

Upper Extremity System

Solar



The Solar[®] Total Shoulder System...

Key Benefits:

- **Male trunnion humeral component more accurately recreates the anatomic center of rotation**
- **Patented, divergent peg glenoid takes advantage of greatest bone density in superior and inferior regions of the glenoid**
- **Unique dual radius head allows for independent sizing of head thickness and head diameter**

All humeral heads, glenoids and humeral components are completely interchangeable



The Solar® Total Shoulder provides a completely interchangeable, modular system which allows the surgeon the flexibility to achieve proper soft tissue tensioning and range of motion in either hemi or total arthroplasty procedures. Cement or press-fit fixation of the humeral component can be achieved while maximizing component selection.

- **Patented, most stable glenoid available***
- **Most user friendly instruments**

***Results on file at Stryker**

Stryker Solar[®] Total



System Overview and Design Rationale



Shoulder System

Humeral Components

The design of the Solar® humeral component was developed to accommodate a wide range of humeral anatomy. An extensive radiographic study was conducted from which the data was used to set the design parameters of components. These parameters included component stem length, proximal sizing, distal canal sizing, humeral head diameters, head height and the location of the anatomic center of rotation. The humeral components are manufactured from forged titanium alloy for superior strength and biocompatibility. The double wedge design of the proximal body offers an optimal geometry for both press-fit and cemented applications. Fins are placed laterally as well as in the anterior and posterior aspects of the proximal body to provide rotational stability and aid in fracture fixation. Long stem versions (200mm) are available for traumatic or revision indications.

- Proximal body has a roughened, grit blasted texture to aid in cement adhesion
- Distal end is polished for easy removal of the stem, if revision of a cemented component is required
- Proximal collar is minimized for easier access to the cement mantle in the event of a revision

Sizing Range of Humeral Components

Catalog No.	Distal Diameter	Stem Length
5351-4103	7mm	115mm
5351-4104	8mm	120mm
5351-4105	9mm	120mm
5351-4106	10mm	125mm
5351-4107	11mm	125mm
5351-4108	12mm	130mm
5351-4109	13mm	130mm
5351-4110	14mm	135mm
5351-4111	15mm	135mm
5351-4112	16mm	140mm
5351-4113	17mm	140mm
LONG STEMS		
5351-4205	9mm	200mm
5351-4207	11mm	200mm
5351-4209	13mm	200mm





Glenoid Components

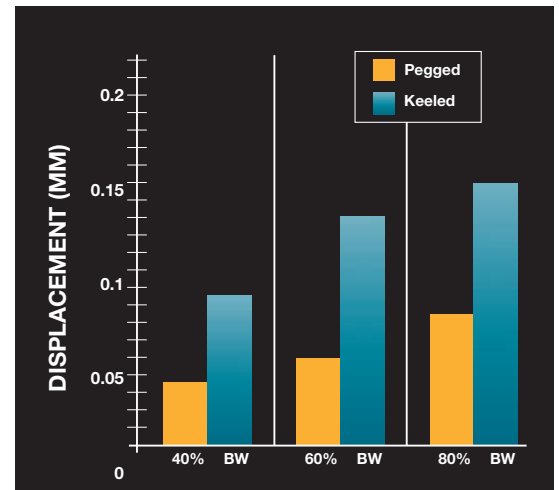
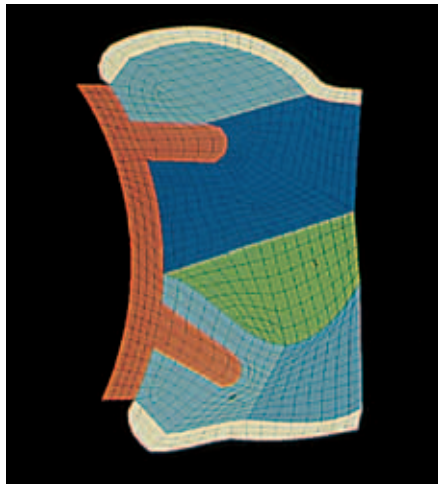
The Solar® glenoid component has been developed to address the issues of glenoid loosening and long term fixation. The components are manufactured from ultra-high molecular weight polyethylene (UHMWPE) and sized to provide anatomic curvature to the glenoid fossa. The patented angled inferior peg has been designed to resist the high superior loading forces which have a tendency to “rock out” the component as the humeral head translates through a range of motion.

The inferior angled peg, straight superior peg, and peg location are major factors that contribute to the stability of the Solar™ glenoid component. The peg design and locations take advantage of the greatest bone density in the superior and inferior aspects of the glenoid. They avoid the poorest bone quality region of the central glenoid. A keeled glenoid component with normalizations is also offered.

