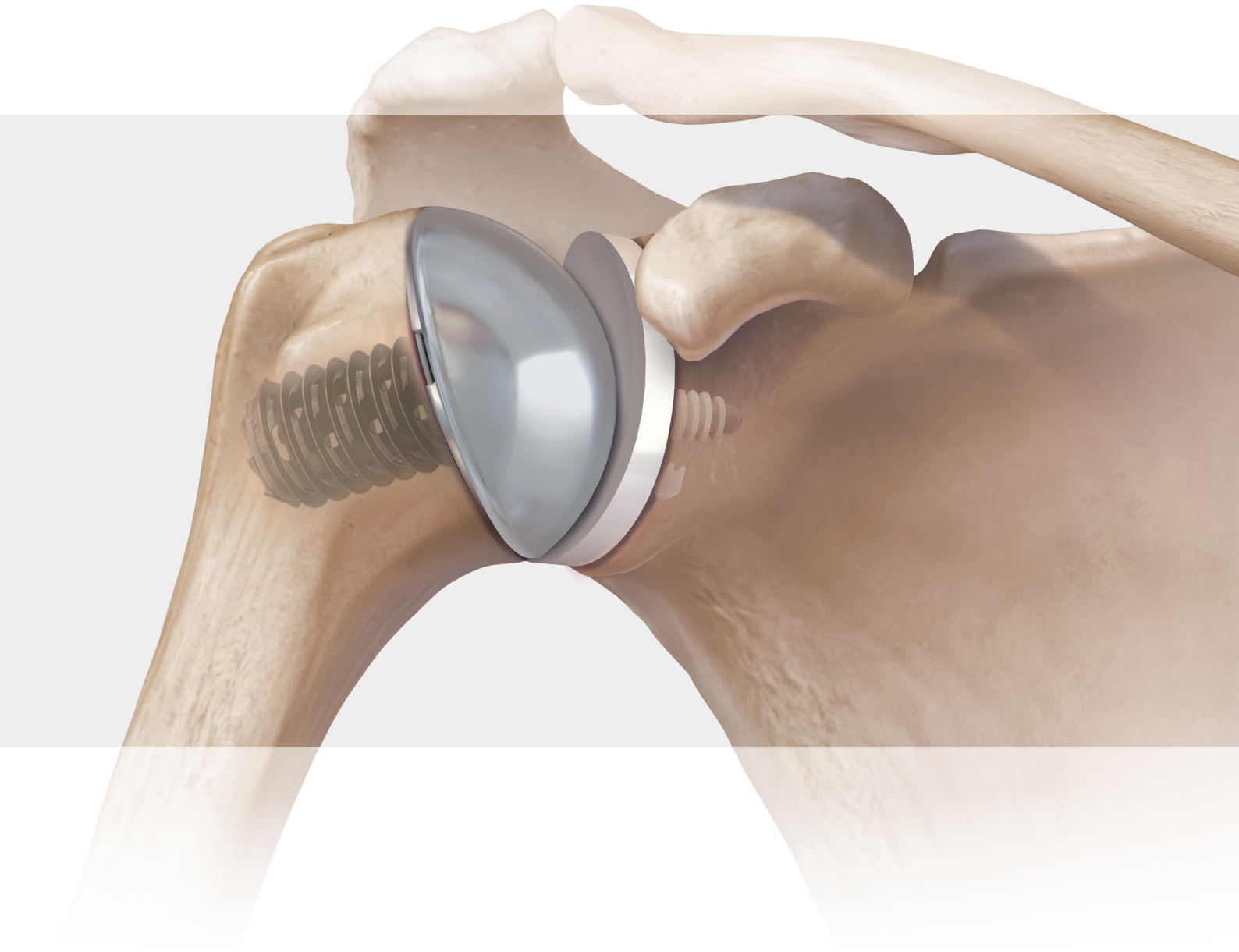
Eclipse™ Total Shoulder Arthroplasty System

Surgical Technique



Arthrex®

Eclipse™ Total Shoulder Arthroplasty System

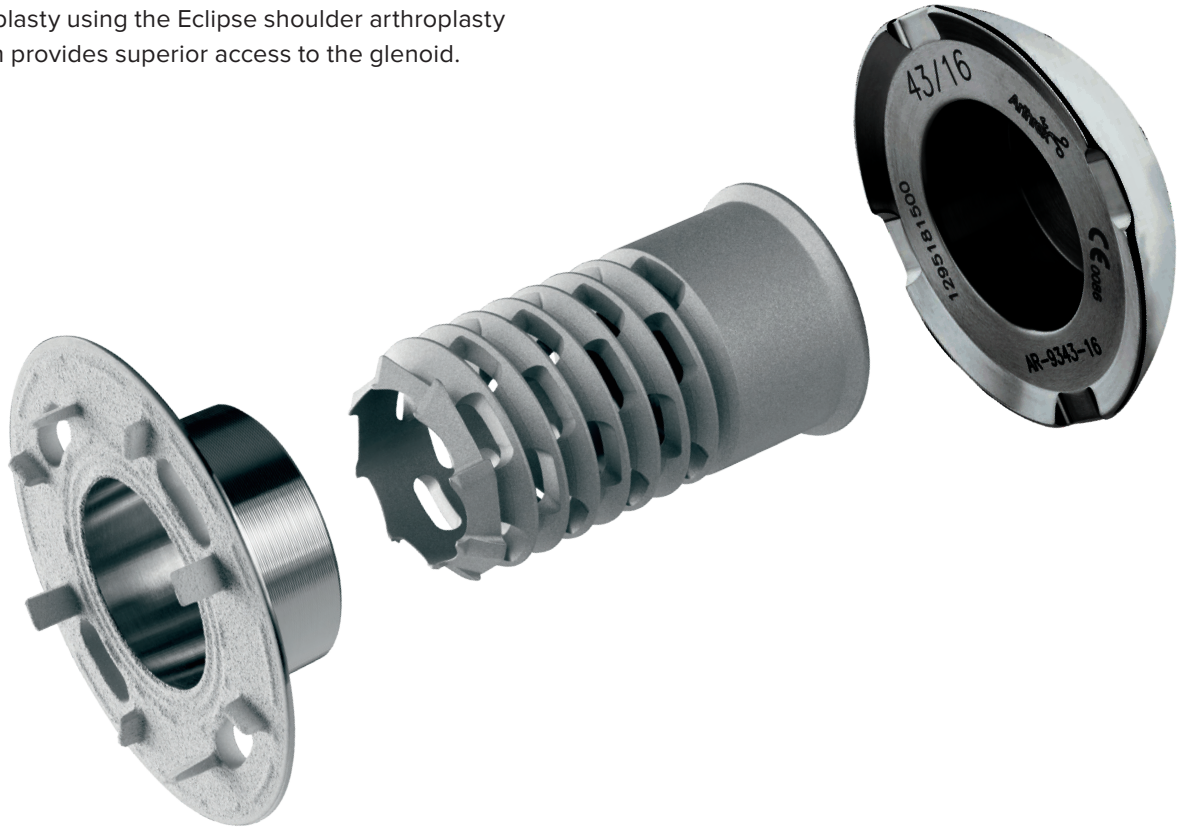
The Eclipse total shoulder arthroplasty system exemplifies a clinically proven design. Its efficacy has been substantiated in various publications spanning a range of short-, mid-, and long-term clinical follow-up.[1] In cases of post-traumatic and primary arthritis, the 9-year outcome after shoulder replacement using the Eclipse system has proven to be comparable to that of third- and fourth-generation standard, stemmed shoulder arthroplasty.[2]

