

User Information Sheet 013

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ACME threaded couplings

1 INTRODUCTION

ACME threaded couplings/end fittings are widely used for LPG transfer operations where hoses are used.

2 GENERAL

2.1 Design

ACME threads should conform to class 2G of American Standards Association Specification B1.5.

Coupling dimensions (including seals) are given in BS EN 14422.

To maintain an Industry standard and minimise the use of adapters, couplings for liquid fill and vapour balance connections for commercial butane and commercial propane should be one of the types and sizes indicated below.

Liquid	Vapour
3/4" ACME (M) R.H. x 6 TPI	2 1/4" ACME (M) R.H. x 6 TPI
2 1/4" ACME (M) R.H. x 6 TPI	1 3/4" ACME (M) R.H. x 6 TPI
1 3/4" ACME (M) R.H. x 6 TPI	1 1/4" ACME (M) R.H. x 5 TPI

1 1/4" ACME x 5 TPI couplings are used for some liquid offtake cylinders. The dimensions are given in BS EN 15202.

Vapour balance couplings should not be used on liquid connections.

The fixed coupling should be a male coupling and the coupling on the hose female.

The vent hole in the male coupling should point downwards.

To prevent inadvertent connection of commercial LPG, couplings for un-odorised LPG should have left hand ACME threads conforming to one of the above sizes.

2.2 *Fittings associated with bulk LPG transfer*

Fixed couplings should be protected by a manually operated shut-off valve or by an automatic valve linked to a site shut down system.

Where a storage vessel is to be filled on a regular basis by a single supplier then the fill coupling should be the same size as the coupling on the tanker delivery hose.

Where the use of an adapter is unavoidable only one single adapter should be used.

2.3 *Fittings associated with the filling of cylinders for "Mechanical Handling and Maintenance Equipment"*

The fill coupling should be positioned so that it can be connected easily from ground level.

The filling coupling on the vehicle should incorporate a non-return valve. (LPGA Code of Practice 30 *Gas Installations for Motive Power on Mechanical Handling and Maintenance Equipment* gives further guidance.)

3 USE

- Suitable hand and eye protection should be worn when connecting and/or disconnecting couplings.

ACME threaded couplings are rugged but they can be damaged through misuse. Both male and female couplings will eventually wear and require replacement.

Dropping or dragging hose couplings should be avoided. This may damage them or introduce dirt which may cause wear on threads or prevent the functioning of safety devices.

Female couplings should never be tightened by hitting the lugs (e.g. with a hammer or the coupling cap) as this can cause excessive thread wear, stretching of the threads or even fracture the coupling.

Before connecting a visual check of both parts of the connection should be carried out. If threads appear to be damaged or worn, the coupling should not be used until it has been inspected in accordance with 4.

The seal is made by compressing a seal or 'O' ring between the two parts of the coupling. The seal should be checked prior to each connection and replaced as necessary. It is good practice to keep spare seals readily available. More than one seal should never be used in a coupling.

The hose coupling should be held in line with the male coupling so the female threaded ring will turn easily onto the male thread. Misalignment and stress on the connection when tightening increases thread wear. Particular care should be taken for larger sizes and heavier hoses,

The two halves of the coupling should make a leak free connection without the use of excessive force. This should be achieved by hand tightening although an appropriate wrench may be used for 2¼" and 3¼" couplings.

After connection the hose end valve should be opened slowly and the connection checked to confirm it does not leak.

If the connection leaks when tightened in the proper manner then the associated isolation valves should be closed, the coupling depressurised and disconnected for further examination of the seal and the metal sealing surfaces for "dents". Damaged or leaking couplings should never be used.

On completion of the LPG transfer, the associated isolation valves should be closed and the pressure released from the coupling before disconnection.

The preferred method of relieving the trapped pressure is to use a bleed valve or self venting hose end fitting. On some couplings pressure release can only be achieved by undoing the female coupling half a turn.

