ABSTRACT

Safety work in underground mining area is strongly influenced by the stability of existing rock. Stability of underground mines is affected by several factors such as strength of rock, fractures, underground water, vibration, including earthquakes and others. Rockbolt role is to maintain stability so that landslides can be avoided. Rock bolts on the market today is rock bolt formed from a special material so the selling price is expensive. Mining in Indonesia is largely still developing and there is still much less attention to safety works. This is evident from one of the gold mining at “Gunung Pongkor Bogor” who did not use rock bolts because they were very expensive. Hence, it is required to design and manufacture rockbolt with standard material so that its price can be lower.

In this research, the author design a rockbolt with material of SS304. This material is the type of material in the form of a standard local market with a hard steel alloy austenitic, carbon, chromium, nickel and manganese appropriate. This form of sheets of material cut by the size of 1067 mm x 120 mm then roll bended by using a roll bending machine. This product is a cylindrical shell with a gap, 2.5 mm, has a length of 1067 mm and diameter of 39 mm. Modeling of rock bolts by using ANSYS 11
is required to ensure the forces act on the surface of the rock bolt is within the power of rock bolts support.

Results from this study is a product of rock bolts using SS304 material with a diameter of 39 mm and 130-150 kN support strength. Limit load of rock bolts can be accepted until the break is 741.93kN. Based on ANSYS 11 simulation, the critical stress which occurs when there is tensile loading washers in the area around the rocks (ring area). The combination of rock bolts with bearing plate will get the value of rock bolts tensile strength is more greater.

**Keywords:** Rock bolt, split set stabilizer, SS39, bending roll, ANSYS 11,