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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

## Petition for Cancellation

Notice is hereby given that the following party has filed a petition to cancel the registration indicated below.

## Petitioner information

Name	Samsung Electronics Co., Ltd.			
Entity	Limited Company Citizenship Republic of Korea			
Address	129, SAMSUNG-RO YEONGTONG-GU YONGIN-SI, GYEONGGI-DO KOREA, REPUBLIC OF	129, SAMSUNG-RO YEONGTONG-GU YONGIN-SI, GYEONGGI-DO, 17113 KOREA, REPUBLIC OF		

Attorney informa- tion	DAVID A. PLUMLEY LEWIS ROCA ROTHGERBER CHRISTIE LLP 655 NORTH CENTRAL AVENUE SUITE 2300 GLENDALE, CA 91203 UNITED STATES Primary email: pto@lewisroca.com Secondary email(s): dplumley@lewisroca.com, kykim@lewisroca.com, jbollinger@lewisroca.com 626-795-9900
Docket no.	306492-00028

## Registration subject to cancellation

Registration no.	6115619 Registration date		08/04/2020	
Register	Principal			
International re- gistration no.	NONE International re- gistration date NONE			
Registrants	Rosnes Corporation 5-1, YAMANOUCHIYORO-CHO, UKYO-KU, KYOTO-SHI KYOTO 615-0081 JAPAN OPNOUS K.K co., Ltd. 1-5-4, KOJIMACHI, CHIYODA-KU TOKYO 1020083			

## Goods/services subject to cancellation

Class 009. First Use: None First Use In Commerce: None All goods and services in the class are subject to cancellation, namely: Semi-conductors; semiconductor devices; integrated circuits; image sensors

## Grounds for cancellation

Abandonment	Trademark Act Section 14(3)
Other	Non-Use - Trademark Act Section 14(6)

Attachments	Petition.pdf(560286 bytes ) Declaration and Exhibits_Part1.pdf(6136517 bytes ) Declaration and Exhibits_Part2.pdf(6212754 bytes ) Declaration and Exhibits_Part3.pdf(865745 bytes )
Signature	/Karen Y. Kim/
Name	Karen Y. Kim

Date

08/04/2023

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

ı.

In the Matter of Trademark Registration No. 6115619 For the mark DIAMOND PIXEL (word mark)

SAMSUNG ELECTRONICS CO., LTD.,	Cancellation No.
Petitioner,	
V.	PETITION FOR CANCELLATION
ROSNES CORPORATION; and OPNOUS	
K.K CO., LTD.	
Registrants.	

Samsung Electronics Co., Ltd. ("Samsung" or "Petitioner") is a Republic of Korea limited company with an address of 129, Samsung-ro, Yeongtong-gu, Yongin-si, Gyeonggi-do, Republic of Korea 17113, and who believes that it is being damaged and will continue to be damaged by the registration of the word mark DIAMOND PIXEL as show in U.S. Trademark Registration No. 6,115,619 (the "Registration") in International Class 9 for "Semi-conductors; semiconductor devices; integrated circuits; image sensors" and hereby seeks to cancel the registration.

As grounds for cancellation, Petitioner alleges that:

1. Registrants Rosnes Corporation ("Rosnes") and Opnous K.K Co., Ltd.

("Opnous") (collectively, "Registrants") are the owners of United States Trademark Registration No. 6,115,619 (the "Registration") for the mark DIAMOND PIXEL ("Registrants' Mark") for "Semiconductors; semiconductor devices; integrated circuits; image sensors" in International Class 9. The application that later issued as the Registration was filed on January 28, 2020, pursuant to Section 66(a) of the Trademark Act (15 U.S.C. §1141f(a)) based on International Registration

No. 1522407. As it was based on a Section 66(a) application, the Registration issued on August 4, 2020, without the Registrants submitting any evidence of use of the trademark in U.S. Commerce.

2. On information and belief, Rosnes is a Japanese corporation.

3. On information and belief, Opnous is a Japanese limited company.

 Petitioner is the owner of United States Trademark Application No. 90/127,492
 ("Petitioner's Application") for the mark SAMSUNG DIAMOND PIXEL for "Digital signage display panels; Light emitting diode (LED) displays; OLED (Organic light emitting diode) display panels;
 Flat panel display screens; LCD large-screen displays; Flexible flat panel displays for
 computers; Video display screens for portable communications apparatus" in International Class
 9. Petitioner's Application was filed on August 20, 2020, on an intent to use basis. A copy of the TESS printout for Petitioner's Application is attached as Exhibit A.

5. Petitioner's Application was refused registration based on an alleged likelihood of confusion with the Registrants' Mark.

On appeal, the Board affirmed such refusal based on Registrants' Mark.
 Petitioner has sought and obtained an extension of time to appeal or review the decision of the Board.

7. Given the Board's decision in Petitioner's Application, Petitioner is being injured by the continued existence of the Registration and has standing to petition for its cancellation.

On information and belief, Registrants have never used the Registrants' Mark in
 U.S. Commerce in connection with "Semi-conductors; semiconductor devices; integrated circuits; image sensors."

9. On information and belief, Rosnes operates its company website using the domain <u>rosnes.jp</u> (the "Rosnes Domain") which resolves to the homepage for the English language website for Rosnes at <u>http://rosnes.jp/en/rosnes-inc/</u> (the "Rosnes Website"). Declaration of Julie Bolliger ("Bolliger Declaration") ¶ 14.

10. On information and belief, Opnous operates its company website using the domain <u>opnous.co.jp</u> (the "Opnous Domain") which resolves to the homepage for the English language website for Opnous at <u>https://opnous.co.jp/</u> (the "Opnous Website"). Bolliger Declaration ¶ 15.

11. Using the Google search engine, Petitioner conducted an Internet search for webpages that include the terms "DIAMOND PIXEL" and "Rosnes." The search did not identify any evidence of use of the Registrants' Mark by Rosnes in the United States. Bolliger Declaration ¶¶ 4-9.

12. Using the Google search engine, Petitioner conducted an Internet search for webpages that include the terms "DIAMOND PIXEL" and "Opnous." The search did not identify any evidence of use of Registrants' Mark by Opnous in the United States. Bolliger Declaration ¶¶ 10-13.

13. Using the "Advanced Search" feature of the Google search engine, Petitioner conducted an Internet search for any occurrences of either of the terms "DIAMOND" or "DIAMOND PIXEL" at the Rosnes Domain. The search did not identify any evidence of use of the Registrants' Mark by Rosnes in the United States. Bolliger Declaration ¶¶ 16, 18-19.

14. Using the "Advanced Search" feature of the Google search engine, Petitioner conducted an Internet search for any occurrences of either of the terms "DIAMOND" or "DIAMOND PIXEL" at the Opnous Domain. The search did not identify any evidence of use of Registrants' Mark by Opnous in the United States. Bolliger Declaration ¶¶ 17, 20.

15. Using the Wayback Machine at www.archive.org, Petitioner searched for archived "snapshots" of webpages having a Uniform Resource Locator ("URL") with a prefix matching that of the Rosnes Website: <u>http://rosnes.jp/en</u>. Upon reviewing snapshots taken between August 4, 2020 and August 4, 2023, Petitioner found no evidence that Rosnes had used Registrants' Mark. Bolliger Declaration **¶¶** 20-21.

16. Using the Wayback Machine, Petitioner searched for archived "snapshots" of webpages having a Uniform Resource Locator ("URL") with a prefix matching that of the Opnous Website: <u>http://opnous.co.jp</u>. Upon reviewing snapshots taken between August 4, 2020 and August 4, 2023, Petitioner found no evidence that Opnous had used Registrants' Mark. Bolliger Declaration ¶¶ 23-24.

#### CAUSES OF ACTION FOR CANCELLATION

## COUNT I: PRESUMPTION OF ABANDONMENT BASED ON THREE YEARS OF NON-USE

17. Petitioner repeats and realleges the allegations of paragraphs 1-16 of the petition.

18. On information and belief, it has been at least three (3) consecutive years since the Registration issued as a registration, and during that time, Registrants have never used Registrants' Mark in U.S. Commerce for the goods identified in the Registration. Thus, the statutory presumption of abandonment applies pursuant to Section 45 of the Trademark Act (15 U.S.C. § 1127).

19. On information and belief, Registrants cannot rebut the statutory presumption of abandonment with any evidence of actual use of Registrants' Mark in U.S. Commerce nor with any evidence of intent to resume use of Registrants' Mark in U.S. Commerce.

20. By virtue of the foregoing, if Registrants' Mark is permitted to remain on the Principal Register, Petitioner will continue to be damaged, including its ability to secure a registration for its SAMSUNG DIAMOND PIXEL mark, and Registrants will enjoy unlawful gain and advantage to which it is not entitled under the Lanham Act.

21. The Registration should be cancelled pursuant to the Trademark Act §§14(3) and 45 (15 U.S.C. §§ 1064(6) and 1127), and TBMP § 309.03(c)(1) paragraph 13.

### COUNT II: ABANDONMENT WITH NO INTENT TO RESUME USE

22. Petitioner repeats and realleges the allegations of paragraphs 1-21 of the petition.

23. On information and belief, Registrants have either never used, or have completely ceased using, the Registrants' Mark in U.S. Commerce in connection with any or all of the goods and services identified in the Registration in the United States.

24. On information and belief, any use that Registrants made of Registrants' Mark in the United States was not a use made in the ordinary course of trade and was merely to reserve a right in Registrants' Mark.

25. On information and belief, Registrants do not have an intent to resume use of the Registrants' Mark in U.S. Commerce in connection with any or all of the goods identified in the Registration in the reasonably foreseeable future.

26. On information and belief, Registrants have not taken any steps towards a bona fide use of the Registrants' Mark in U.S. Commerce in connection with any or all of the goods identified in the Registration in the United States.

27. By virtue of the foregoing, if Registrants' Mark is permitted to remain on the Principal Register, Petitioner will continue to be damaged, including its ability to secure a registration for its SAMSUNG DIAMOND PIXEL mark, and Registrants will enjoy unlawful gain and advantage to which it is not entitled under the Lanham Act.

28. The Registration should be cancelled pursuant to the Trademark Act §§14(3) and 45 (15 U.S.C. §§ 1064(6) and 1127), and TBMP § 309.03(c)(1) paragraph 13.

### COUNT III: EXPUNGEMENT FOR NON-USE

29. Petitioner repeats and realleges the allegations of paragraphs 1-28 of the petition.

30. The Registration issued on August 4, 2020 pursuant to Section 66(a) of the United States Trademark Act and is now at least three years old.

