

TSN/lhh

## APPROVAL

(Unofficial translation of the type approval issued in Danish)

According to Order no. 829 from the Ministry for the Environment, issued 24<sup>th</sup> October 1999, about design, installation and operation of oil tanks, piping systems and pipelines.

- A. Construction: A system of specially constructed plastic piping, including electro-welding fittings. Piping for liquid products shall be either single-wall installed in containment pipes, or integral double-wall pipe.
- B. Designation: SMARTFLEX.
- C. Approval number: RT-60-0111
- D. Validity of the Approval: This type approval is valid until 1<sup>st</sup> January 2006
- E. Holder of the Approval:  
NUPI S.p.A.  
Via Dell'Artigianato, 13  
I-40023 Castel Guelfo di Bologna  
ITALIA
- F. Description: The type approval cover the following:
- F1. TSMA liquid carrying pipe. This type of pipe has a green inner liner in a black outer casing. Externally, the black casing is marked with two green lines interrupted by the text "LINED – PRODUCT/FILLING LINES".
  - F2. TMSAU vapour carrying pipe for vapour return, venting and for filling lines. This type of pipe has a yellow inner liner in a black casing. Externally, the black casing is marked with two yellow lines interrupted by the text "VAPOR/VENT/FILLING LINES".
  - F3. SMARTCONTAINMENT integral double-wall pipe for liquid
  - F4. Electro-welding-fittings for the above-mentioned pipe.
  - F5. Metallic mechanical fittings for connections to other types of pipe.

In addition, the system includes sumps for tanks and sales dispensers, and an overpressure leak detection system for the double-wall pipe. At the time of issue of this approval, there are no Danish regulations for these items.

- G. Approval: The SMARTFLEX piping system is approved according to § 8 section 3 of the above mentioned Order as underground piping for the oil products regulated by the Order.

The TMSA pipes for liquid (with green marking) are approved for both pressure and suction lines. TMSA pipes may be used for vapour lines as well. Single-wall liquid carrying pipe shall be installed in containment pipes.

Both the TMSA and the TMSAU types of pipe are approved as filling pipe. For this purpose, they may be installed directly in the soil. It is a pre-requisite, that filling pipe is installed with definite one-way fall towards the tank.

The pipes may be bent to a radius of 18 times the external diameter. For tighter bends, elbow fittings shall be installed.

Joining of all types of SMARTFLEX pipes shall be made with the special electro-welding fittings belonging to the system as mentioned under F4 above, and the welding shall be performed using the special tools made for this purpose. Such joints made in vapour carrying pipe and in integral double-wall pipe may be installed directly in the soil.

The interstitial space in SMARTCONTAINMENT double-wall pipe and containment pipe for single-wall liquid pipes shall either be open to the atmosphere at least in one end, or shall be connected to a leak detection system.

Transition to aboveground steel pipe shall be made at least 25 cm below ground level.

Steel pipe and metallic fittings installed below ground level shall either be installed in dry sumps or shall be protected against corrosion according to attachment 1 chapter V of the Order.

Installation, joining, soil covering and leak testing shall be performed by NUPI S.p.A. or by a company authorised by NUPI to perform this work. The work shall be performed according to "Tekniske Datablade" version 01A DK dated 11/2002.

Joining shall be done using the special tools developed by NUPI for this purpose, and shall be performed by suitably instructed personnel. NUPI or the by NUPI authorised company is responsible for the instruction of personnel.

Liquid and vapour carrying pipes shall be pressure tested to 5 barg.

The interstitial space in integral double-wall pipe shall be pressure tested to 110% of the operating pressure of a possible leak detection system, however always at least 0.3 barg.

- H. Provisos:

- H1. If NUPI S.p.A. decides to authorise another company to install the SMARTFLEX piping system in Denmark, PUFO shall immediately receive this information.
- H2. This approval is based on the fact, that NUPI S.p.A. operates a certified QA system according to ISO 9001. At the issue of this approval, reference is made to certificate no. 004 issued by CISQ at the 16<sup>th</sup> September 2002.

- I. Use of the Approval: Referring to the SMARTFLEX piping system as type approved by PUFO (Prøvnings-Udvalget for Olietanke, the testing commission for oil tanks) shall be done only by reproducing this approval letter in its entirety.

On behalf of the Commission



Palle Boeck