



arthrocare.com/international

Corporate Headquarters

7000 West William Cannon Drive
Austin, TX 78735
Main Phone: +1.512.391.3900
Order Entry: +1.800.797.6520
Order Entry Fax: +1.888.994.2782

Asia Pacific Headquarters

17th Floor, Tower B
Ping An International Financial Centre
No. 1-3, Xin Yuan Nan Road
Chao Yang District
Beijing, China 100027
Phone: +852 3793 3430 32

EMEA Headquarters

St. James Business Park
9, Grimbald Crag Court
Knaresborough
North Yorkshire HG5 8QB
Phone: +44 (0) 1423 888806
Fax: +44 (0) 1423 888816

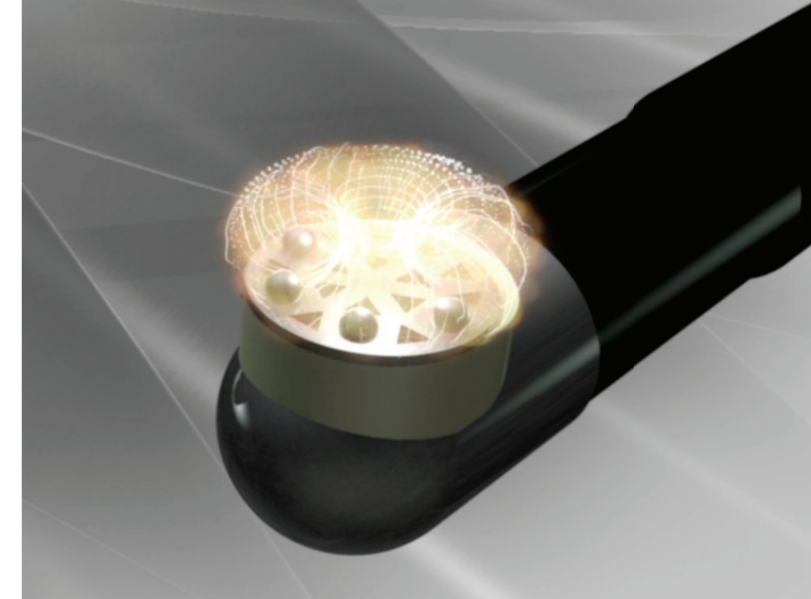
Authorised Representative

Skeppsbron 2
111 30 Stockholm
Sweden
Phone: +46 8 546 172 00
Fax: +46 8 546 172 39

Not for distribution in the United States.

©2013 ArthroCare Corporation. All rights reserved. All trademarks, service marks and logos listed herein are registered and unregistered trademarks of ArthroCare Corporation, its affiliates or subsidiaries or a third party who has licensed its trademarks to ArthroCare.

P/N 50595.gb



Coblation®

Performance. Precision. Protection.





Coblation is unique to ArthroCare

Coblation generates a precise plasma layer used to remove target tissue whilst minimising damage to the surrounding area.

Contents

Our Heritage	04
Our Technology	06
Confidence in Coblation	08
Performance	10
Precision	12
Protection	14
Delivering Performance, Precision & Protection	16
References	18

Our Heritage



Coblation is unique to ArthroCare

No one knows the science better and no one has more experience applying it to the demanding and ever changing requirements of the surgical environment.



>> 1993

ArthroCare founded in Sunnyvale, California

>> 1997

- Arthrocare's first Coblation generator released. System 2000 (SPM)
- First Coblation patents granted

>> 1999

Entered the spine market

>> 2003

First temperature indicating wand released. Paragon™ T2

>> 2004

- ENT Coblator™ II launched
- Super TurboVac™ 90 launched

>> 2006

SPM Generation 3 generator released. Quantum™

>> 2011

Ambient™ technology released with the SPM Quantum 2 generator

>> 2013

Over 6 million wands used in arthroscopies

>> 1995

First Coblation case performed. (Arthroscopy: Philippe Hardy, Paris)