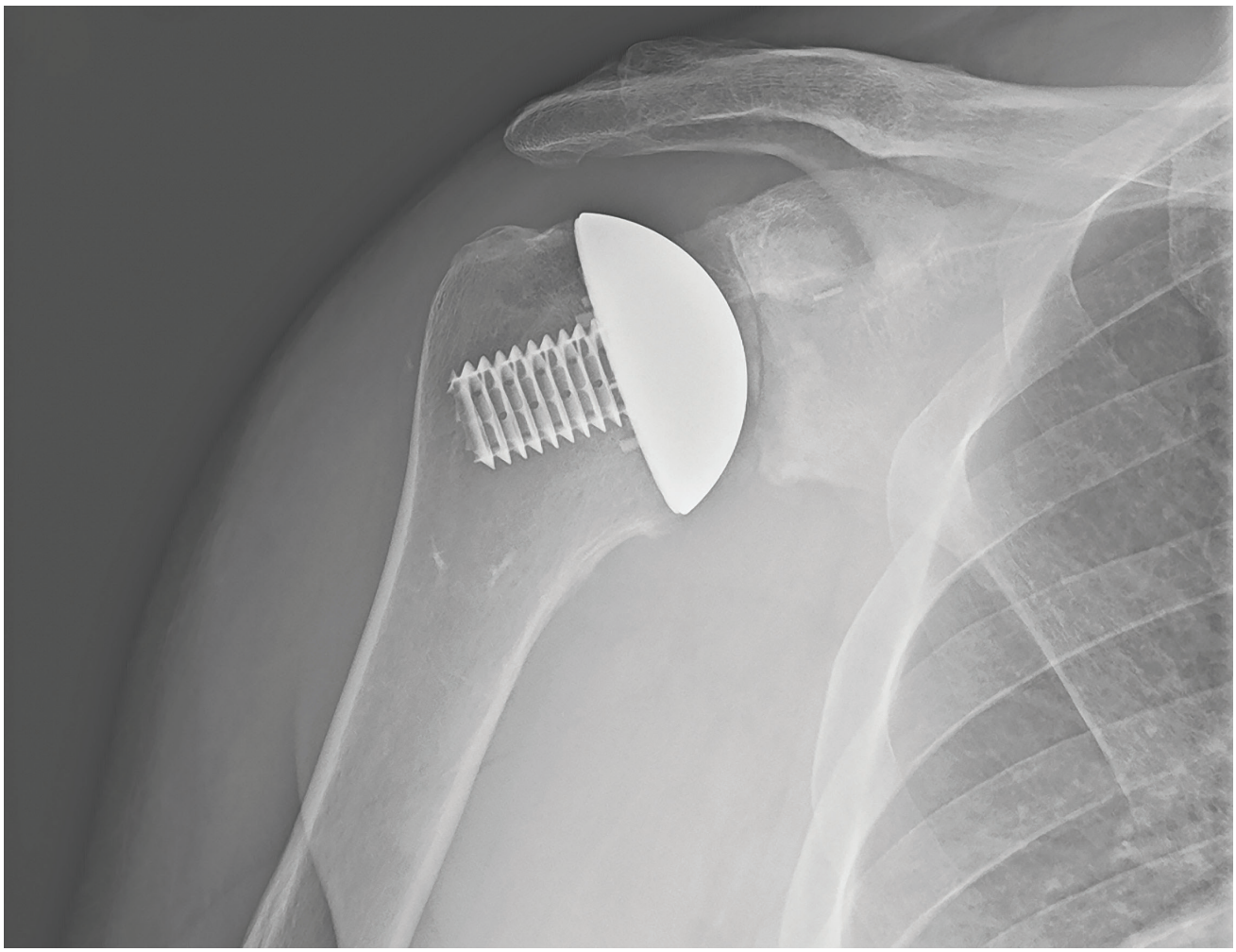
As a result of its design and operative technique, which obviate the need to broach the intramedullary canal, an approximate 20-minute reduction in operative duration has also been noted.[3] Benefits over a traditional stemmed prosthesis include, but are not limited to, reduced blood loss, lower infection rates, and a bone-conserving approach that provides for a primary-like setting in the event of revision arthroplasty.[1]

Intraoperatively, the Eclipse system allows for individual anatomic reconstruction of the humeral head based on accurate orientation with the cortical rim of the humeral resection plane. The benefits of this type of anatomic reconstruction, with the ability to place the humeral component independent of the humeral shaft axis, are perhaps most advantageous in post-traumatic cases. In contrast to humeral head resurfacing, total shoulder arthroplasty using the Eclipse shoulder arthroplasty system provides superior access to the glenoid.

In the absence of any published drawbacks associated with the use of a stemless implant versus a traditional long stem when performing primary shoulder arthroplasty, it can be said with confidence that the Eclipse total shoulder arthroplasty system offers several proven advantages for both the patient and surgeon.

Prof. Dr. med. Peter Habermeyer
ATOS Clinic Munich | Munich, Germany





Eclipse™ Total Shoulder Arthroplasty System

Humeral Heads	37 mm-55 mm (2 mm increments) Humeral heads offered in cobalt chrome and titanium (special order)
Heights	Anatomic and Extended (+2 mm) **Note: Only one head height is available for 37 mm**
Cage Screw	**Small:** 30 mm **Medium:** 35 mm **Large:** 40 mm **X-large:** 45 mm
Trunnion	37 mm-55 mm (sized with humeral head)

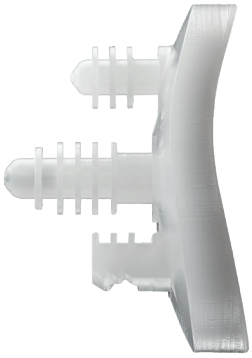
Glenoid Options: Univers VaultLock® Glenoid or VaultLock Augmented Glenoid

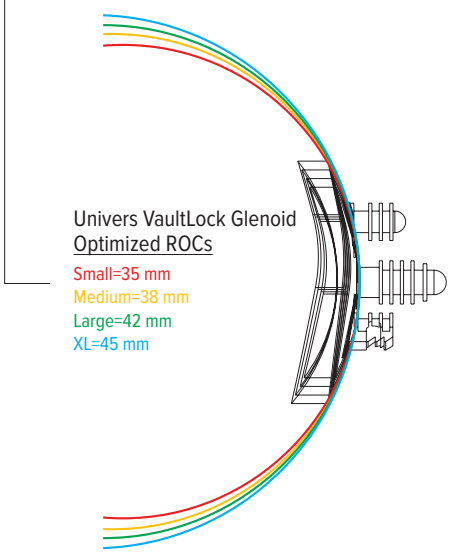
Fluted Central Peg
- Immediate fixation
- OR efficiency

Inferior Keel
- Decreased cortical penetration compared to inferior pegs
- Multiple fixation features, including reverse barbs, flutes, and central cement fenestration

Superior Peg
- Enhanced immediate fixation
- Self-pressurizing design

Inline Configuration
- Combines all advantages of pegged and keeled implants, including stability and preparation ease

