

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PASCAL TECHNOLOGIES,
Petitioner

v.

CAMBRIDGE ENTERPRISE LIMITED, UNIVERSITAT DE BARCELONA,
AND UNIVERSITAT POLITÈCNICA DE CATALUNYA,
Patent Owner

Case No. IPR2024-01235
U.S. Patent No. 11,230,656

PETITIONER’S SUPPLEMENTAL INFORMATION
UNDER 37 C.F.R. § 42.123(a)

Petitioner's Supplemental Information

Pursuant to the Board's Order granting the Motion to Submit Supplemental Information (Paper 21), Petitioner Pascal Technologies hereby serves Exhibit 1025, supplemental declaration of Sylvia Hall-Ellis, Ph.D., as supplemental information.

EXHIBIT LIST

Exhibit No. ¹	Description
1001	U.S. Patent No. 11,230,656 ("the '656 Patent")
1002	Prosecution File History of the '656 Patent
1003	Excerpt of comparison of GB1617508.5 specification to '656 Patent specification.
1004	Expert Declaration of Mircea Dincă, Ph.D.
1005	CV of Mircea Dincă, Ph.D.
1006	Zhongjian Xie and Yao Zhu, "Demonstration of liquid crystal for barocaloric cooling application," arXiv 1609.07939v1 (submitted Sept. 26, 2016).
1007	Lluís Mañosa et al., "Advanced materials for solid-state refrigeration," J. Mater. Chem. A, 1, 4925-4936 (2013), DOI: 10.1039/C3TA01289A (submitted 28 Nov. 2012; accepted 25 Jan. 2013; published 29 Jan. 2013).
1008	Lluís Mañosa et al., "Advanced Materials for Solid-State Refrigeration," [cond-mat.mtrl-sci] (2013), DOI: 10.48550/arXiv.1303.3811 (submitted 15 Mar. 2013).
1009	Satyanarayan Patel et al., "Elastocaloric and barocaloric effects in polyvinylidene di-fluoride-based polymers," Appl. Phys. Lett. 108, 072903 (2016), DOI: 10.1063/1.4942000 (received 16 Oct. 2015; accepted 30 Jan. 2016; published 16 Feb. 2016).
1010	E. Stern-Taulats et al., "Inverse barocaloric effects in ferroelectric BaTiO ₃ ceramics," APL Materials 4, 091102 (2016), DOI: 10.1063/1.4961598 (received 17 June 2016; accepted 11 Aug. 2016; published 19 Sept. 2016).
1011	Nuria Pol Català, "Efectes barocalòrics en cristalls plàstics," Final Degree Project, Escola Tècnica Superior d'Enginyeria Industrial de Barcelona (23 June 2016).
1012	Certified Translation of Nuria Pol Català, "Efectes barocalòrics en cristalls plàstics," Final Degree Project, Escola Tècnica Superior d'Enginyeria Industrial de Barcelona (23 June 2016).
1013	Lluís Mañosa et al., "Inverse barocaloric effect in the giant magnetocaloric La-Fe-Si-Co compound," Nature Comms. 2:595

¹ Citations to patents are made by column and line cite; citations to patent publications are made by paragraph number; citations to other exhibits are made with reference to page number.

