Abstract Template

Joining of polymer rod through Y-shape extrusion channel Abstract

Pintu Kumar[1], S S Panda[2]

[1,2] *Indian Institute of Technology Patna, Bihar, India*

Abstract

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.

Keywords— *Y-shape extrusion channel, Temperature, Polymer Joining, Destructive testing*

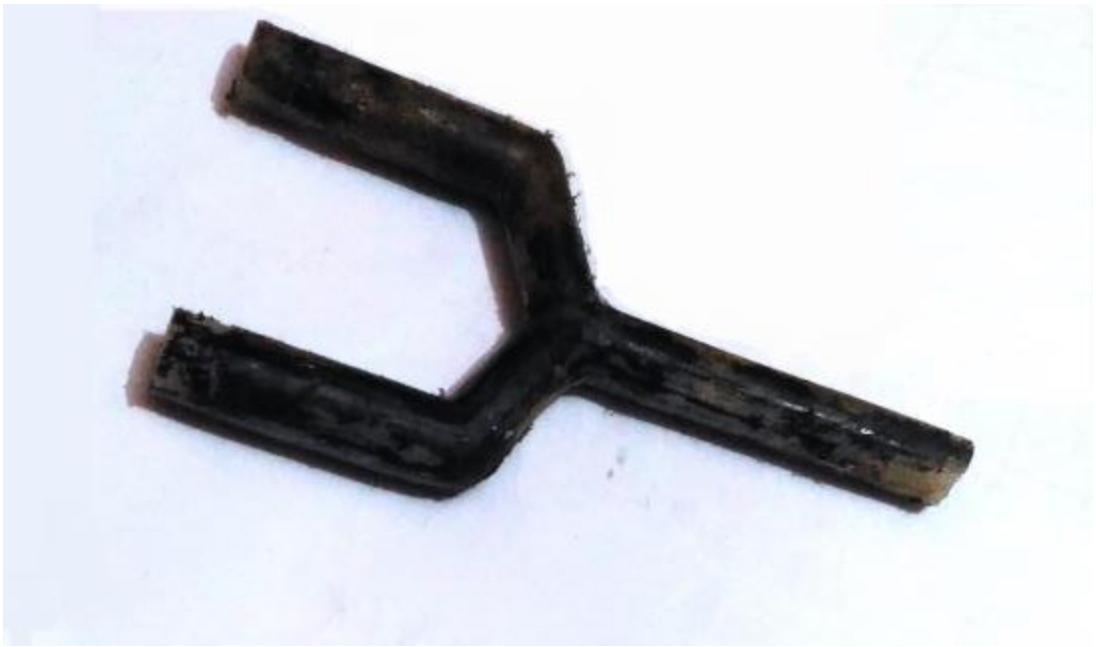


Figure: Two similar polymer joint through Y-shape die channel

Professional Biography

I am Pintu kumar completed Bachelor of engineering in year 2012 from Rajiv Gandhi University Bhopal, India. After completing my BE, i engaged in teaching. In year 2012 and 2013 i also qualified Graduate Aptitude Test in Engineering (GATE). GATE is a national level test for admission to M.Tech/ Ph.D. and other Government Scholarships/Assistantships in the field of engineering and technology. In year 2013 i joined Advanced Materials and Processes Research Institute–Bhopal, which is a unit of Council of Scientific and Industrial Research (CSIR) India. From year 2014 to till date i am a PhD student in Indian institute of technology Patna under the supervision of Dr. S S Panda. During my PhD work I have 1-patent, 1-book chapter, 6-conference and 3 papers in reputed journals. I also received reviewer invitation form Metallurgical and Materials Transactions A in year 2017.



Full Name - Pintu Kumar
Email Id- **pintu.pme13@iitp.ac.in** / **pin.kumar650@gmail.com**
Contact No: 8271724676
Social Network Details (FaceBook/LinkedIn):

Any Comments:

Thanks for your all invitation and pleasant response as i received form the team of EuroSciCon.