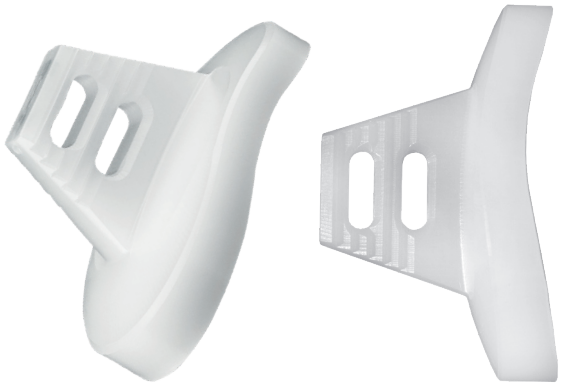




Anatomic Backside Radius of Curvature (ROC)
- Matches glenoid poly to glenoid anatomy
- Bone-sparing reaming
- Simplified decision-making

Univers VaultLock Glenoid: Optimized ROCs
- Anatomic solution with subchondral, bone-preserving design

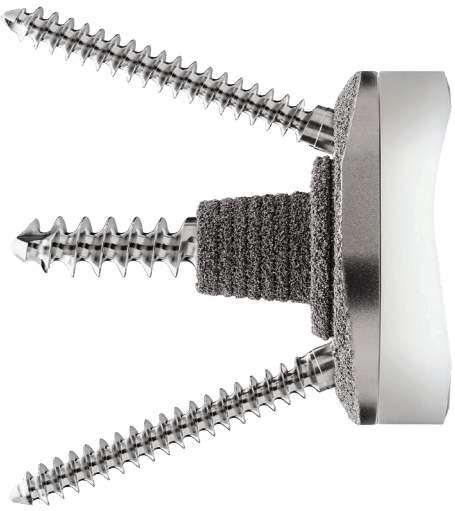
Glenoid Options: Keeled



Keeled Glenoid

- Dual fenestrations for enhanced anchoring
- Reverse barbs for expansion effect within the glenoid vault

Glenoid Options: Convertible Universal Baseplate

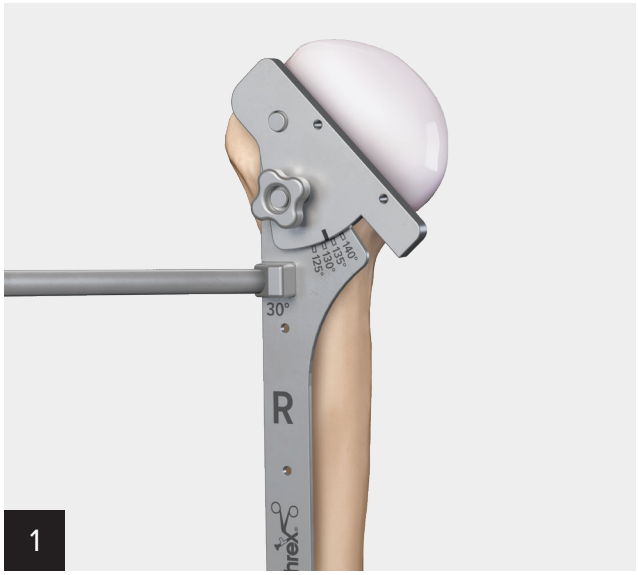


Convertible Universal Baseplate for Anatomic TSA

- Combines advantages of polyethylene with the stability of screw fixation, resulting in reduced risk of radiolucent lines
- Virtual Implant Positioning™ (VIP™) preoperative planning system for appropriate joint-line restoration
- Three sizes (S, M, L), two polyethylene thicknesses (baseplate + polyethylene = 7 mm or 8 mm), and appropriate glenohumeral mismatch for restoration of anatomic joint kinematics
- Immediate screw fixation (compression and locking)

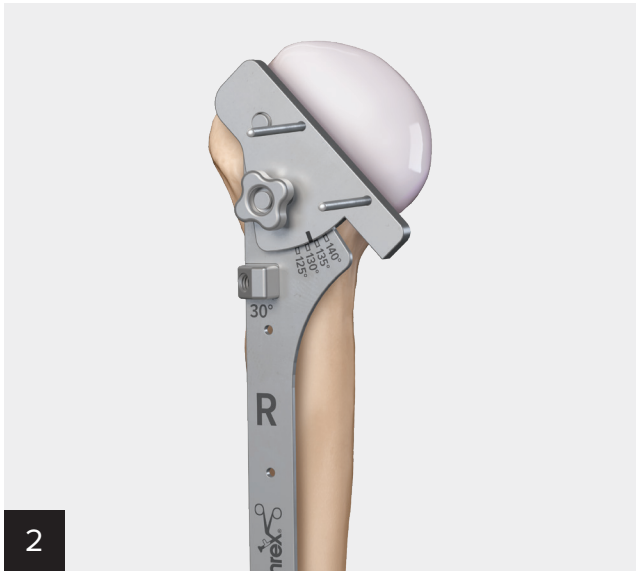
Resection Methods

Humeral Resection Template Method



1

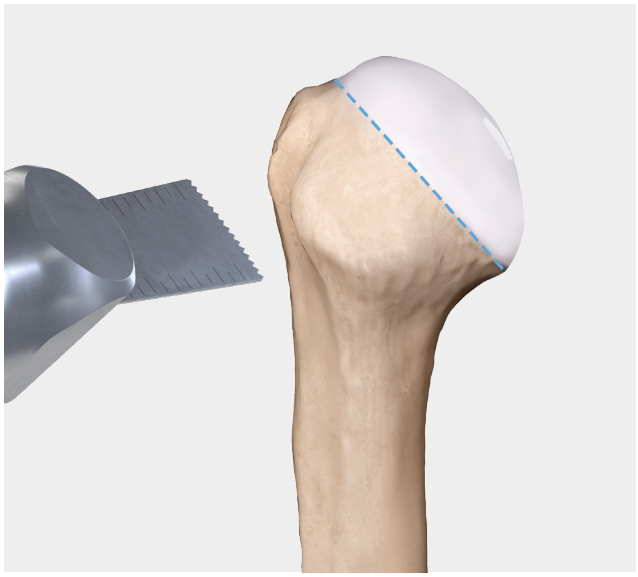
Use the humeral resection template to guide the humeral head cut. Align the handle with the forearm to provide 30° of retroversion.



2

Pin the template to resect the humeral head over the template.

Freehand Humeral Resection

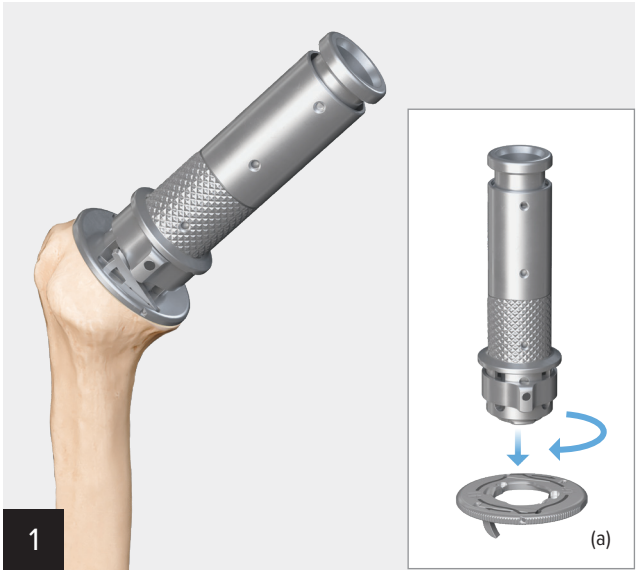


Following careful removal of osteophytes and exposure of the humeral neck, complete a freehand resection. Take care to follow the humeral neck and to avoid resection of the nonarticular portion of the humerus.