>> 1998

Entered the ENT market with the first integrated suction wand

>> 2001

FDA clearance for Coblation tonsillectomy

>> 2003

SPM next generation generator released. Atlas™

>> 2005

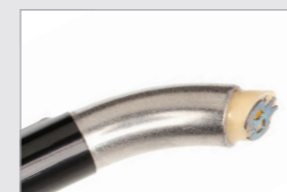
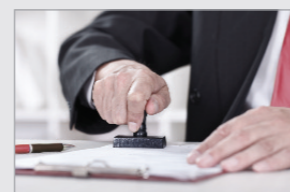
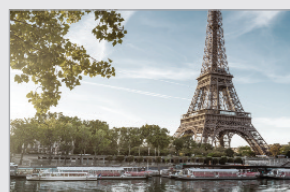
Super MultiVac™ 50 launched

>> 2007

FDA clearance to treat malignant tumours in the spine

>> 2012

Over 1 million wands used in knee arthroscopies

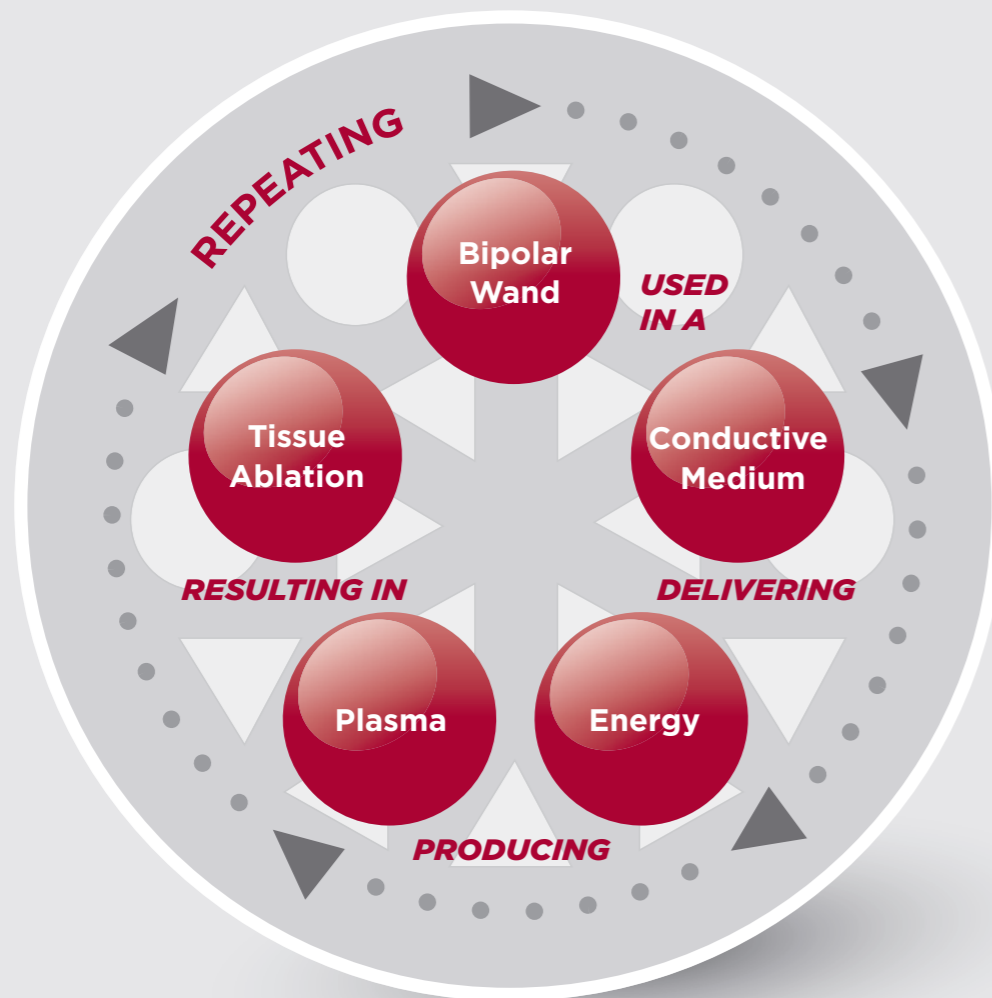


Coblation is unique to ArthroCare

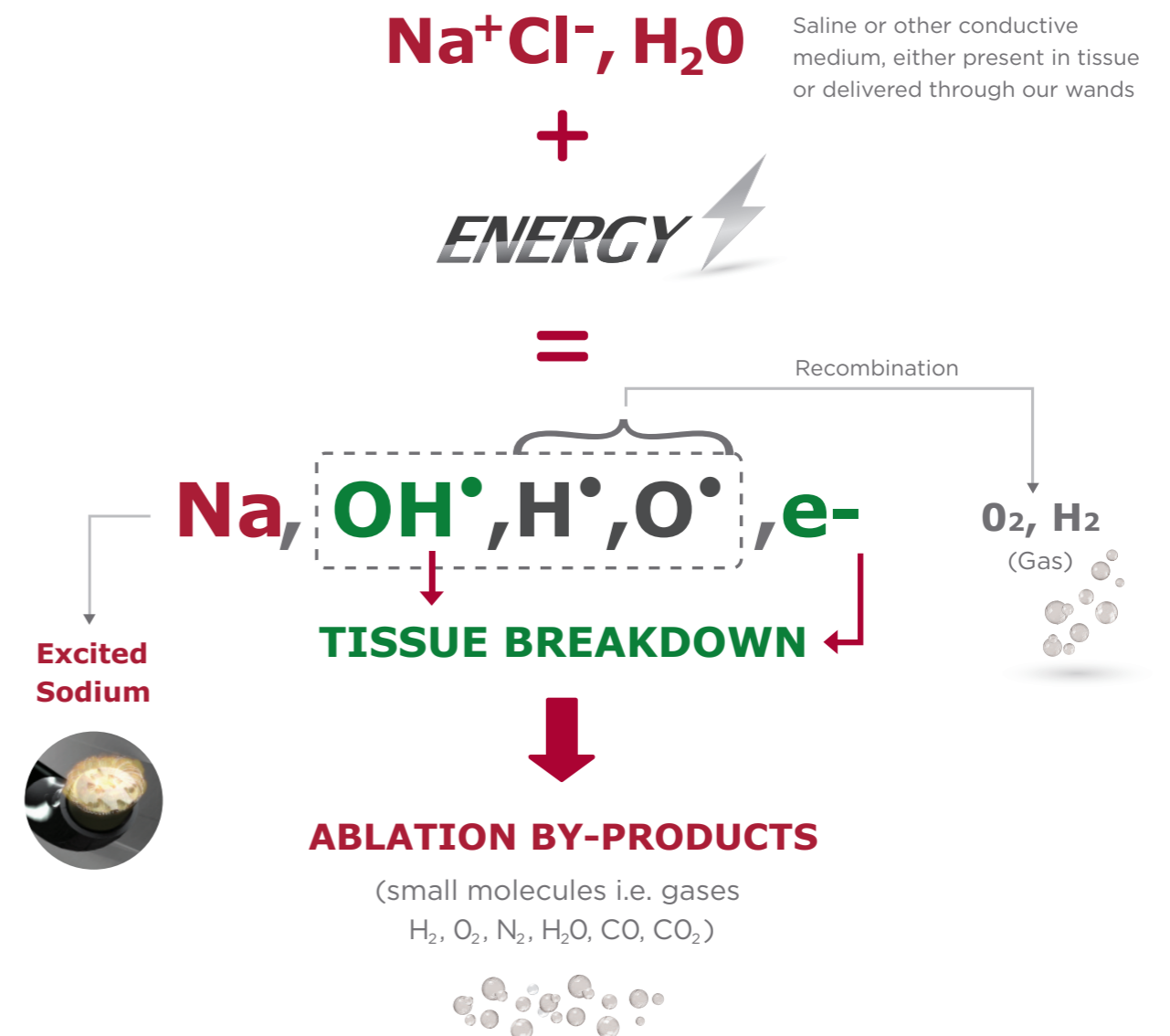
Coblation technology is a controlled, non-heat driven process which uses energy (current) to excite electrolytes in a conductive medium to create a precisely focused plasma.

