* Note: HRT30, HRT40 and HRT50 front plates are fixed

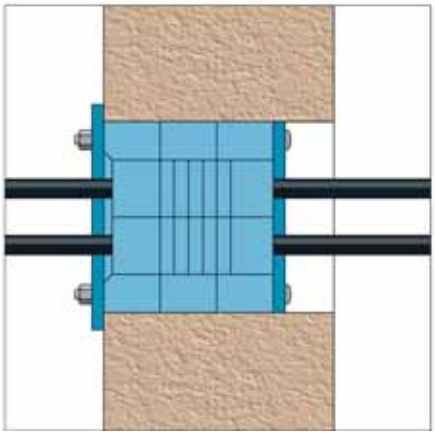
HRT APPLICATIONS



Cast Pipe



Welded Tube



Core Drilled Hole

TRANSIT ASSEMBLY CHECKLIST

1.Measure the outside diameter of each cable and ensure that the diameter is within the cable range marked on the front of the block that seals each cable.

2.Check that all colour codes on the block pairs are matching.

3.Check that there are sufficient blocks installed into the frame and that there are no gaps not sealed by blocks.

4.If the transit application is in excess of 3.5 bar high pressure stayplates should be used ref. 931p, together with an extra 5mm sealing strip.

5.Check the correct amount of compression has been applied to the end packer bolts, 10mm of thread on each bolt should be protruding.

Hawke
Round Transit System

HRT Applications

The HRT is certified for use in civil and marine installations.

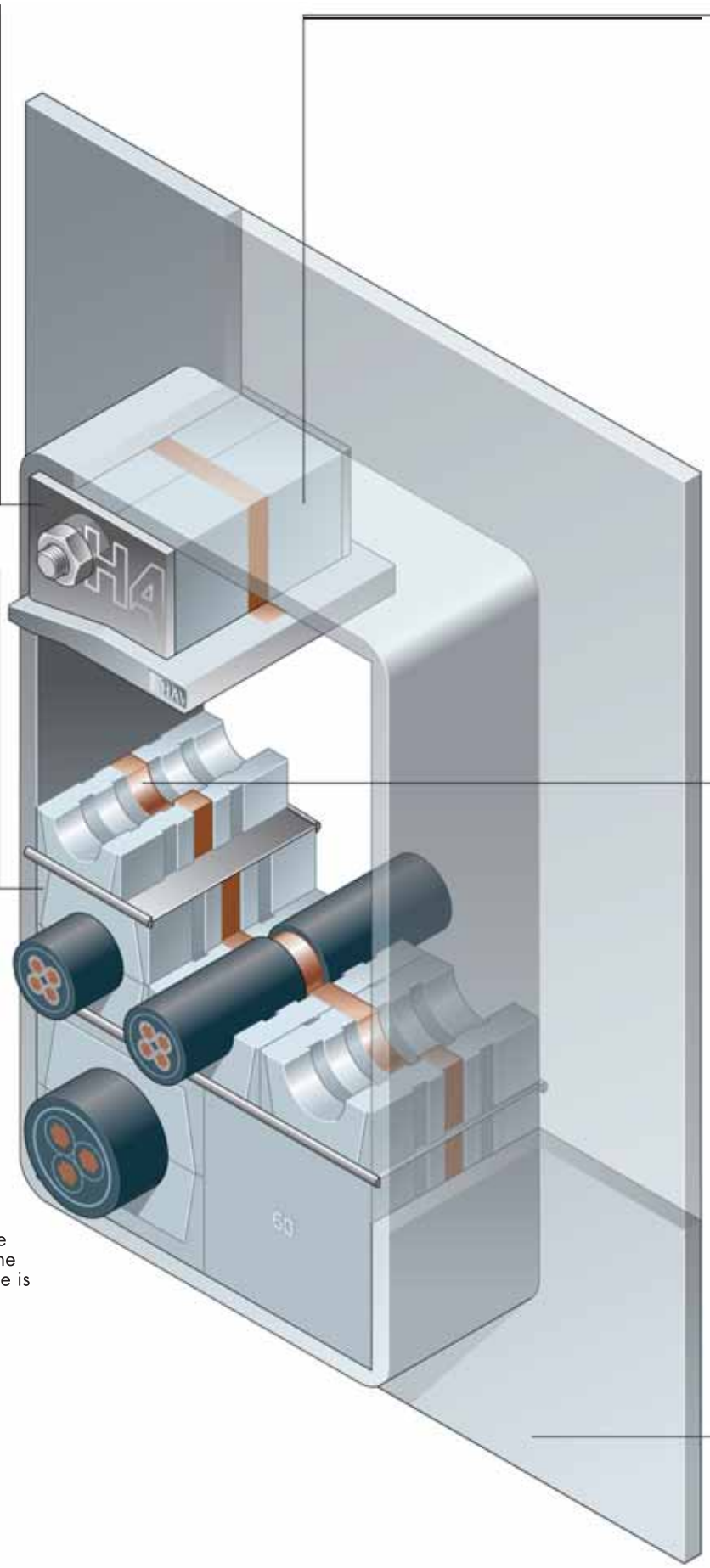
The HRT seals cables or pipes within cast pipes, welded tubes or core drilled holes.

