



Stryker GmbH  
Tina Mornak  
Staff Regulatory Affairs Specialist  
325 Corporate Drive  
Mahwah, New Jersey 07430

February 15, 2019

Re: K183039

Trade/Device Name: ReUnion Reversible Fracture System (RFX), ReUnion Reverse Shoulder Arthroplasty System (RSA), ReUnion Total Shoulder Arthroplasty System (TSA)  
Regulation Number: 21 CFR 888.3660  
Regulation Name: Shoulder Joint Metal/Polymer Semi-Constrained Cemented Prosthesis  
Regulatory Class: Class II  
Product Code: KWS, HSD, PHX  
Dated: January 15, 2019  
Received: January 17, 2019

Dear Tina Mornak:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. Although this letter refers to your product as a device, please be aware that some cleared products may instead be combination products. The 510(k) Premarket Notification Database located at <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm> identifies combination product submissions. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's

requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803) for devices or postmarketing safety reporting (21 CFR 4, Subpart B) for combination products (see <https://www.fda.gov/CombinationProducts/GuidanceRegulatoryInformation/ucm597488.htm>); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820) for devices or current good manufacturing practices (21 CFR 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm>.

For comprehensive regulatory information about medical devices and radiation-emitting products, including information about labeling regulations, please see Device Advice (<https://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/>) and CDRH Learn (<http://www.fda.gov/Training/CDRHLearn>). Additionally, you may contact the Division of Industry and Consumer Education (DICE) to ask a question about a specific regulatory topic. See the DICE website (<http://www.fda.gov/DICE>) for more information or contact DICE by email ([DICE@fda.hhs.gov](mailto:DICE@fda.hhs.gov)) or phone (1-800-638-2041 or 301-796-7100).

Sincerely,

**Daniel S. Ramsey -S**  
2019.02.15 11:26:40 -05'00'

FOR Mark N. Melkerson  
Director  
Division of Orthopedic Devices  
Office of Device Evaluation  
Center for Devices and  
Radiological Health

Enclosure

DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Food and Drug Administration

Form Approved: OMB No. 0910-0120  
Expiration Date: 06/30/2020  
See PRA Statement below.

## Indications for Use

510(k) Number (if known)

K183039

Device Name

ReUnion Reverse Shoulder Arthroplasty System (RSA)

Indications for Use (Describe)

The ReUnion RSA Shoulder System is intended for primary, fracture, or revision of total Shoulder replacement. The patient's joint must be anatomically and structurally suited to receive the selected implant(s), and a functional deltoid muscle is necessary to use the device.

The patient's joint must have gross rotator cuff deficiency, a functional deltoid muscle and be anatomically and structurally suited to receive the selected implant(s).

- Painful, disabling joint disease of the shoulder resulting from: degenerative arthritis or rheumatoid arthritis.
- Proximal humeral fracture.
- Revision of previously failed shoulder joint replacement.

Glenoid Baseplate components are intended for cementless use with the addition of screw fixation.

The Humeral Stem components are intended for both cemented and cementless use.

In the case of revision, when ReUnion TSA humeral stems are well fixed, the system is indicated for conversion to a reverse shoulder arthroplasty.

In conjunction with ReUnion RSA humeral and glenoid components, ReUnion TSA humeral stems can be converted from a hemi or total shoulder arthroplasty to a reverse shoulder arthroplasty, as well as revised from an existing reverse shoulder arthroplasty to a secondary reverse shoulder arthroplasty, in treatment of a grossly deficient rotator cuff with severe arthropathy or previously failed joint replacement with a grossly deficient rotator cuff. The patient must have a functional deltoid muscle, and be anatomically and structurally suited to receive the implant(s).

Type of Use (Select one or both, as applicable)

☒ Prescription Use (Part 21 CFR 801 Subpart D)

☐ Over-The-Counter Use (21 CFR 801 Subpart C)

### CONTINUE ON A SEPARATE PAGE IF NEEDED.

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DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Food and Drug Administration

Form Approved: OMB No. 0910-0120  
Expiration Date: 06/30/2020  
See PRA Statement below.