Sizing Range of Glenoid Components

Catalog No.	Size	Thickness	Pegs
5361-6105	#5	4mm	2 (superior/inferior)
5361-6107	#7	4mm	2 (superior/inferior)
5361-6109	#9	4mm	4 (2 superior/inferior, 2 central)
5361-6111	#11	4mm	4 (2 superior/inferior, 2 central)
5361-6205	#5	4mm	Keeled Glenoid
5361-6207	#7	4mm	Keeled Glenoid
5361-6209	#9	4mm	Keeled Glenoid
5361-6211	#11	4mm	Keeled Glenoid

The finite element analysis demonstrates that the pegged component produces a stress distribution in the surrounding bone more similar to the anatomic glenoid than a keeled device. The pegged design takes advantage of the distribution of the bone density by placing the pegs in the denser region of the glenoid providing more stability and less stress shielding.



Displacement of Glenoid in mm as a function of percent body weight.



Humeral Heads

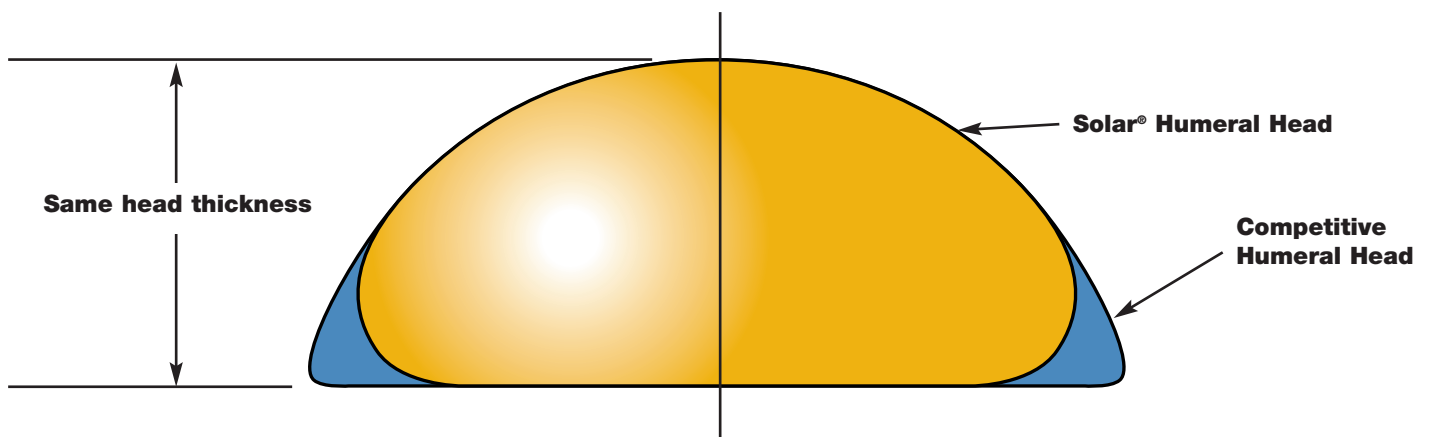
The Solar® humeral heads are manufactured from cobalt chromium alloy to minimize poly wear. The articulating spherical radius is constant throughout the size range.


Therefore, all humeral heads, glenoid components, and humeral components within the Solar® Total Shoulder System are completely interchangeable.

The heads also have a unique Dual Radius Design which allows for the independent sizing of head thickness and head diameter. For instance, a head thickness of 21mm is available to the surgeon in four diameters, 40, 45, 50, and 55mm. This allows the surgeon to balance the soft tissues in the neutral position with the proper translation, while still being able to select a diameter that will allow a good range of motion without overstuffing the joint space (less mass in the joint space). This reduced mass results in less stress in the surrounding soft tissues, allowing greater range of motion.

Sizing Range of Humeral Heads

Catalog No.	Overall Diameter	Thicknesses/mm
5350-40XX	40mm	12, 15, 18, 21
5350-45XX	45mm	12, 15, 18, 21, 24
5350-50XX	50mm	15, 18, 21, 24, 28
5350-55XX	55mm	18, 21, 24, 28, 34



 Competitive humeral heads have more mass for the same thickness as the Solar® humeral bearing heads. Greater mass at the rim of the head restricts the range of motion as it impinges on the glenoid.

Solar® Bipolar Shoulder System

The Solar® Bipolar component consists of three pre-assembled pieces: a cobalt chromium shell, UHMWPE insert and locking ring. Used as a hemi-shoulder replacement device, the Solar® Bipolar is intended to articulate directly with the anatomic glenoid. The bi-rotational nature of the Bipolar head offers potentially less wear on the acromion and the glenoid due to decreased friction and a reduction in loading forces to both of these structures.

