

approaches to ~~create~~ creating metallic material with ultra-fine grain (UFG) [1-3]. Materials produced by SPD are ~~no~~ no-porosity materials and have desirable mechanical properties such as strength and toughness [4]. Some common methods in SPD include Equal Channel Angular Pressing (ECAP) [5], Accumulative Roll Bonding (ARB) [5 and 6], ~~repetitive~~ Repetitive corrugation Corrugation and ~~straightening~~ Straightening (RCS) [5], and Constraint Groove Pressing (CGP), which is practical for sheet metals [8-13]. The basis of the CGP process is that metals ~~is~~ undergone repetitive shear deformation under plastic strain deformation conditions by ~~using means of~~ periodic pressing with ~~asymmetrically~~ groove dies and flat dies [5]. Up to now, ~~a lot of many~~ works have been carried out mainly on microstructures evolution, mechanical properties, and strengthening mechanism of UFG materials prepared by CGP [10-13]. ~~Lately, w~~ With regard to engineering applications, ~~more attentions have been paid to~~ the study of fracture and fatigue properties ~~lately has been greatly emphasized~~ [14 and 15]. Much work has been obtained fatigue properties of specimens that subjected to Equal Channel Angular Pressing (ECAP) in recent years [16-19]. ~~But~~ However, until now it ~~hasn't been worked on~~ fracture properties of materials ~~that~~ prepared by CGP have not been addressed in any study.

In this research, plane stress fracture toughness of CGPed pure copper commercial sheets is investigated, and in addition, by tensile test and hardness tests, characteristics of deformed sheets are obtained. In order to establish the fracture toughness ~~Model model~~, the specimens ~~was~~ were subjected ~~under to~~ CGP process was designed to Compact Tension Test (C (T)). Plane stress fracture toughness is not an inherent material property, and has in stable measure, because its value depends on geometry. This work aims to compare fracture toughness values between variable passes of CGPed pure copper commercial sheets.

Comment [SMM2]: ?
رفرنس دهی صحیح بررسی شود.

Comment [SMM asymmetric]: نامتقارن =

Comment [SMM4]: ?

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Comment [SMM 5]: جمله ایراد مفهومی و ساختاری دارد. بسته به مفهومی که به دنبال آن هستید دوباره نویسی شود.

Comment [SMM 6]: باز نویسی جمله شماسست، اما بررسی کنید که آیا واقعاً کاری روی موضوع صورت نگرفته است؟

Comment [SMM 7]: چک شود آیا در متون علمی مشابه چنین استفاده ای متعارف است؟ در غیر این صورت کل عبارت را به کار ببرید.

Comment [SMM8]: نامفهوم

Comment [SMM 9]: منظور از این عبارت چیست؟