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**COMMITTEE OF EXPERTS ON THE TRANSPORT OF  
DANGEROUS GOODS AND ON THE GLOBALLY  
HARMONIZED SYSTEM OF CLASSIFICATION  
AND LABELLING OF CHEMICALS**

Sub-Committee of Experts on the  
Transport of Dangerous Goods

Thirty-first session  
Geneva, 2-6 July 2007  
Item 3 of the provisional agenda

**LISTING, CLASSIFICATION AND PACKING**

Amendment to UN 3474 for inclusion of 1-HOBt Monohydrate

Transmitted by the expert from the United States of America

**Background**

1. At its 30<sup>th</sup> session, the Sub-Committee considered a proposal from the United States of America for inclusion of 1-HOBt Monohydrate in UN 3474 (UN/SCETDG/30/INF.27). The proposal was not adopted because some members of the Sub-Committee of Experts on the Transport of Dangerous Goods felt they did not have sufficient time to review the data and others expressed concerns about the lower water content in the monohydrate.
2. The expert from the United States of America has taken the concerns and opinions given at the last session of the Sub-Committee into account and once more reviewed the physical properties and explosive test results conducted on the hydrated form of 1-HOBt. The findings are briefly summarized as follows:

Composition of the substance:	1-hydroxybezotriazole (1-HOBt) monohydrate
Content of water:	11.7% water (1 mole of water per mole of HOBt as an integral part of the crystalline structure)
Thermal stability:	1-HOBt monohydrate is stable. It will not lose its water at or above 45% RH (relative humidity) at ambient temperature. It will take more than 10 hours to convert it to the anhydrous HOBt when monohydrated HOBt is exposed to 60 degree C and <5% RH, a condition not encountered in normal transport environment
Explosive tests results:	<p>The following explosive tests were conducted on 1-HOBt Monohydrate: Time/Pressure Test (1c(i)Test), BAM Friction Test (3(b) Test), Thermal Stability Test (3(c) Test), Small Scale Burning Test (3(d) Test), Stack Test (6(B)), and Bonfire Test (6(c) Test).</p> <p>Results of these tests show that 1-HOBt Monohydrate does not meet the definition of a Class 1 substance. These results further support the conclusion drawn by Germany in UN/SCETDG/29/INF.22 (para. 2)</p>

3. Additional information regarding these test results is provided in the annex.
4. Based on the above findings, the expert from the United States of America believes it is proper to classify 1-HOBt Monohydrate as a Division 4.1 Desensitized Explosive substance and proposes that it be included in the proper shipping name for UN 3474.

### **Proposal**

5. It is proposed that the proper shipping name for UN 3474 be amended to read as follows:  
  
"1-HYDROXYBENZOTRIAZOLE, ANHYDROUS, WETTED with not less than 20% water, by mass or 1-HYDROXYBENZOTRIAZOLE, MONOHYDRATE".

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### Annex

#### **Summary of Explosive Property Testing for HOBt monohydrate**

1. Thermal Stability Test at 75 degrees (C (UN test 3(c))  
50 gm sample was tested at 75 degrees C for 48 hours. No ignition or explosion was detected.
2. Small Scale Burning Test (UN test 3(d))  
10 grams of sample was placed in a beaker. The beaker was placed centrally on a kerosene-soaked dust and the sawdust was ignited with an electric igniter. The test was performed twice with 10 grams of sample and twice with 100 grams to determine the response to a fire.  
The observed results were events of burning but no explosion. The test results are considered negative. HOBt is not considered too dangerous for transport.
3. BAM Friction (UN test 3(b) (i))  
No sparking or flames were observed in six trails at a load of 360N. The sample is not particularly sensitive to ignition by friction.
4. Friction Sensitivity Test in a custom modified ball valve assembly  
51.57 grams of HOBt monohydrate was introduced into the ball valve assembly. Two thermocouples were introduced on either side of the ball valve assembly, which were connected to a data-acquisition system to monitor the system temperature. The ball valve was operated at a three cycles per minute for a total run time of 4 hours. Neither ignition nor decomposition (or powder color change) was noted.
5. Time/Pressure Test (UN test C.1)  
The test is designed to determine the effects of igniting the substance under confinement. If the ignition leads to a deflagration with explosives violence at pressures which can be attained in normal commercial packages. Three repeated time/pressure trails were conducted. The time for pressure rise from 100 to 300 psi was 530, 304 and 376 milliseconds respectively. HOBt monohydrate does propagate a deflagration; however it's much greater than 5 ms and considered slow burning.
6. Stack Test (UN test 6 (b))  
Sample was packaged in 5 kg double plastic bags, each tied separately. Five of these bags were placed in a specification fiberboard drum. Six drums were used for the stack test to determine whether an explosion is propagated from one package to another.  
The results of the test were negative. There was no explosion, damage to the witness plates, or propagation of any kind between packages. Three repetitions were performed.

7. External Fire (bonfire) Test (UN test 6 (c))

Sample was packaged in 5kg double plastic bags, each bag tied separately. Five of these bags was placed in a specification fiberboard drum. Six drums were used for the bonfire test to determine whether there is a mass explosion or a hazard from a violent burning.

The test results were negative. There was no explosion, only black smoke that belled from the test hiding the flames completely. There was no damage to the witness and no sample material scattered beyond the ash ring.

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