International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2321-8169
Volume: 4 Issue: 4 604 - 605

Cheapest Method of Leakage Testing of Casting

Kupwade Shubham Raosaheb
Department of mechanical engineering.
PVPIT,BavdhanPune.
Pune,India.
Shubham457kupwade@gmail.com

Gopale Kamlesh Tukaram
Department of mechanical engineering.
PVPIT,BavdhanPune.
Pune,India
kamleshgopale@gmail.com

***Abstract*—**by studying different methods of leakage testing for castings it is observed that the cheapest and optimum method for leakage testing of casting is obtained by the application of acupressure principle.

Keywords-*leak,leak detection methods,cost,porosity,NDT,accupressure principle*

*****

I. INTRODUCTION

The leak detection techniques are now a days found to be expensive.It is therefore important to get the knowledge about the cheapest methods that are available for leak detection of such castings with favourable results. The easily available and cheapest method of detecting the leaks is by the application of acupressure principle. In this the component to be tested is filled with pressurized air and is dipped intoa water container. Leaks,if any,are present give indication by formation of bubbles from the surface where leak is present.This is the easiest and simplest method of leak detection requiring minimum or very less time. The cost required for leak detection by this method is approximately 2 (two)rs per piece which is very less as comparfed to other NDT(Non Destructive Testing) methods of leak testinble shows the costings required per piece for inspection by different methods.

Voids are generally formed in thin films irrespective of the film preparation method (electrodeposition, evaporation, or sputtering) as long as the deposition process involves a phase transformation from the vapor to the solid state. These voids can be extremely small (approximately 10A) and high in density . Porosity is one of the main sources of discontinuities in electroplated coatings; the others are cracks from high internal stresses and discontinuities caused by corrosion or subsequent treatments such as wear of deposits after plating. In most cases porosity is undesirable. Pores can expose substrates to corrosive agents, reduce mechanical properties, and deleteriously influence density, electrical properties and diffusion characteristics. As discussed in the chapter on diffusion, pores formed as a result of heating (Kirkendall voids) can noticeably reduce adhesion of a deposit. Porosity in a sacrificial coating such as zinc on steel is not too serious since in most environments zinc will cathodically protect steel at the bottom of an adjacent pore. However, for a noble metal, similar porosity may be problematic. A special significance of porosity is that it permits the formation of tarnish films and corrosion products on the surface, even at room temperature. In the electronics industry, which utilizes the largest quantity of gold coatings for engineering purposes, porosity is a major concern because of its effect on the electrical properties of plated parts. Porosity in cadmium deposits, which is desirable for purging hydrogen codeposited during plating, can result in rapid postplating embrittlement due to to the lack of a barrier to hydrogen reentering the steel during exposure ofthe plated part to corrosive environment.Depending on the method of formation of the coating, the pore can be filled with air or foreign matter such as gases, fluids, solids, etc. For example, analysis of electrodeposits reveals small amounts of many constituents from plating solutions easily explained by solution filled cavities of small pores but difficult to account for otherwise.

"ACCUPRESSURE PRINCIPLE"-

It is the method of leak detection by pressuring the component to be tested with compressed air (generally at 2 Bar) and then the part is dipped into liquid(water),the region on the surface of part where leaks are present gives out bubbles thereby detecting leaks.

TABLE I. INSPECTION COSTINGS

Table Head	**Cost for inspection of a unit casting**		
	Inspection Method	***Quantity***	***Cost(rs)***
1	Accupressure principle	1	2
2	Ultrasonic testing	1	10
3	Radiographic testing	1	12
4	Dye penetrant testing	1	8
5	Magnetic particle inspection	1	6
6	Eddy current inspection	1	10

ACKNOWLEDGMENT

It is indeed a great pleasure and moment of immense satisfaction for us to present this report on "**CHEAPEST METHOD OF LEAKAGE TESTING OF CASTING"** amongst a wide panorama who provided us inspiring guidance and encouragement, we take the opportunity to thanks to thanks those who gave us their indebted assistance. We wish to extend our cordial gratitude with profound thanks to professors of Dept of Mechanical Engg of PVPIT for their everlasting guidance. That was inspiration and encouragement which helped us in completing our report.

RESULTS

From various testings,the acupressure method of leak detection is found to be the simplest and cheapest method of leak detection giving favourably accurate results.

REFERENCES

[1] S. Nakahara, "Porosity in Thin Films". ***Thin Solid Films, 64,* 149(1979)**

[2] K.C. Joshi and -R.C. Sanwald, "Annealing Behavior of Electrodeposited Gold Containing Entrapments", J. ***Electron. Materials,*** 2, **(4), 533** (Nov **1973)**

[3] S. Nakahara, "Microporosity Induced by Nucleation and Growth Processes in Crystalline and Non-Crystalline Films", ***Thin Solid Films,* 45,421 (1977)**

[4] R.G. Baker, C.A. Holden and **4.** Mendizza, "Porosity in Electroplated Coatings-A Review of the Art With Respect to

[5] Porosity Testing", ***50th Annual Technical Proceedings,*** American Electroplaters Society,**(1963)**

[6] D. Altura, "Postplating Embrittlment-Behavior of Several Cadmium Deposits", ***Metal Finishing,* 72, 45** (Sept **1974)**

[7] J.G. Rinker and R.F. Hochman, "Hydrogen Embrittlement of **4340** Steel as a Result of Corrosion of Porous Electroplated Cadmium", ***Corrosion,* 28, 231 (1972)**

[8] R.J. Bourcier, D.A. Koss, R.E. Smelser and 0. Richmond, "The Influence of Porosity on the Deformation and Fracture of Alloys", ***Acta Metall.,* 34, 2443 (1986)**

[9] M. Myers and E.A. Blythe, "Effects of Oxygen, Sulphur, and Porosity on Mechanical Properties of Cast High-Purity Copper at **950** C", ***Metals Technology,*** 8, **165** (May **1981)**

[10] R.R. Zito, "Failure of Reflective Metal Coatings by Cracking", ***Thin Solid Films,* 87, 87 (1982)**