THE HAWKE EMC TRANSIT SYSTEM

Stainless Steel Stayplates
Installed to anchor insert and filler blocks into the frame and ease assembly. They also increase the conductance throughout the frame.

Tolerant insert and filler blocks.
Made from an intumescent flame retardant elastomer coated on all surfaces with a silver loaded spray which is highly conductive and provides the excellent shielding ability. In addition, a layer of adhesive copper strip is applied around the block to aid conductivity. Hawke blocks can accommodate cables ranging from 3mm to 100mm diameter, and include tolerant blocks which allow for variations in cable diameters by using five individual sealing faces which take up the cable variations within their own individual areas.

Note:
Block module size should be suffixed E (e.g. 3012/E). The adhesive EMI Shielding Tape is available in the following lengths:
Size 18 = 16.5m
Size 36 = 32.9m



The Compression System
Seals the penetration when all the services have been installed. The 3 part endpacker transmits an evenly distributed pressure onto the compression plate and ensures an effective seal around the cables.

The materials:
Packing blocks - intumescent flame retardant elastomer coated with a silver loaded spray and wrapped with copper strip for effective shielding. End packer plates - Electro zinc plated steel or stainless steel.
Compression plates-Electro zinc plated cast steel.

Adhesive Copper Strip

Provided to build up to the insert
blocks and the stripped cable. The cable outer sheath should be stripped to a maximum width of 2cm to expose the cable screen. All the cables require the removal of the outer sheath to achieve contact between the cable screen and the blocks. The copper EMI shielding tape with conductive adhesive is wrapped around the cable screen until the nominal outside diameter of the cable is achieved. This is important to ensure complete conductance of the electromagnetic pulses/fields in the inner walls of the steel frame against earth.

The Frame
The electro zinc plated steel or stainless steel frame is attached to the structure and forms the
surround for the penetration.

PERFECTION INVITES CLOSER INSPECTION

FOR CABLES AND PIPES

Testing Procedures
Hunting Communication Technology Limited, Electromagnetic Assessment Group, were referred to as specialists with extensive testing facilities. A series of three specified tests were recommended to assess the transit performance and provide design data.

Fig 1.– Test for Shielding Effectiveness (No. U2501/TR/6660)
The aim of the test was to measure the shielding effectiveness of the Transit by a method generally in accordance with MIL STD 285. The testing was actually performed using a swept measurement technique employing a spectrum analyser with tracking generator to 1GHz and a Scalar network analyser from 1GHz to 10GHz.
Conclusion:
The Transit showed good shielding results being in excess of 70dB over much of the tested frequency range.

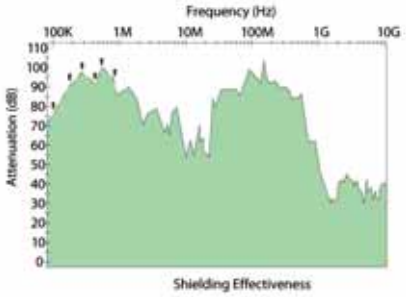


Fig 1.– Test for Shielding Effectiveness (No. U2501/TR/6660)

Fig 2.–Test for Current Leakage (No. U2501/TR/6661)
The test was designed to assess the conductivity of the Transit when used with a variety of cables. As there is not a standard specification for this assessment, a test method was formulated which measured the conductivity in terms of current leakage from the cable shield to earth within a frequency range of 100KHz to 500MHz.
Conclusion:
Based upon the worst case data obtained, it was observed that the current leakage was better than 35dB over the frequency range 100KHz to 500MHz. Infact, for most of the frequency range the current leakage was at least 50db.

