

August 09-10, 2018
Prague, Czech RepublicPolym Sci 2018, Volume 4
DOI: 10.4172/2471-9935-C3-015

JOINING OF POLYMER ROD THROUGH Y-SHAPE EXTRUSION CHANNEL

Pintu Kumar¹, S S Panda²^{1,2}Indian Institute of Technology Patna, Bihar, India

In everyday life polymer structures are widely used as advance structural material for several products due to low weight and high strength to weight ratio. Bonding of polymers are very difficult to achieve during heating (welding) process and hence work focussed on an eco-friendly deformation technique to join two round shape polymers parallel to each other. In this technique two similar nature of polymer rod joined when passed through preheated Y-shape extrusion channel maintaining a constant die temperature and constant reduction ratio. Universal testing machine (UTM) is used to extrude the polymer and joint strength of extruded samples are characterised by using numbers of destructive testing such as tensile, compression, peeling, lap shear, and micro hardness test. In peeling and lap-shear test, failure does not occur along the joint of extruded sample showing robustness of bonding. Base polymer which does not have any joint section failed early as compared to extruded sample during peeling and lap shear test. Hardness of joint section is higher than heat affected zone (HAZ) as well as base polymer as observed through micro hardness test. Concave shape of joint is an indication of better interlocking and hence improvement of joint strength as compared to other solid state joining. Polymers processed at 2/3rd of melting point have thin joint and void free interface as observed through its microstructure.

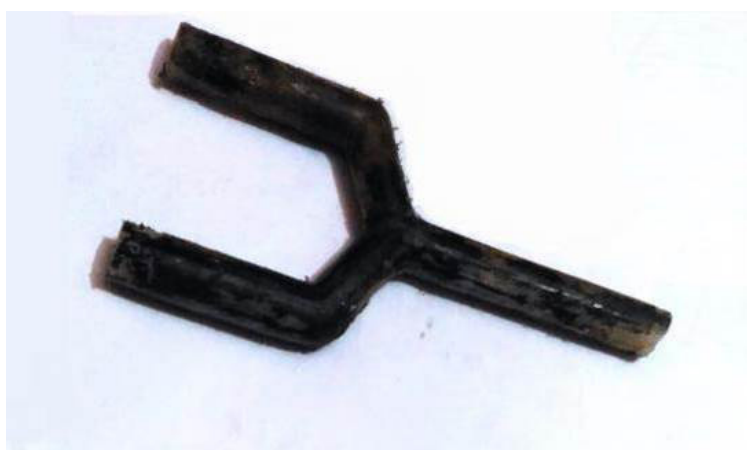
pintu.pme13@iitp.ac.in / pin.kumar650@gmail.com

Figure: Two similar polymer joint through Y-shape die channel