Bone Quality Test

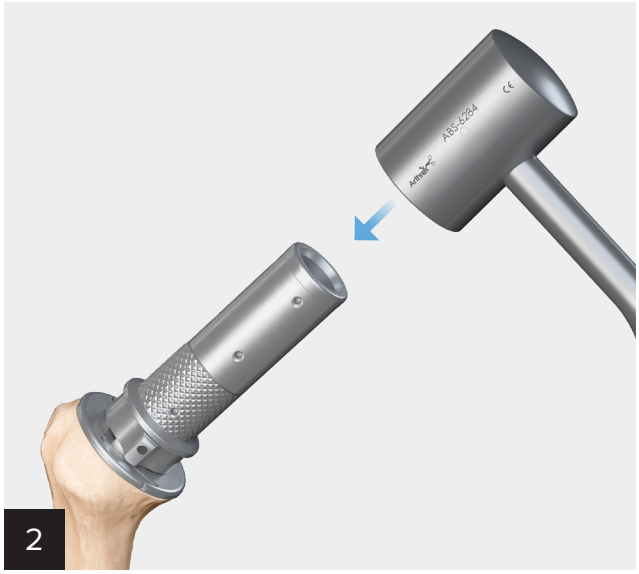
Following humeral resection, assess bone quality by depressing your thumb on the resected humeral surface. If you can depress your thumb into the humeral osteotomy without significant resistance, primary stability of the Eclipse™ prosthesis may be insufficient. In this case, a stemmed prosthesis such as the Univers™ II or Univers Apex OptiFit™ system may provide better fixation.

Humeral Preparation



Determine the size of the trunnion with the sizing plates. Attach the sizer to the inserter by placing the distal end of the inserter flat to the proximal edge of the sizing plate and twisting approximately 1/8th turn. The engraving on the plate will assist proper alignment **(a)**.

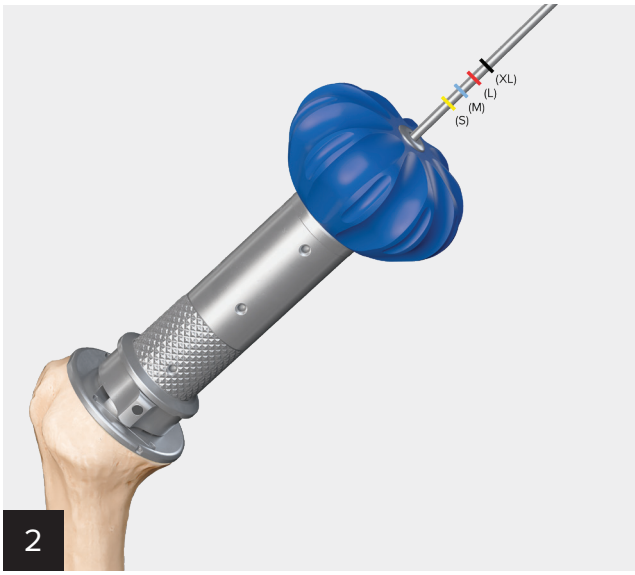
The coring template should match the resected plane of the cortical rim as closely as possible without overhanging.



When the appropriate size has been determined, impact the inserter to secure the sizer to the humerus. The sizer is secured by small claws.

Humeral Preparation

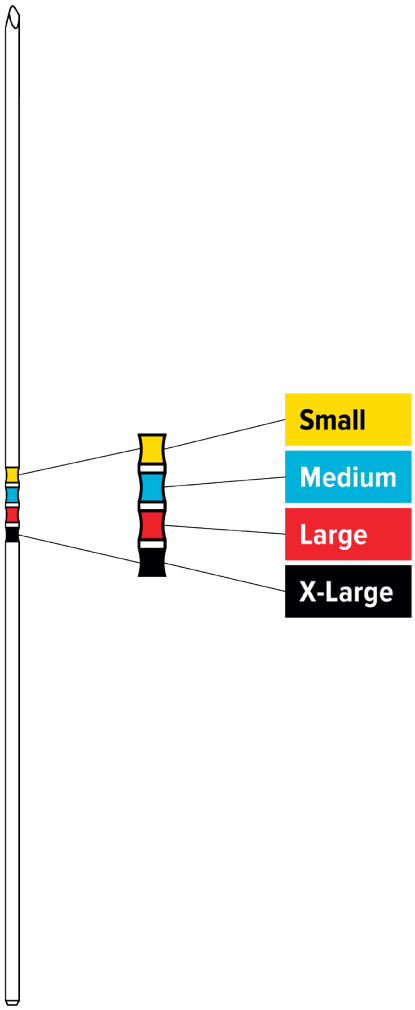
Prepare the humerus for the cage screw using the coring reamer. The coring reamer has a positive spot once the proper depth is reamed.



To determine the length of the cage screw, drill the graduated sizer through the coring reamer until it reaches the lateral cortex.

Note: Do not puncture the lateral cortex.

The size refers to the laser marking and colors (S, M, L, XL) on the pin and it is referenced off the top of the coring reamer. If the measurement is between two marks, choose the shorter cage screw.



Twist the inserter counterclockwise to disengage it from the sizer. Leave the sizer in place to protect the humeral resection as the glenoid is prepared.

Proceed to the steps for the chosen glenoid:

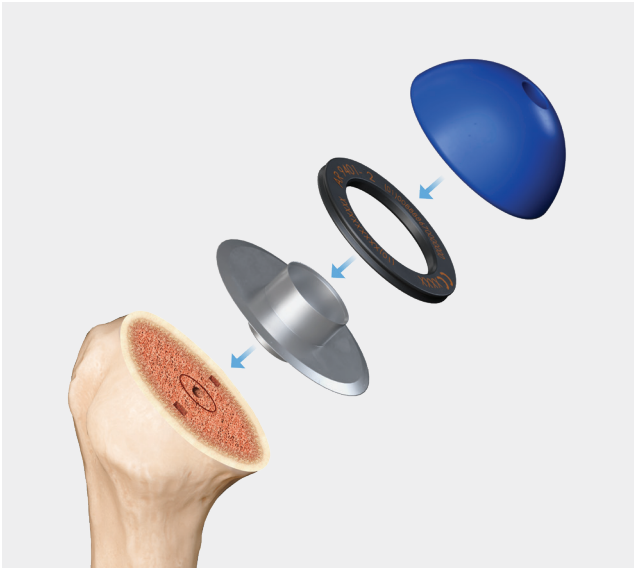
- Univers VaultLock® Glenoid or Keeled Glenoid (LT-000290)
- Univers VaultLock® Augmented Glenoid (LT-000205)
- Convertible Universal Baseplate (LT1-000000)

When glenoid implantation is complete, proceed to humeral implantation (step 1).

Optional: The calcar planer may be used to smooth the resection if desired.

