



University of the  
West of England

**BRISTOL**

Nash, K. (2018) *3D printed, self-glazed ceramics: An investigation inspired by Egyptian faience*. PhD, University of the West of England. Available from: <http://eprints.uwe.ac.uk/29682>

We recommend you cite the published version.

The publisher's URL is:

<http://eprints.uwe.ac.uk/29682/>

Refereed: No

(no note)

Disclaimer

UWE has obtained warranties from all depositors as to their title in the material deposited and as to their right to deposit such material.

UWE makes no representation or warranties of commercial utility, title, or fitness for a particular purpose or any other warranty, express or implied in respect of any material deposited.

UWE makes no representation that the use of the materials will not infringe any patent, copyright, trademark or other property or proprietary rights.

UWE accepts no liability for any infringement of intellectual property rights in any material deposited but will remove such material from public view pending investigation in the event of an allegation of any such infringement.

PLEASE SCROLL DOWN FOR TEXT.

## Bibliography

- Allison, A. and Scudamore, R. (2014) Additive manufacturing. *Strategic agenda*.
- Archer, B. (1995) The Nature of Research. *Co-design Journal* 2. 11, pp. 6-13.
- Balistreri, J. (2015) *Ceramic 3D printing at Medalta*. Available from: <http://johnbalistreriartist.com/ceramic-3d-printing-at-medalta/> [Accessed 17 November 2015]
- Bengisu, M. (2013) *Engineering Ceramics*. Springer Science & Business Media
- Bianchi, R. (1998) *Symbols and Meanings in Gifts of the Nile: Ancient Egyptian faience*. London: Thames and Hudson. P. pg22-31
- Binns, C., Myrtle, K. and Hazel, M. (1932) AN EXPERIMENT IN EGYPTIAN BLUE GLAZE. *Journal of the American Ceramic Society* 15.5., pp. 271-271.
- Buck, T. (2001) Clay art Parian thread. Available from: <http://www.potters.org/subject37403.htm> [Accessed 06 August 2016]
- D. A. Taylor, AZO Materials, (2003) *Advanced Ceramics – The Evolution, Classification, Properties, Production, Firing, Finishing and Design of Advanced Ceramics*. Available from: <http://www.azom.com/article.aspx?ArticleID=2123> [Accessed 17.01.16]
- De Beer, N. (2013) Additive Manufacturing Turning Mind into Matter. *Industry Evaluation and Recommendations Report for Sierra College Center for Applied Competitive Technologies (CACT)* [online], p. 7. [Accessed 17 November 2015]
- Dilatant (2015) Wikipedia [online]. November 2015. Available from: <https://en.wikipedia.org/wiki/Dilatant> [Accessed 17 November 2015]
- Eckel, Z., Zhou, C., Martin, J H. Jacobsen, A J., Carter, W B., Schaedle, T (2016) *Additive manufacturing of polymer-derived ceramics Science* 351 (6268) pp 58-62
- Etherigton, R. (2011) dezeen *The Solar Sinter Project by Markus Kayser*. Available from <https://www.dezeen.com/2011/06/28/the-solar-sinter-by-markus-kayser/> [Accessed 28 February 2017]