Covers, dust caps or plugs should be used to protect the couplings when they are not in use.

4 INSPECTION

4.1 General

To detect damage, thread wear beyond acceptable limits and the need for replacement seals, regular inspection of couplings and adaptors should be carried out. This should be a visual inspection of the coupling for wear and damage together with a thread dimensional check. It is not sufficient to use only a "No Go" gauge to check the threads as this may not identify worn or distorted threads. The results should be recorded in accordance with a schedule drawn up by a competent person.

Pressure testing is not a suitable method of inspection.

The nature and frequency of the inspection should be appropriate to the design, materials of construction and duty of the couplings involved but should not, in general, be less than once a year for plant, hose and tanker couplings.

A greater frequency should be considered where couplings:

- are subject to a high frequency of connection/disconnection (e.g. mechanical handling and maintenance equipment);
- are subject to dropping or dragging or other mishandling which may cause damage;
- are associated with the filling of cylinders.

A lesser frequency may be considered where couplings are fitted to bulk storage tanks at consumer premises which are filled less than five times a year. In this case a visual inspection at the time of filling with a gauge and/or measurement inspection every ten years may be considered.

- UKLPG Code of Practice 14 (Hoses for the transfer of LPG in bulk – Installation, Inspection, Testing and Maintenance) gives guidance on hose assemblies.

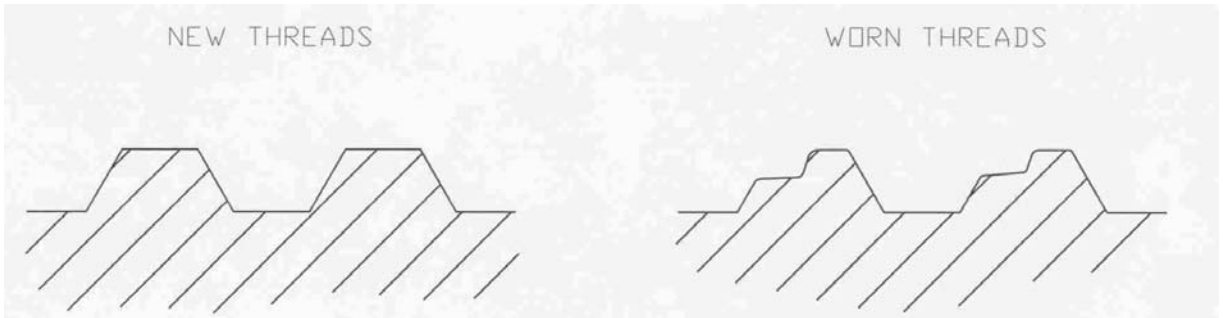
4.2 Visual Examination

Visual examination should be carried out with particular emphasis on:

- Narrowing or distortion of the thread form;
- Cracks, dents, bulges cracked or broken threads (any of which may weaken the fitting);
- Worn threads with a “stepped” appearance (see below);
- Other uneven wear of the threads;
- Debris in the threads;
- Excessive corrosion or pitting; particularly of steel threads;
- Damage or distortion of the internal cone on a female vapour balance coupling;
- Damage to or absence of the pin on male vapour balance coupling;
- Damage to the “lugs” of female couplings (if the “lugs” of female coupling have been damaged this may prevent the use of the correct wrench and may indicate a “stretched” thread);
- Damage to the elastomeric seal of male couplings;
- Damage to the sealing face of the female couplings.

4.3 Mechanical Examination

Visual surveys of ACME threads may not always show potentially dangerous conditions. The majority of thread wear occurs above the thread pitch diameter, standard “GO/NO GO” gauges may not identify this.



Special ACME thread wear gauges are designed with a thread wear allowance. If these gauges can be threaded more than one turn onto (or into) an ACME coupling, this indicates unacceptable thread wear of the coupling.

- ACME thread gauges may not “start” on couplings where the thread is distorted (e.g. not circular).

A coupling failing an inspection should not be used and should be replaced.