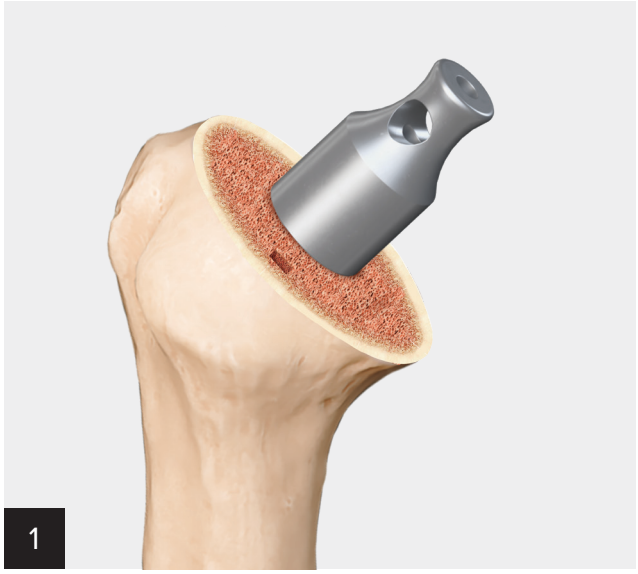
Note: Once cage length has been determined, the pin may be driven deeper into the cortex for planer stability.

Humeral Implantation

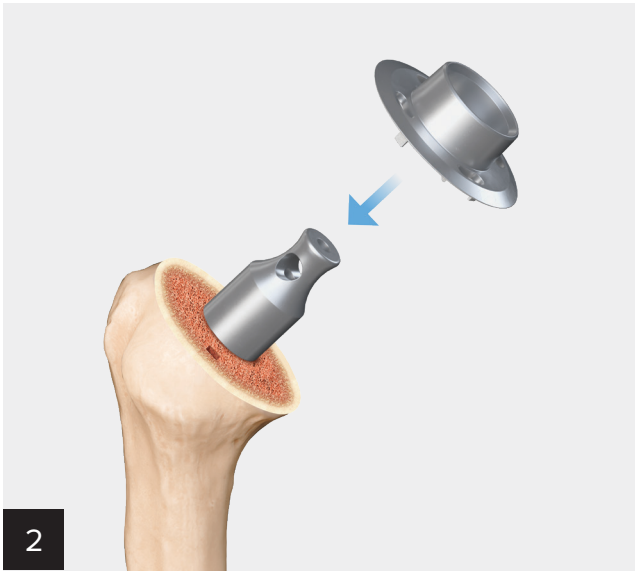


Optional: Humeral head and trunnion sizes can be verified with trial heads and the trial trunnion. The correct size matches the diameter of the cut surface of the humerus, providing cortical support to the implant. The head height is predetermined due to the fixed relationship of the head diameter and height based on normal humeral anatomy. The joint can be reduced and trialed to verify stability and tension.

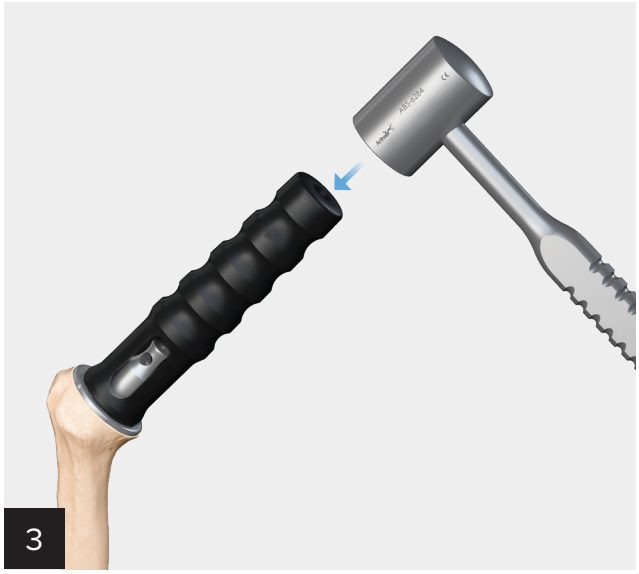
If a tall head trial is needed, use the 2 mm spacer below the head trial as shown.



Remove the sizer and place the centering device into the previously cored channel in the humeral osteotomy. Confirm that it is fully seated.



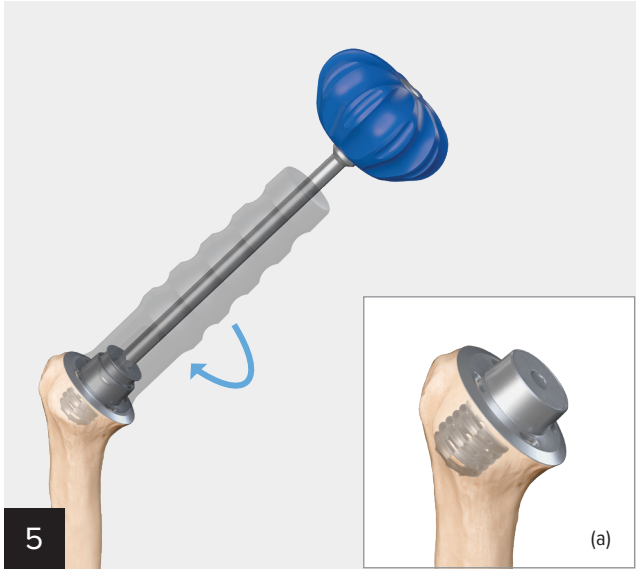
Open the trunnion in a sterile fashion and place it over the centering device.



Seat the trunnion using the trunnion impactor and mallet, then remove the centering device.

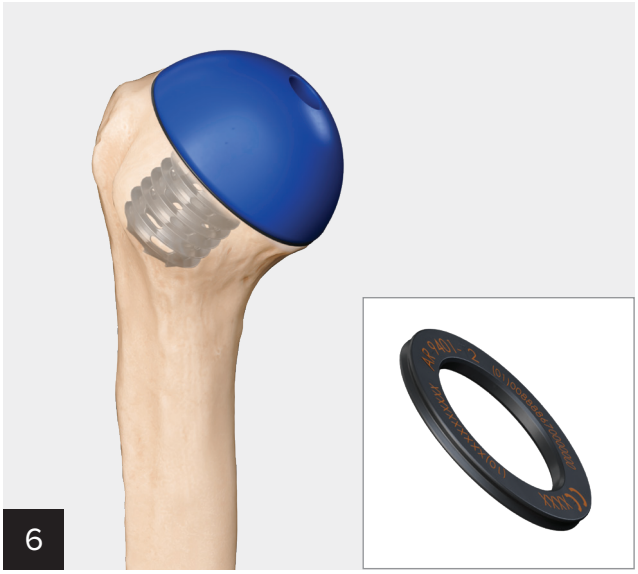
Note: The trunnion should have circumferential contact with the cortical rim.

Select the appropriate cage screw according to the previous measurement (step 2 from humeral preparation). Advance it through the center of the trunnion while holding the trunnion tightly against the resected surface with the trunnion impactor.

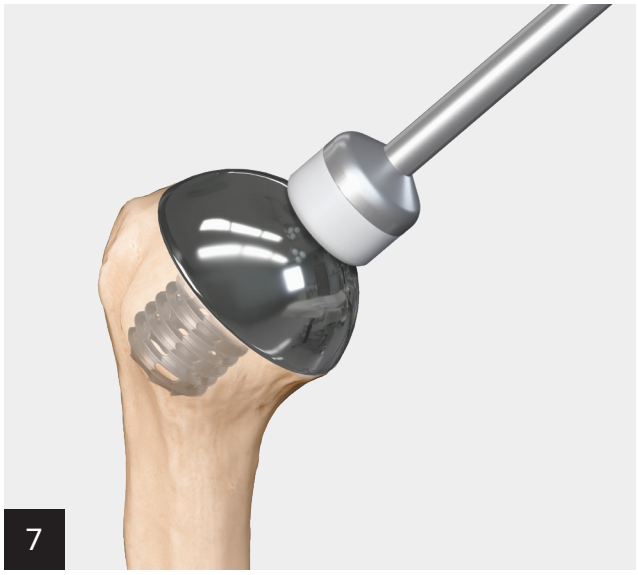


Secure the cage screw with the screwdriver until the head of the screw is flush with the neck of the trunnion. Once the cage screw is fully seated, remove the screwdriver and trunnion impactor **(a)**.

