

Dentin bond strength of calcium silicate-based materials: a systematic review of in vitro studies

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Table S1. POBS results from the included studies.

Author, year	Cement	POBS results (mPa)			
		Coronal	Middle	Apical	Total
Abdelrahman et al., 2021	Adseal	57.93±1.21	44.46±2.16	4.13±0.71	
	Wellroot	68.49±1.62	63.4±1.41	10.74±0.62	
	Ceraseal	73.5±1.88	67.59±1.18	11.6±0.51	
Aktemur et al., 2018	AH26				-SL+: 1.53±0.20 -SL-: 1.53±0.22
	BioRoot RCS				-SL+: 2.03±0.47 -SL-: 1.97±0.46
	MTA Plus				-SL+: 2.02±0.55 -SL-: 1.58±0.41
	EndoSequence putty fast-set:				-NaOCl: 93.6±7.73 -CHX: 110.74±8.09 -Saline: 131.26±26.68
	EndoSequence pasta premezclada:				-NaOCl: 8.65±2.02 -CHX: 14.99±2.48 -Saline: 10.91±2.88
Al.Haddad et al., 2020	iRoot SP				-Control group: 2.62±1.04 -DiaPex Plus: 5.47±6.44 -Odontopaste: 9.68±5.71
	OrthoMTA				-Control group: 4.16±3.41 -DiaPex Plus: 3.49±3.74 -Odontopaste: 4.98±5.27
	MTA				-Control group: 88.14±33.43 -CaOH2: 58.81±16.28 -mTAP: 50.76±9.65
Alsubait et al., 2020	TotalFill				-Control group: 78.18±11.65 -CaOH2: 69.19±37.47 -mTAP: 70.85±23.34

Table S1. *Cont.*

Author, year	Cement	POBS results (mPa)			
		Coronal	Middle	Apical	Total
Anju et al., 2022	NeoMTA Plus	-EDTA: 6.554±1.32	-EDTA: 4.949±1.68	-EDTA: 3.639±0.59	
		-HEDP: 5.074±1.12	-HEDP: 3.648±0.88	-HEDP: 2.963±1.15	
		-MA: 6.559±1.50	-MA: 4.864±1.21	-MA: 3.677±0.83	
		-Saline: 4.764±0.63	-Saline: 3.034±0.78	-Saline: 2.143±1.42	
Bago et al., 2022	BioRoot RCS	-CI+ NaOCl: 0.64±0.39	-CI+ NaOCl: 0.66±0.80	-CI+ NaOCl: 1.57±1.06	
		-PIPS: 0.17±0.06.	-PIPS: 0.27±0.21	-PIPS: 1.06±1.17	
		-CI + diode laser: 0.94±0.58	-CI + diode laser: 2.60±0.73	-CI + diode laser: 5.08±2.38	
		-PDT: 0.62±0.74	-PDT: 0.35±0.20	-PDT: 1.25±1.36	
		-CI + CHX: 0.46±0.30	-CI + CHX: 0.66±0.35	-CI + CHX: 0.78±0.46	
		-Control: 0.28±0.04	-Control: 0.23±0.13	-Control: 2.41±1.08	
					-Conventional method: 3.33±1.8
Bogari et al., 2022	TotalFill BC				-US: 4.21±2.2
					-Laser method: 6.46±0.5
Cardoso et al., 2022	AH Plus:				-Gpp: 0.84±1.23
					-G95E: 1.24±0.94
	Sealer Plus BC				-G70E: 1.16±1.25
					-Gpp: 0.71±0.65
					-G95E: 0.85±0.69
					-G70E: 1.34 ±. 1.38

Table S1. Cont.

Author, year	Cement	POBS results (mPa)			
		Coronal	Middle	Apical	Total
Celik et al., 2021	AH Plus				-NaOCl and EDTA: 8.12±2.37
					-NaOCl and CHX: 12.87±3.89
					-NaOCl, EDTA and CHX: 10.54±4.65
					-Distilled water: 6.68±2.59
	Endoseal MTA				-NaOCl and EDTA: 5.98±2.2
					-NaOCl and CHX: 6.07±2.25
					-NaOCl, EDTA and CHX: 6.87±3.63
					-Distilled water: 5.22±1.6
	Tech Biosealer Endo				-NaOCl and EDTA: 4.02±0.96
					-NaOCl and CHX: 5.17±2.1
					-NaOCl, EDTA and CHX: 5.19±2.11
					-Distilled water: 4.41±1.39
Chisnoiu et al., 2021	RS				1.0062±0.90
	E1-DCR				0.8294±0.18
	E2-BC				0.9322±0.25
	TF-BC				1.4367±1.05
Cimpean et al., 2022	RSSE				1.059±1.240
	EBCS				2.803 ± 1.756
	EDS				4.092±2.232
	BRS				2.038±1.672

