

TOTALCEM

AUTOMIX / DUAL-CURE

WHITE PAPER



Product description

TotalCem is a dual cured self-etching and self-adhesive permanent resin cement.

Main composition	
Matrix	UDMA
	Bis-GMA
	TEGDMA
Acidic monomer	4-META
Filler	Barium glass
	Fumed silica

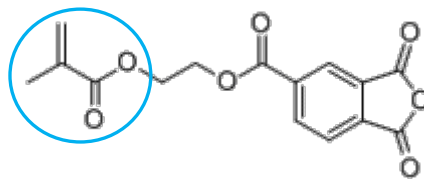


Figure 1 - 4-Methacryloxyethyltrimellitic acid (4-META)

4-META is an acidic monomer giving etching properties to the material. Its methacrylate groups enable the copolymerization with methacrylate monomers of the matrix (TEGDMA, Bis-GMA, UDMA). Hence, 4-META promotes the infiltration of the monomers of the matrix into the hard tissue due to its affinity for tooth structures. This adhesive monomer has affinity for metal as well.

TotalCem is filled with mineral nano particles for good mechanical strength and durability of the biomaterial.

Main advantages:

- Fluoride release
- Hydrophilic
- No taste or odor
- Radiopaque
- Self-etching
- Dual-cured
- Self-adhesive
- Compatible with halogen, LED and plasma arc lights
- Easy to dispense and place
- Easy clean-up

Indications

TotalCem is intended for all substrates (enamel, dentin, metal and composite)

TotalCem is indicated for:

- Permanent cementation of crowns and bridges, inlays and onlays
- Permanent cementation of posts and cores

Shades

TotalCem is available in two shades for more aesthetic results and adaptability to each clinical case.

Shade	Indication
A2 Universal	For bonding most of prosthetic elements
Translucent	To preserve the original shade of very thin restorations

Technical properties

Clinical Evaluation Study:

- Dentists panel: 33 (worldwide)
- Clinical cases: 426

Evaluation criteria:

- Ergonomics
- Viscosity
- Setting time
- Working time
- Excess material removal
- Ambient light sensitivity

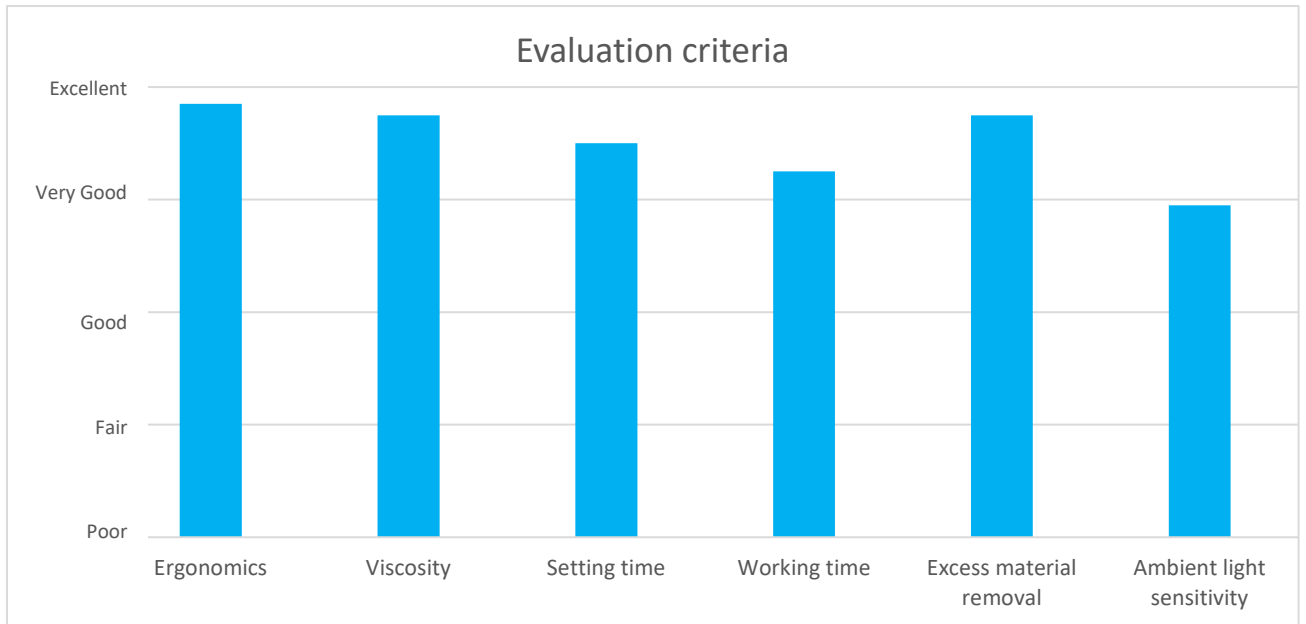


Figure 2 - TotalCem key features evaluation [1]

TotalCem is considered as very good or excellent for all expected clinical criteria for a permanent cementation.

