CREATING COMPLEX HOLLOW METAL GEOMETRIES USING ADDITIVE MANUFACTURING AND METAL PLATING

David Lee McCarthy

Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

Master of Science
in
Mechanical Engineering

Christopher B. Williams (Chair)
Scott T. Huxtable
Pablo A. Tarazaga

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Blacksburg, Virginia

Keywords: Additive Manufacturing, Electroless Plating, Electroplating, Selective Laser Sintering, Electroforming

Draft 09/01/2009

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Description of item under review for fair use: Spirax-Sarco Ltd., "Steam Consumption of Heat Exchangers," ed. http://www.spiraxsarco.com: 600 x 300 px, 2012.

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Virginia Tech ETD Fair Use Analysis Results

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Name: David McCarthy

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Virginia Tech ETD Fair Use Analysis Results

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Name: David McCarthy

Description of item under review for fair use: S. A. Bashar, "Study of Indium Tin Oxide (ITO) for Novel Optoelectronic Devices," ed. http://www.betelco.com/sb/phd/ch3/c34.html: 400 x 334 px, 1998.

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Your consideration of the effect or potential effect on the market after your use of the copyrighted work weighs: ***in favor of fair use***

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Gmail by Google

David McCarthy <thedavidmccarthy@gmail.com>

Figure Use Request (Metal Spraying)

2 messages

David McCarthy <dmccarthy@vt.edu> Mon, May 21, 2012 at 2:58 PM
To: sales@amphardchrome.co.uk

Hello,

I am writing to request permission to use your figure from your Metal Spraying article (link) in my masters thesis for my MS degree in Mechanical Engineering from Virginia Tech. In my thesis, the figure is captioned as follows: "Diagram of the metal spraying process with (a) wire and (b) powder as the source metal form [17]." Where the numerical reference leads to your metal spraying article on your web page with a direct URL and credits the figure to AM Philpot (Hard Chrome), Ltd. I am required by my institution to request specific permission for every figure used from outside sources.

Thank you,

David McCarthy
Virginia Tech DREAMS Lab
Graduate Researcher
dmccarthy@vt.edu

Andy Morgan <andy@amphardchrome.co.uk> Tue, May 22, 2012 at 1:58 AM
To: David McCarthy <dmccarthy@vt.edu>

Hello David

I cannot see any problems with you using items on our website for your thesis, therefore please continue as required.

Any further information you may require please do not hesitate to contact me again.

Regards and good luck

Andy Morgan

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Fax. 01582 584924
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From: David McCarthy [mailto:dmccarthy@vt.edu]
Sent: 21 May 2012 19:58
To: sales@amphardchrome.co.uk
Subject: Figure Use Request (Metal Spraying)

[Quoted text hidden]

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Virginia Tech ETD Fair Use Analysis Results

This is not a replacement for professional legal advice but an effort to assist you in making a sound decision.

Name: David McCarthy

Description of item under review for fair use: D. K. Patrick, "Application of Vacuum Technology for Coating Techniques," in Industrial Heating: The International Journal of Thermal Technology, ed. www.industrialheating.com: 350 x 187 px, 2000.