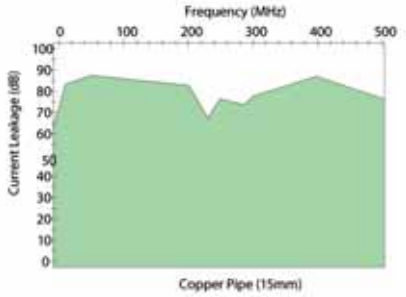


Fig 2.–Test for Current Leakage (No. U2501/TR/6661)

Fig 3.– Test for transient (pulse) conductivity (No. 2501/TR/6662)
The tests involved assessing the transient conductivity of the Transit when used with a variety of cables. The method used measured the conductivity in terms of current leakage from the cable shield to earth under the transient conditions. The test was based upon DEF STAN 59-41 using transients consisting of a 100KHz damped sinusoid applied by a current transformer.
Conclusion:
The current leakage under transient conditions for the cable set ups tested show a minimum insertion loss of 30dB.

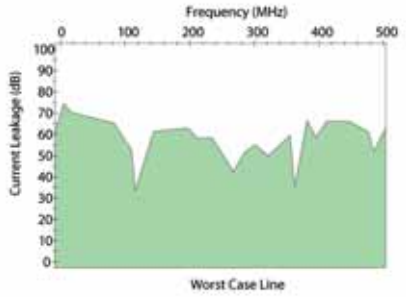


Fig 3.– Test for transient (pulse) conductivity (No. 2501/TR/6662)

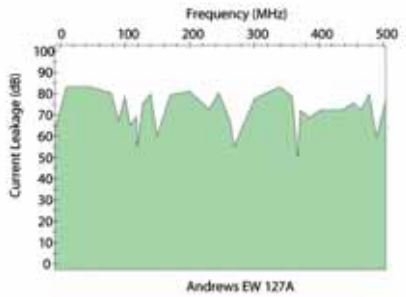
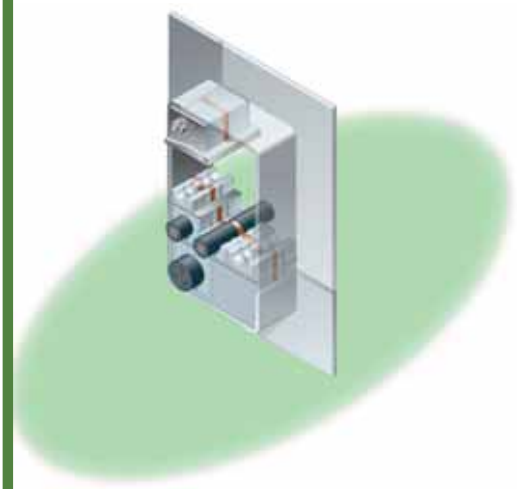


Fig 3.– Test for transient (pulse) conductivity (No. 2501/TR/6662)

Hawke
EMC Transit System for Cables and Pipes



The Hazards of RFI/EMP

The need to protect sensitive electronic equipment against extraneous electromagnetic and radio frequency radiation is an increasing and critical factor in the design of equipment and installations.

A major concern is to ensure the integrity of operation of the equipment such as computers, signalling control and communication systems by effective sealing and low resistance earth continuity bonding at cable and pipe entry points of a low 'noise' environment
.
Electromagnetic Compatibility (EMC). This is the term used to express the ability of electronic equipment or systems to operate satisfactorily in a given environment without responding to electrical noise or emitting unwanted noise.

The Hawke EMC Cable Transit System. Hawke's system has been further developed from the highly successful Civil and Marine Transits which are equally suitable for cables or pipes.

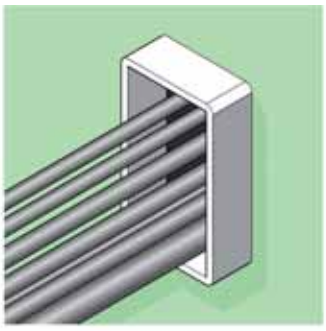
Electromagnetic compatibility is achieved by reducing the Electromagnetic interference (EMI) to a level which in most applications will not disrupt the proper operation of the electronics.

EMC TRANSIT SYSTEM INSTALLATION GUIDE

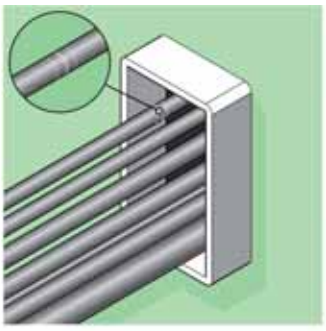
EMC Transit System

The following diagrams explain step by step how easy it is to install EMC Hawke cable/pipe tolerant blocks into EMC Transit frames.

