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## عنوان مقاله:

Ultimate Strength of Internal Ring-Reinforced KT Joints Under Brace Axial Compression


## محل انتشار:

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## خلاصه مقاله:

Internal ring stiffeners are frequently used to improve the ultimate strength of tubular joints in offshore structures. However, there is a noticeable absence of specific design guidance regarding the assessment of their ultimate strengths in prominent offshore codes and design guides. No equations are available to determine the ultimate strength of internal ring-reinforced KT joints. This work developed equations to determine the ultimate strength and the strength ratio of internal ring-reinforced KT joints based on numerical models and parametric studies comprising ring parameters and joint parameters. Specifically, a finite element model and a response surface approach with eight parameters (λ, δ, ψ, ζ, θ, τ, γ, and β) as inputs and two outputs (ultimate strength and the strength ratio) were evaluated since efficient response surface methodology has been proven to give precise and comprehensive predictions. KT-joint with parameters λ=۰.۹۱۱۱, δ=۰.۲, ψ=۰.۷۰۳۰, ζ=۰.۳, θ=۴۵°, τ=۰.۹۰, γ=۱۶.۲۵, and β=۰.۶ has the maximum ultimate strength, and the KT-joint with parameters: λ=۱, δ=۰.۲, ψ=۰.۸, ζ=۰.۵۶۹۷, θ=۴۵°, τ=۰.۶۱, γ=۲۴, and β=۰.۴۱ has the maximum strength ratio. The KT-joints with the optimized parameters were validated through finite element analysis. The percentage difference was less than ۱.۷%, indicating the applicability and high accuracy of the response surface methodology. Doi: ۱۰.۲۸۹۹۱/CEJ-۲۰۲۴-۰۱۰-۰۵-۰۱۲ Full Text: PDF



## کلمات کلیدی:

.KT-Joint; Response Surface Methodology; Ultimate Strength; Ring-Stiffeners; Initial Stiffness; Optimization; Finite Element Analysis; Strength Ratio



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