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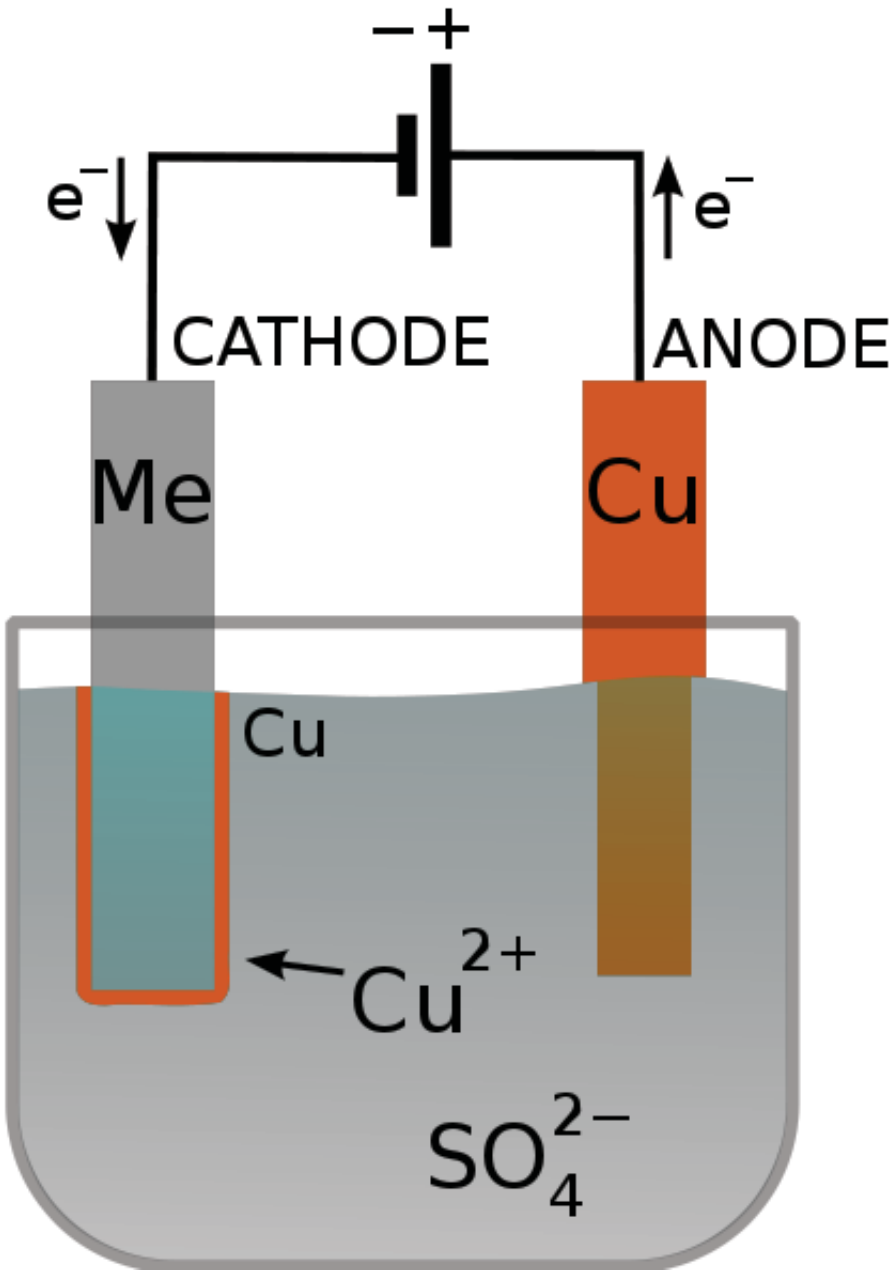

Size of this preview: 471 × 599 pixels.
Full resolution (SVG file, nominally 550 × 700 pixels, file size: 16 KB)

This image rendered as PNG in other sizes: 200px, 500px, 1000px, 2000px.

Description	**Deutsch:** Prinzipskizze zur Galvanostegie (Galvanotechnik), hier: elektrolytische Verkupferung eines Metalls (Me) im Kupfersulfatbad bei Anlegen eines Stromes. **English:** Copper electroplating of a metal (Me) in a copper sulfate bath.
Date	2010-05-08 13:58 (UTC)

Source	▪ GalvanostegiePrinzipskizzeTy.svg
Author	▪ GalvanostegiePrinzipskizzeTy.svg: Torsten Henning ▪ derivative work: Wizard191 (talk)

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  - 2006-12-18T09:04:08Z DrTorstenHenning 583x700 (18969 Bytes) == *Summary* == *{{Information| |Description={{de|Prinzipskizze zur Galvanostegie (Galvanotechnik), hier: elektrolytische Verkupferung eines Metalls (Me) im Kupfersulfatbad bei Anlegen eines Stromes.}} {{en|Electroplating of a m*
  - 2006-12-18T08:58:35Z DrTorstenHenning 744x1052 (19117 Bytes) *{{Information| |Description={{de|Prinzipskizze zur Galvanostegie (Galvanotechnik), hier: elektrolytische Verkupferung eines Metalls (Me) im Kupfersulfatbad bei Anlegen eines Stromes.}} {{en|Electroplating of a metal (Me) with*