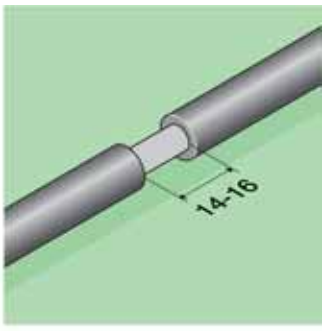
1 Draw up a Hawke Design Template to determine your cable/pipe layout.



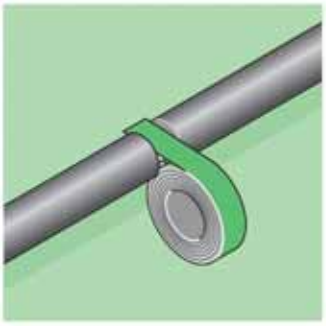
2 Make sure the frame is clean, then pull cables or pipes through,placing the largest at the bottom. (Note: Use open ended frame to fit around existing cables/pipes).



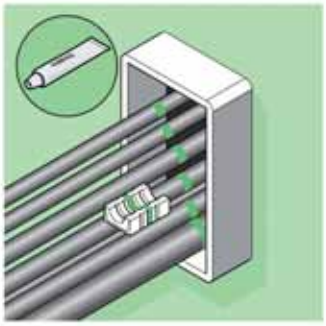
3 Mark each cable in the centre of the frame and 7-8mm either side of this point.



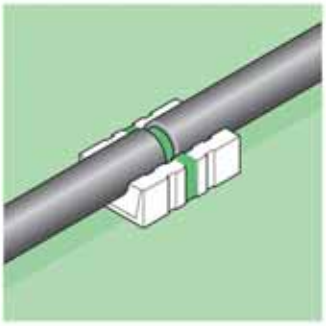
4 Cut and remove cable sheath between two outside marks, to expose the cables conductive screen.



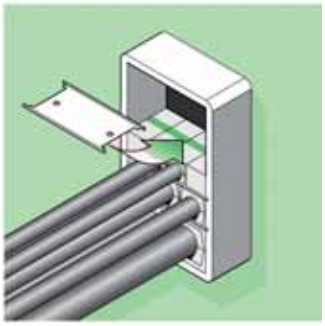
5 Using copper tape provided tightly wrap around the exposed screen until the cable outer diameter is regained. Repeat steps 3, 4 & 5 for all cables.



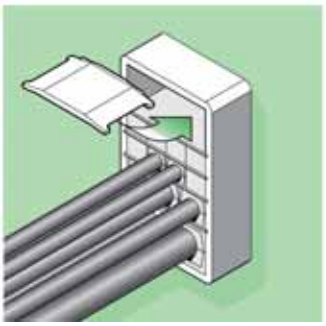
6 Very slightly lubricate the insert blocks taking care not to contaminate the copper tape on block or cable.



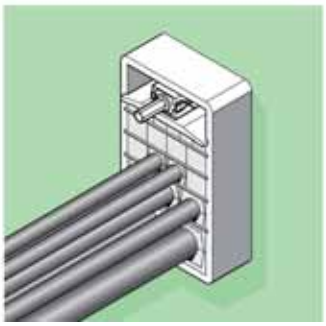
7 Ensure when fitting cables into blocks that the copper tapes on block and cable align.



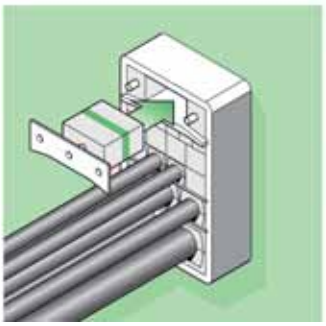
8 Begin packing the frame. A stayplate is inserted between each layer of insert blocks.



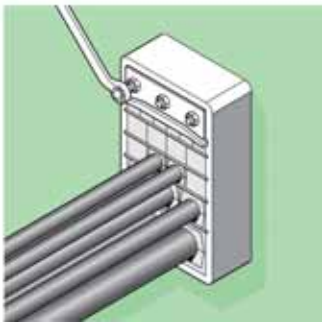
9 Insert the compression plate before the last row of blocks or earlier if required with additional stayplates.



10 Pack the last row, insert the compression tool and tighten until there is sufficient room to fit the tapered end packers.



11 Insert two outside packing pieces then remove tool before fitting centre block.



12 Tighten the nuts on the endpacking to compress and complete the seal. Approximately 10mm of thread should protrude on each bolt.