Indications for the Bipolar include: proximal humeral fracture and/or dislocation; painful, disabling joint disease of the shoulder resulting from degenerative arthritis, rheumatoid arthritis, or post-traumatic arthritis; and aseptic necrosis of the humeral head. The Solar® Bipolar should be used in cementless applications and as a hemi-shoulder system.

Bipolar Exclusive Features:

- Pre-assembled outer shell and insert
- Clinically established patented locking mechanism based on UHR® Hip Bipolar technology
- Dual radius head design addresses broad patient population
- Simple, user friendly instrumentation





22mm Head Trial



Bipolar Head Trial

Sizing Range of Bipolar Heads

Item	Implant Catalog #	Trial Catalog #
22mm Bipolar Modular Head + 0 NK	5080-2200	5180-2200
22mm Bipolar Modular Head + 2 NK	5080-2202	5180-2202
22mm Bipolar Modular Head + 4 NK	5080-2204	5180-2204
40mm Bipolar Head	5081-4000	5181-4000
45mm Bipolar Head	5081-4500	5181-4500
50mm Bipolar Head	5081-5000	5181-5000
55mm Bipolar Head	5081-5500	5181-5500
Bipolar Dedicated Instrumentation	Catalog #	
22mm Bipolar Head Impactor	5180-0020	
Bipolar Head Removal Tool	5180-0050	



The 22mm head is seated with the Head Impactor

Instrumentation for the



Shoulder Retractors

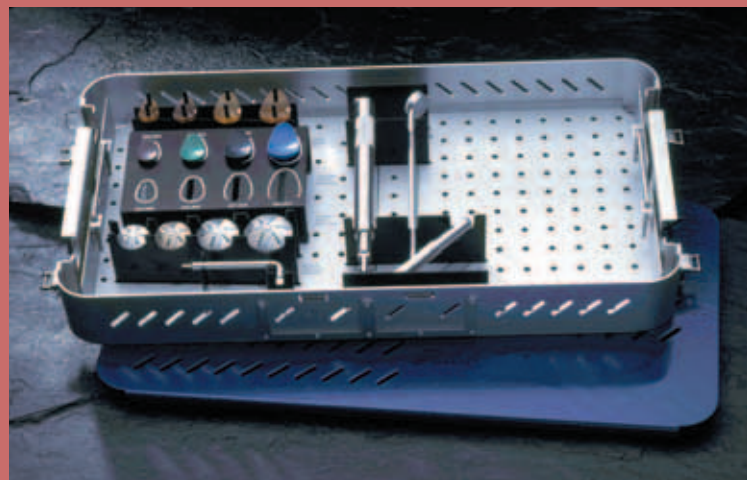
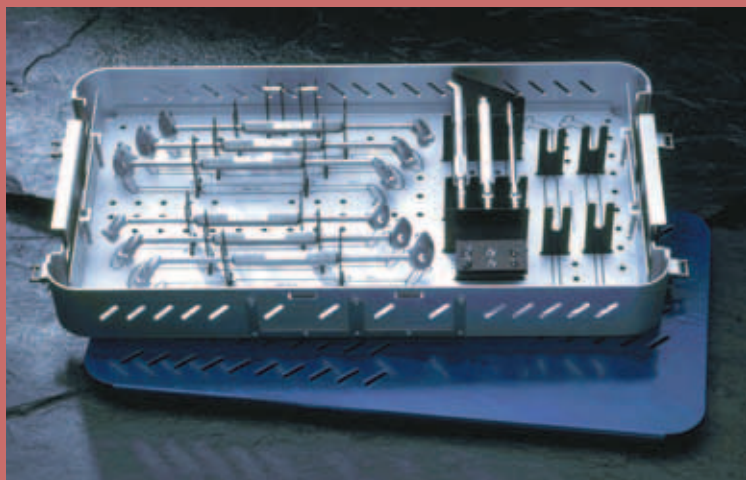
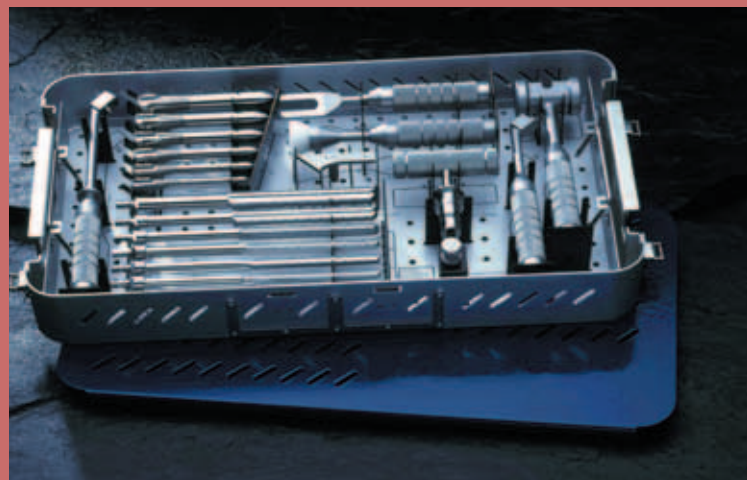
Catalog No.	Descriptions	Catalog No.	Descriptions
5900-4000	Hohmann, Blunt	5900-4008	Darrach – Large
5900-4001	Blunt Bone Hook	5900-4009	Fukuda – Large
5900-4002	Richardson – 30 x 29mm	5900-4010	Fukuda – Small
5900-4003	Richardson – 37 x 37mm	5900-4011	Anterior Glenoid Retractor
5900-4004	Richardson – 47 x 21mm	5900-4025	Posterior Glenoid Retractor
5900-4005	Curette, 3mm	5900-4013	Adson Retractor
5900-4006	Darrach – Small	5900-4014	Gelpi Retractor
5900-4007	Darrach – Medium	5900-4026	Lamina Spreader

