

## 1. General

Flexible Hose Assemblies (FHA) =

The flexible hose itself and/or fittings which are part of the assembly

**Included** are FHA for product transfers:

- at service stations
- at fuel depots
- on road tankers
- on barges

Hose failure presents Risks:

- spills of hazardous products
- explosions and fires when vapours of spilled fuels ignite
- personal injuries when spilled fuels/vapours end up in/on the human body
- soil and water contamination when spilled fuel penetrates the ground and/or reaches surface waters



When purchasing flexible hose assemblies, all assemblies must be:

- Compliant with local requirements (assembly cannot be older than 3 to 6 months upon delivery)
- supplied by approved manufacturers or suppliers/assemblers
- appropriate for the selected application
- accompanied by formal certificates containing typical details\* like
  - Manufacturer's name\*\*
  - Manufacturer's batch number\*\*
  - Manufacturing standard
  - Unique identification number
  - Materials of construction
  - Service application
  - Test pressure
  - Maximum working and burst pressure
  - Year and month of manufacture (NOT date of first use)
  - Rubber hose: certificate stating that no adipates and/or phthalates were used in the rubber

\*In case of FHA on fuel depots, the certificates contain also:

- length and diameter of the FHA
- type of fitting for both ends
- conductivity.

\*\* When bought through a supplier, both manufacturer **and** supplier/assembler data must be indicated on the certificate!

- physically labelled or marked with details



## 2. Storage of flexible hose assemblies

FHA can be stored as a spare part stock (easy replacement) or when not used all the time. Following must be taken into account:

- clean and dry conditions for storage
- away from direct sunlight, corrosive substances and mechanical damage
- laid straight out and supported along their lengths (except when supplied in coiled lengths)
- inspection (and/or testing) of stored FHA
  - always prior to commissioning and
  - periodically when required (law, manufacturer, standard ...)



## 3. Inspection and/or tests

Inspection and/or testing frequency and requirements depend on:

- manufacturer's/assembler's advice
- criticality of service
- FHA operating environment

**The test and inspection requirements and intervals must comply with the ones determined in local law, national standard or insurance stipulations. Test/inspection should only be performed by persons with verifiable competence.**

Testing type can differ, following are typically used:

- hydrostatic pressure test (e.g. at depots)
- air pressure test (e.g. for road tanker FHA)
- vacuum test (e.g. at service stations)
- electric resistance test (e.g. at service stations)

Visual inspection, at least following items should be examined:

- irregularities in the outside diameter, e.g. kinking
- damage, exposed reinforcement or permanent deformation of the hose outer cover, e.g. soft spots, blisters, bulges, cracks
- damage of the end fittings
- improvised repair (e.g. tape ...)
- storage requirements (see above)
- sealing when not in use
- hose or coupling marking/tagging quality

**When test results are not consistent with the requirements, the FHA should be removed from service immediately and formally recorded**



## 4. Inspection and/or tests

NO MAINTENANCE REPAIRS should be carried out. Removal and replacement is required when:

- FHA are (possibly) damaged in incidents (see point 9), e.g. absent minded customer at a service station rips off nozzle/hose; FHA is overrun by a truck; or
- FHA reach the maximum allowed lifetime as determined by local law, national standard, insurance stipulations or the manufacturer\*. (starting from the date of manufacturing – not the date of first use and regardless of damage or not or whether it is used or stored) or
- the age of the FHA can no longer be determined from records or physical markings

## 5. Flexible hose handling & use

- Avoid lifting/supporting FHA from only one suspension point with the ends hanging downward
- Additional preventative measures are required to avoid
  - tripping over FHA on walkways/traffic routes
  - back injuries from heavy FHA; install lifting devices
  - FHA abrading against rough surfaces, dock or vessel/lighting device
  - FHA lying in oil residue or other liquids that may damage rubber components
- Provide necessary PPE for personnel using FHA
- After use, leave FHA only if the following has been checked :
  - if there is still product in the FHA: allow expansion of the product in the FHA
  - If there is still product in the FHA and expansion of the product is not possible: drain the FHA, protect against physical damage and seal the ends (sealing) in order to prevent dehydration, also to prevent dirt and dust in the FHA.

TIP: when FHA are not used for a longer time, one should consider to return them to the storage or shelter area to prevent wear and tear, including wear due to unfavourable weather conditions

## 6. Decommissioning and waste

- Used FHA which will be stored as useable spare, must be rinsed, cleaned, ends sealed, and properly stored (see point 3 and 7)
- FHA, used or stored, which are no longer fit for purpose:
  - must be rinsed and has to be dry
  - should have the end fittings removed (or one can consider to cut the FHA in two if this can be done in a safe way)
  - the whole marked as “scrap” or other visible indication
  - disposed of in line with local waste regulations
- The FHA register must be updated accordingly. The data regarding the decommissioning and waste management has to be traceable in the intervention reports of the competent contractor

## 7. Incident reporting

- Incidents must be reported, e.g.
  - absent minded customer ripping off nozzle/hose
  - spills from failing hoses and/or connections
  - injuries as result of failing FHA, such as: the connection jumps away hurting a body part, fuel ended up in the eyes or on the body, escaped vapours were inhaled, ...
  - fire and explosions due to hose failure spills
- Near misses must be reported timely in order to prevent incidents, e.g.
  - cracks in hoses
  - loose fittings
  - fuel FHA used for other purposes
  - hoses overrun by a heavy vehicle
  - deformed hoses
  - connections showing traces of or small fuel leakages/drops (no spill yet)
  - abnormal sweating of hoses
  - variations in hardness of the rubber