BITUMEN (ASPHALT)

19.1. INTRODUCTION

Asphalt (or Bitumen) is a natural component of most petroleum.

The crude petroleum is refined to separate the various fractions and recover the asphalt.

Asphalt has many uses, as it is a very strong cement, easily adhesive, waterproof and durable. It is a plastic substance that imports controllable flexibility to mixtures.

It is highly resistant to the actions of most acids, alkali's and salts. Although a solid or semi-solid at atmospheric temperature, asphalt may be readily liquefied by applying intense heat or by dissolving it in petroleum solvents.

Almost all asphalts used in the world are refined from petroleum. This asphalt is produced in a variety of final types of grades.

The semi-solid form known as asphalt cement, is the basic material.

19.1.1. Some uses of asphalt

Disinfectants, fence-post coatings, protection for tanks, wind and water corresson control, roofing felts/coatings, airport runways, roads, highways, taxiways, flooring for buildings, crack fillers, acid-proof enamels, acid-resistant coatings, anti-corrosive paints and many others.

19.1.2 Transporting of asphalt

- 1. 42 Gallon Steel Drums
- 2. Specially Designed Road tankers
- 3. Dedicated Sea Barges
- 4. Specially Modified Sea tankers

19.2. TERMINAL INSTALLATION STORAGE AND LOADING OPERATION OF ASPHALT

19.2.1. Shore operations

Asphalt is stored in specially insulated cylindrical tanks and is constantly heated to a temperature range of 150-190 °C.

This is to ensure that the asphalt is in constant liquid condition.

Quantification of the asphalt in these tanks is based on physical or remote gaugings (ullages). The level of the ullage (void space between the asphalt and reference point) is then recorded and the volume is derived from the calibration tables of the tanks which reflects the volume of aughalt at all levels of the ullage.

It is advisable to apply a film of lube oil or grease on the metal rod of the gauging tape or sensor rod before taking ullage/temperature. This is for easy cleaning.

The temperature of the asphalt is also measured by means of a thermo-fluke specially designed to record high temperatures. The metal sensor rod is immersed in the asphalt until it covers approx, half of the rod and the temperature is read.

The fluke consists of a sensor rod (approx 200cm long) which is connected to a highly heat resistant wire that is attached to the temperature indicator which registers the temperature.

The gross standard volume is calculated by using the VCF from one of the following methods:

- 1. ASTM Table 55
- ASTM Standard D 4311 (also called Asphalt Institute table (4-1)
- Asphalt Institute table (4-2).

Items 1 and 2 will result in a VCF, which reduces the volume to 15°C.

Item 3 will result in a VCF, which reduces the volume to 60°F.

The quantity in weight or mass is calculated by multiplying the gross observed volume by the V.C.F. to derive to the gross standard volume. The GSV is then multiplied with the WCF from table 56 OR the density, depending whether it is calculated in air or vacuum.

These measurements are carried out before and after the loading/discharge to ascertain the quantity delivered/received. Weights may be verified by draft surveys.

19.2.2. Draft surveys

Locally draft surveys may be applied to establish the delivered or received quantities.

Refer to chapter 20 for draft survey procedures.

19.2.3. Pipelines system for asphalt

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