31. On information and belief, Registrants have not used Registrants' Mark in U.S. Commerce in connection with any of the goods identified in the Registration at any time since the Registration issued.

32. On information and belief, no special circumstances exist that excuse such nonuse.

33. The Registration should be cancelled in whole on the grounds of expungement pursuant to the Trademark Act §14(6) (15 U.S.C. §1064(6)), and TBMP § 307.03, TBMP § 309.03(c)(1) paragraph 28, as Registrants have never used the Registrants' Mark in U.S. Commerce in connection with any of the goods recited in the Registration at any time since the Registration issued.

WHEREFORE, Petitioner prays that this Petition for Cancellation be sustained in favor of Petitioner and that U.S. Registration No. 6,115,619 be cancelled in its entirety.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

Date: August 4, 2023

By /Karen Y. Kim/

David A. Plumley Karen Y. Kim Attorneys for Petitioner P.O. Box 29001 Glendale, CA 91209-9001 (626) 795-9900

# Exhibit A

United States Patent and Trademark Office Home  Site Index  Search  FAQ  Glossary   Contacts  eBusiness   eBiz alerts   News
Irademarks > Irademark Electronic Search System (TESS)
ESS was last updated on Fri Aug 4 03.47.22 EDT 2023
SS HOWS NOW USER STRUCTURED FREE FORM Revenuence SEARCHOG BOTTOW HELP Pricy List Current List Fried Doc Party Doc Nact Doc List Doc
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ublished for Opposition May 19, 2020
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(REGISTRANT) OPNOUS K K co., Ltd. Company Limited JAPAN 1-5-4, Kojimachi, Chiyoda-ku Tokyo 1020083 JAPAN
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https://tmsearch.uspto.gov/bin/showfield?f=doc&state=4808:d3gapx.2.9 Google Chrome 115.0.5790.170 1:49:49 PM 8/4/2023 Windows 10 Enterprise 64-bit Build 19044

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

i.

In the Matter of Trademark Registration No. 6115619 For the mark DIAMOND PIXEL (word mark)

SAMSUNG ELECTRONICS CO., LTD.,	Concellation No.
Petitioner,	
V.	DECLARATION OF JULIE BOLLIGER
ROSNES CORPORATION; and OPNOUS K.K CO., LTD.	
Registrants.	

I, Julie Bolliger, am competent to testify to the matters set forth herein and declare and state as follows:

1. I am submitting this Declaration in support of Samsung Electronics Co., Ltd.'s Petition for Cancellation regarding the trademark DIAMOND PIXEL, Reg. No. 6115619, (the "Registration") jointly owned by Rosnes Corporation ("Rosnes") and OPNOUS K.K co., Ltd. ("Opnous.")

2. I am a paralegal at Lewis Roca Rothgerber Christie LLP. My main focus of work is intellectual property and am familiar with the fundamentals of U.S. trademark law.

3. Except as otherwise indicated, the facts set forth herein are known personally to me or are being provided on information and belief.

4. Using the Google search engine, I conducted an Internet search for webpages that include both of the terms "diamond pixel" and "rosnes." A printout of the search results for this search is attached as **Exhibit 1** and it is my conclusion that this search did not reveal any

trademark use of the DIAMOND PIXEL trademark by Rosnes. I explain each result from that search in the following paragraphs.

5. Website: <u>https://trademarks.justia.com/owners/rosnes-corporation-2120629/</u>. This webpage lists U.S. trademark applications or registrations owned or co-owned by Rosnes and identifies the Registration but fails to show any use of DIAMOND PIXEL as a trademark by Rosnes in connection with the goods of the Registration. See **Exhibit 2**.

6. Website: <u>https://uspto.report/TM/88869753</u>. This webpage shows the trademark application details for DIAMOND PIXEL, Ser. No. 88869753 (filed by Samsung Display Co., Ltd.) and also lists information about the Registration but fails to show any use of DIAMOND PIXEL as a trademark by Rosnes in connection with the goods of the Registration. See **Exhibit** 

3.

7. Website: https://doras.dcu.ie/22520/1/PFONeill Aug2018.pdf. This webpage links to a PhD submission paper by Paul Francis O'Neill at Dublin City University, School of Mechanical and Manufacturing Engineering, entitled "Internal void fabrication via mask projection microstereolithography: A rapid repeatable microfluidic prototyping technique." Because this paper is 235 pages long, Exhibit 4 includes only the introductory portions through the abstract and those pages that include either "diamond pixel" or "Rosnes." The paper includes the term "diamond pixel" in what appears to be a descriptive way, and also includes three footnotes to other articles that appear to be authored by a person with the surname "Rosnes." However, this paper fails to show any use of DIAMOND PIXEL as a trademark by Rosnes in connection with the goods of the Registration. See Exhibit **4**.

8. Website: <u>https://www.houjin.info/details/1130001028431</u>. This website appears to be in Japanese, providing company information about Rosnes including information about the Registration but fails to show any use of DIAMOND PIXEL as a trademark by Rosnes in connection with the goods of the Registration. See **Exhibit 5**.

9. Website: <u>https://okashik.atype.jp/redirect.php?action=url&goto=lautestfast.tk/iavzdoh372</u> okashikatypejpmini3 This page does not load. See **Exhibit 6**.

10. Using the Google search engine, I conducted an Internet search of the terms "diamond pixel" and "opnous." A printout of the search results for this search is attached as **Exhibit 7** and it is my conclusion that this search did not reveal any trademark use of the DIAMOND PIXEL trademark by Opnous. I explain each result from that search in the following paragraphs.

11. Website: <u>https://uspto.report/TM/88869753</u>. This webpage shows the trademark application details for DIAMOND PIXEL, Ser. No. 88869753 (filed by Samsung Display Co., Ltd.) and also lists information about the Registration but fails to show any use of DIAMOND PIXEL as a trademark by Opnous in connection with the goods of the Registration. See **Exhibit 8**.

12. Website: <u>https://trademarks.justia.com/owners/rosnes-corporation-2120629/</u>. This webpage lists U.S. trademark applications or registrations owned or co-owned by Opnous and identifies the Registration but fails to show any use of DIAMOND PIXEL as a trademark by Opnous in connection with the goods of the Registration. See **Exhibit 9**.

13. Website: <u>https://www.houjin.info/detail/2010001178766/</u>. This website appears to be in Japanese, providing company information about Opnous including information about the Registration but fails to show any use of DIAMOND PIXEL as a trademark by Opnous in connection with the goods of the Registration. See **Exhibit 10**.

14. Using the Google search engine, I searched for the term "Rosnes Corporation" and from that search, I believe that the domain name for the website operated by Rosnes is <u>rosnes.jp</u> (the "Rosnes Domain.") That domain resolves to the homepage for what I believe is the English language website for Rosnes at <u>http://rosnes.jp/en/rosnes-inc/</u> (the "Rosnes Website.") A printout of the homepage for the Rosnes Website is attached as **Exhibit 11**.

15. Using the Google search engine, I searched for the term "Opnous Co" and from that search, I believe that the domain name for the website operated by Opnous is <u>opnous.co.jp</u> (the

"Opnous Domain.") That domain resolves to the homepage for what I believe is the English language website for Opnous at <u>https://opnous.co.jp/</u> (the "Opnous Website.") A printout of the homepage for the Opnous Website is attached as **Exhibit 12**.

16. Using the Google "Advanced Search" search engine, I searched for any occurrences of the term "diamond pixel" at the Rosnes Domain with no results. A printout of the result page for that search is attached as **Exhibit 13**.

17. Using the Google "Advanced Search" search engine, I searched for any occurrences of the term "diamond pixel" at the Opnous Domain with no results. A printout of the result page for that search is attached as **Exhibit 14**.

18. Using the Google "Advanced Search" search engine, I searched for any occurrences of the term "diamond" at the Rosnes Domain with one result. A printout of the result page for that search is attached as **Exhibit 15**.

19. The one result from the Google "Advanced Search" for occurrences of "diamond" at the Rosnes Domain is: <u>http://www.rosnes.jp/kigyou\_en.html</u>. This appears to be a webpage that mentions the company "Mitsuboshi [sic] Diamond industrial" but includes no use of DIAMOND or DIAMOND PIXEL as a trademark by Rosnes in connection with the goods of the Registration. See **Exhibit 16**.

20. Using the Google "Advanced Search" search engine, I searched for any occurrences of the term "diamond" at the Opnous Domain with no results. A printout of the result page for that search is attached as **Exhibit 17**.

21. Using the Wayback Machine at <u>www.archive.org</u>, I searched for archived "snapshots" of Uniform Resource Locators ("URLs") with the prefix <u>http://rosnes.jp/en</u> (the "Rosnes URL Prefix Search.") According to the results of the Rosnes URL Prefix Search, 22 different URLs with that prefix had been captured, some with multiple captures. See **Exhibit 18**.

22. I then reviewed each capture from the Rosnes URL Prefix Search with a capture date between August 4, 2020 and the date of this Declaration, and found no occurrences of either of the terms "DIAMOND" or "DIAMOND PIXEL" at any of those captures.

23. Using the Wayback Machine, I searched for archived "snapshots" of URLs with the prefix <u>https://opnous.co.jp</u> (the "Opnous URL Prefix Search.") According to the results of the Opnous URL Prefix Search, 5 different URLs with that prefix had been captured, some with multiple captures. See **Exhibit 19.** 

24. I then reviewed each capture from the Opnous URL Prefix Search with a capture date between August 4, 2020 and the date of this Declaration, and found no occurrences of either of the terms "DIAMOND" or "DIAMOND PIXEL" at any of those captures.

I declare under penalty of perjury of the laws of the United States of America that the foregoing is true and correct.

EXECUTED this 4<sup>th</sup> day of August, 2023 at Phoenix, Arizona, United States of America.

By: <u>/Julie Bolliger/</u> Julie Bolliger, Paralegal LEWIS ROCA ROTHGERBER CHRISTIE LLP

# EXHIBIT 1



About 5 results (0.32 seconds)

USPTO .report
 https://uspto.report > ... :

#### DIAMOND PIXEL - Samsung Display Co., Ltd.

Mark For: **DIAMOND PIXEL** trademark registration is intended to cover the categories of computer monitors; video monitors; computers; Television receivers; ...

Justia

https://trademarks.justla.com > owners > rosnes-corpor...

#### **Rosnes Corporation Trademarks**

DIAMOND PIXEL. Filed: January 28, 2020. Semi-conductors; semiconductor devices; integrated circuits; image sensors. Owned by: Rosnes Corporation and OPNOUS ...

https://trademarks.justia.com > owners > opnous-k-k-c...