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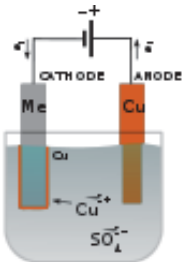
current	14:00, 8 May 2010		550 × 700 (16 KB)	Wizard191 (talk | contribs)	{{Information |Description= {{de|Prinzipskizze zur Galvanostegie (Galvanotechnik), hier: elektrolytische Verkupferung eines Metalls (Me) im Kupfersulfatbad bei Anlegen eines Stromes.}} {{en|Electroplating of a metal (Me) with copper in a copper sulfate bat

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Name: David McCarthy

Description of item under review for fair use: I. Classic Plating, "Electroless Nickel Plating," ed. http://www.classicplating.com/En.html: 307 x 279 px, 2012.

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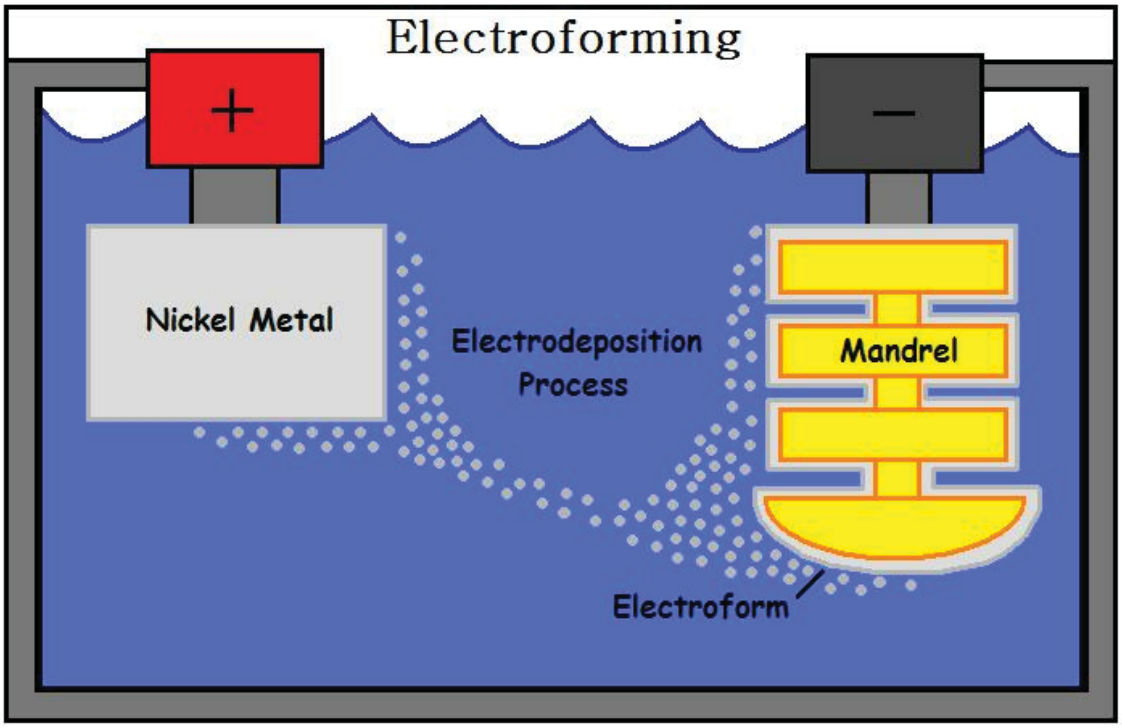

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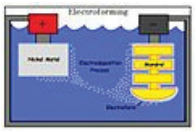
current	22:25, 21 April 2008		720 × 480 (43 KB)	Maestro Sargento (talk | contribs)	{{Information |Description= A diagram showing the electroforming process |Source= Own Work |Date= April 21, 2008 |Author= Nathan Sargeant |Permission= I Nathan Sargeant do hereby give my permission for this graphic to be viewed and used as needed by wikip

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