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Fasteners — Preloading test for the detection of hydrogen embrittlement — Parallel bearing surface method

*Éléments de fixation — Essai de précharge pour la détection de la
fragilisation par l'hydrogène — Méthode des plaques parallèles*



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Foreword

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Introduction

When atomic hydrogen enters steels, it can cause loss of ductility or load-carrying ability, cracking (usually as submicroscopic cracks) or catastrophic brittle failures at applied stresses well below the yield strength or even the normal design strength for the alloys. This phenomenon often occurs in alloys that show no significant loss in ductility when measured by conventional tensile tests, and is frequently referred to as hydrogen-induced delayed brittle failure, hydrogen stress cracking or hydrogen embrittlement. The hydrogen can be introduced during heat treatment, gas carburizing, cleaning, pickling, phosphating, electroplating and in the service environment as a result of cathodic protection or corrosion reactions. Hydrogen can also be introduced during fabrication, for example during roll forming, machining, and drilling due to coolant or lubricant break-down as well as during welding or brazing operations.