Abstract:

The plasma spray process allows for the application of advanced technical coatings to nearly any surface and finds wide application in industry. Wear of plasma spray gun nozzles is a documented source of variation in the plasma spray process. Wear detection currently relies upon observed gun voltage drops during operation which has limited utility. An offline means of determining wear state of GH type nozzles for SM 9MB plasma spray guns has been developed. By recording and analyzing the acoustic signal of a controlled gas flow through each nozzle, 22 nozzles were accurately categorized by their degree of wear. This test also distinguished between three manufacturers of new GH nozzles. Degree of wear was verified using surface profilometry and voltage drop. This method allows for improved quality assurance and enhanced useful nozzle life.

Bio sketch:

Taylor is a PhD candidate in the MSE department at Virginia Tech where he is advised by Dr. Gary Pickrell. His research focuses on aeroacoustics and thermal spray process monitoring. He received his B.S. in materials science and engineering from the University of Michigan.