



Statement

Please make note of the warranty provisions listed below for our technical advice

Combustion Gases from Polyurethanes and Polyisocyanate Raw Materials

April 11, 2009

Dr. J. Schrot

All organic materials when ignited or heated to high temperatures evolve water, carbon monoxide, carbon dioxide, hydrocarbons, lower and higher molecular weight aldehydes and ketones as well as carbon black like pyrolysis products in varying amounts depending on fire conditions (e. g., temperature and oxygen supply).

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From nitrogen containing materials like polyurethanes and polyisocyanate raw materials as well as other coating and structural polymers and materials from natural sources additionally volatile nitrogen compounds like ammonia, nitric oxides, nitriles, and, at temperatures from 800 °C - 1000 °C, also hydrocyanic acid, are evolved.

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Further, depending on the chemical structure of the material, the formation of isocyanate or isocyanate-like compounds may be observed. In the case of polyurethanes this reaction starts at about 250 °C and reaches its peak at 400 - 600 °C.

Chairman of the
Supervisory Board:
Wolfgang Plischke

Again it is stressed that this behaviour is shown by all nitrogen containing materials, also those of natural origin.

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The pyrolysis gases from polyurethane coated fir wood were shown by comparative animal tests to be not more toxic than those being evolved from the untreated wood.

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From burning polyisocyanate coating/adhesive/sealant raw materials the evolution of greater amounts of monomeric diisocyanates besides the decomposition products named above must be anticipated.

Nature and amount of harmful components in the combustion gases depend on individual fire conditions, which can only very roughly be modelled by laboratory tests. E. g., the formation of hydrocyanic acid is favoured in smoldering fires under conditions of low oxygen supply. Being a combustible carbon compound, however, it is consumed again in a full fire with free access of oxygen.

In general carbon monoxide must be expected as being the predominant risk factor present in the combustion gases from all organic materials

In fire fighting self contained breathing equipment must be used.

Yours sincerely,

Bayer MaterialScience AG

A handwritten signature in blue ink, appearing to read 'i.v. Schrot', is written over a faint circular stamp.

Dr. J. Schrot

Health, Safety, Environment, Quality

Regulatory Affairs and Product Support