The plasma's energised particles have sufficient energy to break molecular bonds within tissue, causing tissue breakdown at relatively low temperatures.

The result is volumetric removal of target tissue with minimal damage to surrounding tissue.



Modern bi-polar technology means current does not pass directly through tissue during the Coblation process, allowing minimal tissue heating.



Coblation is unique to ArthroCare

Coblation generates a precise plasma layer used to remove target tissue whilst minimising damage to the surrounding area.

The Fundamentals



The **Performance** you want

“The efficient tissue ablation and precise haemostasis achieved with coblation result in a significant reduction in operative time and costs*.” ¹



The **Precision** you need

“Coblation technology enables the precise, well controlled ablation of soft tissue that results in smoother, more anatomic surfaces than those produced by conventional monopolar diathermy or mechanical shaver.” ¹



The **Protection** you get

“Trying to ensure the safest possible patient care is as old as medicine itself. ‘First do no harm’ is one of the core principles of medical practice.” ²

“Coblation [is] also associated with a high level of ablative precision and control, the creation of smoother anatomical surfaces and the prevention of thermal injury to surrounding tissues.” ¹

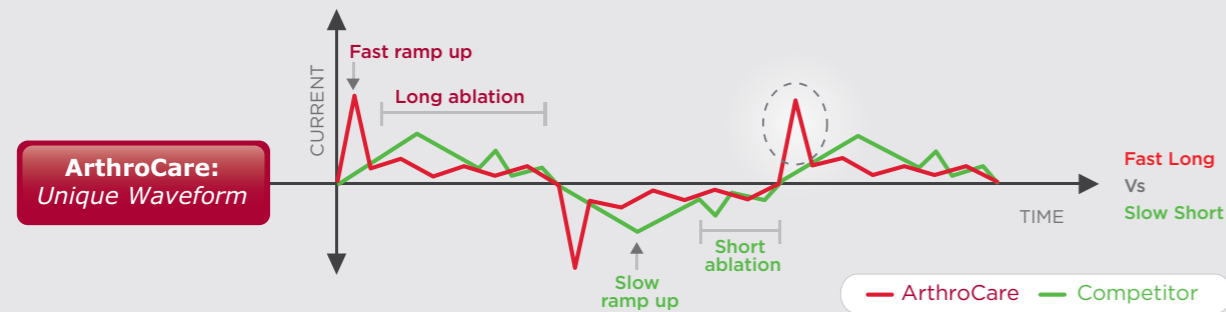
Performance



A unique combination of waveform & frequency designed to deliver optimum performance

Waveform

ArthroCare's waveform requires less time to start plasma and allows more time per half cycle for ablation.