- Fahlman, B.D. (2011) *Materials Chemistry*. Available from:  
[http://www.springer.com/cda/content/document/cda\\_downloaddocument/9789400706927-c2.pdf?SGWID=0-0-45-1116555-p174110375](http://www.springer.com/cda/content/document/cda_downloaddocument/9789400706927-c2.pdf?SGWID=0-0-45-1116555-p174110375) [Accessed 07 July 2014]
- formlabs, (2016) *3D Printing Comparison: SLA vs. DLP* Available from:  
<https://formlabs.com/blog/3d-printing-technology-comparison-sla-dlp/> [Accessed 2<sup>nd</sup> March 2017]
- Frayling, C. (1993) *Research in Art and Design. Royal College of Art Research Papers*. 5, pp. 1-5.
- Friedman, F. (1998) *Gifts of the Nile: Ancient Egyptian faience*. London: Thames and Hudson
- Gibbons, G., Williams, R., Purnell, P. and Farahi, E. (2010) 3D Printing of Cement Composites. *University of Warwick Institutional Repository*: [online]. [Accessed 17 November 2015].
- Glass Studio Supplies. Microwave Kilns and Accessories. Available from:  
[http://www.glasstudiosupplies.co.uk/epages/es137568.sf/en\\_GB/?ObjectPath=/Shops/es137568/Categories/%22Microwave%20Kilns%20%26%20Accessories%22](http://www.glasstudiosupplies.co.uk/epages/es137568.sf/en_GB/?ObjectPath=/Shops/es137568/Categories/%22Microwave%20Kilns%20%26%20Accessories%22) [Accessed 16 November 2015]
- Grace, D. (2008) LUDOX Colloidal Silica Ceramic Shell Investment Casting, Material and Packing Technologies. Available from: [https://grace.com/general-industrial/en-us/Documents/ludox\\_ceramic\\_Investment%20casting\\_E\\_08\\_081110.pdf](https://grace.com/general-industrial/en-us/Documents/ludox_ceramic_Investment%20casting_E_08_081110.pdf) [Accessed 28 February 2017]
- Griffin, P. (2001) CASE STUDIES IN RECONSTRUCTING THE MATERIALS AND TECHNOLOGY OF ANCIENT EGYPTIAN FAIENCE. *Materials Issues in Art and Archaeology* Vi.
- Griffin, P. (2001) Reconstructing the materials and technology of Egyptian faience and frit. *Materials Research Society 2002* [online]. [Accessed 17 November 2015].
- Griffiths, L. (2016) TCT Magazine, *HP launches end-to-end HP Jet Fusion 3D Printing Solution*. Available from <http://www.tctmagazine.com/tct-events/3d-printing-at-rapid/hp-end-to-end-hp-jet-fusion-3d-printing-solution>. Accessed 22<sup>nd</sup> January 2017
- Hammer, F. and Hammer, J. (1997) *The Potters Dictionary of Materials and Techniques*. 5th ed. London: A & C Black.

- Hansen, T. (2003) Digital Fire Reference Database, *Flux*. Available from: [https://digitalfire.com/4sight/glossary/glossary\\_flux.html](https://digitalfire.com/4sight/glossary/glossary_flux.html) [Accessed 23 January 2016]
- Hansen, T. (2003) Digital Fire Reference Database, *Stain*. Available from: [http://digitalfire.com/4sight/material/stain\\_2451.html](http://digitalfire.com/4sight/material/stain_2451.html) [Accessed 17 November 2015]
- Hansen, T. (2003-2008) Digital Fire Reference Database, *Understanding Thermal Expansion In Ceramic Glazes*. Available from: [http://digitalfire.com/4sight/education/understanding\\_thermal\\_expansion\\_in\\_ceramic\\_glazes\\_198.html](http://digitalfire.com/4sight/education/understanding_thermal_expansion_in_ceramic_glazes_198.html). [Accessed 14th January 2016]
- Hatton, G., Shortland, A. and Tite, M. (2008) The Production Technology of Egyptian Blue and Green Frits from Second Millennium BC Egypt and Mesopotamia. *Journal of Archaeological Science.*, p. 1591–1604.
- Hopper, R. (2010) *Egyptian Paste*. Available from: <http://ceramicartsdaily.org/wp-content/uploads/2010/06/egyptianpaste.pdf> [Accessed 16 November 2015]
- Hoskins, S. (2014) *3d Printing For Artists, Designers and Makers: Technology Crossing Art and Industry*. 1st ed. : Bloomsbury.
- Huson, D and Hoskins, S (2011) *Ceramic product and process*. Patent number WO2011154732A1
- Huson, D. (2015) Unpublished results. *Private communication regarding particle size requirements for powder binder 3D printing* [11 December 2015]
- i.materialise (2015) Available from: <https://i.materialise.com/> [Accessed 17 November 2015]
- Jarvis, D. (2013) *Amaze project aims to take 3D printing 'into metal age'* by James Morgan, Available from: <http://www.bbc.co.uk/news/science-environment-24528306> [Accessed 17.07.16]
- Kemmis, S. and Mc Taggart, R. (1982) *The action Research Reader*. 1st ed. Australia: Deakin University Press.
- Kiefer, C. and Allibert, A. (1971) Pharonic blue ceramics. *Archaeology* 24.2., pp. 107-117.