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Author, year	Cement	POBS results (mPa)		
		Coronal	Middle	Apical
Dabaj et al., 2018	AH	CLC: 17.48±7.131 C: 9.573±7.291		
	ES	CLC: 3.56±1.703 C: 3.127±2.286		
Dem et al., 2019	GuttaFlow 2	0.43±0.37		
	GuttaFlow Bioseal	1.17±0.47		
	AH Plus	12.20±4.90		
Donnermeyer et al., 2018	AH Plus	7.03±2.41		
	TotaFill BC	3.52±1.41		
	Endo CPM	1.60±0.83		
	BioRoot RCS	2.31±1.31		
Falakaloglu et al., 2022	BC HiFlow	SC		
		-5mm: 5.28		
		-10mm: 2.34		
		WVC		
		-5mm: 5.43		
		-10 mm: 2.25		
	CeraSeal	SC		
		-5mm: 5.24		
		-10 mm: 2.17		
		WVC		
		-5mm: 5.17		
		-10 mm: 2.24		
	BioRoot	SC		
		-5mm: 5.18		
		-10 mm: 2.26		
		WVC		
		-5mm: 3.32		
		-10 mm: 1.28		

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Author, year	Cement	POBS results (mPa)			
		Coronal	Middle	Apical	Total
Grazziotin et al., 2020	AH Plus				-NbG: 4.51±2.6
					-45S5: 7.14±3.9
					-CaOH2: 7.13±2.7
					-Control: 11.33±3.5
	MTA Fillapex				-NbG: 0.33±1.68
					-45S5: 0.15±0.5
					-CaOH2: 0.97±0.7
					-Control: 0.38±0.2
Gundogar et al., 2019	Endosequence				-2.5% NaOCl:
					1.18±0.59
					-17% EDTA:
					2.51±0.42
					-2% clorhexidina:
					2±0.56
Hashem et al., 2020	AH Plus				-QMix 2 en 1:
					3.49±0.61
					Photodynamic therapy:
					-DW+UI: 3.12±0.73
					-17% EDTA:
					7.49±1.17
	MTA Fillapex				-2% CHX: 6.25±1.89
					Photobiomodulation therapy:
					-DW+UI: 3.82±0.88
					-17% EDTA:
					7.61±1.42
					-2% CHX: 5.98±1.37
Khalil et al., 2019	GuttaFlow bioseal	1.690±0.022	2.077±0.129	2.374±0.017	Photodynamic therapy:
					-DW+UI: 1.03±0.15
					-17% EDTA:
					2.62±0.87
	Zical	4.254±0.017	4.360±0.022	7.300±0.022	-2% CHX: 1.73±0.71
					Photobiomodulation therapy:
					-DW+UI: 1.19±0.20
					-17% EDTA:
					2.45±0.56
					-2% CHX: 1.49±0.63

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Author, year	Cement	POBS results (mPa)			
		Coronal	Middle	Apical	Total
Khurana et al., 2019	AH Plus	Paper points: 4.29±0.06	Paper points: 3.32±0.07	Paper points: 2.27±0.07	
		70% isopropyl alcohol: 4.66±0.06	70% isopropyl alcohol: 4.24±0.06	70% isopropyl alcohol: 2.80±0.05	
	EndoSequence BC	Paper points: 4.63±0.06	Paper points: 3.65±0.07	Paper points: 2.59±0.06	
		70% isopropyl alcohol: 4.97±0.06	70% isopropyl alcohol: 4.59±0.06	70% isopropyl alcohol: 3.09±0.06	
	MTA Fillapex	Paper points: 1.53±0.06	Paper points: 0.95±0.06	Paper points: 0.65±0.06	
		70% isopropyl alcohol: 1.98±0.05	70% isopropyl alcohol: 1.51±0.06	70% isopropyl alcohol: 1.07±0.06	
Küden et al., 2022	AH Plus	-NaOCl/EDTA: 2.88±0.67	-NaOCl/EDTA: 1.88±0.38		
		-PDT + methylene blue: 3.1±0.65	-PDT + methylene blue: 1.85±0.40		
		-PDT + curcumin: 2.21±0.51	-PDT + curcumin: 1.44±0.37		
		-PDT + toluidine blue: 2.58±0.57	-PDT + toluidine blue: 1.52±0.28		
	BioRoot RCS	-NaOCl/EDTA: 3.64±0.96	-NaOCl/EDTA: 2.11±0.39		
		-PDT + methylene blue: 4.43±0.65	-PDT + methylene blue: 2.44±0.47		
		-PDT + curcumin: 3.67±0.74	-PDT + curcumin: 2.26±0.46		
		-PDT + toluidine blue: 3.26±0.67	-PDT + toluidine blue: 2.36±0.38		
Kurup et al., 2021	AH Plus	18.6±3.76	14.04±3.24	15.75±4.09	
	MTA Fillapex:	6.03±1.27	10.76±4.13	10.87±6.31	
	Apexit Plus:	6.21±1.3	11.34±3.67	11.73±6.12	