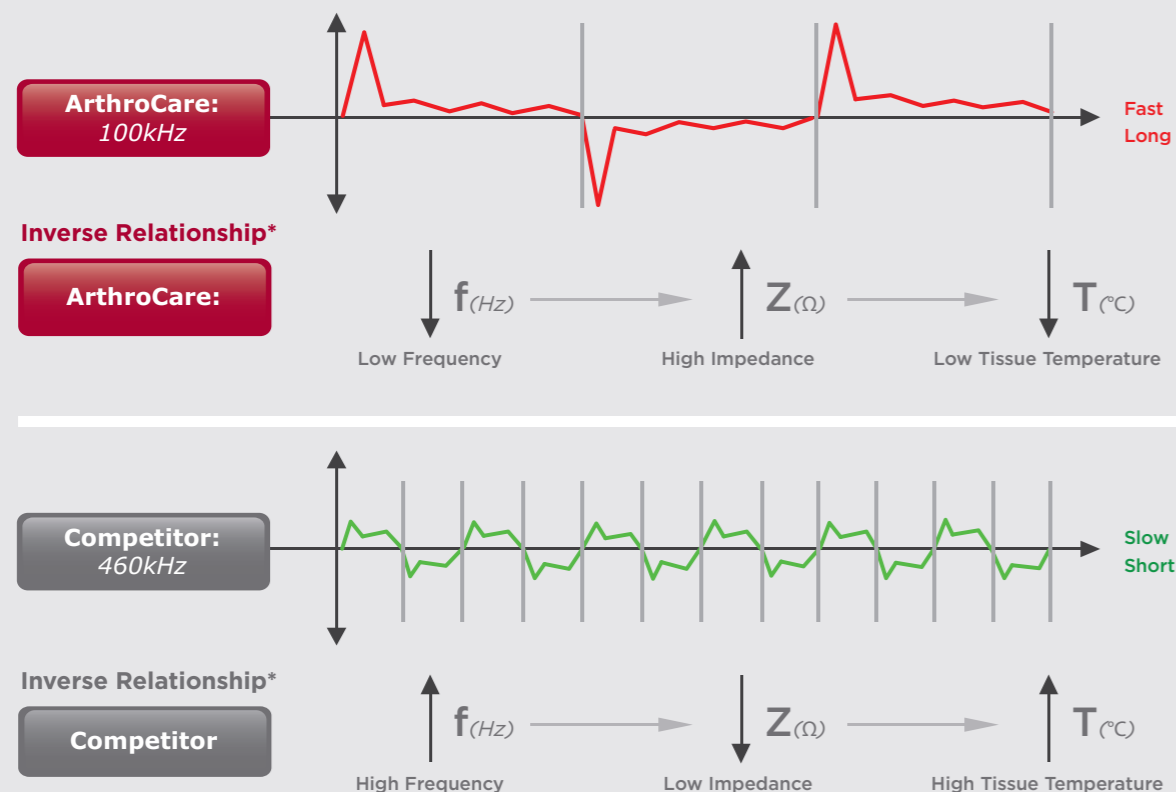


Frequency

ArthroCare operates at 100Khz (lower frequency compared to the competition (460KHz) requiring less energy cycles to drive plasma formation.)³

As the frequency increases
tissue impedance decreases.

