

## Metallurgical Analysis of Surface Defect in Telescopic Front Fork

**Authors :** Souvik Das, Janak Lal, Arthita Dey, Goutam Mukhopadhyay, Sandip Bhattacharya

**Abstract :** Telescopic Front Fork (TFF) used in two wheelers, mainly motorcycle, is made from high strength steel, and is manufactured by high frequency induction welding process wherein hot rolled and pickled coils are used as input raw material for rolling of hollow tubes followed by heat treatment, surface treatment, cold drawing, tempering, etc. The final application demands superior quality TFF tubes w.r.t. surface finish and dimensional tolerances. This paper presents the investigation of two different types of failure of fork during operation. The investigation consists of visual inspection, chemical analysis, characterization of microstructure, and energy dispersive spectroscopy. In this paper, comprehensive investigations of two failed tube samples were investigated. In case of Sample #1, the result revealed that there was a pre-existing crack, known as hook crack, which leads to the cracking of the tube. Metallographic examination exhibited that during field operation the pre-existing hook crack was surfaced out leading to crack in the pipe. In case of Sample #2, presence of internal oxidation with decarburised grains inside the material indicates origin of the defect from slab stage.

**Keywords :** telescopic front fork, induction welding, hook crack, internal oxidation

**Conference Title :** ICSSCI 2019 : International Conference on Steel Structures and Construction Industry

**Conference Location :** Venice, Italy

**Conference Dates :** April 11-12, 2019