Table S1. Cont.

Author, year	Cement	POBS results (mPa)			
		Coronal	Middle	Apical	Total
Marquezan et al., 2018	MTA-Angelus				-Uncontaminated:
					24h: 0.34
					7d: 1.40
					28d: 3.46
					-Contaminated:
	BD				24h: 1.84
					7d: 1.69
					28d: 1.39
					-Uncontaminated:
					24h: 8.89
Moinuddin et al., 2019	AH Plus	Lateral condensation: 7.27±1.2	Lateral condensation: 6.18±1.87	Lateral condensation: 4.48±1.76	
		Thermoplasticized technique: 10.34±4.00	Thermoplasticized technique: 8.87±3.36	Thermoplasticized technique: 5.31±2.79	
		Single cone: 12.70±4.12	Single cone: 10.60±2.84	Single cone: 6.48±2.38	
	BC	SCO (SAH): 1.091±0.460	SCO (SAH): 1.087±0.534	SCO (SAH): 1.551±0.518	
		CLC (LAH): 1.308±0.466	CLC (LAH): 1.199±0.395	CLC (LAH): 1.388±0.658	
		SCO (SS): 1.455±0.500	SCO (SS): 1.639±0.766	SCO (SS): 2.614±1.016	
Nouroloyouni et al., 2023	AH Plus	CLC (LS): 1.993±0.969	CLC (LS): 2.827±1.357	CLC (LS): 3.102±1.140	
	SSR				
Oktay et al., 2018					-CH: 6.20±0.69
					-TAP: 6.35±0.68
					-DAP: 5.62±0.66
					-mTAP: 5.03±0.63
					-Control: 4.99±0.46

Table S1. Cont.

Author, year	Cement	POBS results (mPa)				
		Coronal	Middle	Apical	Total	
Paulo et al., 2021	MTA	4.97	8.22±3.34	7.98±4.28		
	Biodentine	9.10	9.54±5.53	6.83±3.68		
	TotalFill BC	8.64	10.77±4.95	9.56±3.81		
Pawar et al., 2022	GP-AH					PTN
						SN: 1.4±0.3
						PUI: 1.7±0.3
						SA: 1.6±0.3
						WO
						SN: 1.8±0.3
						PUI: 2.0±0.3
						SA: 1.9±0.2
						SAF
						SN: 2.9±0.5
						PUI: 3.0±0.7
						SA: 2.5±0.3
	C-EBC					PTN
						SN: 1.6±0.3
						PUI: 2.0±0.6
						SA: 1.9±0.4
						WO
						SN: 3.1±0.4
						PUI: 3.3±0.3
						SA: 3.1±0.4
						SAF
						SN: 4.6±0.5
						PUI: 4.9±0.3
						SA: 4.2±0.5
Putrianti et al., 2020	BioRoot RCS					Grupo 1: 19.6500
						Grupo 2: 8.7100

Table S1. *Cont.*

Author, year	Cement	POBS results (mPa)			
		Coronal	Middle	Apical	Total
Retana - Lobo et al., 2021	AH Plus				-GP-S: 3.959±1.12 -S: 4.897±0.84
	EndoSequence BC				-GP-S: 3.223 ±1.06 -S: 4.579±1.45
	ProRoot ES				-GP-S: 3.267±1.19 -S: 4.953±1.59
	BioRoot RCS				-GP-S: 3.522±1.40 -S: 5.576±1.68
Rifaat et al., 2022	AH Plus				-EDTA: 0.881±0.52 -Maleic: 2.377±0.19 -H3PO4: 1.915±0.19
	EndoSeal MTA				-EDTA: 1.379±0.22 -Maleic: 1.317±0.27 -H3PO4: 0.494±0.13
Rodrigues et al., 2021	Biodentine				14.79
	MTA Repair HP				8.84
	Bio-C Repair				3.48
Roy et al., 2022	AH Plus				Control: 164±174.9 CHX al 2%: 84.7±69
	BioRoot RCS				Control: 88.9±75.5 CHX al 2%: 93.1±83.8
	GuttaFlow 2				Control: 73±90 CHX al 2%: 2:73.9±77.1