↑ Current passed through tissue
↑ Risk of thermal damage



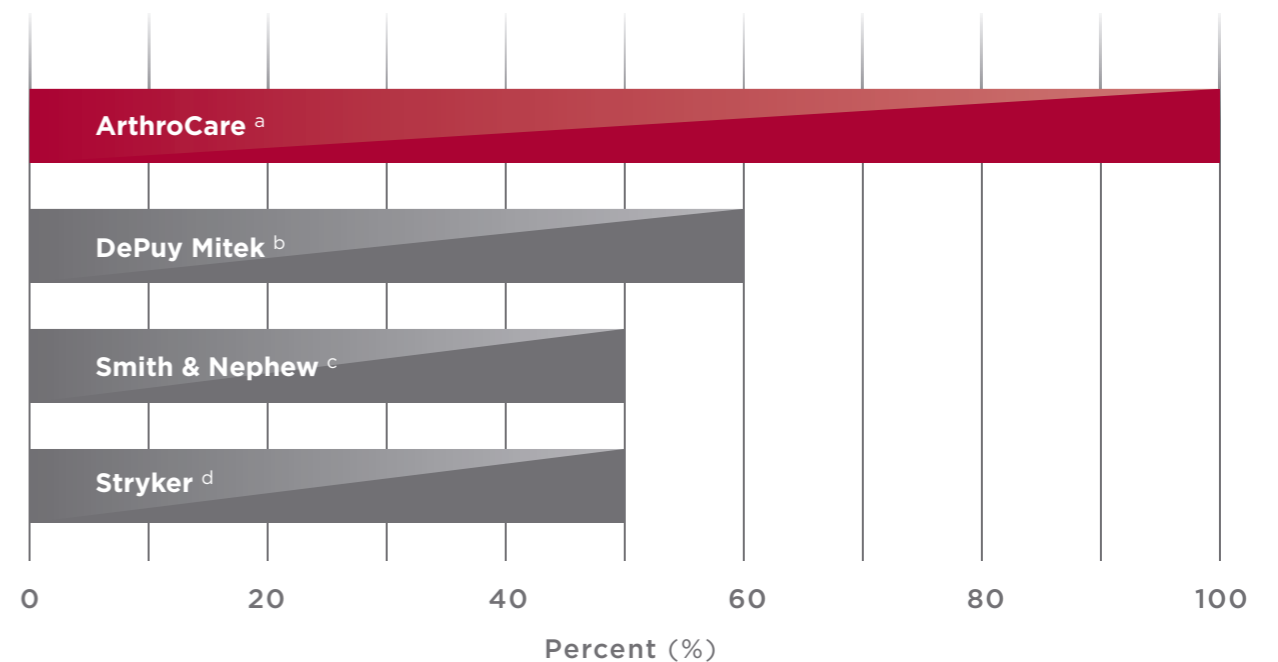
The Performance you want

“Time and cost savings have been attributed to the ablative efficiency and the simultaneous coagulation of the Coblation device.”¹



Big Ablation

Competitive Ablation Rate Performance Compared to Ambient MegaVac 90^{4,5}



a. MegaVac™ 90 b. VAPR S-90 c. Whirlwind d. Super 90S

*The inverse relationship between frequency and tissue impedance.³

Charts shown on this page is for visual representation only



The **Precision** you need

ArthroCare wands are precision-designed to meet the anatomical needs of specific procedures

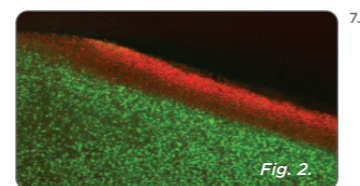
Precise Plasma Layer

“The 100 - 200µm plasma layer allows for an accurate removal of soft tissue.”⁶

Minimal Collateral Damage

Articular Cartilage

“Radiofrequency probes create a well-controlled debridement in normal articular cartilage with smooth edges and a defined margin of chondrocyte death that extended approximately 100-200µm into the treatment area.”⁷



Bovine femoral condyle cartilage treated with the Paragon T2 ArthroWand.



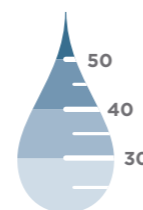
Image showing tissue effects of electrocautery versus coblation.

Electrocautery versus Coblation

“Bovie-type monopolar devices dissipate energy from the electrode through the patient to ground at a distant site. This leads to ‘scattering’, decreased current density at the point of application, and damage to the surrounding tissues.”⁸

Precision Monitoring of Interarticular Fluid Temperature

Ambient™ is the only technology offering real time temperature monitoring of the intra articular fluid



PROcise™ Mini Laryngeal Wand EVac 70 Xtra

Delivering precision performance to the larynx, tonsils and adenoids



Ambient Super MultiVac™ 50 Ambient Super TurboVac™ 90

Addressing your anatomic requirements for volumetric tissue removal



Paragon™ T2

The only bipolar wand specifically designed for articular cartilage



Covator™ 20

Designed for the efficient separation of soft tissue from bone



Fig. 2. Red-Green viability staining reveals minimal cell disruption. Margin of Chondrocyte death 129.7 µm (SD ± 2.3) on controller setting 8.

