



REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS  
OFFICE OF THE SECRETARY  
MANILA

097.13 DPWH

12-10-2014

DEC 10 2014

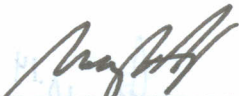
DEPARTMENT  
ORDER

SUBJECT: DPWH Standard Specification on the  
Use of Anti-Stripping Agent for Hot  
Mix Asphalt (HMA)

No. 144  
Series of 2014 *WASH 12-10-14*

In line with the continuing efforts to upgrade the construction technology thru the adoption of successful research studies, this Department has approved the use of Anti-Stripping Agent as additive material for Hot Mix Asphalt (HMA) subject to its specifications hereto attached.

This Order shall take effect immediately.

  
**ROGELIO L. SINGSON**  
Secretary

Department of Public Works and Highways  
Office of the Secretary



WIN4U01001

5.5.2 FET/JFS

## **DPWH Standard Specification on the Use of Anti-Stripping Agent for Hot Mix Asphalt (HMA)**

### **1.1 Description**

This Item shall consist of an application of bitumen adhesion promoter or anti-stripping agent use in pre-mix work to protect asphalt pavement from damaging effects of water in accordance with the Plans and Specifications.

Anti-Stripping Agent - An additive material in hot mix asphalt (HMA) used to increase the strength and durability of the adhesion between aggregates and bituminous binders.

### **1.2 Material Requirements**

#### **1.2.1 Types of Anti-Stripping Agents**

The types of anti-stripping agents to be used are fatty acid amines and tallow diamines, and fatty amino and imidazoline derivatives having a long hydrocarbon chain.

#### **1.2.2 Physical and Chemical Requirements**

The anti-stripping agents shall conform to the physical and chemical requirements given in Table 1.

***Table 1 – Physical and Chemical Requirements of Anti-Stripping Agents***

<b>Test Characteristics</b>	<b>Test Method</b>	<b>Limit</b>
Appearance	Visual	Liquid/Solid
Odor	Smelling	Agreeable
Total base value mg KOH/g	ASTM D 664	Calculated
Nitrogen content mass per cent	ASTM D 3228	Calculated
Boiling water test, minimum	ASTM D 3625	85
Retained Marshall Stability, per cent	ASTM D 1075 ASTM D 1559	Calculated

### **1.3 Construction Requirements**

#### **1.3.1 Additive Dosage**

The proportion of anti-stripping agent on the basis of weight of binder materials shall be from 0.20 to 0.50 mass percent. The exact percentage to be used shall depend on the job mix formula and the other quality control requirements established in the laboratory.

#### **1.3.2 Mixing Procedure During Construction:**

The required dose of the anti-stripping agent shall be poured into the hot bitumen tank and allowed 15 to 30 minutes of circulation or stirred to ensure a homogenous mix. It is necessary to use a stable anti-stripping agent or increase the dose according to expected degradation. Alternatively, the correct dose shall be injected into the bitumen line by means of a pump. The agent is fed into the bitumen first before it is sprayed on the aggregate in the mix; thus, no separate mixing time for mixing the agent with bitumen is required. In rolled asphalt and bitumen mastic surfacing works, pre-coated chippings are pressed into the hard surface while the mix is still hot to make the newly laid surface skid resistant. These chippings shall be pre-coated with bitumen treated with anti-stripping compound.

#### **1.3.3 Mixing During Maintenance Works**

When repair works such as pothole filling, crack sealing, rutting, and other maintenance works are carried out where possibility of moisture damage is high, an addition of anti-stripping agent ensure stable repairs.

### **1.4 Sampling**

Samples of anti-stripping agents shall be taken at the place of manufacture or at the destination as agreed upon by the parties concerned. Samples shall not be taken from broken packages.

### **1.5 Testing**

Anti-stripping agents shall be tested in accordance with ASTM D 664, ASTM D 3228, ASTM D 3625, ASTM D 1075 and ASTM D 1559.

### **1.6 Rejection**

Materials failing to meet the specification requirements shall be reported to the manufacturer within one (1) week after tests have been completed and the cause for rejection shall be stated.

## **1.7 Packing and Marking**

Anti-stripping agents may be shipped in bulk or in containers agreed upon by the manufacturer and the purchaser. It shall be packed in containers made of steel, plastic or other suitable packing materials. These containers shall be properly sealed.

Each container shall be marked with the following information:

- a. Name, form and type of the product;
- b. Net mass or volume;
- c. Name and address of manufacturer and recognized trademark, if any;
- d. Manufacturer's batch number and date of manufacture
- e. Made in the Philippines and,
- f. Required handling procedures

## **1.8 Storage and Handling**

Anti-stripping agents shall be properly stored in closed containers made of steel or aluminum. Containers made of zinc, copper, polythene PVC and most types of rubber are not suitable for use. As most of the anti-stripping agents cause irritation when in contact with human skin and are also irritating to the eyes, protective gloves for hands and goggles for the eyes shall be used while handling them, especially in case of liquid anti-stripping agents.

## **1.9 Measurement and Payment**

Anti-stripping agent shall not be measured and paid for separately, but the cost thereof shall be considered as included in the contract unit price of the items where called for.

### **REFERENCES :**

1. CONSTRUCTION OF PILOT ROAD RESEARCH PROJECT USING WET FIX BE AS ANTI-STRIPPING AGENT IN ASPHALT PAVEMENT CONSTRUCTION BY DPWH – BRS – RDD (JANUARY AND DECEMBER 2012)
2. DPWH STANDARD SPECIFICATIONS FOR HIGHWAYS, BRIDGES AND AIRPORTS, VOLUME II (2004)
3. ASTM INTERNATIONAL
4. MAHA CHEMICALS PHILIPPINES, INC. (WET FIX BE ANTI-STRIPPING AGENT)
5. INTERNET
  - PETROCHEM SPECIALTIES  
<http://www.petrochemspecialties.com/anti-stripping-agent.htm>
  - OPAL PAINT PRODUCTS PVT. LTD.  
[http://opalpaints.com/Anti\\_Stripping\\_Agents\\_Additives.html](http://opalpaints.com/Anti_Stripping_Agents_Additives.html)
  - UNIQUE PAVING MATERIALS CORPORATION  
<http://www.uniquepavingmaterials.com/products/pavegrip-hot-mix-adhesion-promoter/>
  - DIAMINES AND CHEMICALS LIMITED