#### OPNOUS K.K co., Ltd. Trademarks

DIAMOND PIXEL. Filed: January 28, 2020. Semi-conductors; semiconductor devices; integrated circuits; image sensors. Owned by: Rosnes Corporation and OPNOUS ...

Dublin City University

https://doras.dcu.ie > PFONeill\_Aug2018 PDF

#### Internal void fabrication via mask projection micro ... - DORAS

by PF O'Neill · 2018 · Cited by 4 — The Asiga 3D printer DMD optical engine is oriented in a **diamond pixel** orientation as previously reported by Gong et al.12 and verified in section 6.2.1... 235 pages

法法人.info

https://www.houjin.info>detail · Translate this page : 株式会社Rosnes | 京都府京都市下京区

Jul 28, 2021 — 株式会社Rosnes(ロスネス)は、法人番号:1130001028431で京都府京都市下 京区鶏鉾町480番地 ... 株式会社Rosnesについて(項目別) ... Diamond Pixel.

Southern United States - Based on your past activity - Update location

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# EXHIBIT 2

## **JUSTIA** Trademarks Q Search Find a Lawyer Ask a Lawyer Research the Law Law Schools Laws & Regs Newsletters Marketing Solutions Justia > Trademarks > Rosnes Corporation **Rosnes Corporation Trademarks** JUSTIA ROSNES



#### Filed: February 3, 2011 Telecommunication devices and apparatus for capturing and/or processing images; parts for telecommunication devices and ... Owned by: Rosnes Corporation Serial Number: 79094570

#### DIAMOND PIXEL Filed: January 28, 2020

Diamond Pixel

Semi-conductors; semiconductor devices; integrated circuits; image sensors Owned by: Rosnes Corporation and OPNOUS K.K co., Ltd. Serial Number: 79281958

## EARTH CAMERA

cameras; camera parts and accessories; television cameras; digital cameras; digital camcorders; network cameras; panoramic... EARTH CAMERA Owned by: Rosnes Corporation and KANEMATSU (CHINA) Co., Ltd. Serial Number: 86056930



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## JUSTIA Trademarks

EARTH CAMERA

digital camcorders; network cameras; panoramic... Owned by: Rosnes Corporation and KANEMATSU (CHINA) Co., Ltd. Serial Number: 86056930



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#### **Marketing Solutions**

Justia Connect Membership Justia Lawyer Directory Justia Premium Placements Justia Elevate (SEO, Websites) Justia Amplify (PPC, GBP) Justia Onward Blog Testimonials More...

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Justia Connect Legal Portal Company Help Terms of Service Privacy Policy Marketing Solutions

# EXHIBIT 3



video monitors; computers; Television receivers; cathode ray tubes; Plasma display panels; flat panel electroluminescent displays; diodes; Portable communication machines; Displays for portable communication equipment; MP3 players; Displays for MP3 players; MP4 Players; Displays for MP4 Players; Portable multimedia players; Displays for portable multimedia players; Vehicle navigation devices; Displays for

Status 2020-04-16 UTC

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The trademark application has been accepted by the Office (has met the minimum filing requirements) and has not yet been assigned to an examiner.

Research	👿 💟 Ň 💁 🌞 OneLook Acronym Finder	
Serial Number	88869753	
Registration Number	6422005	
Mark Literal Elements	DIAMOND PIXEL	
Mark Drawing Type	4 - STANDARD CHARACTER MARK	
Mark Type	Trademark	
Current Location	NEW APPLICATION PROCESSING 2020-04-16	
Basis	44(e)	
Class Status	ACTIVE	
Primary US Classes	021: Electrical Apparatus, Machines and Supplies	
	023: Cutlery, Machinery, Tools and Parts Thereof	
	026: Measuring and Scientific Appliances	
	036: Musical Instruments and Supplies	
	038: Prints and Publications	
Primary International Class	009 - Primary Class	
	(Electrical and scientific apparatus) Scientific, nautical, surveying, electric, photographic, cinematographic, optical, weighing, measuring, signaling, checking (supervision), lifesaving and teaching apparatus and instruments; apparatus for recording, transmission or reproduction of sound or images; magnetic data carriers, recording discs; automatic vending machines and mechanisms for coin operated apparatus; cash registers, calculating machines, data processing equipment and computers; fire-extinguishing apparatus.	
Filed Use	No	
Current Use	No	
Intent To Use	No	
Filed ITU	No	
44D Filed	No	
44E Current	Yes	
66A Current	No	
Current Basis	No	
No Basis	No	
Attorney Name	David A. Plumley	
	188997	

The trademark application h	as been accepted by th	ne Office (has n	net the minimum filing	requirements) a	and has not vet been	assigned to an examiner.
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Research	👿 🔽 Ň 🔤 🜞 OneLook Acronym Finder	
Serial Number	88869753	
Registration Number	6422005	
Mark Literal Elements	DIAMOND PIXEL	
Mark Drawing Type	4 - STANDARD CHARACTER MARK	
Mark Type	Trademark	
Current Location	NEW APPLICATION PROCESSING 2020-04-16	
Basis	44(e)	
Class Status	ACTIVE	
Primary US Classes	021: Electrical Apparatus, Machines and Supplies	
	023: Cutlery, Machinery, Tools and Parts Thereof	
	026: Measuring and Scientific Appliances	
	036: Musical Instruments and Supplies	
	038: Prints and Publications	
Primary International Class	009 - Primary Class	
	(Electrical and scientific apparatus) Scientific, nautical, surveying, electric, photographic, cinematographic, optical, weighing, measuring, signaling, checking (supervision), lifesaving and teaching apparatus and instruments; apparatus for recording, transmission or reproduction of sound or images; magnetic data carriers, recording discs; automatic vending machines and mechanisms for coin operated apparatus; cash registers, calculating machines, data processing equipment and computers; fire-extinguishing apparatus.	
Filed Use	No	
Current Use	Νο	
Intent To Use	No	
Filed ITU	No	
44D Filed	Νο	
44E Current	Yes	
66A Current	No	
Current Basis	No	
	No	
No Basis		
No Basis Attorney Name	David A. Plumley	

Attorney Name			David A Plumley	
Attorney Docket Num	her		188007	
, atomey prochet null				
Timeline				
2014-07-04			Trademark Registered	
2020-04-13			Application Filed	
2020-04-16			Location: NEW APPLICATION PROCESSIN	G
2020-04-16			Status: Live/Pending	
2020-04-16			Status: New application will be assigned to a approximately 3 months after filing date.	an examining attorney
2020-04-16			Transaction Date	
2021-07-13			Trademark Registered	
Trademark Partie	es (Applicants & Owners	)		
Party:			G Samsung Display Co., Ltd.	
Address			1, Samsung-ro, Giheung-gu Yongin-si, Gyeo OF 17113	nggi-do KOREA, REPUBLIC
Legal Entity Type			Limited Company (Itd.)	
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# EXHIBIT 4



#### Internal void fabrication via mask projection micro ... - DORAS

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## Internal void fabrication via mask projection micro-stereolithography: A rapid repeatable microfluidic prototyping technique

Paul Francis O'Neill, B.A., B.A.I

submitted as part of the degree of Philosophiæ Doctor (PhD)

from

Dublin City University,

School of Mechanical and Manufacturing Engineering

Supervisor: Prof. Dermot Brabazon

Co-supervisor: Prof. Dermot Diamond

August 2018

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## **List of Publications**

## Journal Papers

<u>O'Neill P. F.</u>, Ben Azouz, A., Vázquez, M., Liu, J., Marczak, S., Slouka, Z., Chang, H. C., Diamond, D., Brabazon, D., Advances in three-dimensional rapid prototyping of microfluidic devices for biological applications, Biomicrofluidics 8, 052112 (2014).<sup>1</sup>

O'Neill, P., Jolivet, L., Kent, N. J. & Brabazon, D. Physical integrity of 3D printed parts for use as embossing tools. Adv. Mater. Process. Technol. 698, 1–10 (2017).<sup>2</sup>

Kent, N. J., Jolivet, L., O'Neill, P. & Brabazon, D. An evaluation of components manufactured from a range of materials, fabricated using PolyJet technology. Adv. Mater. Process. Technol. 698, 1–12 (2017).<sup>3</sup>

## International Peer Reviewed Conference Papers

<u>O'Neill, P. F.</u>, Kent, N., Brabazon, D., Mitigation and control of the overcuring effect in mask projection micro-stereolithography, Proceedings of the 20<sup>th</sup> International ESAFORM Conference on Material Forming, ESAFORM 2017<sup>4</sup>

<u>O'Neill, P.</u>, Barrett, A., Sullivan, T., Regan, F., Brabazon, D., Rapid prototyped biomimetic antifouling surfaces for marine applications, Advances in Functional Materials (AFM 2015)<sup>5</sup>

McCann, R., Freeland, B., <u>O'Neill, P.</u>, "Nanoparticle Fabrication via Pulsed Laser Ablation in Liquid: A Step Towards Production Scale-up", Proceedings of the 20<sup>th</sup> International ESAFORM Conference on Material Forming, ESAFORM 2017

## **Oral Presentations**

<u>O'Neill P. F.</u>, Vázquez, M., Liu, J., Marczak, S., Chang, H. C., Diamond, D., Brabazon, D., Direct fabrication methods for high pressure micro-total analysis systems, Advances in Microfluidics & Nanofluidics (AMN), Academia Sinica, Taiwan, R.O.C, May 2014

<u>O'Neill, P. F.</u>, Kent, N., Brabazon, D., Mitigation and control of the overcuring effect in mask projection micro-stereolithography, 20<sup>th</sup> International ESAFORM Conference on Material Forming, Dublin City University, April 2017 McCann, R., Freeland, B., <u>O'Neill, P.</u>, "Nanoparticle Fabrication via Pulsed Laser Ablation in Liquid: A Step Towards Production Scale-up", 20<sup>th</sup> International ESAFORM Conference on Material Forming, ESAFORM 2017

Brabazon, D., <u>O'Neill, P.</u>, McCann, R., Groarke, R., "Photonic assisted fabrication of advanced liquid UTLC and modular SPE chromatographic platforms", 31st International Symposium on Chromatography, 28 Aug – 1 Sept 2016, Cork, Ireland

## Poster Presentations

<u>O'Neill, P. F.</u>, Vázquez, M., Liu, J., Diamond, D., Brabazon, D., Direct fabrication methods for micro-total analysis systems, 9<sup>th</sup> International Conference on Surfaces, Coatings and Nanostructured Materials (NANOSMAT Dublin), Trinity College Dublin, September 2014

