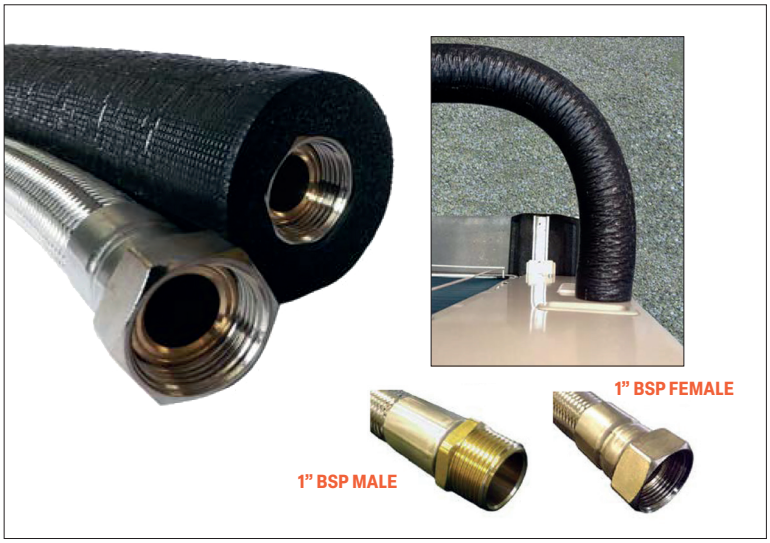
# FLEXIBLE HOSE




DiversiTech flexible hose is designed to meet the requirements of the MCS MIS 3005 installation specification to allow the flow and return pipe work to connect to a heat pump.

The flexible hose helps to avoid transmission of vibration in the pipe work and allows for a smooth bend when connecting the flow and return pipe to the heat pump or biomass boiler.

The 28/35mm hose is sleeved within a stainless steel braid for added protection, available in female or male BSP (British Standard Pipe) thread at one end and 28/35mm compression fitting at the other. All flexible hose comes complete with external grade PVC coated 19mm thick insulation.

## FEATURES

- Stainless steel braided hose
- Pre-insulated with 19mm thick PVC coating (25mm - 35mm hose)
- 1" and 1-1/4" male or female BSP thread fitting available
- 28mm compression fitting Suitable for most ASHP & Biomass boilers
- Additional 80mm of insulation to cover the connectors
- Working pressure 10 BAR @ 85°C

## THE PACKAGE

- 2 x Flexible Hose
- 2 x Insulation
- 2 x Elbow (Only in Elbow Version)
- 2 x Fibre Washers

## RELATED PRODUCTS

- Flexi Lite Slab and Foot Kit
- ASHP Trunking

| No. | Description |
|---|---|
| FH-300-28-F-ELBOW | Flexible ASHP Hose Pair -300mm x 28mm - 1 " FEMALE c/w elbow |
| FH-300-28-1-1/4ELB | Flexible ASHP Hose Pair -300mm x 28mm - 1 1/4" FEMALE c/w elbow |
| FH-500-22-F | Flexible ASHP Hose Pair -500mm x 22mm - 1" FEMALE |
| FH-500-28-F | Flexible ASHP Hose Pair -500mm x 28mm - 1" FEMALE |
| FH-750-28-F | Flexible ASHP Hose Pair -750mm x 28mm - 1" FEMALE |
| FH-750-28-M | Flexible ASHP Hose Pair-750mm x 28mm - 1" MALE |
| FH-750-28-F-ELBOW | Flexible ASHP Hose Pair -750mm x 28mm - 1" FEMALE c/w elbow |
| FH-750-28-1-1/4F | Flexible ASHP Hose Pair -750mm x 28mm - 1 1/4" FEMALE |
| FH-750-28-1-1/4M | Flexible ASHP Hose Pair -750mm x 28mm - 1 1/4" MALE |
| FH-750-35-1-1/4F | Flexible ASHP Hose Pair -750mm x 35mm - 1 1/4" FEMALE |
| FH-1000-28-F | Flexible ASHP Hose Pair-1000mm x 28mm - 1" FEMALE |