## Indications for Use

510(k) Number (if known)

K183039

Device Name

ReUnion Total Shoulder Arthroplasty System (TSA)

Indications for Use (Describe)

For use as a Hemi or Total Shoulder Replacement

- Aseptic necrosis of the humeral head.
- Painful, disabling joint disease of the shoulder resulting from: degenerative arthritis, rheumatoid arthritis or posttraumatic arthritis.
- Proximal humeral fracture and/or dislocation.
- Clinical management problems where arthrodesis or alternative reconstructive techniques are less likely to achieve satisfactory results.
- Revision of previous unsuccessful total shoulder replacement, resurfacing or other procedure.

Glenoid components are intended for cemented use only. The humeral stem components are intended for both cemented and cementless use.

In the case of revision, when ReUnion TSA humeral stems are well fixed, the system is indicated for conversion to a total shoulder arthroplasty. In conjunction with ReUnion TSA humeral and glenoid components, if the natural glenoid provides sufficient bone stock, ReUnion TSA humeral stems can be converted from a hemiarthroplasty to a total shoulder arthroplasty, as well as revised from an existing total shoulder arthroplasty to a secondary total shoulder arthroplasty. It is also indicated for conversion to a hemiarthroplasty. In conjunction with ReUnion TSA humeral components, ReUnion TSA humeral stems can be converted from a total or ReUnion RSA reverse shoulder arthroplasty to a hemiarthroplasty, as well as revised from an existing hemiarthroplasty to a secondary hemiarthroplasty, in treatment of previously failed shoulder arthroplasty cases where revision to a reverse shoulder arthroplasty is inappropriate.

Type of Use (Select one or both, as applicable)

☒ Prescription Use (Part 21 CFR 801 Subpart D)

☐ Over-The-Counter Use (21 CFR 801 Subpart C)

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**Indications for Use**

510(k) Number (if known)

**K183039**

Device Name

Reversible Fracture System (RFX)

**Indications for Use (Describe)**

The ReUnion RFX System includes a Reversible Fracture Stem (RFX Stem) that can utilize either the ReUnion Total Shoulder Arthroplasty (TSA) or ReUnion Reverse Shoulder Arthroplasty (RSA) humeral and glenoid components and is indicated for use as a hemi, total or reverse shoulder replacement. The ReUnion RFX stem is intended for cemented use only.

**When used with ReUnion TSA Humeral & Glenoid Components**

The ReUnion RFX System, when used with ReUnion TSA Humeral and Glenoid components, is indicated for use as a Hemi or Total Shoulder Replacement:

- Aseptic necrosis of the humeral head.
- Painful, disabling joint disease of the shoulder resulting from: degenerative arthritis, rheumatoid arthritis, or post-traumatic arthritis.
- Proximal humeral fractures and/or dislocation.
- Clinical management problems where arthrodesis or alternative reconstructive techniques are less likely to achieve satisfactory results.
- Revision of previous unsuccessful total shoulder replacement, resurfacing or other procedure.

In the case of revision, when ReUnion RFX humeral stems are well fixed, the system is indicated for conversion to a total shoulder arthroplasty. In conjunction with ReUnion TSA humeral and glenoid components, if the natural glenoid provides sufficient bone stock, ReUnion RFX humeral stems can be converted from a hemiarthroplasty to a total shoulder arthroplasty, as well as revised from an existing total shoulder arthroplasty to a secondary total shoulder arthroplasty. It is also indicated for conversion to a hemiarthroplasty. In conjunction with ReUnion TSA humeral components, ReUnion RFX humeral stems can be converted from a total or reverse shoulder arthroplasty to a hemiarthroplasty, as well as revised from an existing hemiarthroplasty to a secondary hemiarthroplasty, in treatment of previously failed shoulder arthroplasty cases where revision to a reverse shoulder arthroplasty is inappropriate.

The glenoid components are intended for cemented use only.

**When used with ReUnion RSA Humeral & Glenoid Components**

The ReUnion RFX System, when used with ReUnion RSA humeral & glenoid components, is intended for primary, fracture, or revision total shoulder replacement. The patient's joint must have gross rotator cuff deficiency, a functional deltoid muscle, and be anatomically and structurally suited to receive the implant(s).

