

Purpose

- 1 Clarify the Mechanics Behavior of Bearing and Friction Hybrid joint
- 2 Define the limit state for hybrid joint
- 3 Propose a desing methods and strength equation

Ch. 2: State of The Art

Reasearch Methods: Literature review, Theoretical reasoning

Issue: No clear method for calculating the bearing strength.

Contens: investigate the previous study, summarize the mechanical behavior of bearing and friction, then introduce the issue

Part-I: For aging riveted joint

Proposed a replacement methods by use HSB, and strength calculate equation.

Ch. 3: Experiment of Rivet-HSB hybrid Connection

- Investigate the slip coefficient of riveted joint
- Confirm the strength of riveted-HSB hybrid joint
- Discussion of bolt replacement locations

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Ch. 4: FE Analysis of Rivet-HSB hybrid Connection

- Clarify the load redistribution mechanism when replacement rivet
- Investigate the load share mechanism
- Investigate the properly replacement position
- Propose a strength calculate formula

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Part-II: For newly constructed bolted joint

Investigate the limit state, proposed the properly bolt arrangement methods and strength calculate equation

Ch. 5: FE Analysis of IFB-HSB hybrid Connection

- investigate the bolt arrangement methods.
- Load share mechanism IFB and HSB
- Discussion serviceability limit state and strength calculate equation
- Investigate the influence of preload on the mechanical behavior of IFB.

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Ch. 6: Experiment of IFB-HSB hybrid Connection

- Validation of the FE model
- Investigate installation methods
- Discussion the deformation of hybrid joint
- Investigate the influence of preload on the mechanical behavior of IFB.

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Ch. 7: Limit state design methods of Hybrid Connection

Discussion of both rivet-HSB and IFB-HSB hybrid joints

Research Methods: Numerical analysis, Theoretical reasoning, Literature review

- Investigate the serviceability limit state
- Propose a generic design methods for hybrid joint
- Propose a generic bearing yield strength calculation equation

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Ch. 8: Conclusions and Future research