<u>O'Neill, P. F.</u>, Kent, N., Brabazon, D., Mitigation and control of the overcuring effect in mask projection micro-stereolithography, Dublin City University Faculty Research Day, January 2017

## Contents

Declaration	i
List of Publications	iii
Contents	v
List of figures	ix
List of tables	xix
List of Abbreviations	xxi
List of Symbols	xxiii
Acknowledgements	xxv
Dedication	xxvii
Abstract	1
Chapter 1 Introduction	3
1.1 Overview	3
1.2 Objectives	5
1.2.1 Thesis outline	5
Chapter 2 Literature review	7
2.1 Microfluidics	7
2.1.1 A brief history of microfluidics	8
2.1.2 Applications of microfluidic devices	10
2.2 Traditional microfluidic materials and fabrication methods	11
2.2.1 Materials	11
2.2.2 Fabrication methods	12
2.2.2.1 Replication methods	12
2.2.2.2 Chip bonding	16
2.2.2.3 Direct fabrication methods	
2.3 3D printed microfluidic devices	21
2.3.1 Fused Filament Fabrication (FFF)	21
2.3.1.1 Microfluidic applications	22
2.3.2 Ink-jet 3D printing (i3DP)	23
2.3.2.1 Microfluidic applications	25
2.3.3 Powder bed technologies	26
2.3.3.1 Microfluidic applications	
2.3.4 Vat photopolymerisation (VP)	

2	2.3.4.1 VP configurations	29
2	2.3.4.2 Microfluidic applications	34
2.3.	.5 Summary	36
2.4	Photopolymerisation process modelling	37
2.4.	.1 Photopolymer materials	37
2.4.	.2 Photopolymer curing kinetics	40
2.4.	.3 Overcure	43
2.5	Summary	45
Chapter	3 3D printed microfluidic chip for biological sample pre-treatment	47
3.1	Introduction	48
3.2	Materials and Methods	50
3.2.	.1 Protocol design	50
3.2.	.2 Chip design	50
3.2.	.3 Fabrication of the 3D printed pre-treatment device	51
3.2.	.4 Sample preparation	53
3.2.	.5 Solid phase extraction	55
3.3	Results and discussion	56
3.4	Conclusions	61
Chapter	4 Microfluidic chip fabrication via Mask Projection n	nicro-
Stereoli	thography: An evaluation	63
4.1	Introduction	63
4.2	Materials and methods	64
4.2.	.1 Chip design and fabrication	64
4.2.	.2 3D printed microfluidic fittings	68
4.3	Results and discussion	69
4.3.	.1 Dimensional analysis	69
4.3.	.2 Characterisation of the overcuring effect	73
4.3.	.3 Burst pressure test	74
4.3.	.4 Plasma treatment	76
4.4	Conclusions	77
Chapter	A new design algorithm for mitigation of the overcuring effect in	Mask
Projectio	on micro-Stereolithography	79
5.1	Introduction	79

5.2	Theory	81
5.3	Mathematical model	82
5.3	.1 Internal void formation – Theory	87
5.3	.2 Total optical dose for a multi-layered part	90
5.3	.3 Modelling of an embedded channel	94
5.3	.4 3D model	95
5.4	Predictive design algorithm	97
5.4	.1 CAD design and slicing	97
5.4	.2 Generation of $\delta$ array	98
5.4	.3 Implementation of the predictive design algorithm	98
5.5	Results and Discussion	104
5.6	Conclusions	112
Chapter	6 Model verification	113
6.1	Introduction	113
6.2	Materials and methods	114
6.2	.1 3D printer	114
6.2	.2 Materials	116
6.2	.3 Resin optical absorbance	117
6.2	.4 Measurement of experimental constants	118
6.2	.5 Experimental validation of exposure times	126
6.2	.6 Experimental design	127
6.2	.7 CAD models	128
6.2	.8 Predictive model	133
6.2	.9 Printing and part development	134
6.3	Results and discussion	135
6.3	.1 Modified versus unmodified builds	135
6.3	.2 Channel height prediction	139
6.4	Conclusions	157
Chapter	7 Conclusions	159
7.1	Conclusions	159
7.2	Suggested future work	161
Referen	ces	

## List of figures

Figure 2.1. Schematic diagram of the concept of an ideal sensor, a 'total chemical
analysis system' (TAS) and a 'miniaturised total chemical analysis system'
( $\mu$ -TAS) adapted from the 1990 publication by Manz et al. <sup>31</sup> 9
Figure 2.2. A Venn diagram showing the relationship between the different micro-
scale device categories10
Figure 2.3. Fabrication of microfluidic channels in PDMS via soft lithography as
reported by Duffy et al <sup>34</sup> . The soft lithography technique represents the first
step toward rapid prototyping of microfluidic devices14
Figure 2.4. An injection moulded, disposable LoaC device for applications in clinical
diagnostics and point-of-care testing <sup>61</sup> 16
Figure 2.5. SEM images of a microchannel demonstrating the smoothing effect of
exposure to a solvent vapour; (A) PMMA post-milling; (B) PMMA after 4
min chloroform solvent vapour and 30 min 60°C heat cycle; (C) COC post-
milling (D) COC after 4 min cyclohexane solvent vapour and 30 min $60^{\circ}$ C
heat cycle <sup>40</sup> 17
Figure 2.6. Microfluidic chip fabrication via xurography <sup>84</sup> 19
Figure 2.7. Direct-write fabrication of 3D microstructures inside photosensitive glass
via femtosecond laser ablation, adapted from <sup>93</sup> . (A) Femtosecond laser direct
writing; (B) heat treatment, 505°C 1hr - 605°C 1hr; (C) ultrasonic etching in
10% hydrofluoric acid solution20
Figure 2.8. The fused filament fabrication (FFF) 3D printing process <sup>6</sup> 22
Figure 2.9. The PolyJet 3D printing technique (Stratasys Objet), adapted from <sup>2</sup> 24
Figure 2.10. Microfluidic chip integrating membrane inserts <sup>111</sup> 25
Figure 2.11. Microfluidic chip for electrochemical detection: A-B) schematic of the
chip showing threaded ports; C) picture showing alignment of both working
and pseudo-reference electrodes within the channel; D) picture showing the
chip connected to the syringe pump <sup>112</sup>
Figure 2.12. Schematic of the SLM process <sup>113</sup> 27
Figure 2.13. Schematic outline of the three main approaches to vat
photopolymerisation, adapted from <sup>118</sup> . (A) The laser vector scanning (free
surface) method developed by Hull <sup>119</sup> , (B) the mask projection (constrained
- Figure 2.16. Optically transparent microfluidic mixer chip integrating 10-32 threads<sup>8</sup>.

- Figure 2.22. Layer-by-layer fabrication process for a microchannel oriented vertically and horizontally on the MPµSL build platform, adapted from<sup>12</sup>. The resulting microfluidic channel height is considerably smaller than the input channel height for the channel oriented horizontally on the build platform due to

- Figure 2.23. SEM images of micro-fans fabricated via MPµSL in an acrylate-based photopolymer material; (A) 0.0 and (B) 0.05 % (<sup>w</sup>/<sub>w</sub>) Tinuvin 327<sup>13</sup>. The effect of poor depth resolution in the *z*-plane can be seen in (A). This is overcome by doping the photopolymer resin with Tinuvin 327 in (B). ......44

- Figure 3.3. The SPE packing weir was oriented to benefit from higher resolution of the MPµSL printing process in the horizontal (*x-y*) plane. (A) CAD rendering of the SPE chip with integrated weir and (B) and microscope image of the chip cross-section taken using a Keyence VHX-2000 digital microscope. The integrated packing weir has a total diameter of 136 µm......51

- Figure 3.9. Eluent conductivity before, during, and after the wash step using two different wash buffers: 2-Propanol; and 70%Ethanol+TE. DEPC-treated H<sub>2</sub>O was used as a control, simulating a scenario in which no wash buffer is used. Sample conductivity was reduced below 2 mS/cm after only 100 μl wash using 70%Ethanol+TE.

- Figure 4.4: Mean height (diameter) of circular and square channels at each orientation A-F. Vertical channel orientations E and F consistently show close correlation with the input dimension. All dimensions were measured at the channel outlet. Error bars show 80% confidence interval (CI) (n = 3).....70
- Figure 4.5. Circular and square cross-section microfluidic channels printed via MPμSL. Input channel dimension for circular and square channels was 750 μm diameter and side length respectively. Horizontal orientations A-D are poorly defined showing in a higher variance in channel dimension with most prints resulting in blocked channels. Vertical orientations E and F are well

- Figure 4.8. Contact angle (CA) of 3D printed PlasClear material. (A) Before plasma treatment,  $CA = 77^{\circ}$ ; (B) After O<sub>2</sub> plasma treatment for 5 minutes,  $CA = 18^{\circ}$ .
- Figure 5.1. Illustration of Beer's law as applied in the process model with definition of the characteristic penetration depth  $h_a$ . Adapted from Gong et al.<sup>12</sup>......82

- Figure 5.5. Normalised dose ( $\Omega$ ) plotted as a function of depth (*z*) for a solid polymer block of material consisting of five layers. Individual layer doses for layers

- Figure 5.12. The model parameters  $\lambda$  and  $\lambda_c$ , number of enclosing layers.  $\lambda$  is measured from the bottom of the channel, while  $\lambda_c$  is measured from the middle of the channel. 104

- Figure 6.2. Characterisation of DMD pixel angle on the Asiga Pico+27 3D printer. Image (A) is a 3D profile of the part used for angle characterisation, (B) shows a 2D microscope image of the same part with angles superimposed. Image (C) shows a single layer of material (1 x 1 mm) with edges aligned with X and Y axes of the build platform, lines of DMD pixels are clearly visible and are oriented at 45° w.r.t the bottom edge of the part. In image (D) the edges of the material are oriented at 45° w.r.t the X and Y axes. Image (A) was taken using a Brucker Contour GT white light interferometer while images (B-D) were taken using a Keyence VHX 2000 digital microscope.