- Painful, disabling joint disease of the shoulder resulting from degenerative arthritis or rheumatoid arthritis;
- Proximal humeral fractures
- Revisions of previously failed shoulder joint replacements

In the case of revision, when ReUnion RFX humeral stems are well fixed, the system is indicated for conversion to a reverse shoulder arthroplasty. In conjunction with ReUnion RSA humeral and glenoid components, ReUnion RFX humeral stems can be converted from a hemi or total shoulder arthroplasty to a reverse shoulder arthroplasty, as well as revised from an existing reverse shoulder arthroplasty to a secondary reverse shoulder arthroplasty, in treatment of a

grossly deficient rotator cuff with severe arthropathy or previously failed joint replacement with a grossly deficient rotator cuff. The patient must have a functional deltoid muscle, and be anatomically and structurally suited to receive the implant(s).

Glenoid Baseplate components are intended for cementless use with the addition of screw fixation.

Type of Use (Select one or both, as applicable)

☒ Prescription Use (Part 21 CFR 801 Subpart D)

☐ Over-The-Counter Use (21 CFR 801 Subpart C)

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**510(k) Summary**

**Proprietary Name:** ReUnion Reversible Fracture System  
ReUnion Reverse Shoulder Arthroplasty System  
ReUnion Total Shoulder Arthroplasty System

**Common Name:** A Prosthesis, shoulder, semi-constrained, metal/polymer cemented (21 CFR 888.3660)  
  
Shoulder joint humeral (hemi-shoulder) metallic uncemented prosthesis (21 CFR 888.3690)

**Regulation Description:** Shoulder joint metal/polymer semi-constrained cement prosthesis (21 CFR 888.3660)  
  
Shoulder joint humeral (hemi-shoulder) metallic uncemented prosthesis (21 CFR 888.3690)

**Regulation Number:** 21 CFR 888.3660  
21 CFR 888.3690

**Product Code:** KWS, HSD, PHX

**Device Class:** Class II

**Sponsor:** Stryker GmbH  
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2545 Selzach / Switzerland

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**Date Prepared:** October 31, 2018

**Primary Predicate:** Stryker ReUnion Reversible Fracture System, ReUnion Reverse Shoulder Arthroplasty System and ReUnion Total Shoulder Arthroplasty System: K181742

**Reference Predicate:**

Zimmer Biomet Comprehensive Total Shoulder System:  
K060692

Stryker Triathlon® X3® Total Knee Tibial Insert and Patellar  
Components: K172634

Stryker Triathlon PKR X3 Tibial Inserts, Mako X3 Uni Onlay  
Tibial Inserts: K180612

**Description**

This Traditional 510(k) submission is being supplied to the U.S. FDA to provide authorization to market new devices within the ReUnion TSA System and ReUnion RSA System, including modifications to:

- ReUnion TSA System to add shorter length ReUnion S humeral stems
- ReUnion TSA System to add EtO sterilized X3 glenoid components
- ReUnion RSA System to add EtO sterilized X3 humeral inserts

A line extension to the existing standard ReUnion TSA humeral stems is being introduced to the existing system. The line extension, also referred to as ReUnion S, will consist of reduced length humeral stems. While the ReUnion S stem is shorter in length compared to the standard stems, both stems share similar instrumentation and surgical workflow.

In addition to the line extension, this submission will introduce Reunion X3 Glenoids and Inserts that are identical in their design to the predicate components, Glenoids and Inserts (K181742). The subject inserts will use a different method of terminal sterilization of ethylene oxide per ISO 11135 and will be formed by consolidating resin via conventional methods which meet the specifications of ASTM F648. The same change was previously cleared in K172634 and K180612.

**ReUnion Reversible Fracture System (RFX)**

The ReUnion Reversible Fracture System consists of a humeral fracture stem component which may be used in conjunction with TSA or RSA humeral and glenoid components for conventional total shoulder arthroplasty or reverse shoulder arthroplasty. It may also be used in conjunction with TSA humeral components to articulate directly with the anatomic glenoid in a hemi-shoulder application. The device contains various number of suture holes. The stems have a female taper on the proximal end of the shaft to accept TSA and RSA Gleno-humeral components. It is designed to be used in cemented applications only.