Note: Do not overtighten the screw, as this could lead to ineffective fixation.



The humeral head can be trialed on the definitive trunnion implant. If a tall head trial is needed, use the 2 mm spacer below the trial head (inset).



Select the appropriate humeral head and impact the humeral head onto the trunnion using the head impactor.

Note: The size of the humeral head must correspond to the size of the trunnion.

Note: For patients sensitive to cobalt alloy, titanium humeral heads are available for special order.

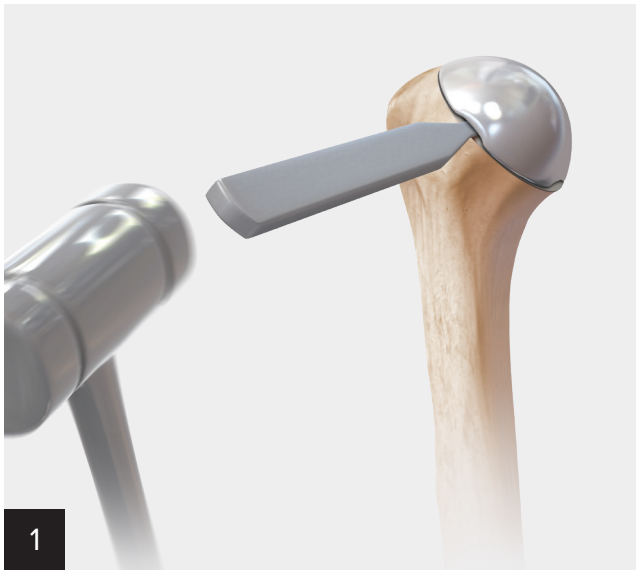
After performing a subscapularis peel and humeral head osteotomy, and following the final glenoid, trunnion, and cage-screw implantation, the technique is as follows:

1. Use the trunnion adapter to determine optimal placement of the 3 medial-row FiberTak® DR anchors.
2. Using the trunnion adapter to avoid the cage screw and trunnion, prepare a socket for the first FiberTak DR anchor. Remain parallel or divergent to the trunnion adapter. Implant the FiberTak DR anchor and set it. If soft bone is encountered, choose an alternative location. Repeat for the next 2 FiberTak DR anchors, spanning the medial footprint of the subscapularis.
3. Using the trunnion adapter, drill and mark 2 sockets in the bicipital groove for the 3.9 mm SwiveLock® anchors, but do not implant the anchors.
4. Remove the trunnion adapter and impact the final humeral head.
5. A SutureTape can be passed through the upper border of the subscapularis and the anterior border of the supraspinatus to reapproximate the native footprint of the tissue. Next, pass the FiberTak DR LabralTape™ sutures through the subscapularis.
6. Finish the repair by placing 1 LabralTape suture from each FiberTak DR anchor into a 3.9 mm SwiveLock anchor. Set the tension of the repair and place the anchor into 1 of the 2 bicipital groove sockets. Repeat, placing the final 3 LabralTape sutures into the final 3.9 mm SwiveLock anchor to finish the repair.

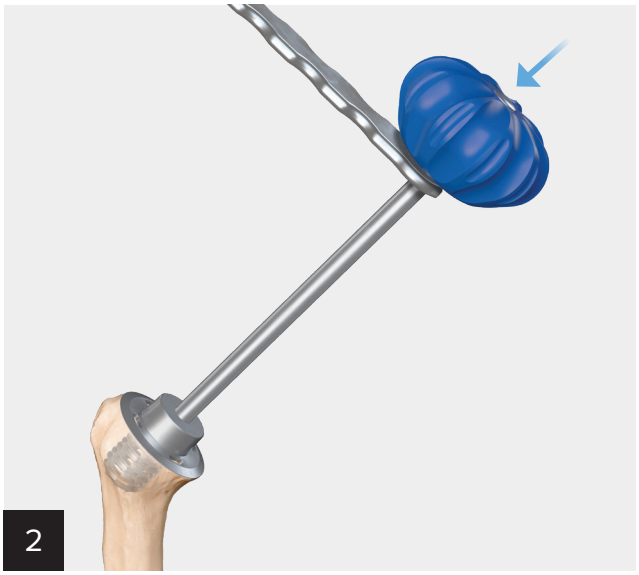
Pearls

- Remain parallel or divergent to the silhouette of the trunnion adapter. A convergent trajectory may cause the drill to hit the cage screw.
- Remain parallel to the hash marks on the trunnion adapter, representing a 5 mm space below the trunnion. A convergent trajectory may cause the drill to hit the undersurface of the trunnion.
- The trunnion adapter sits in the screw, not on the trunnion itself, so the Morse taper is not affected.
- For more information, animation and technical video, visit Arthrex.com.

Extracting the Eclipse™ Shoulder Arthroplasty System

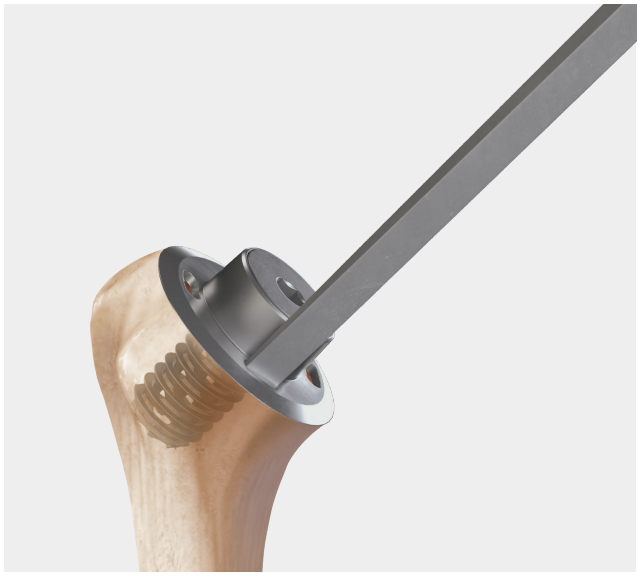


Remove the humeral head by placing the head extractor under one of the head slots. Tapping the end of the extractor will disengage the Morse taper connection.

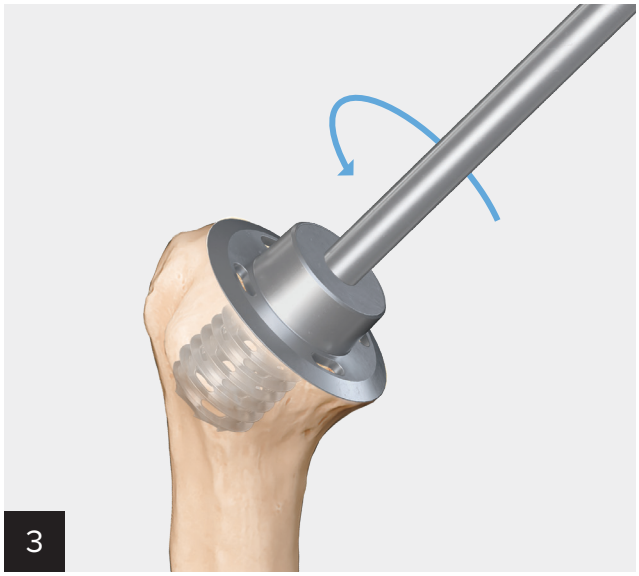


After engaging the screwdriver to the cage screw, lightly tap the handle. This will assist in detaching the cage screw from the bone. Turn the screwdriver slightly clockwise to fully detach it from the bone.

