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COMPARISON OF THE STRESS CRACK RESISTANCE OF POLYETHYLENE GRADES WITH THE TEST PERFORMANCE BEHAVIOUR OF PACKAGINGS FOR THE TRANSPORT OF DANGEROUS GOODS

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Comparison of the stress crack resistance of polyethylene grades with the test performance behaviour of packagings for the transport of dangerous goods Ute Niebergall and Margit Weltschev, Federal Institute for Materials Research and Testing (BAM), Unter den Eichen 87, 12205 Berlin, Germany Resistance to stress cracking by wetting solution is one of the selected properties together with the corresponding test method FNCT and tolerances for a comparison of polyethylene grades of one design type in the procedural rule on suitability proof for alternative plastic resins used for packagings and intermediate bulk containers (IBCs) for the transport of dangerous goods. The environmental stress crack resistance determined by Full Notch Creep Test (FNCT) represents the impacts from the stacking tests at 40 °C performed with standard liquid wetting solution (without pre-storage) and with normal butyl acetate saturated wetting solution (pre-storage with normal butyl acetate). Environmental stress crack resistance determined with FNCT for the polyethylene grades was related to the times to failure of different jerrican samples made of these grades in stacking tests with 5 % wetting solution and a n-butyl acetate saturated wetting solution (pre-storage with n-butyl acetate) at 40 °C. The FNCT is suitable for comparison of polyethylene grades in relation to environmental stress crack resistance independent of their use as drum, IBC or jerrican material. The stiffness of polyethylene grades should be taken into account to the comparison as jerricans are not only chemically but also mechanically stressed.