Protection



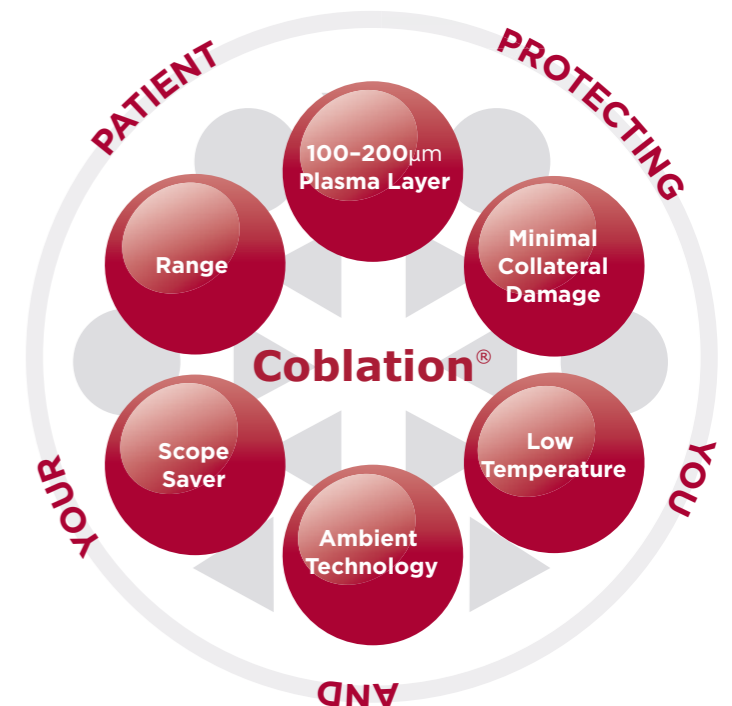
The **Protection** you get

Combining Performance and Precision with our key proprietary features to deliver Protection to you and your patient.

Leading the way in temperature feedback

Ambient Technology

The **only** system offering real time temperature monitoring of the intra articular fluid providing direct visual and audio feedback.



Protecting your capital equipment

Scope Saver

All ArthroCare controllers automatically suspend the output when there is a spike in current, such as when a wand is in close proximity to a metal object (ie Arthroscope).

Thermal Cell Damage

The diverse array of heat sources commonly used in minimally invasive surgery creates the need for surgeons to stay informed about the safe temperature ranges for the tissue they encounter.

- Mechanical shavers and burrs
- Microbrider
- Lasers
- Scope lights
- RF devices
- Monopolar and bipolar

Fluid temperatures as low as 45°C may have deleterious effects on chondrocytes and soft tissue cells. ⁹

Mechanical Cell Damage

“There is evidence that suggest that shavers tend to rip and tear tissue resulting in unstable and non smooth surfaces contributing the propagation of fissures and cracks, ultimately making lesions larger.” ^{10, 11}

“Compared with classical mechanical debridement, bipolar radiofrequency currently appears to be the superior method for achieving a good midterm result.” ¹²



SHAVER

SEM (Scanning Electron Microscope) image of mechanical shaver time = 0, x 1,000













COBLATION



SEM image of Coblation time = 0, x 1,000





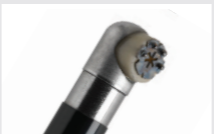
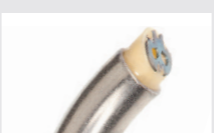
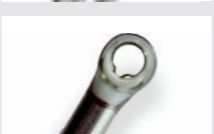





ENT (Ear, Nose & Throat)

		Product Name	Product Code
Tonsillectomy/ Adenoidectomy		EVac™ 70 Xtra	EIC5872-01
		EVac 70 Xtra HP	EIC5874-01
		PROcise EZ View	EIC8875-01
Turbinate Reduction		ReFlex Ultra™ PTR	EIC4835-01
		ReFlex Ultra 45	EIC4845-01
Snoring/ Soft Tissue Reduction		ReFlex Ultra 55	EIC4855-01
		ReFlex Ultra SP	EIC4857-01
Sinus Surgery		PROcise EZ View	EIC8875-01
Laryngeal Lesions and Tracheal Procedures		PROcise LW	EIC7070-01
		PROcise MLW	EIC7071-01