Klein, J., Stern, M., Franchin, G., Kayser, M., Inamura, C., Dave, S., Weaver, J., Houk, P., Colombo, P., Yang, M. and Oxman, N. (2015) Additive Manufacturing of Optically Transparent Glass. *3d Printing and Additive Manufacturing* [online]. 2 (3), pp. 92-105. [Accessed 17 November 2015].

Koop, R. (2014) Back Door Pottery. EGYPTIAN PASTE FAIENCE CLAY BEADS Workshop. February 5th 2014. Available from: <http://www.backdoorpottery.com/egyptian.html> [Accessed 17 November 2015]

Kühne, K. (1969) ur Kenntnis silikatischer Werkstoffe und der Technologie ihrer Herstellung im 2. Jahrtausend vor unserer Zeitrechnung: mit einem Vorwort von Steffen Wenig. *Akad.-verlag* [online]. [Accessed 17 November 2015].

Lipson, H. and Kurman, M. (2013) *Fabricated The New World of 3d Printing*. Indianapolis: John Wiley & Sons Inc.

Lucas, A. (1948) *Ancient Egyptian Materials & Industries*. 3rd ed. London: Edward Arnold & Co.

MakerBot (2015) *Thingiverse*. Available from: <http://www.thingiverse.com/> [Accessed 17 November 2015]

Matin, M. and Matin, M. (2012) Egyptian faience glazing by the cementation method part 1: an investigation of the glazing powder composition and glazing mechanism. *Journal of Archaeological Science*. 39 (3), pp. 763-776.

Nannan, G.U.O. and Ming, C. (2013) Additive manufacturing: technology, applications and research needs. *Higher Education Press and Springer-verlag Berlin Heidelberg* [online]. [Accessed 17 November 2015].

Noble, J. (1969) he technique of Egyptian faience. *American Journal of Archaeology.*, pp. 435-439.

Natron (2015) Wikipedia [online]. 15 September 2015. Available from: <https://en.wikipedia.org/wiki/Natron> [Accessed 17 November 2015]

Nicholson, P. (2009) *Faience technology*. In *Willeke Wendrich (ed.)*. Ucla Encyclopaedia of Egyptology: Los Angeles.

Nicholson, P. (1998) *Materials and Technology. in Friedman, F. D. Gifts of the Nile, Ancient Egyptian Faience*. London: Thames and Hudson Ltd.

NHS Choices, (2015) *Silicosis*. Available from:

<http://www.nhs.uk/conditions/Silicosis/Pages/Introduction.aspx> [Accessed 17 November 2015]

Open 3DP, University of Washington (2015) *An Open 3D Printing Forum*. Available from:

<http://depts.washington.edu/open3dp/%20Accessed%2019.05.15> [Accessed 17 November 2015]

Oppenheim, A.L., Brill, R.H., Barag, D. and Saldern, A.V. (1970) *Glass and Glassmaking in Ancient Mesopotamia*.

Palermo, E. (2013) Fused Deposition Modelling: Most Common 3D Printing Method.

