

# Flexibility of hybrid load transfer assemblies: Influence of tightening pre-stress

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## Abstract

The flexibility of bolted assemblies of thin parts is a significant parameter, especially in calculating the load distribution between the various fasteners in an assembly. This characteristic is poorly understood in the case of assemblies that are working both in plastic deformation- shearing and friction. The present study firstly focuses on flexibility of an assembly working only by friction. It highlights the influence of pre-stressing and the coefficient of friction on flexibility as also on hysteresis and assesses the influence of the assembled parts' geometrical characteristics. The study then goes on to consider a hybrid load transfer assembly. Simulations performed using ABAQUS software provided insight as to how the joint behaves in relation to the pre-stress applied. The results are compared to the case of an assembly working without pre-stress. Using these simulations, a model for determination is proposed. This allows the apparent flexibility of the fastener to be calculated, dissociating the case of apparent flexibility on the first loading cycle needed to calculate the load transfer from the apparent flexibility of the following loading cycles. The formulations proposed thus allow the behaviour of a hybrid load transfer fastener to be characterised in relation to the transferred load FT and a dimensionless parameter characterising the latter's global behaviour (adhesion or slipping).

## Biography

Jose Andriamampianina Optimisation du mélange charbon de terre - balles de riz destiné à la gazéification Optimal conception of embarked hydrogen generator for injection of an auxiliary additional combustible in gasoline engines Modélisation et simulation numérique de la propagation du son dans un milieu poreux flexible Simulation de l'infiltration des eaux usées à travers une microstructure saturée Focus sur le changement climatique et les énergies renouvelables à Madagascar Flexibility of hybrid load transfer assemblies: Influence of tightening pre-stress. Conception et réalisation de la pico centrale hydroélectrique d'Andretsemboka d'une puissance de 7,5 KW Determining load distribution between the different rows of fasteners of a hybrid load transfer bolted joint assembly Comportement hydroélastique de la structure en caissons des citernes de navires méthaniers Dimensionnement optimal d'une liaison par boulon ajusté prenant en compte la précontrainte de serrage Importance of Artificial Intelligence