Table S1. *Cont.*

Author, year	Cement	POBS results (mPa)			
		Coronal	Middle	Apical	Total
Sarrafan et al., 2023	AH26				-Ethanol: 5.61±2.27
					-Paper points: 3.10±1.88
					-Luer Vacuum: 1.41±0.67
					-Control: 1.31±0.61
	MTA Fillapex				-Ethanol: 1.46±1.12
					- Paper points: 1.82±1.32
					- Luer Vacuum: 1.07±0.56
					-Control: 1.70±1.00
	Endoseal MTA				Ethanol: 2.73±1.78
					Paper points: 1.94±1.39
					Luer Vacuum: 1.52±0.79
					Control: 2.36±2.21
Sfeir et al., 2023	SureSeal				Etanol: 4.69±1.76
					Paper points: 8.07±3.14
					Luer Vacuum: 1.34±0.82
					Control: 1.72±1.28
	AH Plus				-1A (GP 0.04): 3.10±0.33
					-1B (GP 0.06): 3.23±0.21
					2A (GP 0.04): 2.94±0.28
					2B (GP 0.06): 3.09±0.14
	BioRoot RCS				-Paper points: 2.04±0.03
					-Paper points + 95% ethanol: 1.95±0.03.
					-Paper points + 70% isopropanol: 1.56±0.03.
					-Air-blowing thermostatic oven: 0.68±0.04.
Wang et al., 2023	iRoot SP				-Paper points: 2.04±0.03
					-Paper points + 95% ethanol: 1.95±0.03.
					-Paper points + 70% isopropanol: 1.56±0.03.
					-Air-blowing thermostatic oven: 0.68±0.04.

Table S1. Cont.

Author, year	Cement	POBS results (mPa)			
		Coronal	Middle	Apical	Total
Yaghmoor et al., 2020	MTA	-Control: 6.81±2.4	-Control: 3.58±0.9		
		-CaOH ₂ : 10.14±3.4	-CaOH ₂ : 9.15±3.4		
		-1.000 mg/mL	-1.000 mg/mL		
		TAP: 6.04±2.2	TAP: 3.92±1.3		
		-1mg/mL TAP:	-1mg/mL TAP:		
		10.12±2.4	8.36±1.7		
		-1.000 mg/mL	-1.000 mg/mL		
		DAP: 2.22±0.6	DAP: 2.74±1.1		
	Biodentine	-1 mg/mL DAP:	-1 mg/mL DAP:		
		10.56±2.2	8.18±1.7		
		Control: 7.63±2.5	Control: 4.88±1.8		
		CaOH ₂ : 11.59±3.5	CaOH ₂ : 8.22±2.9		
		1.000 mg/mL TAP:	1.000 mg/mL		
		12.55±4.5	TAP: 7.63±3.7		
		1mg/mL TAP:	1mg/mL TAP:		
		11.47±1.4	9.39±3.7		
	Endosequence putty	1.000 mg/mL DAP:	1.000 mg/mL		
		10.26±2.4	DAP: 10.69±3.2		
		1 mg/mL DAP:	1 mg/mL DAP:		
		15.34±2.7	13.98±1.9		
		Control: 10.7±1.3	Control: 8.53±1.2		
		CaOH ₂ : 11.58±2.2	CaOH ₂ : 10.00±1.6		
		1.000 mg/mL TAP:	1.000 mg/mL		
		9.73±3.2	TAP: 8.99±3.1		
	AH Plus	1mg/mL TAP:	1mg/mL TAP:		
		11.48±0.7	8.65±1.9		
		1.000 mg/mL DAP:	1.000 mg/mL		
		9.51±2.7	DAP: 9.69±2.0		
	Endosequence BC	1 mg/mL DAP:	1 mg/mL DAP:		
		13.32±1.4	11.59±2.4		
		GP: 3.262 ± 1.409	GP: 2.455 ± 1.575		
		GP after NAP:	GP after NAP:		
		5.018±1.816	3.322 ± 0.870		
		GP: 5.33 ± 5.83	GP: 5.34 ± 5.39		
		GP after	GP after NAP:		
		NAP:11.14 ± 11.44	12.73 ± 10.89		