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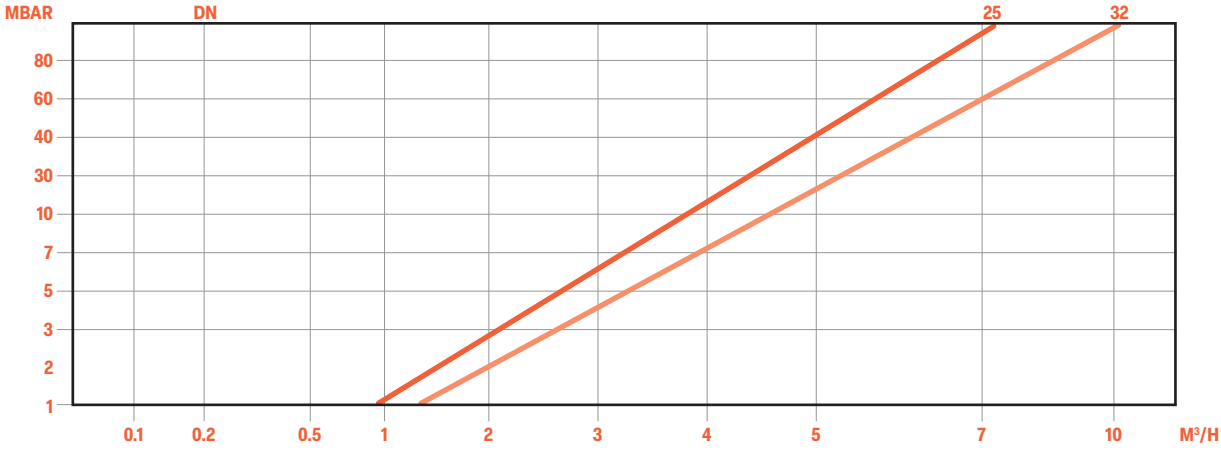
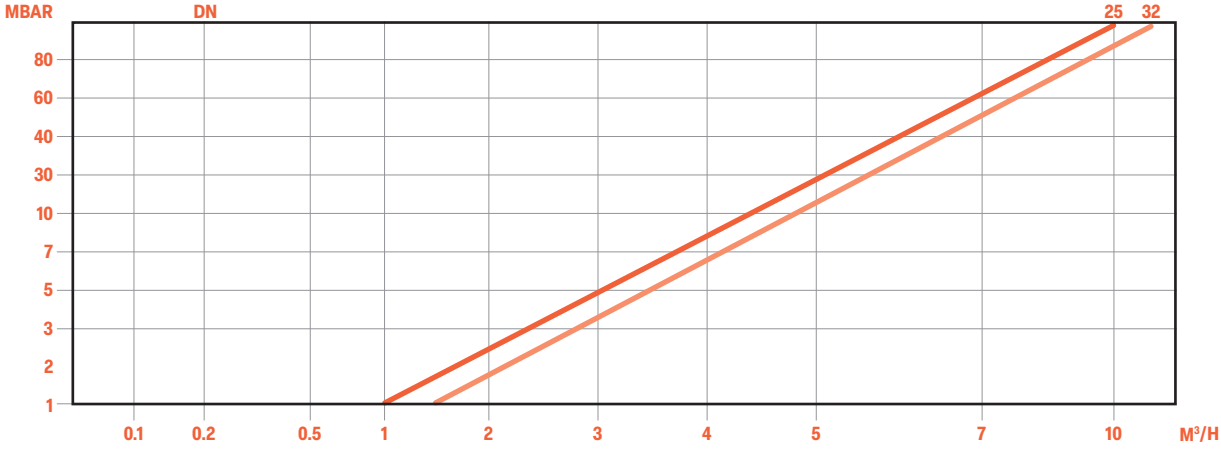
# FLEXIBLE HOSE PRESSURE DROP