- Figure 6.3. Resin optical absorbance for three resins, Formlabs Clear (FL), Asiga PlasClear v2 (PC), and DETAX Freeprint Mould (DX) with an overlay of the Asiga 3D printer UV LED spectrum. Peak ranges for monomers and reactive diluents, and photoinitiator (PI) resin components are outlined in the graph.
- Figure 6.4. Generation of the photopolymer working curve using the Asiga Pico +273D printer. The slide holder holds the quartz slide in place while UV light is projected into the resin volume for a defined exposure time setting. Exposure

- Figure 6.12. Front elevation view of the CAD designs used for validation of the predictive model. Experimental design parameters are coloured, number of enclosing layers ( $\lambda$ ) in red, and layer thickness ( $z_l$ ) in green. The number of enclosing layers ( $\lambda$ ) is counted from the top of the channel for both square and circular channels as outlined by the magnified sections of the image.131

- Figure 6.14. Comparison of the unmodified (A) and modified (B) parts produced via the MPµSL technique using DETAX Freeprint Mould photopolymer resin for three paired layer thickness (*z*<sub>l</sub>) and layer exposure time (*t*<sub>l</sub>) settings.......135
- Figure 6.16. Comparison of the unmodified (A) and modified (B) parts produced via the MP $\mu$ SL technique using Asiga PlasClear v2.0 photopolymer resin for three paired layer thickness ( $z_l$ ) and layer exposure time ( $t_l$ ) settings.......137
- Figure 6.17. Variation of channel height ( $\mu$ m) with number of enclosing layers ( $\lambda$ ) and slice thickness ( $z_l$ ) ( $\mu$ m) for circular channels fabricated using DETAX Freeprint Mould Clear photopolymer material. The numerical model follows the trend of the experimental data closely. Error bars represent a 95% CI.
- Figure 6.18. Variation of channel height ( $\mu$ m) with number of enclosing layers ( $\lambda$ ) and slice thickness ( $z_l$ ) ( $\mu$ m) for square channels fabricated using DETAX Freeprint Mould Clear photopolymer material. The numerical model follows the trend of the experimental data closely. Error bars represent a 95% CI.

- Figure 6.21. Variation of channel height ( $\mu$ m) with number of enclosing layers ( $\lambda$ ) and slice thickness ( $z_l$ ) ( $\mu$ m) for circular channels fabricated using Asiga

### List of tables

Table 2.1. $Tg$ for common thermopolymers used in microfluidic device fabrication.
Table 2.2. Composition of photopolymer resins, adapted from <sup>133</sup>
Table 3.1. Material properties of Freeprint® mould material <sup>146</sup>
Table 3.2. Solid phase extraction column and stationary phase parameters60
Table 4.1. Experimental design space
Table 5.1. Resin curing model parameters
Table 5.2. Resin curing model unitless parameters
Table 5.3. Multi-layered part - experimental parameters
Table 5.4. Multilayered part - unitless parameters
Table 5.5. Design algorithm inputs.    101
Table 5.6. Percentage relative error $(E_{rel})$ for the three cases presented in Figure 5.15,
Figure 5.14, and Figure 5.13 for channels with enclosing layers $\lambda =$
10, 25, and 50 respectively111
Table 6.1. Common photopolymer resin viscosities, adapted from ref. $^{159}$ and Appendix
В116
Table 6.2. Experimental constants $h_a$ and $T_c$ calculated from resin working curves.
Table 6.3. Experimental parameters; layer thickness $(z_l)$ , normalised layer thickness
$(\zeta_l)$ , and exposure time $(t_l)$ for three photopolymer materials: DETAX
Freeprint mould (DX), Formlabs Clear (FL), and PlasClear v2.0 (PC)127
Table 6.4. Experimental design space    127
Table 6.5. Total thickness of the enclosing layers $(z_l \times \lambda)$ (µm) above the microfluidic
channels128
Table 6.6. Maximum iterations $(i_{max} \leq \lambda)$ for each microfluidic channel model
categorised by material: DETAX Freeprint mould (DX), Formlabs Clear
(FL), and PlasClear (PC)134

### List of Abbreviations

2D	Two-Dimensional
3D	Three-Dimensional
ABS	Acrylonitrile Butadiene Styrene
AM	Additive Manufacturing
ANOVA	Analysis of Variance
ATP	Adenosine Triphosphate
CA	Contact Angle
CAD	Computer Aided Design
CAM	Computer Aided Manufacturing
CI	Confidence Interval
COC	Cyclo Olefin Co-polymer
COP	Cyclo Olefin Polymer
DENV	Dengue Virus
DEPC	Diethylpyrocarbonate
DI	De-ionised
	Digital Light Processing
	Digital Micromirror Device
	Deep Reactive Ion Etching
	Ethylanadiaminatatragaatia Aaid
EDIA	Euryreneuranninetetraacetic Actu
	Fused Deposition Modeling
FWHM	Full Width at Half Maximum
HPLC	High Performance Liquid Chromatography
13DP	Ink-jet 3D Printing
IC	Ion Chromatography
IEM	Ion Exchange Membrane
IPA	Isopropyl Alcohol
LC	Liquid Chromatography
LED	Light Emitting Diode
LoaC	Lab on a Chip
LOM	Laminate Object Manufacturing
MEMS	Micro Electro-Mechanical Systems
MJM	MultiJet Modelling
MJP	MultiJet Printing
MPSL	Mask Projection Stereolithography
MPµSL	Mask Projection micro-Stereolithography
Nd:YAG	Neodymium-doped Yttrium-Aluminium Garnett
PC	Polycarbonate
PCR	Polymerase Chain Reaction
PDMS	Polydimethylsiloxane
PE	Polyethylene
PEEK	Polyether ether ketone
PET	Polyethylene terephthalate
PJ	PolyJet
PLA	Polylactic Acid
PMMA	Polymethyl methacrylate
POC	Point of Care
PP	Polypropylene

PS	Polystyrene
PSA	Pressure Sensitive Adhesive
PTFE	Polytetrafluoroethylene
PVA	Poly(vinyl alcohol)
PVC	Poly(vinyl chloride)
qRT-PCR	Quantitative Reverse Transcription Polymerase Chain Reaction
RIE	Reactive Ion Etching
ROI	Region of Interest
SEM	Scanning Electron Microscope
SL	Sterelithography
μSL	Micro-Stereolithography
SLM	Selective Laser Melting
SLS	Selective Laser Sintering
SPE	Solid Phase Extraction
STL	Standard Tessellation Language
TAS	Total (chemical) Analysis System
μTAS	Miniaturised Total Analysis System
TE	Tris-EDTA (pH buffer)
Tg	Glass transition temperature
TPP	Two-Photon Polymerisation
UV	Ultraviolet
UV-Vis	Ultraviolet-Visible
VP	Vat Photopolymerisation

## List of Symbols

Symbol	Unit(s)	Equation	Name		
D	J.cm <sup>-2</sup>	tI	Optical energy dose		
$D_c$	J.cm <sup>-2</sup>	$T_c I_0$	Critical optical energy dose		
$D_n$	J.cm <sup>-2</sup>	$t_l I_n$	Optical energy dose received at depth $z$		
			during exposure of layer n		
D <sub>sim</sub>	J.cm <sup>-2</sup>	-	Optical energy dose numerical solution		
$E_{rel}$	%	-	Relative error limit		
$h_a$	μm	$1/\alpha$	Characteristic resin penetration depth		
i <sub>max</sub>	-	-	Maximum number of iterations		
Ι	W.cm <sup>-2</sup>	$I_0 e^{-\alpha z}$	Optical irradiance		
$I_0$	W.cm <sup>-2</sup>	-	Optical irradiance at the interface		
$I_n$	W.cm <sup>-2</sup>	-	Optical irradiance received at depth $z$		
			during exposure of layer <i>n</i>		
п	-	-	Layer index		
Ν	-	-	Total number of layers		
$p_x$	μm	-	DMD pixel depth		
$p_{y}$	μm	-	DMD pixel width		
t	S	-	Time		
$t_l$	S	-	Layer exposure time		
$t_p$	S	-	Polymerisation time		
$T_c$	S	$D_c/I_0$	Photopolymer critical time		
Ζ	μm	-	Depth		
$Z_l$	μm	-	- Build layer thickness		
$z_p$	μm	$h_a \ln(t_p/T_c)$	Polymerisation depth		
Z <sub>shift</sub>	-	-	Voxel z-shift		
α	µm⁻¹	-	Material absorption coefficient		
γ	-	$t_l/T_c$	Normalised layer exposure time		
$\delta_{in}$	-	-	Input voxel array		
$\delta_{mod}$	-	$ heta_{ideal} - \phi_{\downarrow}$	Modified voxel array		
$\delta_n$	-	-	Binary solid/liquid classifier		
ζ	-	$z/h_a$	Normalised depth		
$\zeta_l$	-	$z_l/h_a$	Normalised layer thickness		
$\zeta_p$	-	$z_p/h_a$	Normalised polymerisation depth		
$ heta_{ideal}$	-	-	Ideal solution		
$ heta_{real}$	-	-	Numerical solution		
λ	-	-	Number of enclosing layers		
τ	-	$t/T_c$	Normalised time		
$ au_p$	-	$t_p/T_c$ Normalised polymerisation time			
$\phi$	-	$\theta_{real} - \theta_{ideal}$	$-\theta_{ideal}$ Difference between ideal and numerical solution		
$\phi_{\perp}$	-	-	Shifted difference array		
Ω	-	$D/D_c$	Normalised energy dose		
$\Omega_n$	-	$D_n/D_c$	Normalised energy dose received at depth		
11		<i>11.1</i> C	z during exposure of layer $n$		
$\Omega_{sim}$	-	$D_{sim}/D_c$	Normalised energy dose numerical solution		

### Acknowledgements

Firstly, I would like to acknowledge my supervisor Prof. Dermot Brabazon for your patience, advice, guidance, and encouragement in times of doubt over the last four years. Thanks also to my co-supervisor Prof. Dermot Diamond for always being available to offer advice.

I gratefully acknowledge the financial scholarship received from both Science Foundation Ireland and the Naughton Foundation. Thanks to Prof. Dermot Brabazon for encouraging me to apply for the Naughton Fellowship in my first year and to Martin and Carmel Naughton, and all at the Naughton Foundation for sponsoring and running such a great exchange program between Irish Universities and the University of Notre Dame.

A special thanks to Ronan and Brian for the countless cups of coffee (and pints of beer) when a break was needed, the PhD process would have been unendurable without you.

To my colleagues and friends Huw, Stephen, Ben, Cleo, Louis, Aoife, Claire, Adam, and David for sharing the PhD experience with me; and to Dr. Bert Ellingboe, and members of the plasma research laboratory, this research would have 'ground' to a halt long ago without the use of your coffee machine.

To past and present members of the Advanced Processing Technology Research Centre including Dr. Mercedes Vazquez, Dr. Nigel Kent, Dr. Robert Groarke, Dr. Shadi Karazi, Dr. Muhannad Obeidi, Dr. Inam Ul Ahad, Cian Hughes, and Dr. Komal Bagga. Thanks also to the staff in the school of Mechanical and Manufacturing Engineering in DCU and the technical staff in the Nano-bioanalytical Research Facility including Liam Domican, Michael May, Lorcan Kent, Stephen Fuller, and Josephine Ozoani.