Optional: The extractor wrench as shown may be used to provide additional torque.



Optional: If the cage screw does not readily detach from the bone when performing step 2, an osteotome can be placed down 1 of the 4 slots of the trunnion to further assist with extraction.



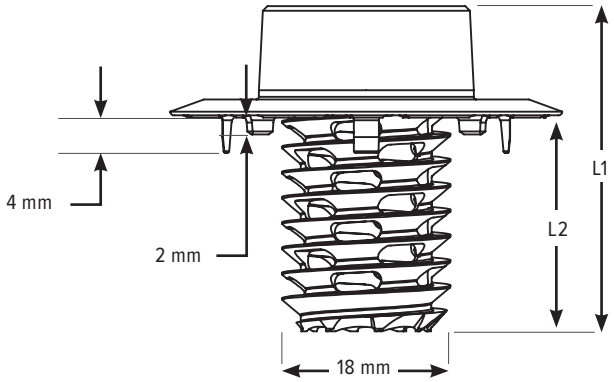
When the cage screw is fully detached, turn the screwdriver counterclockwise to remove. After the cage screw has been removed, lift the trunnion from the surface using the head extractor or an osteotome.

Glenoid Sizing Matrix: Radial Mismatch

Univers VaultLock®, Convertible Universal Glenoid™, and Keeled Glenoids

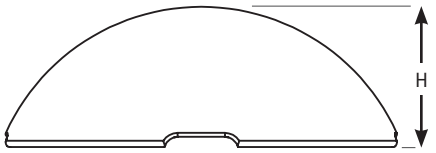
Eclipse™ Total Shoulder Arthroplasty System	Head Size (mm)	Small	Medium	Large	XL
	37	9.9 mm			
	39	8.5 mm			
	41	7.25 mm	8.75 mm		
	43	6 mm	7.5 mm	9 mm	
	45		6 mm	7.5 mm	9 mm
	47		5 mm	6.5 mm	8 mm
	49			5.5 mm	7 mm
	51			4.5 mm	6 mm
	53				5 mm
	55				4 mm

Eclipse System: Key Dimensions



Eclipse Cage and Trunnion

Cage Size	L1 (mm)	L2 (mm)
Small	30	18
Medium	35	23
Large	40	28
X-large	45	33



Eclipse Humeral Heads

		Head Size (mm)									
		37	39	41	43	45	47	49	51	53	55
H (mm)	**Anatomic**	16	16	16	16	17	18	18	19	20	21
	Extended		18	18	18	19	20	20	21	22	23

Ordering Information - Eclipse™ Total Shoulder Arthroplasty System

Implants

Product Description	Item Number
Eclipse trunnion, 37 mm, slotted, TPS and CaP coated	AR-**9301-37CPC**
Eclipse trunnion, 39 mm, slotted, TPS and CaP coated	AR-**9301-39CPC**
Eclipse trunnion, 41 mm, slotted, TPS and CaP coated	AR-**9301-41CPC**
Eclipse trunnion, 43 mm, slotted, TPS and CaP coated	AR-**9301-43CPC**
Eclipse trunnion, 45 mm, slotted, TPS and CaP coated	AR-**9301-45CPC**
Eclipse trunnion, 47 mm, slotted, TPS and CaP coated	AR-**9301-47CPC**
Eclipse trunnion, 49 mm, slotted, TPS and CaP coated	AR-**9301-49CPC**
Eclipse trunnion, 51 mm, slotted, TPS and CaP coated	AR-**9301-51CPC**
Eclipse trunnion, 53 mm, slotted, TPS and CaP coated	AR-**9301-53CPC**
Eclipse trunnion, 55 mm, slotted, TPS and CaP coated	AR-**9301-55CPC**
Eclipse cage screw, small, 30 mm	AR-**9301-01**
Eclipse cage screw, medium, 35 mm	AR-**9301-02**
Eclipse cage screw, large, 40 mm	AR-**9301-03**
Eclipse cage screw, x-large, 45 mm	AR-**9301-04**
Eclipse humeral head, 37 mm/16 mm	AR-**9337-16**
Eclipse humeral head, 39 mm/16 mm	AR-**9339-16**
Eclipse humeral head, 39 mm/18 mm	AR-**9339-18**
Eclipse humeral head, 41 mm/16 mm	AR-**9341-16**
Eclipse humeral head, 41 mm/18 mm	AR-**9341-18**

Product Description	Item Number
Eclipse humeral head, 43 mm/16 mm	AR-**9343-16**
Eclipse humeral head, 43 mm/18 mm	AR-**9343-18**
Eclipse humeral head, 45 mm/17 mm	AR-**9345-17**
Eclipse humeral head, 45 mm/19 mm	AR-**9345-19**
Eclipse humeral head, 47 mm/18 mm	AR-**9347-18**
Eclipse humeral head, 47 mm/20 mm	AR-**9347-20**
Eclipse humeral head, 49 mm/18 mm	AR-**9349-18**
Eclipse humeral head, 49 mm/20 mm	AR-**9349-20**
Eclipse humeral head, 51 mm/19 mm	AR-**9351-19**
Eclipse humeral head, 51 mm/21 mm	AR-**9351-21**
Eclipse humeral head, 53 mm/20 mm	AR-**9353-20**
Eclipse humeral head, 53 mm/22 mm	AR-**9353-22**
Eclipse humeral head, 55 mm/21 mm	AR-**9355-21**
Eclipse humeral head, 55 mm/23 mm	AR-**9355-23**

Special Order Only

Product Description	Item Number
Eclipse titanium humeral head, 37 mm/16 mm	AR-**9337-16T**
Eclipse titanium humeral head, 39 mm/16 mm	AR-**9339-16T**
Eclipse titanium humeral head, 41 mm/16 mm	AR-**9341-16T**
Eclipse titanium humeral head, 43 mm/16 mm	AR-**9343-16T**
Eclipse titanium humeral head, 45 mm/17 mm	AR-**9345-17T**
Eclipse titanium humeral head, 47 mm/18 mm	AR-**9347-18T**
Eclipse titanium humeral head, 49 mm/18 mm	AR-**9349-18T**
Eclipse titanium humeral head, 51 mm/19 mm	AR-**9351-19T**
Eclipse titanium humeral head, 53 mm/20 mm	AR-**9353-20T**
Eclipse titanium humeral head, 55 mm/21 mm	AR-**9355-21T**

Consumables

Product Description	Item Number
Eclipse SpeedScap™ implant system	AR-**9400-SBK**
Eclipse and Univers™ II total shoulder system head resection disposables kit	AR-**9206S**
Eclipse sterile cage-screw sizer	AR-**9401-08S**

Ordering Information - Eclipse™ Condensed Instrument Set (AR-9400CES)