*livescience*. Available from: <http://www.livescience.com/39810-fused-deposition-modeling.html> [Accessed 17 November 2015]

Parian Ware (2016) Wikipedia [online]. May 2016. Available from:

[https://en.wikipedia.org/wiki/Parian\\_ware](https://en.wikipedia.org/wiki/Parian_ware) [Accessed 09 July 2016]

Peña del Olmo, M. N. (2011) *ADDITIVE MANUFACTURING OF NON PLASTIC PORCELAIN MATERIAL BY DIRECT WRITING AND FREEZE CASTING*. PhD, De Montfort University

Photogrammetry (2015) Wikipedia [online] November 2015. Available from:

<https://en.wikipedia.org/wiki/Photogrammetry> [Accessed 18 November 2015]

Popular Archaeology (2012) *The Earliest Known Pottery*. Available from: [http://popular-](http://popular-archaeology.com/issue/june-2012/article/the-earliest-known-pottery)

[archaeology.com/issue/june-2012/article/the-earliest-known-pottery](http://popular-archaeology.com/issue/june-2012/article/the-earliest-known-pottery) [Accessed 17 November 2015]

Premier Composite Technologies. *What are composites?* Available from:

<http://www.pct.ae/composites.php> [Accessed 17.01.16]

Reeves, P. (2012) Could Additive Manufacturing contribute towards environmental

sustainability and carbon reduction across the supply chain? *Econolyst* [online]. [Accessed 18 November 2015].

Riccardelli, C., Mass, J. and Thornton, J. (2002) Egyptian faience inlay techniques: a process for obtaining detail and clarity by refiring. *Materials Research Society Symposium Proceedings*. 712, pp. 545-570.

Rhodes, D. and Hopper, R. (2000) *Clay and Glazes For the Potter*. 3rd ed.: Krause Publications.

Sandia National Laboratories (1999) February 4<sup>th</sup> 1999. Available from: <http://www.sandia.gov/media/robocast.htm> [Accessed 30 November 2015]

Science Daily, University of Washington(2009) *3D-Printing Hits Rock-Bottom Prices With Homemade Ceramic Mix*. Available from: <http://www.sciencedaily.com/releases/2009/03/090331153010.htm> [Accessed 17 November 2015]

Science Learning Hub. *What are ceramics?* (2014) Available from: <http://www.sciencelearn.org.nz/Contexts/Ceramics/Science-Ideas-and-Concepts/What-are-ceramics> [Accessed 07July 2014]

Science learning Hub, *What is clay?* (2010) Available from: <http://sciencelearn.org.nz/Contexts/Ceramics/Science-Ideas-and-Concepts/What-is-clay> [Accessed 04.08.15]

Sedlecky-Kaolin, *Kaolin Origin* (2008) Available from: <http://www.sedlecky-kaolin.cz/en/vyrobky-a-sluzby/vznik-kaolinu.htm> [Accessed 04.08.15]

Shapeways, Inc (2015) Available from: <http://www.shapeways.com> [Accessed 17 November 2015]

Stereolithography (2016) Wikipedia [online] December 2016 Available from <https://en.wikipedia.org/wiki/Stereolithography> [Accessed 2nd March 2017]

Synergy (2015) Wikipedia [online] December 2015. Available from: <https://en.wikipedia.org/wiki/Synergy> [Accessed 16 December 2015]

Shortland, A. and Tite, M. (2008) *Production Technology of Faience and Related Vitreous Materials*. Oxford: Oxford University School of Archaeology.

Tajeddin, Z. (2014) *Egyptian Faience; Ancient Making Methods and Consideration of Technical Challenge in Sculptural Practice*. PhD, University College London

TCT Magazine (2016) *Admatec ADMAFLEX 130 ceramic 3D printer now available for pre-order*. Available from <http://www.tctmagazine.com/3D-printing-news/admatec-admaflex-130-ceramic-3d-printer/> [Accessed 22nd January 2017]

Tite, M., Shortland, A. and Paynter, S. (2002) The Beginnings of Vitreous Materials in the Near East and Egypt. *Accounts of Chemical Research*. 35, p. 585–593.

