

Guidance Notes for Flexible Hoses and Tubing for LPG Applications

Background

For many years two types of flexible hose for LPG vapour service have been supplied which complied with the recommendations of BS3212 "Specification for flexible rubber tubing, rubber hose and rubber hose assemblies for use in LPG vapour phase and LPG/air installations"

Low pressure hose conforms to Type 1 Classification in the standard and is a black walled tube.

'High' pressure hose conforms to Type 2 classifications and is double walled reinforced hose which for many years had a black external wall but in 1975 the standard changed to require the outer wall to be coloured orange. BS3212 was amended in 1991 to allow black hose to part 2, but only when supplied as an assembly. The heavy duty black hose now has a reduced bore, to the preferred 6.3mm and carries the appropriate BS3212 type 2 marking.

The armoured 'Lunken' hose has also been available for many years and its historic use has been as a flexible connector for cookers, Bitumen Boilers and other applications where there is a higher risk of mechanical damage and possible rodent attack. This hose has a thin LPG resistant inner tube, covered by metallic braiding which is protected by spirally wound metallic outer casing and integral end fittings. This hose is not covered by any current British Standard although the relevant parts of BS3212 have been used in its assessment.

A cooker flexible to BS669: pt 1 "Flexible hoses, end fittings and sockets for gas burning appliances. Specification for strip-wound metallic flexible hoses, covers, end fittings and sockets for domestic appliances burning 1st and 2nd family gases" which comprises of a spirally wound inner, sealed rubber bead and covered with a rubber outer sheath for a quick fit coupling and satisfies the Gas Safety (installation and Use) Regulations is identified by a red strip and red labelling. This hose is sold under a number of brand names.

BS6173 "Specification for installation of gas-fired catering appliances for use in all types of catering establishments (2nd and 3rd family gases)" the Catering Appliance Installation standard requires that catering appliances which are designed to be moved for cleaning are connected via a BS699 type 2 "Flexible hoses, end fittings and sockets for gas burning appliances. Specification for corrugated metallic flexible hoses, covers, end fittings and sockets for catering appliances burning 1st, 2nd and 3rd family gases" flexible. This is a plastic sheathed all metal corrugated stainless steel pipe with a quick fit connector. This is a specific version for LPG applications.

European standard BSEN1763 "Rubber and plastics tubing, hoses and assemblies for use with commercial propane, commercial butane and their mixtures in the vapour phase. Requirements for rubber and plastics tubing and hoses" will gradually replace BS3212 : Pt 1 and Pt.2 type hoses and includes two additional categories which are medium pressure (10bar) type 2 and a hose for external use only which is suitable for applications to -30°C.

Conditions of Service

The useful service life of flexible hose will vary dependant upon a number of influences including exposure to sunlight and UV, exposure to rain, pressure cycle, flexing, abrasion, twisting, together with a range of abusive conditions.

Black BS3212 Type 1 & BS EN 1763 Class A hose can be remarkably durable in service and there are numerous examples of properly maintained hose being in use on caravans, etc. for several years.

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The orange BS3212 Type 2 & BSEN1763 Class B hose has proven less durable and resistant to weathering and ageing than the former black hose, particularly, when used in external unprotected applications e.g. pigtails.

Experience to date with the heavy duty black hose to BS 3212 type 2 suggests that the weathering resistance of this hose is excellent.

Service Life

BS3212 or BSEN1763 hoses should bear the year and name of manufacturer.

We have no specific recommendation for the exchange interval for vapour hoses, but it is considered that the normal useful service life of such hoses is 5 years.

Aggressive operating conditions or simple misuse may render the hose unfit for service in a shorter time than 5 years. The User of the hose carries responsibility for routinely checking visually the hose(s) for signs of abrasion, cuts, cracks, fading, brittleness, hot spots or other damage. If the User has doubts about hose integrity then arrangements should be made for a competent person to check and if necessary, fit a replacement(s).

Dealers and Calor Centre delivery persons, caravan park operators, fitters and others who regularly come into contact with flexible hose applications may also participate in this regular visual inspection, and make appropriate recommendations to the customer/owner of the hose concerned.

Certification and Quality Assurance

Hoses and tubing are relatively vulnerable equipment that plays a vital and uniquely valuable role in the LPG Gas installation and they should be selected and stored with care. Any supply should be confirmed as having valid certification to BS3212 or BSEN1763 and have been manufactured under a quality system registered to BS EN ISO 9000.

Stock should be stored carefully, avoiding bright sunlight, dampness, abrasion and excessive loading. Although no specific shelf life is usually quoted strict rotation should be maintained to avoid shortening the useful service life.

Summary

In general terms and given reasonably favourable operating conditions, BS3212 or BS EN 1763 flexible hose should last for up to 5 years normal service life.

However, due to the wide range of factors which can adversely affect the integrity of hose, no specific life should be quoted and emphasis must always be made in the absolute necessity for the customer / owner / delivery person to make regular checks on the condition of hoses.

This guidance is solely applicable to vapour service hoses and is not applicable to liquid duty hoses which come within the requirements of BS EN 1762 "Rubber hoses and hose assemblies for liquefied petroleum gas, LPG (liquid or gaseous phase) and natural gas up to 25 bar (2,5 MPa)". BS4089 "Specification for metallic hose assemblies for liquid petroleum gases and liquefied natural gases".

SUMMARY OF TUBING AND HOSES				
Classification	Construction	External Colour	Max. Pressure Rating	Typical Uses
BS3212: 1991 Type 1 BSEN1763 Class A	Tubing	Black	50mbar	Domestic low pressure applications
BS3212:1991 Type 2 BSEN1763 Class B	Hose	Orange	17.5 bar	Cabinet Heaters, BBQ, Brooders
BS3212 : 1991 Type 2 BSEN1763 Class B	Assembly (Hose v end fittings)	Black	17.5 bar	Pigtails between Cylinder & regulator
Armoured Hose	Armoured & Braided Tubing	Metallic	50 mbar	Bitumen boilers Applications where excessive wear or vermin attack is possible
BS 669 Part 1 1995	Spirally wound flexible hose	Black with red band	50 mbar	Cooker connections
BS 669 Part 2 1995	Convolutd Stainless Steel	White cover	50 mbar	Catering appliances
<p>References</p> <p>BS3212 Specification for flexible rubber tubing, rubber hose and rubber hose assemblies for use in LPG vapour phase and LPG/air installations</p> <p>BS669 Pt 1 Flexible hoses, end fittings and sockets for gas burning appliances. Specification for strip-wound metallic flexible hoses, covers, end fittings and sockets for domestic appliances burning 1st and 2nd family gases</p> <p>BS669 Pt 2 Specification for corrugated metallic flexible hoses, covers, end fittings and sockets for domestic appliances.</p> <p>BSEN1763 <i>Rubber and plastics tubing, hoses and assemblies for use with commercial propane, commercial butane and their mixtures in the vapour phase. Requirements for rubber and plastics tubi hoses. (A revised version is currently in preparation).</i></p>				

The information in this document is intended to give guidance and believed to be accurate and represent good practice at the time of publication. It does not replace the need to consult other formal documents where further information may be required.

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