**ReUnion Reverse Shoulder Arthroplasty System (RSA)**

The ReUnion RSA Shoulder System is a system of components intended for total shoulder replacement in a reverse shoulder configuration. The system is comprised of a humeral cup, humeral insert, glenosphere, glenoid baseplate and screws. The Humeral Cup with the Humeral Insert are attached to the humeral side of the joint via the ReUnion TSA Humeral Stem while the Glenosphere is implanted with the Glenoid Baseplate onto the glenoid side of the joint fixated with locking Center and Peripheral Screws.

**ReUnion Total Shoulder Arthroplasty System (TSA)**

The Reunion Total Shoulder Arthroplasty (TSA) System is intended for shoulder arthroplasty. The components of this system consist of humeral stems, a modular humeral neck adapter, single radius humeral heads, and self-pressurizing glenoids (SPG). The humeral stem is offered in both cemented and cementless designs. The cementless humeral stem design features a circumferential Ti-plasma spray and hydroxyapatite (HA) coating at the proximal end and the cemented humeral stems have no coating at the proximal end. These humeral stems were designed to mate with the subject single radius humeral heads or the modular neck adapter, for compatibility with other marketed humeral heads. The self-pressuring glenoids (SPG) mate with the single radius heads. The SPGs are offered in both pegged and keeled configurations.

Note: ReUnion TSA Humeral Stems include both standard length ReUnion TSA stems and shorter length ReUnion S stems.

### **Intended Use**

The ReUnion TSA System is intended for shoulder arthroplasty.

### **Indications for Use**

#### **ReUnion Reverse Shoulder Arthroplasty System (RSA)**

The ReUnion RSA Shoulder System is intended for primary, fracture, or revision of total Shoulder replacement. The patient's joint must be anatomically and structurally suited to receive the selected implant(s), and a functional deltoid muscle is necessary to use the device.

The patient's joint must have gross rotator cuff deficiency, a functional deltoid muscle and be anatomically and structurally suited to receive the selected implant(s).

- Painful, disabling joint disease of the shoulder resulting from: degenerative arthritis or rheumatoid arthritis.
- Proximal humeral fracture.
- Revision of previously failed shoulder joint replacement.

Glenoid Baseplate components are intended for cementless use with the addition of screw fixation.

The Humeral Stem components are intended for both cemented and cementless use.

In the case of revision, when ReUnion TSA humeral stems are well fixed, the system is indicated for conversion to a reverse shoulder arthroplasty.

In conjunction with ReUnion RSA humeral and glenoid components, ReUnion TSA humeral stems can be converted from a hemi or total shoulder arthroplasty to a reverse shoulder arthroplasty, as well as revised from an existing reverse shoulder arthroplasty to a secondary reverse shoulder arthroplasty, in treatment of a grossly deficient rotator cuff with severe arthroplasty or previously failed joint replacement with a grossly deficient rotator cuff. The patient must have a functional deltoid muscle, and be anatomically and structurally suited to receive the implant(s).

#### **ReUnion Total Shoulder Arthroplasty System (TSA)**

For use as a Hemi or Total Shoulder Replacement

- Aseptic necrosis of the humeral head.

- Painful, disabling joint disease of the shoulder resulting from: degenerative arthritis, rheumatoid arthritis or posttraumatic arthritis.
- Proximal humeral fracture and/or dislocation.
- Clinical management problems where arthrodesis or alternative reconstructive techniques are less likely to achieve satisfactory results.
- Revision of previous unsuccessful total shoulder replacement, resurfacing or other procedure.

Glenoid components are intended for cemented use only. The humeral stem components are intended for both cemented and cementless use.

In the case of revision, when ReUnion TSA humeral stems are well fixed, the system is indicated for conversion to a total shoulder arthroplasty. In conjunction with ReUnion TSA humeral and glenoid components, if the natural glenoid provides sufficient bone stock, ReUnion TSA humeral stems can be converted from a hemiarthroplasty to a total shoulder arthroplasty, as well as revised from an existing total shoulder arthroplasty to a secondary total shoulder arthroplasty. It is also indicated for conversion to a hemiarthroplasty. In conjunction with ReUnion TSA humeral components, ReUnion TSA humeral stems can be converted from a total or ReUnion RSA reverse shoulder arthroplasty to a hemiarthroplasty, as well as revised from an existing hemiarthroplasty to a secondary hemiarthroplasty, in treatment of previously failed shoulder arthroplasty cases where revision to a reverse shoulder arthroplasty is inappropriate.