Thermal expansion (2015) Wikipedia [online] November 2015. Available from: [https://en.wikipedia.org/wiki/Thermal\\_expansion](https://en.wikipedia.org/wiki/Thermal_expansion) [Accessed 17 November 2015]

Thixotropy (2015) Wikipedia [online]. October 2015. Available from: <https://en.wikipedia.org/wiki/Thixotropy> [Accessed 17 November 2015]

[Thomas O. Mason, Encyclopaedia Britannica, Advanced ceramics \(2014\) Available from: www.britannica.com/technology/advanced-ceramics](http://www.britannica.com/technology/advanced-ceramics) [Accessed 29.07.15]

Tragacanth (2015) Wikipedia [online] November 2015. Available from: <https://en.wikipedia.org/wiki/Tragacanth> [Accessed 17 November 2015]

Treggiden, K. (2014) *dezeen. Olivier van Herpt 3D-prints functional ceramic objects*. Available from <https://www.dezeen.com/2014/08/22/olivier-van-herpt-3d-printed-functional-ceramic-objects/> [Accessed 28 February 2017]

Unfold (2010) *L'Artisan Electronique*. Available from: <http://unfold.be/pages/l-artisan-electronique> [Accessed 17 November 2015]

Vandiver, P. (1983) *Appendix A: The Manufacture of Faience*. in A. Kaczmarczyk & R. Hedges, *Ancient Egyptian Faience: An Analytical Survey of Egyptian Faience From Predynastic to Roman Times*. Warminster: Aris & Phillips.

Vandiver, P. and Kingery, W. (1986) Egyptian faience: the first high-tech ceramic. *The American Ceramic Society, Inc.* 3, pp. 9-34.

Vandiver, P. (1998) *A Review and Proposal of New Criteria For Production Technologies of Egyptian Faience*. In S. Colinart & M. Menu (Eds.), *La couleur dans la peinture et l'émaillage de l'Égypte ancienne: Actes de la table ronde*. Bari: Edipuglia.



- Vandiver, P. (1985) Sequential slab construction: a near eastern pottery production technology, 8000-3000 bc. *Diss. Massachusetts Institute of Technology*.
- Vandiver, P. (1982) Technological change in Egyptian faience. *Archaeological Ceramics*, pp. 167-179.
- Verbruggen, D. (2014) The road to better paste extrusion. In Practical exploration of 3D printing. *REPRAP Magazine* [online]. [Accessed 17 November 2015].
- Walters, P., Huson, D. and Southerland, D. (2011) Edible 3D printing. In: *Society For Imaging Science and Technology, , Ed. (2011) Nip27: International Conference on Digital Printing Technologies and Digital Fabrication 2011* [online]. [Accessed 17 November 2015].
- Watson, P.J. (1965) *The Chronology of North Syria and North Mesopotamia From 10,00 B.c. to 200 B.c.*, In: Ehrich, R. W., (Ed.), *Chronologies in Old World Archaeology*. Chicago: Univ. Chicago Press
- Wang, B. (1999) *Concurrent Design of Products, Manufacturing Processes and Systems*. : Gordon and Breach Science Publishers.
- Warnier, C. and Verbruggen, D. (2014) *Printing Things: Visions and Essentials for 3D Printing*. 1st ed. : Prestel Pub.
- Weyers, J. (1987) Porcelain with a Marble air. *The Glasgow Herald*, 13<sup>th</sup> June 1987. 17
- Wohlers Associates (2010) *What is additive manufacturing?* Available from: <https://www.wohlersassociates.com/additive-manufacturing.html> [Accessed 17 November 2015]
- Wulff, H. (1966) *The Traditional Crafts of Persia: Their Development, Technology and Influence on Eastern and Western Civilizations*.
- Wulff, H.E., Wulff, H.S. and Koch, L. (1968) Egyptian faience-a possible survival in Iran. *Archaeology*. 21 (2), pp. 98-107.
- Xjet (2016) *XJET ANNOUNCES 3D CERAMIC CAPABILITIES*. Available from <http://www.xjet3d.com/news-5.html> [Accessed 22nd January 2017]