



INTISARI

Penggunaan penampang tersusun baja canai dingin yang dihubungkan dengan alat sambung sekrup merupakan salah satu metode alternatif untuk memperbesar kekuatan baja canai dingin. Perilaku torsi pada penampang tersusun baja canai dingin turut mempengaruhi kapasitas balok. Penelitian ini bertujuan untuk mengetahui perilaku torsi balok baja canai dingin penampang tersusun terbuka kanal ganda. Dimensi profil kanal yang digunakan yaitu C.81.40.8,5.0,75.

Total 9 balok dikenakan beban eksentris dari tengah sayap benda uji di tengah bentang. Variasi bentang benda uji yang digunakan yaitu 1500 mm, 2000 mm, dan 2500 mm. Parameter yang ditinjau dalam pengujian adalah beban (P), sudut rotasi (α), dan regangan (ϵ) dengan menggunakan strain gauge. Beban eksentris diletakkan di tengah beban dan diaplikasikan secara bertahap hingga balok uji mengalami kegagalan. LVDT dipasang searah vertikal dan horizontal. Sedangkan untuk *strain gauge* dipasang satu buah di elemen sayap bagian bawah penampang tersusun.

Hasil pengujian menunjukkan bahwa kapasitas beban terbesar terjadi pada balok dengan bentang 1500 mm yaitu 1,48 kN dengan sudut rotasi 16° . Beban terkecil terjadi pada balok dengan bentang 2500 mm yaitu 0,92 kN dengan sudut rotasi maksimum sebesar 18° . Kapasitas torsi uji balok menurun ketika bentang balok berkurang. Adapun, bentang balok juga mempengaruhi kapasitas balok tersusun. Analisis dilakukan berdasarkan spesifikasi desain baja canai dingin AISI S100-16. Mode kegagalan penampang tersusun yang teramati selama pembebanan berlangsung berupa tekuk lokal dan tekuk torsi. Namun saat pembebanan dihentikan, penampang benda uji kembali ke bentuk semula dikarenakan masih dalam kondisi elastis.

Kata kunci : baja canai dingin, penampang tersusun, kanal, eksentrisitas, bentang



ABSTRACT

The use of built-up sections of cold formed steel connected using screw joints is an alternative method to increase the strength of cold formed steel. The torsional behavior of the built-up section of cold formed steel also affects the capacity of the beam. This study aims to determine the torsional behavior of open built-up section cold formed steel beams with double channels. The channel profile dimensions used are C.81.40.8,5.0,75.

A total of 9 beams are subjected to an eccentricity load from the center of the flange of the specimen at the center of the span. Variations in the span of the specimens used are 1500 mm, 2000 mm, and 2500 mm. The parameters reviewed in the test are load (P), angle of rotation (α), and strain (ϵ) using a strain gauge. An eccentric load is placed in the mid span and applied until its failure. The LVDTs are installed vertically and horizontally. As for the strain gauge, one is installed on the flange element at the bottom of the open built-up section.

The test results show that the largest load capacity occurs in beams with a span of 1500 mm, namely 1.48 kN with a rotation angle of 16° . The smallest load occurs on a beam with a span of 2500 mm, which is 0.92 kN with a maximum rotation angle of 18° . The test torsional capacity of the beam decreases as the span of the beam decreases. Meanwhile, the beam span also affects the capacity of the beams arranged. The bending capacity analysis was carried out based on the design specifications of AISI S100-16 cold formed steel. The failure modes of the assembled sections observed during loading are local buckling and torsional buckling. However, when the loading is stopped, the built-up section of the test object returns to its original shape because it is still in an elastic condition.

Keywords: *Cold formed steel, Built-up, Canal, Eccentricity, Length*