To all in the Centre for Microfluidics and Medical Diagnostics at the University of Notre Dame, in particular Prof. Hsueh Chia Chang, Assistant Prof. Satyajyoti Senapati, Dr. Sunny Shah, Dr. Yongfan Men, and of course the newlyweds Drs Steven and Chun-Mei Marczak for making my time at Notre Dame so enjoyable.

To my friends Aran, Niall, Alexi, Mike, Leddy, Kev, Mick, Annie, Niall, Jill, and many others near and far, for keeping me grounded and giving me perspective of life beyond academia. Thanks also to Booka Brass Band for giving me a creative outlet outside of the lab.

I could not have completed this PhD without the constant support and encouragement of my girlfriend Gemma. Thanks for being my partner in crime, for showing me the way, and for putting up with me over the last three years; without you this would not have been possible.

To my brothers Dermot and James, thanks for being by my side through thick and thin, I know I can always rely on you.

Finally, I owe this PhD to my parents. To my late father Frank, who passed away suddenly before publication of this final version yet whose encouragement and faith was instrumental in seeing this thesis through to completion, thank you and for teaching me the importance of honesty, perseverance and humour; and to my mother Rena, whose unwavering strength and compassion have always kept me going through difficult times, thank you for your patience and guidance. Thank you both for giving me every possible opportunity in life, I am eternally grateful.

To my mother Rena, for your strength and guidance in difficult times and to my father Frank, for teaching me the importance of perseverance.

#### Abstract

Miniaturisation of common laboratory techniques has gathered significant interest in the last few decades with both academic and industrial researchers seeking to reduce waste, sample volume, and limits of detection for a wide range of applications. These goals present a unique challenge that originally spurred the creation of the multidisciplinary field of microfluidics in the 1980s. In the same time-frame 3D printing has progressed from its inception by Charles Hull in 1983 and developed into a common industry technique used at the design and prototyping stage of product development. 3D printing is now also used in custom end-user products in automotive, aerospace, and biomedical industries. Despite this, achieving internal features and voids at the micro-scale via 3D printing remains a major challenge.

In this thesis, Mask Projection micro-Stereolithography (MP $\mu$ SL) was used as a fabrication method for the production of microscale internal voids and features toward achieving an ultra-rapid prototyping method for microfluidic applications. MP $\mu$ SL is an ideal replication method for microfluidic applications as the working material is a liquid photo-polymer resin and thus can be removed from internal structures with relative ease. In addition, unlike classical multi-step fabrication methods that are prone to delamination, MP $\mu$ SL enables the production of micro-scale capillaries capable of withstanding higher pressures in a single step.

MPµSL build quality, channel reproducibility, channel size and channel shape were examined, and process limitations were characterised. The so-called 'overcuring' of the liquid polymer resin presents the main obstacle in the creation of microscale channels and features using this technique and hence was a primary focus of this thesis. Material characterisation techniques used to determine the nature of the photopolymer materials were applied and a mathematical model was developed and applied to predict areas where overcuring is likely to occur. This model forms the basis of the novel design algorithm developed in this thesis to mitigate for the overcuring effect. Finally, the new algorithm was applied to the production of internal features. The resulting increased control over microchannel dimensions and improvement in repeatability of the technique was quantified.

#### 6.2 Materials and methods

#### 6.2.1 3D printer

A DLP 3D printer (Pico+27, Asiga, CA, USA) based on the MP $\mu$ SL VP technique was used to fabricate microfluidic devices with defined channel height and shape. The Asiga Pico+27 operates at a wavelength of 405 nm and has a reported resolution of 27  $\mu$ m in the build plane in *x* and *y* directions and a variable vertical *z*-resolution of 10 – 150  $\mu$ m. *X*-*Y* resolution is based on the size of a single micromirror in the DMD micromirror array thus representing the base width and depth of a single voxel, with the variable slice thickness in the *z*-direction representing the voxel height. The DMD is a Texas Instruments DLP 4500 module (Austin, TX, USA), with a 912 × 1140 micromirror array arranged in a diamond pixel orientation<sup>12</sup>. In order to ensure alignment with DMD pixels, all test parts are rotated 45° on the build plane as shown in Figure 6.1.



Figure 6.1. The orientation of the Asiga Pico+27 DMD pixels with respect to the X axis, adapted from Gong et al.<sup>12</sup>.

DMD pixel alignment was experimentally verified by curing single  $(1 \times 1 \text{ mm}^2)$  layers of photopolymer material at angles  $(0 - 90^\circ)$  on to a glass slide and imaging using a VHX 2000 (Keyence, Osaka, Japan) and a Contour GT white light interferometer (Bruker, MA, USA), results are shown in Figure 6.2.

After design, the CAD models were exported in the 'stereolithography' (STL) file format and imported to Asiga Composer software (Asiga, Anaheim Hills, CA, USA) for placement on the build platform. Models were sliced at three slice thickness intervals ( $z_l$ ) of 10, 25 and 50 µm respectively corresponding to the experimental design parameters in Table 6.4. Exposure time ( $t_l$ ) for the three materials was set based on the results from section 6.2.5 (see Table 6.3). Raw and modified models were placed in the same build to minimise time-based curing variability between polymer batches as shown in Figure 6.13.

The Asiga 3D printer DMD optical engine is oriented in a diamond pixel orientation as previously reported by Gong et al.<sup>12</sup> and verified in section 6.2.1. Thus, all parts are oriented at  $45^{\circ}$  on the build platform with respect to the x-axis as shown in Figure 6.13.



Figure 6.13. Image from Asiga Composer software showing the orientation of the CAD models on the build platform. Models are oriented at 45° w.r.t the x-axis to align with the 3D printer DMD pixel orientation.

#### 6.2.8 Predictive model

After slicing, the sliced image stacks were downloaded from the Asiga printer web interface and converted into 3D voxel arrays using a custom script developed for this purpose using LabVIEW<sup>™</sup> 2016 software (National Instruments, TX, USA). The 3D voxel arrays were then run through the bespoke algorithm developed for this study and reported in Chapter 5 to predict and mitigate for the effects of overcuring. When complete, the modified voxel array was re-sliced and converted back into a binary PNG image stack for upload to the 3D printer.

Optoelectronic Manufacturing VI. SPIE Proceedings, 2001, pp. 469–477.

- 92. Xu B-B, Zhang Y-L, Xia H, Dong W-F, Ding H, Sun H-B. Fabrication and multifunction integration of microfluidic chips by femtosecond laser direct writing. *Lab Chip* 2013; 13: 1677.
- 93. Sugioka K, Cheng Y. Femtosecond laser processing for optofluidic fabrication. *Lab Chip* 2012; 12: 3576.
- 94. Bellouard Y. The Femtoprint Project. *J Laser Micro/Nanoengineering* 2012; 7: 1–10.
- 95. Briggs M, Clements H, Wynne N, Rennie A, Kellett D. 3D printed facial laser scans for the production of localised radiotherapy treatment masks A case study. *J Vis Commun Med* 2016; 39: 99–104.
- 96. Lupeanu M, Rennie A, Eggbeer D, Neagu C. Redesign of custom-fitted surgical guide with targeted functional analysis fabricated via SLM. In: Rennie AEW, Bocking CE (eds) *Rapid Design, Prototyping and Manufacturing: Proceedings of the twelfth conference on.* Lancaster: CRDM Ltd, 2011, pp. 173–181.
- 97. Huang Y, Leu MC, Mazumder J, Donmez A. Additive Manufacturing: Current State, Future Potential, Gaps and Needs, and Recommendations. *J Manuf Sci Eng* 2015; 137: 014001.
- 98. Guo Q, Cai X, Wang X, Yang J. "Paintable" 3D printed structures via a post-ATRP process with antimicrobial function for biomedical applications. *J Mater Chem B* 2013; 1: 6644.
- 99. Crump SS. *Apparatus and method for creating three-dimensional objects*. US Patent 5,121,329, US: United States Patent and Trademark Office, 1992.
- 100. Tsuda S, Jaffery H, Doran D, Hezwani M, Robbins PJ, Yoshida M, Cronin L. Customizable 3D Printed 'Plug and Play' Millifluidic Devices for Programmable Fluidics. *PLoS One* 2015; 10: e0141640.
- Symes MD, Kitson PJ, Yan J, Richmond CJ, Cooper GJT, Bowman RW, Vilbrandt T, Cronin L. Integrated 3D-printed reactionware for chemical synthesis and analysis. *Nat Chem* 2012; 4: 349–354.
- 102. Dragone V, Sans V, Rosnes MH, Kitson PJ, Cronin L. 3D-printed devices for continuous-flow organic chemistry. *Beilstein J Org Chem* 2013; 9: 951–959.
- Kitson PJ, Rosnes MH, Sans V, Dragone V, Cronin L. Configurable 3D-Printed millifluidic and microfluidic 'lab on a chip' reactionware devices. *Lab Chip* 2012; 12: 3267.
- 104. Kitson PJ, Symes MD, Dragone V, Cronin L. Combining 3D printing and liquid handling to produce user-friendly reactionware for chemical synthesis and purification. *Chem Sci* 2013; 4: 3099–3103.
- 105. Mathieson JS, Rosnes MH, Sans V, Kitson PJ, Cronin L. Continuous parallel ESI-MS analysis of reactions carried out in a bespoke 3D printed device. *Beilstein J Nanotechnol* 2013; 4: 285–291.
- 106. Morgan AJL, Hidalgo San Jose L, Jamieson WD, Wymant JM, Song B, Stephens P, Barrow DA, Castell OK. Simple and Versatile 3D Printed Microfluidics Using Fused Filament Fabrication. *PLoS One* 2016; 11: e0152023.

## EXHIBIT 5



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株式会社Rosnes (ロスネス)は、法人番号:1130001028431で京都府京都市下京区鶏鉾町480番地オ フィス-ワン四条烏丸に所在する法人として京都地方法務局で法人登録され、2015年10月05日に法人番 号が指定されました。登録情報として、商標情報が1件が登録されています。なお、2021年07月16日に 登録情報が変更されています。最終更新日は2021年07月28日です。この地域の労働局は京都労働局。 京都下労働基準監督署が所轄の労働基準監督署です。

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項目	内容
商号又は名称	株式会社Rosnes
商号又は名称(読み仮名)	ロスネス
法人番号	1130001028431
会社法人等番号	1300-01-028431
登記所	京都地方法務局 ※法人設立時に登記が提出された登記所を表示しています。
法人種別	株式会社
郵便番号	〒600-8491 ※地方自治体コードは 26106
国内所在地(都道府県)	京都府 ※京都府の法人数は 105,812件
国内所在地 (市区町村)	京都市下京区 ※京都市下京区の法人数は 9,187件
国内所在地(丁目番地等)	鶏鉾町480番地オフィス-ワン四条烏丸
国内所在地(1行表示)	京都府京都市下京区鶏鉾町480番地オフィス-ワン四条烏丸
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2015年10月05日	【新規登録】 名称が「株式会社Rosnes」で、「京都府京都市右京区山ノ内養老町5 番地の1」に新規登録されました。

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appcloudmaster.com's server IP address could not be found.