Solar[®] Total Shoulder

One of the key factors for successful, reproducible joint arthroplasty has always been carefully designed instrumentation. The Solar[®] Total Shoulder has an extensive yet reliable and simple instrument system. The system includes humeral instruments that provide proper and reproducible cuts, the ability to

size and trial with progressive broaches and reamers, and humeral head trials for soft tissue balancing. A simple and efficient quick release design facilitates the broaching and cylindrical reaming procedure. Solar[®] glenoid instruments have been designed to compensate for the difficult exposure of the glenoid fossa. Glenoid drill

guides allow for the proper location of the fixation pegs and are used in conjunction with various drills. A fixed angle spherical reamer is used to prepare the glenoid surface. Sizing templates and glenoid trials which function for range of motion confirmation add to the completeness of this system.



Solar[®] Linked Semi-Const

Humeral component advantages:

- Anterior offset helps to recreate the natural anatomy of the joint
- Lateral / medial fins help resist rotational forces on humeral component
- Provides maximum contact in the epicondylar regions of the humerus where highest quality bone is present
- Designed to conserve the greatest amount of bone possible

Ulnar component advantages:

- Designed to help recreate the normal carrying angle of the elbow
- Anterior fin helps resist rotational forces on ulnar component

Solar[®] Elbow Benefits:

- Humeral and ulnar components are anatomically designed to duplicate the functional motion of the normal elbow joint
- The Solar[®] Elbow can achieve functional ROM with full extension and flexion up to 140° with approximately 7° of laxity in the varus/valgus plane during supination and pronation
- Bone conserving humeral and ulnar designs are manufactured of titanium alloy
- The Solar[®] Elbow can be implanted as separate humeral and ulnar components or preassembled as one piece
- User friendly instrumentation is designed to give the surgeon consistent, reproducible results

All three sizes of ulnar components are completely interchangeable with both humeral component sizes



rained Elbow System



Solar® Total Elbow Implant Catalog Numbers

Catalog #	Item	Stem Length (mm)
5005-002R	Standard Right Humeral Assembly	79
5005-003R	Large Right Humeral Assembly	89
5005-002L	Standard Left Humeral Assembly	79
5005-003L	Large Left Humeral Assembly	89
5005-012R	Standard Right Long Stem Humeral Assembly	152
5005-013R	Large Right Long Stem Humeral Assembly	152
5005-012L	Standard Left Long Stem Humeral Assembly	152
5005-013L	Large Left Long Stem Humeral Assembly	152
5005-102R	Small Right Ulnar Component	50
5005-202R	Standard Right Ulnar Component	55
5005-302R	Large Right Ulnar Component	63
5005-102L	Small Left Ulnar Component	50
5005-202L	Standard Left Ulnar Component	55
5005-302L	Large Left Ulnar Component	63
5005-2035	Standard Humeral Bearing/Bushing Kit	
5005-3035	Large Humeral Bearing/Bushing Kit	

The Solar® Total Elbow was designed to recreate the joint anatomy and optimize fixation. The Solar® Total Elbow prosthesis incorporates design features which help restore the normal center of rotation of the elbow joint. Indications for use include rheumatoid, traumatic, and degenerative arthritis.

Joint Replacements

Trauma

Spine

Micro Implants

Orthobiologics

Instruments

Interventional Pain

Navigation

Endoscopy

Communications

Patient Handling Equipment

EMS Equipment

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