Description	Item Number
Eclipse sizing pin	AR-**9402-08**
Eclipse sizer protector, size 37 through 55	AR-**9402-XX**
Eclipse protector inserter	AR-**9402-10**
Eclipse coring reamer	AR-**9402-02**
Eclipse targeting adapter	AR-**9402**
Cut guide handle	AR-**9215-1-02**
Cut guide, right	AR-**9200-01R**
Cut guide, left	AR-**9200-01L**
Eclipse trunnion impactor	AR-**9402-05**
Eclipse humeral head extractor	AR-**9401-17**
Eclipse screwdriver	AR-**9402-03**
Eclipse calcar planers, small	AR-**9402-P40**
Eclipse calcar planers, medium	AR-**9402-P48**
Eclipse calcar planers, large	AR-**9402-P56**
Short glove protector	AR-**9402-GP**
Eclipse centering device	AR-**9501-09**
Eclipse trial trunnion	AR-**9401-18**
Head impactor	AR-**9203-13**

Description	Item Number
Eclipse trial head spacer	AR-**9402-T2**
Eclipse trial head, 37/16	AR-**9437-16**
Eclipse trial head, 39/16	AR-**9439-16**
Eclipse trial head, 41/16	AR-**9441-16**
Eclipse trial head, 43/16	AR-**9443-16**
Eclipse trial head, 45/17	AR-**9445-17**
Eclipse trial head, 47/18	AR-**9447-18**
Eclipse trial head, 49/18	AR-**9449-18**
Eclipse trial head, 51/19	AR-**9451-19**
Eclipse trial head, 53/20	AR-**9453-20**
Eclipse trial head, 55/21	AR-**9455-21**

Eclipse™ Shoulder System: Directions for Use

Indications

The Arthrex Eclipse Shoulder Prosthesis is indicated for severely painful and/or disabled joint resulting from osteoarthritis or traumatic arthritis.

The humeral component is fixated with a hollow screw and the glenoid components are intended for cemented fixation in the joint and must only be used with appropriate bone cement.

The Arthrex Titanium Humeral Head is indicated for patients with suspected cobalt alloy sensitivity. The wear properties of titanium and titanium alloys are inferior to that of cobalt alloy. **US Only: A titanium humeral head is not recommended for patients who lack suspected material sensitivity to cobalt alloy.**

Contraindications

1. Insufficient quantities or quality of humeral head and/or humeral neck bone stock.
2. A rotator cuff that is not intact and irreparable.
3. Fractures: including irreducible 3- and 4-part proximal humeral fractures and non-union humeral head fractures of long duration.
4. The use of this device is not suitable as a revision from prior shoulder arthroplasty.
5. Metal allergy.
6. Blood supply limitations and previous infections, which may retard healing.
7. Foreign-body sensitivity. Where material sensitivity is suspected, appropriate tests should be made and sensitivity ruled out prior to implantation.
8. Any active infection or blood supply limitations.
9. Conditions that tend to limit the patient's ability or willingness to restrict activities or follow directions during the healing period, including severe neuro-arthropathy.
10. Do not use for surgeries other than those indicated.
11. The use of this device may not be suitable for patients with insufficient or immature bone. The physician should carefully assess bone quality before performing orthopedic surgery on patients who are skeletally immature. The use of this medical device and the placement of hardware or implants must not bridge, disturb or disrupt the growth plate.

Warnings

1. Caution: Federal law restricts this device to sale by or on the order of a physician.
2. This device is intended to be used by a trained medical professional.
3. Postoperatively and until healing is complete, fixation provided by this device should be considered as temporary and may not withstand weight bearing or other unsupported stress. The fixation provided by this device should be protected. The postoperative regimen prescribed by the physician should be strictly followed to avoid adverse stresses applied to the device.
4. Detailed instructions on the use and limitations of this device, the patient leaflet (www.arthrex.com/patientleaflets) and the patient implant card should be given to the patient. Your surgeon will guide you in deciding what particular treatment is best for you and explain the benefits, risks, and contraindications associated with the treatment.
5. Any decision to remove the device should take into consideration the potential risk to the patient of a second surgical procedure. Implant removal should be followed by adequate postoperative management.
6. Preoperative and operating procedures, including knowledge of surgical techniques and proper selection and placement of the implant, are important considerations in the successful utilization of this device. The appropriate Arthrex delivery system is required for proper implantation of the device.
7. A stemmed prosthesis is recommended for soft/weak bone.
   - It is anticipated that up to 33% of total shoulder candidates lack sufficient bone stock to support a stemless device.
   - If the hollow screw sizer is unstable in the humerus, then this may indicate that the bone is soft/weak.
   - If you can depress thumb into humerus, then this may indicate that the bone is soft/weak.

8. The following operative situations may cause premature loosening and complications:
   - Extreme weakening of the bone structure in preparing the bone bed;
   - Unsuitable selection of the implant size;
   - Inadequate cleaning of the bone bed prior to implantation; and,
   - Excessive use of force in placing or fastening the implant, provoking splintering fractures, or causing the bone to tear.
9. An internal fixation device must never be re-used.
10. Do not re-sterilize this device.
11. This is a single use device. Reuse of this device could result in failure of the device to perform as intended and could cause harm to the patient and/or user.
12. The appropriate Arthrex delivery system is required for proper insertion of the implant.
13. Only Arthrex delivery systems, instruments, and trial prostheses should be used for the implantation procedure.
14. Endoprostheses may not be processed mechanically or changed in any other way.
15. Do not implant any parts that have been scratched or damaged.
16. An artificial joint is subject to wear and/or can loosen over a period of time. Wear and loosening may make it necessary to re-operate on an artificial joint.
17. An infection in an artificial joint may lead to implant removal.
18. This device should only be used in conjunction with other implants designed specifically for use with this system.
19. TPS (titanium plasma sprayed)/CaP coated device - Fluid contact other than patient's blood should be avoided to achieve best ongrowth results.
20. A titanium humeral head is not recommended for patients who lack a suspected material sensitivity to cobalt alloy. Titanium humeral heads are intended for patients with suspected cobalt alloy material sensitivity. The wear properties of titanium and titanium alloys are inferior to that of cobalt alloy
21. Follow your institutions policy for safe disposal of all needles and other sharps or medical waste.
22. Biohazard waste, such as explanted devices, needles and contaminated surgical equipment should be safely disposed of in accordance with the institutions policy.
23. Serious incidents should be reported to Arthrex Inc., or an in-country representative, and to the health authority where the incident occurred.

References

1. Arthrex, Inc. DOC1-000088-en-US (Eclipse™ stemless implant scientific update: a review of existing literature). Naples, FL; 2024.

2. Habermeyer P, Lichtenberg S, Magosch P. 9-13 year results of stemless humeral head replacement. A prospective study. *JSES Open Access.* 2019;3(4):P234. doi:10.1016/j.jses.2019.10.013

3. Hawi N, Magosch P, Tauber M, Lichtenberg S, Habermeyer P. Nine-year outcome after anatomic stemless shoulder prosthesis: clinical and radiologic results. *J Shoulder Elbow Surg.* 2017;26(9):1609-1615. doi:10.1016/j.jse.2017.02.017

This description of technique is provided as an educational tool and clinical aid to assist properly licensed medical professionals in the usage of specific Arthrex products. As part of this professional usage, the medical professional must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professional should rely on their own training and experience, and should conduct a thorough review of pertinent medical literature and the product's directions for use. Postoperative management is patient-specific and dependent on the treating professional's assessment. Individual results will vary and not all patients will experience the same postoperative activity level or outcomes.

Arthrex manufacturer, authorized representative, and importer information (Arthrex eIFUs)

US patent information

arthrex.com