Solubility:

TotalCem offers a high tightness due to its low water sorption and low water solubility properties.

Water sorption	12,0 µg/mm ³
Water solubility	7 µg/mm ³

Figure 3 - Properties in water [1]_ based on ISO 4049:2000 [4]

Fluoride release:

Fluoride plays a key role in the tooth re-mineralization with the formation of fluoroapatite which is more resistant to acids than hydroxyapatite. [2]

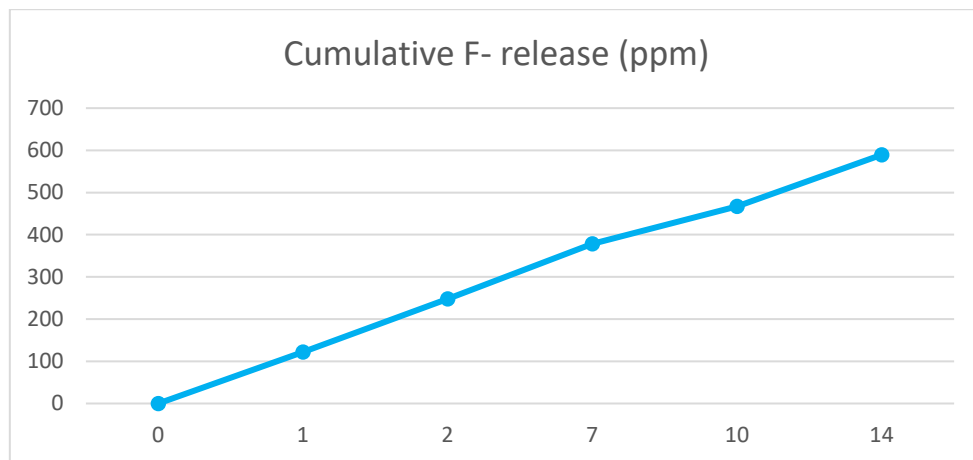


Figure 4 - TotalCem cumulative fluoride release within 14 days [1]

TotalCem promotes an excellent release of Fluoride ions during at least the first 14 days, avoiding the risk of post-operative infections.

Micro-hardness:

Micro-hardness of a cement is linked to its degree of polymerization.

A low hardness indicates a low polymerization percentage which can lead to water leakage, solubility and de-bonding.

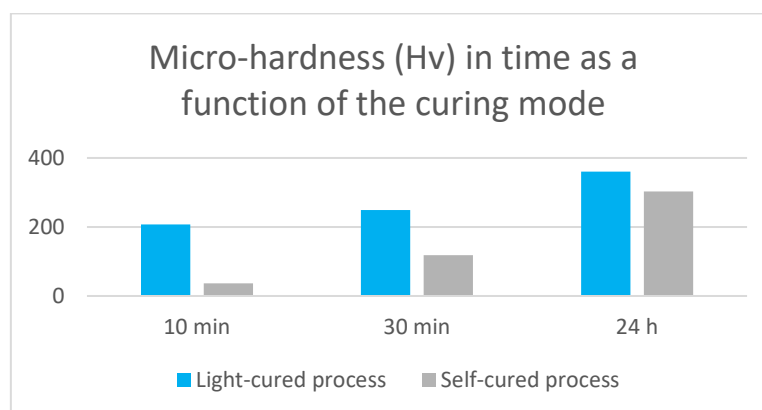


Figure 5 - TotalCem micro-hardness over time vs the curing mode [1]

After 10 minutes curing time, the cement is insufficiently hard if not light-cured.

After 30 minutes curing time, the hardness of the light-cured material is double that of the self-cured material

After 1 day, the hardness of the light-cured material remains superior to that of the self-cured material.

Other properties:

Property	Value [1]
Radiopacity	250 %Al (ISO 4049:2000)
Film thickness	10 µm (ISO 4049:2000)
Working time (in ambient light and temperature)	1.5 – 3.5 minutes
Setting time (in oral temperature)	2.5 – 4.5 minutes
pH	6,3 – 6,5

