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Abstract
EDM process the unrestricted of workpiece materials with hardness and strength properties, electric conductivity material can made EDMed process, process surface have one recasting layer produce , not merely raise the roughness of material surface, and have empty hole, cracks, introduce such defects as the residual stress, EDMed workpiece after processing, it is apply into high temperature, high pressure or must bear fatigue environmental occasion to need too often, so this to how research is it discharge formulation reduce of cracks and increase fatigue life to the discussion .
The Experiment to improvement fatigue life by reducing the formation of crack during EDMed process, it is with the tool steel of SKD11 to select materials for use, it is in the pulse current for 4A, 16A, 32A and plse-on duration for 16μs, 4μs , EDM processing, workpiece go on fatigue test after EDMed, its fatigue loading force is set up for 245kg, 215kg, 185kg, 150kg, stress ratio to R =0.1, workpieces of respectively for having cracks to produce, The white layer compare thickness is no cracks to produce workpiece ,The white layer compare thinness is no cracks to produce workpiece and polishing workpice , carry on the fatigue testing and observe fatigue life, moreover make fatigue broken topography , surface roughness to measurement , recasting layer to analysis ,recasting layer of hardness measurement and surface topography to examine with surface shape property.Understands the EDMed and surface layer characteristic of correlational.
The results revealed that changes EDMed to process the parameters, improvement the pulse current and reducing pulse-on duration , Can suppress effect of effectively the cracks production. White level thickness increases promotes its brittleness, reduces its material ductility, Speeds up the cracks to expand in this fast, then achieves the expiration to failure, reduces its fatigue life.In because the experiment roughness difference is not big, in fatigue life's influence, the cracks effect of existence is bigger than the surface roughness. Use in the different processing test specimens , its fatigue life is best respectively be the polished workpiece,The white layer compare thinness is no cracks to produce workpiece , The white layer compare thickness is no cracks to produce workpiece, has the cracks to produce the test workpiece.The experimental results revealed that processes the parameter to reducing the formation of cracks method, but suppresses the EDMed surface cracks production effectively, processes the parameter to suppress the crack formation method to be possible to improvement the fatigue strength and the fatigue life, then improvement EDMed quality.
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