

# ANALYSIS OF ADHESIVE DISBOND OCCURRENCES IN ROTOR BLADES OF MI-2 HELICOPTERS

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Polish Air Force Institute of Technology is responsible for overseeing the service life extension program for the rotor blades of multiple helicopters in the Polish Air Force (such as Mi-2, Mi-8/17, Mi-14, Mi-24). Due to the usage profile, many of the blades get decommissioned when the calendar service life is reached, while the accumulated flight hour count is still below the hourly service limit. This is why a dedicated research program, as well as inquiry into the usage and technical condition of the blades is necessary. To maintain such a program, regular inspections of the blade structure are required.

In the paper, the Mi-2 life extension program findings are presented. The Mi-2 blade life extension has been implemented in three phases, and life extension of 42 months was achieved. The program is based on non-destructive tests. Inspection procedures include verification of the spar structure (corrosion, cracks) as well as the verification of adhesive bonded joints between various elements of the blade (skin and spar, skin and core, etc.). The inspection is performed with the use of ultrasonic C-Scans. Because adhesive disbands are the main reason for component rejection and decommissioning, they are the main focus of the paper. A study of more than hundred non-destructive inspections is included in the paper. The inspection methodology is presented, as well as the statistics and distribution of the blade defects. The adhesive disbands are also characterized. The study aims to determine the factors that drive the disbond process, and environmental factors are taken into account.

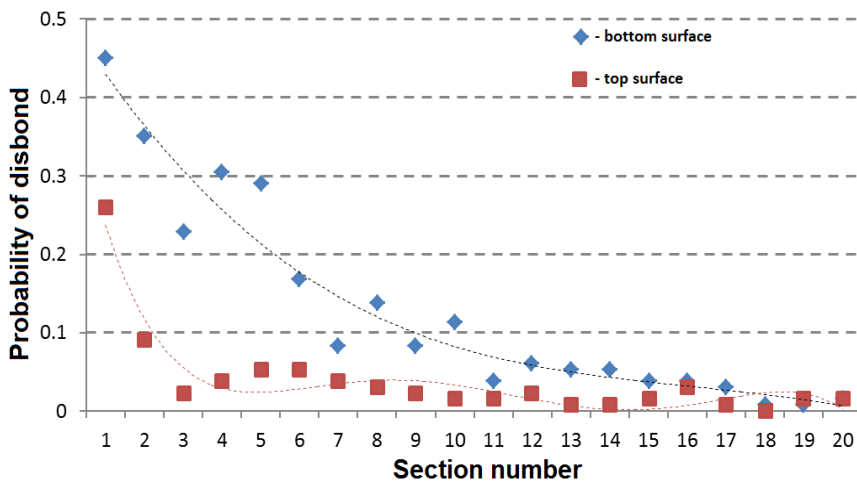


Figure 1. Probability of disbond between section skin and spar.

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