THE CALCULATION OF PRESSURE DROP IS BASED ON THE HOSE INTERNAL DIAMETER AND ESTIMATION OF LOSSES FOR DIFFERENT TYPES OF END CONNECTIONS. THESE ARE EXPLAINED AS FOLLOWS

SCHEDULE 1: PRESSURE LOSS FOR HOSE BASED ON INTERNAL DIAMETER (DN) AND LENGTH.
FORMULAE: PL MBAR = FL X L
WHERE: F1 = PRESSURE DROP (MBAR) ACCORDING TO ITS FLOW CAPACITY IN M3/H
L = LENGTH OF HOSE (METRES)




SCHEDULE 2: PRESSURE LOSS FOR TYPE OF END CONNECTION BASED IN INTERNAL DIAMETER (DN)
FORMULAE: P2 = P3 X R
WHERE: P3 = PRESSURE DROP IN MBAR ACCORDING TO ITS FLOW CAPACITY IN M3/H
R = CORRECTION FACTOR - 0, FOR STRAIGHT FEMALE AND MALE END CONNECTIONS
1.5, FOR ONE ELBOW & 3.0, FOR TWO ELBOWS




THEREFORE PRESSURE DROP (MBAR) CAN BE CALCULATED FOR ANY GIVEN HOSE ASSEMBLY ADDING PL AND P2.

EXAMPLE:

| | | |
|---|---|---|
| FLEXIBLE HOSE | **DN25** | P = (FL X L) + (P3 X R) |
| FLOW CAPACITY | 2,000 LIT/HR (33.3/MIN) & (3.0M3/HR) | P = (5.5MBAR X 0.5M) + (0) = 2.75MBAR |
| LENGTH | 500MM HOSE WITH 1" STRAIGHT AND 28MM COMPRESSION | |
| CORRECTION FACTOR | 1.5 | |

EXAMPLE:

| | | |
|---|---|---|
| FLEXIBLE HOSE | **DN32** | P = (FL X L) + (P3 X R) |
| FLOW CAPACITY | 2,000 LIT/HR (33.3/MIN) & (3.0M3/HR) | P = (5.5MBAR X 0.5M) + (0) = 2.75MBAR |
| LENGTH | 500MM HOSE WITH 1" STRAIGHT AND 28MM COMPRESSION | |
| CORRECTION FACTOR | 1.5 | |



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# INSTALLATION GUIDE

Flexible hoses should be installed by a competent plumber or qualified engineer and comply with the following guidelines:

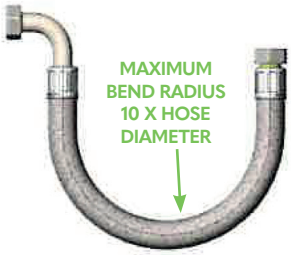
**PRE-INSTALLATION CHECKLIST:**

- VERIFY FLEXIBLE HOSES INTENDED FOR USE ON POTABLE WATER SUPPLIES ARE WRAS APPROVED (FERRULES STAMPED "QWRAS")
- VERIFY TEMPERATURE AND PRESSURE RATINGS DO NOT EXCEED THOSE STATED FOR THE TYPE OF HOSE SELECTED
- VERIFY INTEGRITY OF MATING PARTS AND ENSURE PIPE WORK IS CLEAN AND FREE FROM BURRS
- VERIFY THAT CHILLED WATER APPLICATIONS ARE NOT EXPOSED TO CORROSIVE CONTAMINANTS