Exhibit No. ¹	Description
	(2011), DOI: 10.1038/ncomms1606 (received 20 July 2011; accepted 22 Nov. 2011; published 20 Dec. 2011).
1014	Lluís Mañosa et al., “Giant solid-state barocaloric effect in the Ni-Mn-In magnetic shape-memory alloy,” <i>Nature Mats.</i> 9, 478-481 (2010), DOI: 10.1038/nmat2731 (published 4 April 2010).
1015	P. Lloveras et al., “Giant barocaloric effects at low pressure in ferroelectric ammonium sulphate,” <i>Nature Comms.</i> 6, 8801 (2015), DOI: 10.1038/ncomms9801 (received 17 July 2015; accepted 5 Oct. 2015; published 26 Nov. 2015).
1016	Andrés Mencke et al., “A simple apparatus for time-resolved x-ray diffraction biostructure studies using static and oscillating pressures and pressure jumps,” <i>Rev. Sci. Instrum.</i> 64, 383-389 (1993), DOI: 10.1063/1.1144261 (received 2 Dec. 1991; accepted 6 Oct. 1992; published 1 Feb. 1993).
1017	E.L. Rodriguez & F.E. Filisko, “Thermoelastic temperature changes in poly(methyl methacrylate) at high hydrostatic pressure: Experimental,” <i>J. Appl. Phys.</i> 53, 6536–6540 (1982), DOI: 10.1063/1.330081 (published 1 Oct. 1982).
1018	Anchi Cheng et al., Kinetics and Mechanism of the Barotropic Lamellar Gel/Lamellar Liquid Crystal Phase Transition in Fully Hydrated Dihexadecylphosphatidylethanolamine: A Time-Resolved X-Ray Diffraction Study Using Pressure Jump, <i>J. Biophys.</i> , Vol. 67, Issue 1, 293-303 (July 1994), DOI: 10.1016/S0006-3495(94)80480-1 (received 8 Feb. 1994; final form 25 April 1994; published July 1994; available online 6 Jan. 2009).
1019	Richard J. Lewis, Sr., <i>Hawley's Condensed Chemical Dictionary</i> (13th ed. 1997).
1020	X. Moya et al., Caloric materials near ferroic phase transitions, <i>Nature Mater.</i> 13, 439-450 (received 30 July 2013; accepted 19 March 2014; published 22 April 2014; issue date May 2014), DOI: 10.1038/nmat3951.
1021	J. Li. Tamarit et al., “Thermodynamic Study of Some Neopentane Derivated by Thermobarometric Analysis,” <i>Molecular Crystals and Liquid Crystals Science and Technology. Section A. Molecular Crystals and Liquid Crystals</i> , 250:1, 347-358 (received 01 Jun. 1993; accepted 09 Jul 1993; published online 24 Sept. 2006), DOI: 10.1080/10587259408028219.

Petitioner's Supplemental Information

Exhibit No.¹	Description
1022	J. Timmermans, "Plastic Crystals: A Historical Review," Journal of Physics and Chemistry of Solids, Vol. 18, Issue 1, 1-8 (Jan. 1961).
1023	H. G. Kreul et al., "Differential Thermal Analysis and Dielectric Studies on Neopentanol under Pressure," Z. Naturforsch. 47:11, 1127-1134 (received 27 July 1992; published 1992), DOI: 10.1515/zna-1992-1106.
1024	Declaration of Sylvia Hall-Ellis, Ph.D.
1025	Supplemental Declaration of Sylvia Hall-Ellis, Ph.D.

Dated: June 05, 2025

Respectfully submitted,

/Jeffrey Johnson/
Jeffrey Johnson (Reg. No. 53,078)
Baker Botts L.L.P.
910 Louisiana Street
Houston, TX 77002
Tel: 713-229-1222
Jeffrey.Johnson@BakerBotts.com

Lead Attorney for Petitioner

CERTIFICATE OF SERVICE

The undersigned hereby certifies on this 5th day of June, 2025, that true and correct copies of the foregoing Petitioner's Supplemental Information Pursuant to 37 C.F.R. § 42.123(a) and Exhibit 1025 were served in their entirety on the following parties via email on Counsel for Patent Owner at the email addresses as indicated in their Mandatory Notices under 37 C.F.R. § 42.8:

Justin Krieger
jkrieger@ktslaw.com

Nicoletta Kennedy
nkennedy@ktslaw.com

Megan Saia
msaia@ktslaw.com

Kilpatrick Townsend & Stockton LLP
IPR2024-01235@ktslaw.com

Dated: June 05, 2025

BAKER BOTTS L.L.P.
/ Jeffrey Johnson /
Jeffrey Johnson (Reg. No. 53,078)
Lead Attorney for Petitioner