- Try: Checking the connection Checking the proxy, firewall, and DNS configuration Running Windows Network Diagnostics

ERR\_NAME\_NOT\_RESOLVED



Details

Google Chrome

115.0.5790.170

11:09:02 AM 8/4/2023

Windows 10 Enterprise 64-bit Build 19044

# EXHIBIT 7



#### About 3 results (0.25 seconds)

#### Justia

https://trademarks.justia.com > owners > opnous-k-k-c...

#### OPNOUS K.K co., Ltd. Trademarks

DIAMOND PIXEL. Filed: January 28, 2020. Semi-conductors; semiconductor devices; integrated circuits; image sensors. Owned by: Rosnes Corporation and OPNOUS ...

WSPTO .report https://uspto.report ....

#### DIAMOND PIXEL - Samsung Display Co., Ltd.

Mark For: **DIAMOND PIXEL®** trademark registration is intended to cover the categories of computer monitors; video monitors; computers; Television receivers; ...



https://www.houjin.info>detail · Translate this page

#### OPNOUS株式会社 | 東京都千代田区

**OPNOUS**株式会社(オプナス)は、法人番号:2010001178766で東京都千代田区一番町4番地36-604に所在する法人... **OPNOUS**株式会社について(項目別)... **Diamond Pixel**.

In order to show you the most relevant results, we have omitted some entries very similar to the 3 already displayed. If you like, you can repeat the search with the omitted results included.

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Document title: "diamond pixel" opnous - Google Search Capture URL: https://www.google.com/search?q=%22diamond+pixel... Capture timestamp (UTC): Fri, 04 Aug 2023 18:13:24 GMT

## EXHIBIT 8

DIAMOND	PIXEL

### Samsung Display Co., Ltd.

OSI TO Trademark.	Samsung Display Co., Eu. 7 Planonu TixerA	pication #00003733	
	<b>Go to Facebook</b> Connect, share, enjoy. Go to Facebook.		⊳×
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Application Filed: 20	20-04-13		
Trademark Applicat	on Details		
Mark For: DIAMO video monitors electrolumines equipment; MF multimedia pla Show All Status 2020-04-16 UTC O Refresh	OND PIXEL® trademark registration is in computers; Television receivers; catho cent displays; diodes; Portable commun 3 players; Displays for MP3 players; MP vers: Displavs for portable multimedia p	AD FIAEL ntended to cover the categories of computer r de ray tubes; Plasma display panels; flat pan- ication machines; Displays for portable comm P4 Players; Displays for MP4 Players; Portable lavers: Vehicle navigation devices; Displays for DN Awaiting Examination	monitors; el nunication le or
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The trademark application has been accepted by the Office (has met the minimum filing requirements) and has not yet been assigned to an examiner.

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Research	🖤 💟 Ň 🔩 🜞 OneLook Acronym Finder
Serial Number	88869753
Registration Number	6422005
Mark Literal Elements	DIAMOND PIXEL
Mark Drawing Type	4 - STANDARD CHARACTER MARK
Mark Type	Trademark
Current Location	NEW APPLICATION PROCESSING 2020-04-16
Basis	44(e)
Class Status	ACTIVE
Primary US Classes	021: Electrical Apparatus, Machines and Supplies
	023: Cutlery, Machinery, Tools and Parts Thereof
	026: Measuring and Scientific Appliances
	036: Musical Instruments and Supplies
	038: Prints and Publications
Phinary international class	(Electrical and scientific apparatus) Scientific, nautical, surveying, electric, photographic, cinematographic, optical, weighing, measuring signaling, checking (supervision), lifesaving and teaching apparatus and instruments; apparatus for recording, transmission or reproduction of sound or images; magnetic data carriers, recording discs; automatic vending machines and mechanisms for coin operated apparatus; cash registers, calculating machines, data processing equipment and computers; fire-extinguishing apparatus.
Filed Use	No
Current Use	No
Intent To Use	No
Filed ITU	No
44D Filed	No
44E Current	Yes
66A Current	No
Current Basis	No
No Basis	No
Attorney Name	David A. Plumley

1,7,5	
Attorney Name	David A. Plumley
Attorney Docket Number	188997
Timeline	
2014-07-04	Trademark Registered
2020-04-13	Application Filed
2020-04-16	Location: NEW APPLICATION PROCESSING
2020-04-16	Status: Live/Pending
2020-04-16	Status: New application will be assigned to an examining attorney approximately 3 months after filing date.
2020-04-16	Transaction Date
2021-07-13	Trademark Registered

Trademark Parties (Applicants & Owners)	
Party:	Samsung Display Co., Ltd.
Address	1, Samsung-ro, Giheung-gu Yongin-si, Gyeonggi-do KOREA, REPUBLIC OF 17113
Legal Entity Type	Limited Company (Itd.)
Legal Entity State	KOREA, REPUBLIC OF





1,7,5	
Attorney Name	David A. Plumley
Attorney Docket Number	188997
Timeline	
2014-07-04	Trademark Registered
2020-04-13	Application Filed
2020-04-16	Location: NEW APPLICATION PROCESSING
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Party:	Samsung Display Co., Ltd.
Address	1, Samsung-ro, Giheung-gu Yongin-si, Gyeonggi-do KOREA, REPUBLIC OF 17113
Legal Entity Type	Limited Company (Itd.)
Legal Entity State	KOREA, REPUBLIC OF





Document title: DIAMOND PIXEL - Samsung Display Co., Ltd. Trademark Registration Capture URL: https://uspto.report/TM/88869753 Capture timestamp (UTC): Fri, 04 Aug 2023 18:16:45 GMT
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	Drawing	JPEG		2020-04-13	
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# Start Now

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- 2. Add Total Privacy for Chrome™

#### Attorney of Record

DAVID A. PLUMLEY LEWIS ROCA ROTHGERBER CHRISTIE LLP P.O. BOX 29001 GLENDALE, CA 91209-9001

#### Good, Services, and Codes

International Codes:	9
U.S. Codes:	021,023,026,036,038
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#### **DNC** Overview

DNC Overview – FactoryWiz Monitoring Easily Transfer CNC Programs with FactoryWiz.

FactoryWiz

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### **Rosnes Corporation Trademarks**

#### ROSNES



Filed: February 3, 2011 Telecommunication devices and apparatus for capturing and/or processing images; parts for telecommunication devices and... **Owned by:** Rosnes Corporation **Serial Number:** 79094570

#### DIAMOND PIXEL Filed: January 28, 2020

Diamond Pixel

Semi-conductors; semiconductor devices; integrated circuits; image sensors **Owned by:** Rosnes Corporation and OPNOUS K.K co., Ltd. **Serial Number:** 79281958

#### EARTH CAMERA

EARTH CAMERA Own

cameras; camera parts and accessories; television cameras; digital cameras; digital camcorders; network cameras; panoramic... **Owned by:** Rosnes Corporation and KANEMATSU (CHINA) Co., Ltd. **Serial Number:** 86056930



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### Capitol Consulting Firm



Capitol Consulting Firm

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#### OPNOUS株式会社について

OPNOUS株式会社(オプナス)は、法人番号:2010001178766で東京都千代田区一番町4番地36-604 に所在する法人として東京法務局で法人登録され、2016年10月07日に法人番号が指定されました。登 録情報として、商標情報が1件が登録されています。なお、2022年10月04日に登録情報が変更されてい ます。最終更新日は2022年10月12日です。この地域の労働局は東京労働局。中央労働基準監督署が所 轄の労働基準監督署です。

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法人種別		
都道府県		
市町村		
番地以降		
	検索	

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■東京都の法人一覧

■東京都千代田区の法人一覧

■東京都千代田区の株式会社の法人一覧

昨日の東京都の法人アクセスランキング

1位 八島興産合同会社(9)

2位 株式会社Ace'S Corporation(7)

3位 株式会社kmビジネスサービス(7)

4位 エントリー株式会社(6)

5位 マークモニター・ジャパン合同会社(6)

6位 株式会社シグマシステムエンジニアリン グ(6)

7位 New Being株式会社(5)

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8位 シーレックス・ファシリティーズ株式会 社(5)

9位 デジタルバリューチェーンパートナーズ

#### OPNOUS株式会社について(項目別)

項目	内容
商号又は名称	OPNOUS株式会社
商号又は名称 (読み仮名)	オプナス
法人番号	2010001178766
会社法人等番号	0100-01-178766
登記所	東京法務局 ※法人設立時に登記が提出された登記所を表示しています。
法人種別	株式会社
郵便番号	〒102-0082 ※地方自治体コードは 13101
国内所在地(都道府県)	東京都 ※東京都の法人数は 1,225,838件
国内所在地(市区町村)	千代田区 ※千代田区の法人数は 90,687件
国内所在地 (丁目番地等)	一番町4番地36-604
国内所在地(1行表示)	東京都千代田区一番町4番地36-604
国内所在地 (読み仮名)	-
更新年月日	2022年10月12日
変更年月日	2022年10月04日
法人番号指定年月日	2016年10月07日

国内所在地(読み仮名)		7
更新年月日	2022年10月12日	8
変更年月日	2022年10月04日	7
法人番号指定年月日	2016年10月07日	ç
管轄の労働局	東京労働局 〒102-8305~〒102-8307 東京都千代田区九段南1丁目2番1号 九段第3合同 庁舎12階~14階	1
管轄の労働基準監督署	中央労働基準監督署 〒112-8573 東京都文京区後楽1-9-20飯田橋合同庁舎6・7階	

ピ国税庁法人番号公表サイトで確認

【公式】次重	E塩素酸水ノロックス	
家中のお悩みに	norox空間対策	
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#### 位 New Being株式会社(5)

3位 シーレックス・ファシリティーズ株式会 ±(5)

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#### ① OPNOUS株式会社の登録履歴

日付	内容
2022年10月04日	【住所変更】 国内所在地が「東京都千代田区一番町4番地36-604」に変更されました。
2016年10月07日	【新規登録】 名称が「OPNOUS株式会社」で、「東京都千代田区麹町1丁目5番地4 ライオンズステーションプラザ半蔵門713号」に新規登録されました。