Product Performances / MARKET

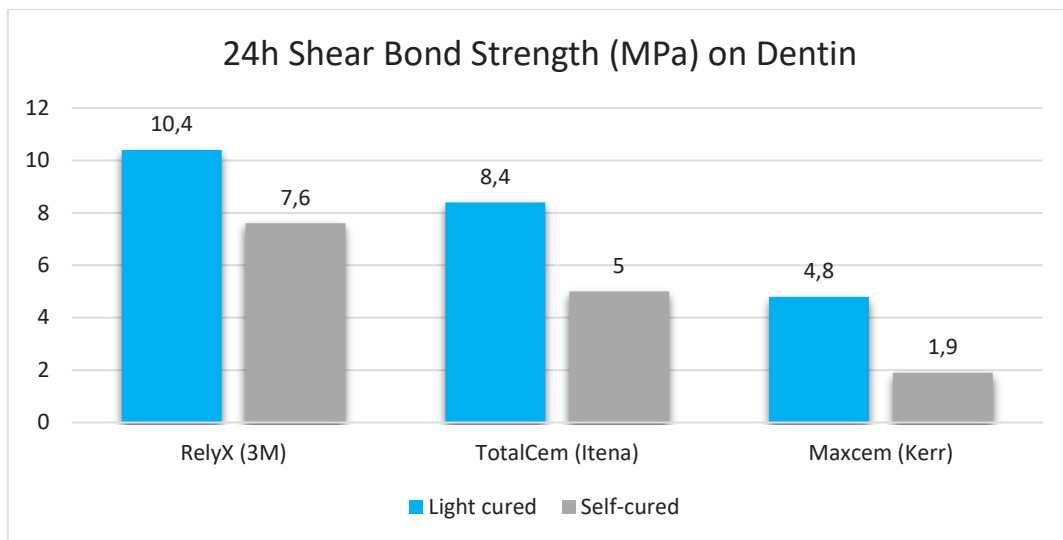


Figure 6 - 24h Shear Bond Strength on dentin (MPa) [3]

All the cements tested show a higher shear bond strength after 24 hours if light cured.

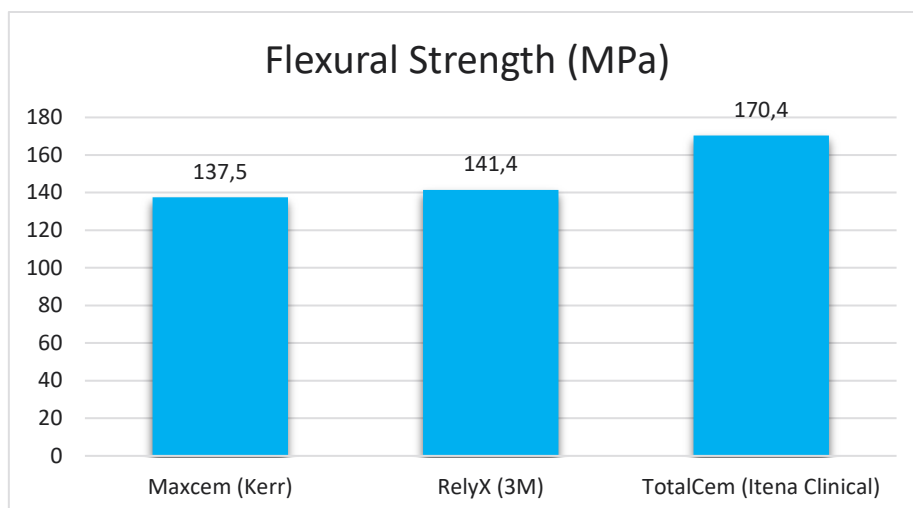


Figure 7 - Flexural strength of TotalCem compared with other products on the market [1]

TotalCem has the highest flexural strength compared with other competitive products on the market.

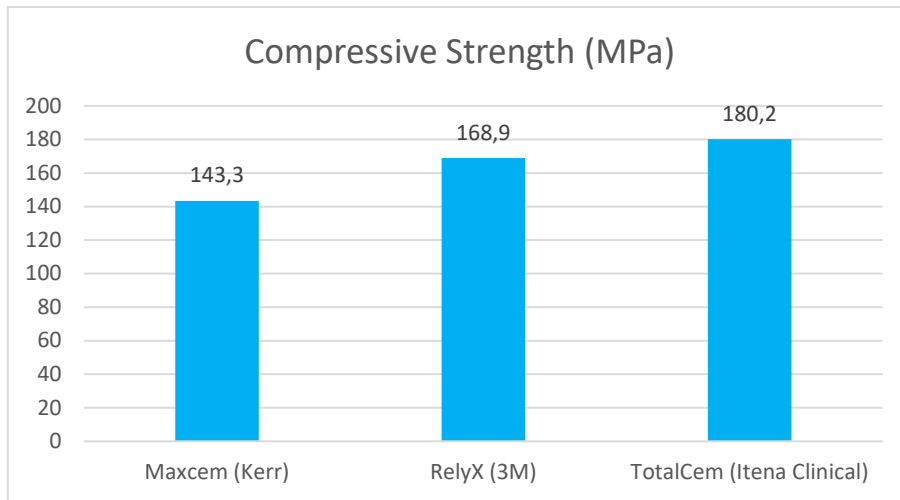


Figure 8 - Compressive strength of TotalCem compared with other products on the market [1]

TotalCem has the highest compressive strength compared with other products on the market [1].

This property enables a very good behavior in the process of mastication because many of the chewing forces are compressive.

Scientific Literature data:

[1] Itena's R&D internal test report

[2] Paula M. Koenigs, PhD; Robert V. Faller, BS. Fluoride's Mechanism of Action. Dentalcare.com

[3] Mark A. Latta, D.M.D, M.S. Associate Dean for Research. 24 hour Shear Bond Strength of Ceramic to Dentin Using Three Cement Systems. Creighton University Medical Center. 2006

[4] ISO 4049:2000 – Dentistry – Polymer-based filling, restorative and luting materials