## DO

INSTALL WITH COMPRESSION OR SLACK TO ABSORB MOVMENT OR EXPANSION

HOSE REMAINS RELAXED AND ABLE TO ABSORB EXPANSION & MOVEMENT




## DON'T

TWIST

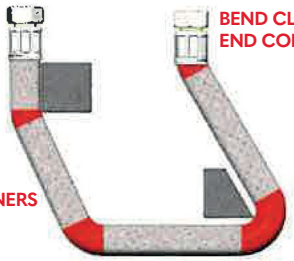
STRETCH OR TENSION

USE GRIPPER TOOLS OR OVER TIGHTEN

NOT SUITABLE FOR EARTH CONTINUITY

USE WITH SOLDER, FLUXES OR CHEMICALS

USE NEAR HEAT SOURCE OR SOLDER TORCH



BEND CLOSE TO END CONNECTION

BEND OR WRAP AROUND SHARP OR ACUTE CORNERS

**POST-INSTALLATION CHECKLIST:**

- ALWAYS VERIFY CONNECTIONS ARE SECURE AND TESTED FOR LEAKS IN ACCORDANCE WITH BS 6700:2006
- ALWAYS FLUSH WATER CIRCUITS TO REMOVE SOLDER FLUXES AND DEBRIS IN ACCORDANCE WITH BS 6700:2006

**Failure to comply with these guidelines may compromise the hose integrity and invalidate your warranty.**



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# INSTALLATION GUIDE

## PART 2: INSTALLATION GUIDE STRESS CORROSION CRACKING

Copper alloys (Brasses) used in the mating connections of flexible hose assemblies have an excellent corrosion resistance and if installed correctly can confidently be expected to provide trouble-free service life. Many millions of flexible hoses and brass mating connections are installed every year without defect, many of which will exceed the life time of the building.

In order to achieve such longevity, designers and installers must take basic precautions. Largely these precautions have been incorporated into various standards and codes of practice such as BS6700. These include the need for protection in certain aggressive or potentially aggressive environments in order to avoid external contamination.

### WHAT IS STRESS CORROSION CRACKING (SCC)?

Stress corrosion cracking occurs in duplex brasses and is commonly referred to as season cracking. In the case of copper alloy fittings, it is manifested by the appearance of inter-granular cracking, along lines of material thinning or stress. The essential elements for stress corrosion cracking are:

- Residual Stress
- Stress Cracking Agent
- Moisture
- Alkaline environment

### RESIDUAL STRESS:

The more common cause of stress is introduced through the installation process such as tightening tapered male and compression fittings. In the case of compression fittings, tightening the nut will introduce a hoop stress, which, if of a sufficiently high magnitude, can trigger SCC. Joints made between taper male and female threads will always result in a stressed region at the mouth of the female end of the adaptor, especially if subjected to over tightening. Similarly the application of jointing compound to the threads should be avoided, as this tends to pack in the gap and increase the stress levels.

### STRESS CRACKING AGENTS:

There are specific stress-cracking agents for brasses, these are usually ammonia or ammoniacal compounds, other less common contaminates are sulphur dioxide and mercury. These agents are common place in building materials such as concrete additives, insulating materials especially foams and flame retarding treatments.

### MOISTURE:

Moisture can arise from various sources including soils, cement or concrete, condensation, etc. However, it should be noted that moisture generally poses no problems for copper alloys; it is only when the moisture absorbs aggressive constituents from component surroundings that problems may arise. Particular problem areas are in chilled water installations when the pipe work is usually covered with insulating material especially phenolic foams and flame retarding treatments, which allow the condensed moisture to be retained and kept in close contact with the end fitting. The contaminants will collect in the condensation and promote sec.

### ALKALINE ENVIRONMENT:

Alkalinity in itself does not cause stress corrosion cracking and indeed copper alloys generally have good corrosion resistance in alkaline environments. Nevertheless, for stress corrosion cracking to occur, the environment needs to be of an alkaline nature. Thus with plaster and concrete being predominantly based on alkaline cement. most construction sites can be considered to be alkaline. Also certain insulation materials have an alkaline reaction if they become wet.