#### ① OPNOUS株式会社の法人活動情報



#### OPNOUS株式会社の商標情報(1件)

日付 公表組織 / 種類	活動対象 / 分類等
2019年10月11日	Diamond Pixel

Document title: OPNOUS株式会社 | 東京都千代田区 | 法人番号:2010001178766の詳細 - 法人.info Capture URL: https://www.houjin.info/detail/2010001178766/ Capture timestamp (UTC): Fri, 04 Aug 2023 18:20:01 GMT

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#### ① OPNOUS株式会社の商標情報(1件)

日付 公表組織 / 種類	活動対象 / 分類等
2019年10月11日	Diamond Pixel
特許庁 / 商標	09類

#### III OPNOUS株式会社の閲覧回数



#### OPNOUS株式会社の近くの法人









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#### 株式会社UME

法人番号:7010001236908 / 更新:2023年07月18日 所在地:東京都千代田区一番町6番地4-1301号

#### GCシステム株式会社

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#### 株式会社雅芳堂

法人番号:9010001236550 / 更新:2023年07月06日 所在地:東京都千代田区一番町3番地8

#### クロノアドバイザーズ株式会社

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#### 株式会社ボディクエスト 法人番号:4010001143941 / 更新:2023年07月03日 所在地:東京都千代田区一番町6番地

株式会社もんじ 法人番号:4010001216581 / 更新:2023年06月29日 所在地:東京都千代田区一番町10番8号一番町ウエストビル5階

株式会社ナビゲータープラットフォーム 法人番号:1011301019347/更新:2023年06月26日 所在地:東京都千代田区一番町21番地

株式会社モニクル 法人番号:3010001221582 / 更新:2023年06月26日 所在地:東京都千代田区一番町21番地

株式会社OneMile Partners 法人番号:9010401142340 / 更新:2023年06月26日 所在地:東京都千代田区一番町21番地

#### 株式会社ポラリス

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#### 日本デリカフーズ協同組合 法人番号:7010005007628 / 更新:2023年06月22日

所在地:東京都千代田区一番町21番地

#### Honmono Japan株式会社 法人番号:8021001076879 / 更新:2023年06月22日 所在地:東京都千代田区一番町3-7カーサー番町202号室

#### トンダ株式会社

法人番号:2011501028337 / 更新:2023年06月21日 所在地:東京都千代田区一番町23番地2番町ロイヤルコート806

#### 株式会社Gemax

法人番号:6010401118137 / 更新:2023年06月16日 所在地:東京都千代田区一番町10番地8一番町ウェストビル5階



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前の法人:株式会社マイナビダイレクト

次の法人:株式会社リヴァストーン



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Company

News

# Contribute to the world with analog technology and sensor technology.

Analog etc. circuit design contract business Rosnes Sensor/Module technology Recruit

### Analog circuit/Layout design and verification contract business start 2021-08-01

We started an analog circuit/layout design and verification contract business. Our engineers with a wealth of experience, knowledge, and skills utilize technologies such as ADC, DAC, PLL, and DLL to meet the diverse needs of our customers with the following three pillars. 1) Respond flexibly to your requests. 2) Realize quality that satisfies you. 3)[...続きを読む]

💿 日本語 🔤 English

IntoKyoto

Start three-dimensional (3D) CMOS sensors development for distance measurement III 2021-04-18

Rosnes was established in January 2007, and for the past 15 years has been developing 2D-CMOS sensors such as smart phone, security camera and medical etc... During the time, 2D-CMOS sensors technology didn't expand strongly, so, new attractive 2D-CMOS sensors was not developed a lot. As a result, many of the independent and venture companies[...続きを読む]





News

# technology and sensor technology.

### Analog circuit/Layout design and verification contract business start 2021-08-01

We started an analog circuit/layout design and verification contract business. Our engineers with a wealth of experience, knowledge, and skills utilize technologies such as ADC, DAC, PLL, and DLL to meet the diverse needs of our customers with the following three pillars. 1) Respond flexibly to your requests. 2) Realize quality that satisfies you. 3)[...続きを読む]

### Start three-dimensional (3D) CMOS sensors development for distance measurement !!! 2021-04-18

Rosnes was established in January 2007, and for the past 15 years has been developing 2D-CMOS sensors such as smart phone, security camera and medical etc... During the time, 2D-CMOS sensors technology didn't expand strongly, so, new attractive 2D-CMOS sensors was not developed a lot. As a result, many of the independent and venture companies[...続きを読む]



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Office One Shijo-Karasuma 602 480, Niwatoriboko-cho, Shimogyo-ku, Kyoto, JAPAN

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#### OPNOUS \* Smart Sensing & AI Technology

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rosnes.jp

http://www.rosnes.jp>kigyou\_en

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### [Japanese]

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Corpo	orate profile	Corporate information
Corporate Name	Rosnes Corporation	• Greating
Address	<ul> <li>AYA Shijo Karasuma Bldg. 3F-302</li> <li>167, Dojisha-cho, Shimogyo-ku, Kyoto,</li> <li>6008421 JAPAN</li> <li>TEL +\$1.75.352.7002</li> </ul>	Access
	• FAX : +81-75-352-7003	History
Foundation	• Jan. 24th, 2007	<ul> <li>2007 Jan. Rosnes founded</li> <li>2007 Feb. Established Kyoto design center in I</li> </ul>
Capital	• 156million JPY	<ul> <li>2007 Feb. Established Ryold design center in F</li> <li>2007 Feb. Started image sensor development p</li> </ul>
Major stock holders NTT Finance • Mitsuboshi Diamond Industrial • Ikeda Senshu Capital • Mitsubishi UFJ Capital • Takumi Yamaguchi		<ul> <li>2007 Jun. Started OEM</li> <li>2008 Jan. Started ombedded software developr</li> <li>2008 Jan. Stared image signal processing proje</li> <li>2008 Oct. Kyoto design center was relocated to</li> <li>2009 Apr. Started module development</li> <li>2009 Aug. Started camera development</li> <li>2008 Apr. Started camera development</li> </ul>
President	• CEO: Takumi Yamaguchi	<ul> <li>2012 Apr. Started network camera project.</li> <li>2012 Oct. Started recognition camera developm</li> </ul>
Headcount	· 15	<ul> <li>2013 Jan. Started security use image sensor developm</li> <li>2017 Nov. Started BSI image sensor developm</li> </ul>
Business	<ul> <li>Custom image sensor business</li> <li>Camera module business</li> <li>Camera business</li> </ul>	2018 Mar. Started 3D stacked image sensor det
Main financial bank	<ul> <li>Kyoto Chuo Shinkin Bank</li> <li>Sumitomo Mitsui Banking Corporation</li> </ul>	

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- nter in Kyoto Research Park pment project
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- ect.
- levelopment ensor development
- evelopment ensor development



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				Filter results by URL or MIME Type (i.e. '.txt')			'.txt')
URL ↑	MIME Type	From	То		Captures	Duplicates	Uniques
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http://rosnes.jp/en/2021/03/	text/html	Apr 18, 2021	Ap	r 18, 2021	1	0	1
http://rosnes.jp/en/2021/04/	text/html	Apr 18, 2021	M	ay 31, 2023	6	2	4
http://rosnes.jp/en/2021/08/	text/html	Oct 3, 2022	M	ar 23, 2023	4	1	3
http://rosnes.jp/en/analog-circuit-layout-design-and-verification-contract-business-start/	text/html	Oct 3, 2022	M	ay 31, 2023	4	0	4
http://rosnes.jp/en/author/admin/	text/html	Dec 4, 2022	De	ec 4, 2022	1	0	1
http://rosnes.jp/en/business-2/	text/html	Sep 26, 2020	M	ay 31, 2023	9	2	7
http://rosnes.jp/en/category/kyoto-intro/	text/html	Apr 18, 2021	Ju	l 26, 2021	5	2	3
http://rosnes.jp/en/category/news-en/	text/html	Nov 25, 2020	M	ay 30, 2023	9	2	7
http://rosnes.jp/en/company-2/	text/html	Sep 26, 2020	M	ay 31, 2023	10	1	9
http://rosnes.jp/en/contact/	text/html	Sep 26, 2020	M	ay 30, 2023	8	1	7
http://rosnes.jp/en/creating-a-cmos-sensor-business-for-three-dimensional-3d-distance-measurement/	text/html	Apr 18, 2021	Ap	r 18, 2021	1	0	1
http://rosnes.jp/en/creation-of-an-own-brand-business-for-new-cmos-sensors-2/	text/html	Apr 18, 2021	Ap	r 18, 2021	1	0	1
http://rosnes.jp/en/creation-of-an-own-brand-business-for-new-cmos-sensors/	text/html	May 11, 2021	Au	g 19, 2022	7	0	7
http://rosnes.jp/en/establishment-of-a-cmos-sensor-business-for-three-dimensional-3d-distance-measurement/	text/html	May 11, 2021	M	ay 30, 2023	6	2	4
http://rosnes.jp/en/news-2/	text/html	Sep 26, 2020	M	ay 31, 2023	11	1	10
http://rosnes.jp/en/product-2/	text/html	Sep 26, 2020	M	ay 31, 2023	10	2	8
http://rosnes.jp/en/recruit-2/	text/html	Sep 26, 2020	M	ar 23, 2023	11	0	11
http://rosnes.jp/en/rosnes-inc/	text/html	Sep 26, 2020	Ju	n 8, 2023	26	8	18
http://rosnes.jp/en/survey-of-feasibility-of-commercialization-of-virtual-kyoto-sightseeing-tour/	text/html	Nov 25, 2020	0	t 23, 2021	8	1	7
http://rosnes.jp/en/we-finished-the-feasibility-study-of-the-virtual-tour-business/	text/html	Apr 18, 2021	Ap	r 18, 2021	1	0	1
http://rosnes.jp/enkaku.glf	image/gif	Dec 30, 2013	No	ov 22, 2018	4	3	1

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http://opnous.co.jp/	unk	Dec 18, 2021	Oct 26, 2022	5	3	2	
http://opnous.co.jp/favicon.ico	unk	Feb 19, 2022	Feb 19, 2022	1	0	1	
http://opnous.co.jp/robots.txt	unk	Dec 18, 2021	Oct 26, 2022	6	4	2	
https://opnous.co.jp/sitemap.website.xml	application/xml	Oct 26, 2022	Oct 26, 2022	1	0	1	
https://opnous.co.jp/sitemap.xml	application/xml	Oct 26, 2022	Oct 26, 2022	1	0	1	
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