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A mathematical model of frictional damage to parachute canopy

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Abstract

The damage to parachute canopy caused by friction involves a number of parameters, including material properties, pressure, sliding velocity and surface condition, etc. A theoretical model is proposed to analyze the friction process and help evaluate effects of the parameters on the damage to parachute canopy. Relevant prevent-burn tests were performed to validate the model, which is built with the aim of providing relevant information or clues for parachute design and material selection.

Keywords: Parachute, Damage, Friction, Mechanism, Prediction

1. Introduction

Parachute is a type of aerodynamic decelerator, which has a wide range of applications. Parachute may fail when is over-loaded, but damage often occurs under lower load conditions. It is noticed that the damage is triggered by local melting or burn caused by frictional heat. Fig.1 illustrates local burned areas on parachute canopies

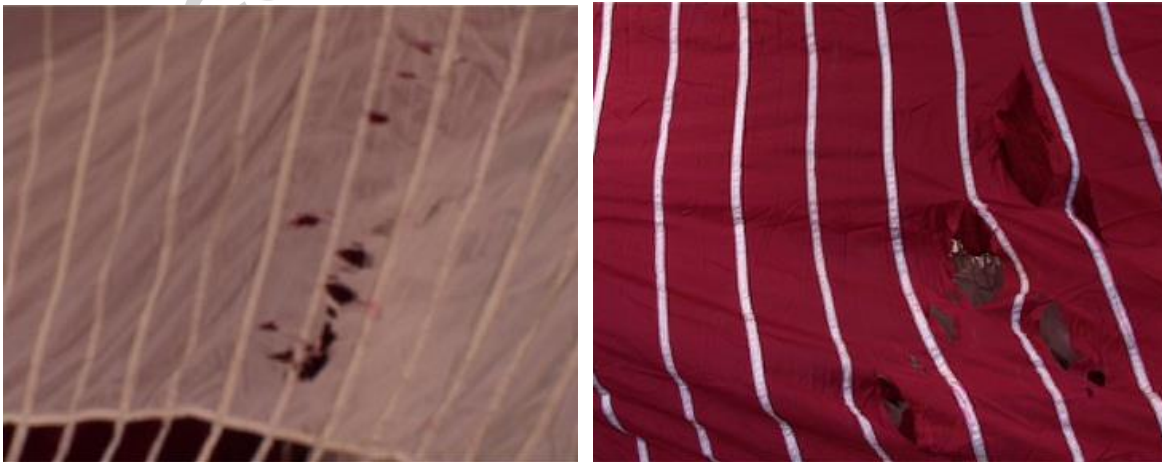


Fig.1 Local melt or burn is observed on canopies.

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