

of 0.15 mm/s. Two tests were carried out for each condition. ~~Microhardness~~ Microhardness measurements were made on the longitudinal sections along the length of the specimen. A 15 kg load applied for 15 ~~sseconds~~ was utilized for these measurements. ~~then~~, Vickers hardness test ~~is-was~~ performed according to ASTM E92-04. ~~Besides~~ Moreover, the microstructure of processed specimens ~~was-was~~ observed by an optical ~~microseopy~~ microscope to investigate the effect of increasing pass on grain size distribution of CGPed sheets.

2-Fracture test

To ~~achieve to the main purpose~~ the main objective of this process, we tested specimens of three states of CGPed pure copper. Complying to ASTM E647 standard C (T) specimens ~~are-were~~ cut from deformed copper sheets with wire-cut machines. Pre-cracks ~~are-were~~ made in the specimen through wire-cutting technique. This ~~way-method~~ was ~~Approval in~~ approved several years ago by scientist [23]. The specimen size is 23.75mm×22.8mm×2mm thick. In the specimen, a narrow slit of approximately 2mm width, 2mm and 12mm length 12mm approximately was introduced by machining. It was terminated into a 60° \sqrt{V} -notch. The tip of the \sqrt{V} -notch was further extended by 1 mm with a_0/W ratio of 0.45. This extension was ~~done-completed through-via~~ wire-cut machining. The wire radius was 100 μ m. Three different specimens are shown in Fig. 3. C (T) type specimen under Mode I is presented. These tests were conducted done under displacement control conditions. Experimental set-up is shown in Fig. 4. Specimens were quasi-statically loaded ~~quasi-statically~~ at a moving head speed of 0.1 mm/min up to the maximum load and beyond until the full separation of the specimen on a SANTAM grip, until the full separation of the specimen. The Load load showed a tendency to gradually fall from the maximum to ~~the~~ full separation. Three or four samples were tested for each pass.

Comment [SMM10]: ?

Comment [SMM11]: درج نام فرد. این جمله، جمله بی اساسی است، مگر اینکه نام فرد درج شود + سال.

Comment [SMM12]: منظور از این عبارت چیست؟

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Comment [SMM13]: باید مشخص کنید نمونه ها مربوط به چه هستند.

Comment [SMM14]: شکل صحیح عبارت بررسی شود.