INTISARI

Perubahan tata letak dalam industri manufaktur menciptakan kebutuhan peralatan penanganan material. Hal ini terjadi pada salah satu industri manufaktur di mana muncul kebutuhan kelancaran proses suplai komponen menuju *robot welding station* baru. Komponen yang harus disuplai bermassa sekitar 970 kg dengan dimensi berkisar 3440 mm × 955 mm × 180 mm. Jarak asal komponen menuju *station* hanya sekitar 18 m. Massa yang berat menjadi penghambat jika ditangani tenaga manusia sehingga perlu dilakukan perancangan alat *rail transfer trolley*. Penelitian terdahulu sudah melakukan perhitungan elemen mesin *rail transfer trolley* namun belum ada yang mengkaji sasisnya secara mendalam. Peneletian ini akan merancang *chassis rail transfer trolley* dengan analisis perbandingan variasi bentuk penampang material SS400 menggunakan *finite element analysis*. Variasi bentuk penampangnya yaitu *channel*, *I-section* dan *hollow rectangular*. Analisis yang dilakukan bertujuan untuk mengetahui faktor keamanan dan penampang *chassis* yang paling kuat. Hasil penelitian menunjukkan ketiga variasi penampang *chassis* memenuhi *safety factor* minimum 4. *Chassis* berpenampang *I-section* memiliki nilai *von mises stress* terendah yaitu 24,61 MPa dengan nilai *safety factor* tertinggi yaitu 9,96. Data yang diperoleh dapat digunakan sebagai referensi dalam menentukan material untuk *chassis rail transfer trolley*.

Kata kunci: *Chassis, Finite Element Analysis, Material Handling Equipment, Rail Transfer Trolley*

ABSTRACT

Layout changes in the manufacturing industry create the need for material handling equipment. This is the case in one manufacturing industry where there is a need for a smooth component supply process to a new robot welding station. The components to be supplied have a mass of about 970 kg with dimensions ranging from 3440 mm × 955 mm × 180 mm. The distance from the component to the station is only about 18 m. Heavy mass becomes an obstacle if handled by human labor so it is necessary to design a rail transfer trolley tool. Previous research has done the calculation of rail transfer trolley machine elements but no one has studied the chassis in depth. This research will design a rail transfer trolley chassis with a comparative analysis of variations in the cross-sectional shape of the SS400 material using finite element analysis. The cross-sectional shape variations are channel, I-section and hollow rectangular. The analysis carried out aims to determine the safety factor and the strongest chassis cross section. The results show that the three variations of the chassis cross section meet the minimum safety factor of 4. The chassis with I-section has the lowest von misses stress value of 24,61 MPa with the highest safety factor value of 9,96. The data obtained can be used as a reference in determining the material for the rail transfer trolley chassis.

Key words: *Chassis, Finite Element Analysis, Material Handling Equipment, Rail Transfer Trolley*