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# INSTALLATION GUIDE

**INSTALLATION GUIDE LINES TO AVOID STRESS CORROSION CR ACKING:**

Adherence to good installation practice will normally prevent the necessary combination of factors,

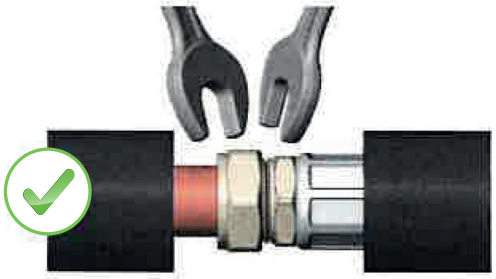
- Use flat faced spanners, avoid serrated jaw wrenches as these can damage the surface and induce stress
- Do not over tighten fittings, be especially careful to avoid over tightening male taped and compression joints
- Use PTFE tape or approved liquid sealant, avoid use of hemp
- For chilled water application, ensure all joinst are protected from condensation by way of moisture barrier

**PRE-INSTALLATION CHECKLIST:**

1. VERIFY TEMPERATURE AND PRESSURE RATING IS CORRECT FOR APPLICATION (CHECK TECHNICAL DOCUMENTS)
2. VERIFY WATER QUALITY HAS BEEN CHECKED IN ACCORDANCE WITH BS6700
3. VERIFY PIPE INSULATION COMPLIES WITH BS 5422 AND OTHER RELEVANT BRITISH STANDARDS FOR CONSTRUCTION AND AVOIDANCE OF POTENTIALLY HARMFUL CONTAMINATES

## DO

EXPOSE ALL JOINTS BEFORE LEAK TESTING

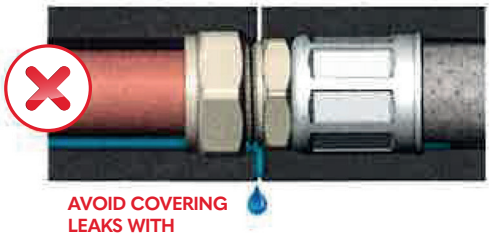


ONLY USE CORRECTLY SIZED SPANNERS

ENSURE JOINTS INSULATED AND SEALED

## DON'T

EXPOSE HOSE TO CONDENSATION



AVOID COVERING LEAKS WITH INSULATION

LEAVE JOINTS EXPOSED TO CONDENSATE

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# NOT *ALL* INSULATION IS THE SAME!

GREY/SILVER INSULATION FOR INTERNAL USE ONLY

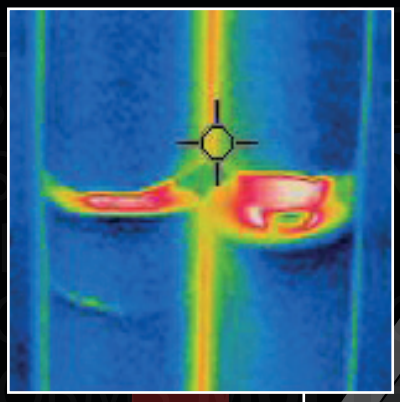
PAINTED GREY INSULATION SHORT FIELD LIFE AND REQUIRES RECOATING EVERY FEW YEARS

BLACK CLASS 0 WEATHER-PROOF BUT *NOT* UV STABLE

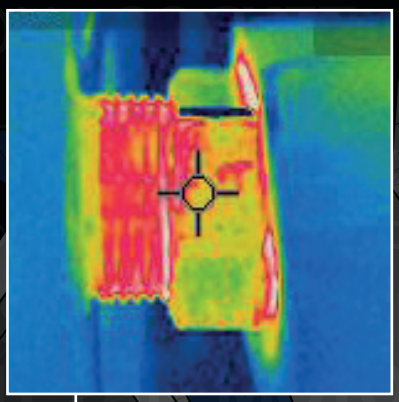
BLACK PVC COATED CLASS 0 WEATHER-PROOF AND UV STABLE

## ARE YOU GETTING 100% OF THE ASHP HEAT INTO YOUR PROPERTY

### INSULATE PIPEWORK



### INSULATE CONNECTIONS



### INSULATE THROUGH THE WALL