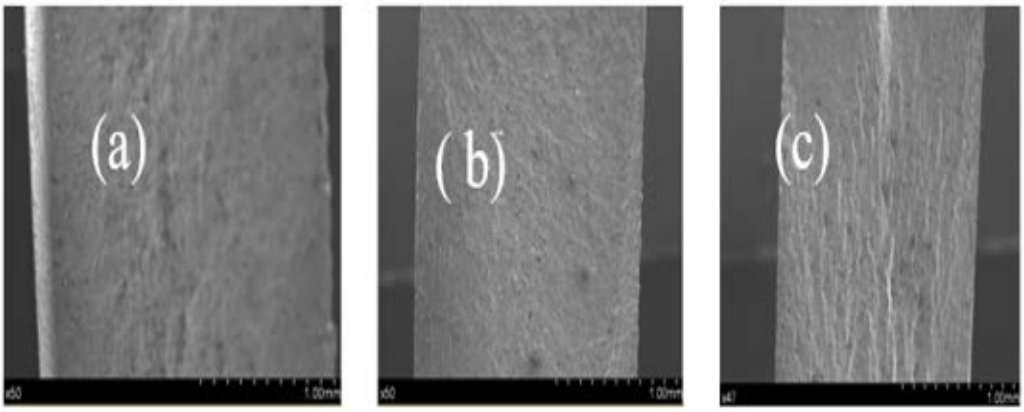

Figure11. Fatigue fracture macrostructure morphology :(a) NOLSP, (b) S20J and D20J

4. Conclusions

The impact of LSP of different LSP shock on AHSS–DP 350/600 specimens were investigated. The fatigue cycles, residual stress, morphologies, microhardness and roughness on the surface of the specimens treated and untreated were investigated. The fatigue fracture of metal door/gate characteristic of AHSS-DP 350/600 specimens before and after LSP were discussed and analyzed:

1). Residual stress analysis of LSP can be seen that the induced outward layer peak compressive residual stresses are increased by 3 times in D20J and 2 times in S20J when the LSP paths increased from 1 to 3 in both paths. It indicated that shocking pulse of square sharp edge introduced tiny cracks on the outward layer which the wave's inner compressive residual stress vice versa with enclosure significantly stepped up with enlargement of LSP coverage area.

2). Quality of the specimen's surface treatment of different shock of LSP were all improved. However, the highest fatigue cycle life before fractured among the specimens was D20J as compared to NOLSP respectively. It was significantly indicated that clearer differences of time of 48514 seconds before failure as compared to without LSP respectfully.

3). The fatigue roughness of striation of the specimens of different shock with and without LSP revealed that the higher the shocked energy the higher roughness and the lower the shocked energy the lower the smoothness of the surface of the specimens.

4). From the metal door/gate material of AHSS-DP350/600 specimens with different shocked, there was collectively changed of fatigue crack initiation outward layer and the fatigue striation spacing with LSP. This is alarming that the totality of all the experiments and its observations done on LSP specimens in this paper on AHSS-DP350/600 had a great influence as compared to without LSP significantly.

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