If possible after completion the assembly should be tested for conductivity

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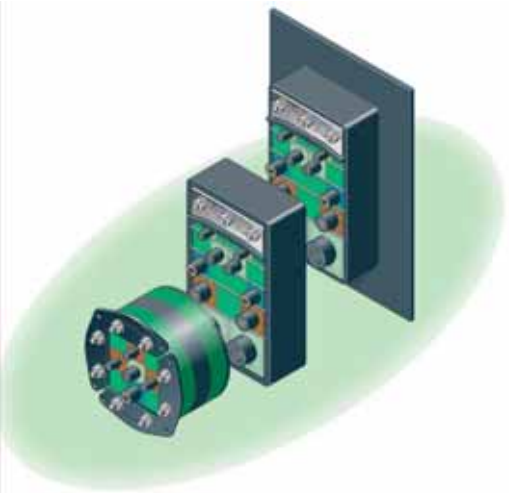

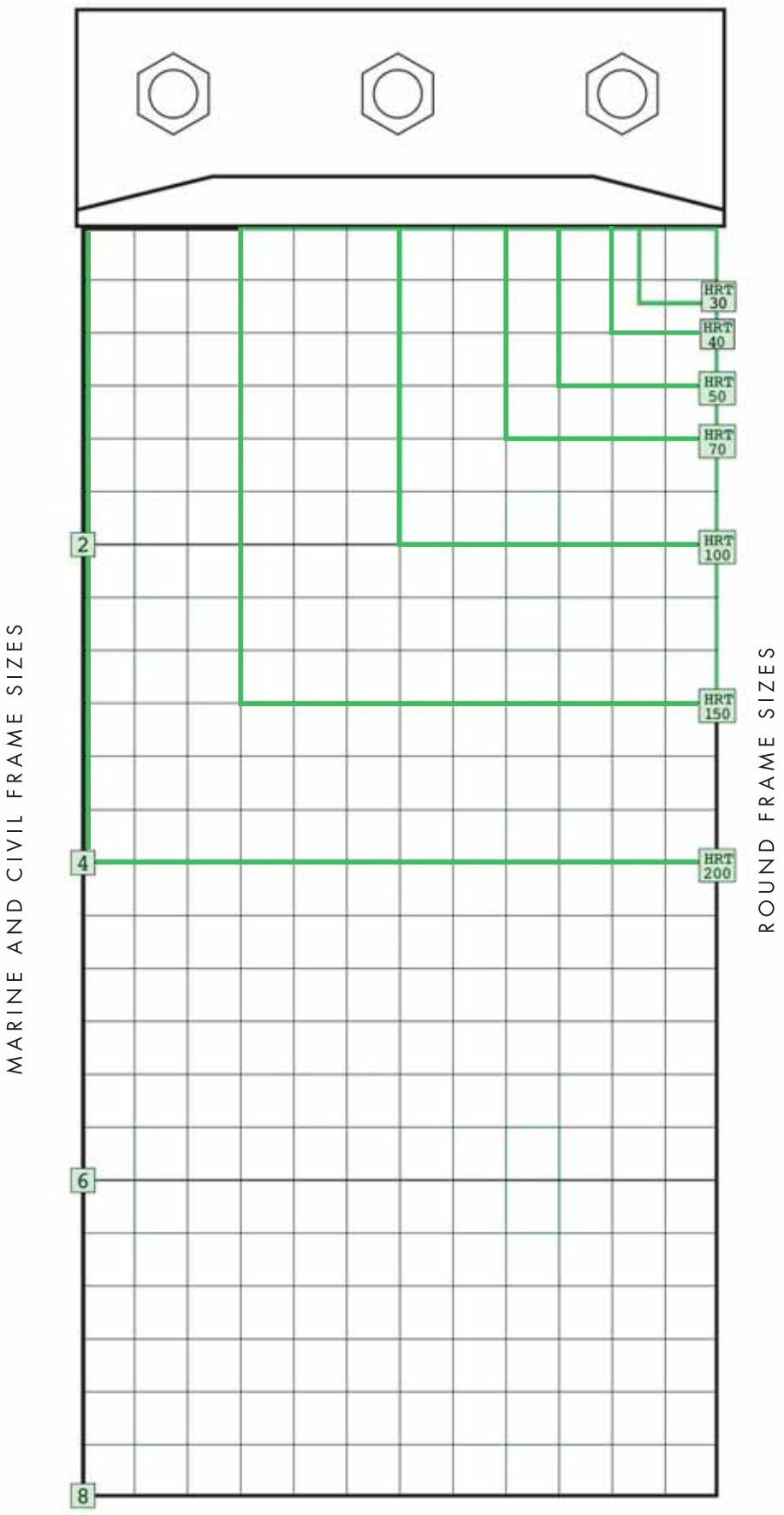

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