Spine

		Product Name	Product Code
PDD		DC SpineWand™	SDC03-01
		DLR SpineWand™	SDLR03-01

Sports Medicine Core Products

		Product Name	Product Code	Finger Switch
Shoulder		Ambient™ MegaVac™ 90	ASCA5001-01	<input checked="" type="checkbox"/>
		Ambient SuperTurboVac™ 90	ASHA4250-01	<input checked="" type="checkbox"/>
		StarVac™ 90	ASC4251-01	<input type="checkbox"/>
Knee		Ambient SuperMultiVac™ 50	ASHA4830-01	<input checked="" type="checkbox"/>
		Paragon™ T2	AC5531-01	<input type="checkbox"/>
Hip		Ambient HipVac™ 50	ASHA 4730-01	<input checked="" type="checkbox"/>
		SideWinder™ Blade	AC2340-01	<input type="checkbox"/>
Cutting		Saber™ 30	AC4330-01	<input type="checkbox"/>
		CoVator™ 20	AC4340-01	<input type="checkbox"/>
Tendon		TOPAZ™ Micro Debrider IFS	ACH4040-01	<input checked="" type="checkbox"/>

References

1. Diab M, Fernandez G, Elsarafy K. Time and cost savings in arthroscopic subacromial decompression: the use of the bipolar versus monopolar radiofrequency. *International Orthopedics* 33:175-179, 2009.
2. World Health Organization. A brief synopsis on patient safety, 2010.
3. Gabriel S, Lau RW, Gabriel C. The Dielectric Properties of Biological Tissues: II. Measurements in the Frequency Range 10 Hz to 20 GHz. *Phys. Med. Biol.*, 41: 2251-2269, 1996.
4. Data on File at ArthroCare. Report, Engineering Studies, Comparative Study of Ablation Tissue Removal Rates, Sports Medicine, Ambient MegaVac 90 (ASCA5001-01) and Ambient TurboFlash 90 IFS (ASHA6001-01).
5. Data on File at ArthroCare. Comparative Study of Ablation Rate and Effectiveness for Sports Medicine and Competitor Wands.
6. Woloszko J, Stalder K, Brown I. Plasma Characteristics of Repetitively-Pulsed Electrical Discharges in Saline Solutions Used for Surgical Procedures. *IEEE Trans Plasma Science*, 30, 1376-1382, 2002.
7. Amiel D, Ball S T, Tasto J P. "Chondrocyte viability and metabolic activity after treatment of bovine articular cartilage with bipolar radiofrequency: an in vitro study," *Arthroscopy* 20(5), 503-10 (2004).
8. Allen R T, Tasto J A, Cummings J, Robertson C M, Amiel D, "Meniscal debridement with an arthroscopic radiofrequency wand versus an arthroscopic shaver: comparative effects on menisci and underlying articular cartilage," *Arthroscopy*, 22(4), 385-393. 2006.
9. Bojan B, Zoric M D, Horn N, Braun S, MD, Millett PJ, MD, MSC. Factors Influencing Intra-Articular Fluid Temperature Profiles with Radiofrequency Ablation.
10. Gundel J, Saskin H, Popovitz L, Goldstein J, Ytkinler D Frenkel S, Woloszko J, Rokito A, Sherman O. The Effect of Bipolar Radiofrequency Energy on Partial - Thickness Chondral Defects in a sheep Model. Presented as a poster at the Arthroscopy Association of North America (AANA) Annual Meeting, Seattle, WA, 2001.
11. Uribe J W. The use of the radiofrequency devices for chondral debridement. *Sports Medicine and Arthroscopy Review* 11:214-221, 2003.
12. Spahn G, M.D, Klinger H M, M.D, Mückley T, M.D, Hofmann G O, M.D, Ph.D. Four-Year Results From a Randomized Controlled Study of Knee Chondroplasty With Concomitant Medial Meniscectomy: Mechanical Debridement Versus Radiofrequency Chondroplasty. by the Arthroscopy Association of North America, 2010.



Coblation is unique to ArthroCare

Coblation generates a precise plasma layer used to remove target tissue whilst minimising damage to the surrounding area.