### **ReUnion Reversible Fracture System (RFX)**

The ReUnion RFX System includes a Reversible Fracture Stem (RFX Stem) that can utilize either the ReUnion Total Shoulder Arthroplasty (TSA) or ReUnion Reverse Shoulder Arthroplasty (RSA) humeral and glenoid components and is indicated for use as a hemi, total or reverse shoulder replacement. The ReUnion RFX stem is intended for cemented use only.

#### **When used with ReUnion TSA Humeral & Glenoid Components**

The ReUnion RFX System, when used with ReUnion TSA Humeral and Glenoid components, is indicated for use as a Hemi or Total Shoulder Replacement:

- Aseptic necrosis of the humeral head.
- Painful, disabling joint disease of the shoulder resulting from: degenerative arthritis, rheumatoid arthritis, or post-traumatic arthritis.
- Proximal humeral fractures and/or dislocation.
- Clinical management problems where arthrodesis or alternative reconstructive techniques are less likely to achieve satisfactory results.
- Revision of previous unsuccessful total shoulder replacement, resurfacing or other procedure.

In the case of revision, when ReUnion RFX humeral stems are well fixed, the system is indicated for conversion to a total shoulder arthroplasty. In conjunction with ReUnion TSA humeral and glenoid components, if the natural glenoid provides sufficient bone stock, ReUnion RFX humeral stems can be converted from a hemiarthroplasty to a total shoulder arthroplasty, as well as revised from an existing total shoulder arthroplasty to a secondary total shoulder arthroplasty. It is also indicated for conversion to a hemiarthroplasty. In conjunction with ReUnion TSA humeral components, ReUnion RFX humeral stems can be converted from a total or reverse shoulder arthroplasty to a hemiarthroplasty, as well as revised from an existing hemiarthroplasty to a secondary hemiarthroplasty, in treatment of previously failed shoulder arthroplasty cases where revision to a reverse shoulder arthroplasty is inappropriate.

The glenoid components are intended for cemented use only.

### When used with ReUnion RSA Humeral & Glenoid Components

The ReUnion RFX System, when used with ReUnion RSA humeral & glenoid components, is intended for primary, fracture, or revision total shoulder replacement. The patient's joint must have gross rotator cuff deficiency, a functional deltoid muscle, and be anatomically and structurally suited to receive the implant(s).

- Painful, disabling joint disease of the shoulder resulting from degenerative arthritis or rheumatoid arthritis;
- Proximal humeral fractures
- Revisions of previously failed shoulder joint replacements

In the case of revision, when ReUnion RFX humeral stems are well fixed, the system is indicated for conversion to a reverse shoulder arthroplasty. In conjunction with ReUnion RSA humeral and glenoid components, ReUnion RFX humeral stems can be converted from a hemi or total shoulder arthroplasty to a reverse shoulder arthroplasty, as well as revised from an existing reverse shoulder arthroplasty to a secondary reverse shoulder arthroplasty, in treatment of a grossly deficient rotator cuff with severe arthropathy or previously failed joint replacement with a grossly deficient rotator cuff. The patient must have a functional deltoid muscle, and be anatomically and structurally suited to receive the implant(s).

Glenoid Baseplate components are intended for cementless use with the addition of screw fixation.

### Summary of Technological Characteristics

The new ReUnion S humeral stems are identical in intended use, indications, operational principles and sterilization method as the predicate devices. The line extension will consist of reduced length humeral stems.

The new Glenoids and Inserts are identical in intended use, indications, design, and operational principles as the predicate device. The new devices are different from the predicate devices in its terminal sterilization method. The new X3 devices are terminally sterilized by Ethylene Oxide, whereas the predicate device is sterilized using Gas Plasma. Consolidation of X3® polyethylene can be performed via conventional methods. The X3® UHMWPE continues to meet the same ASTM F648 specification.

A comparison of the systems demonstrated that the subject ReUnion RFX, RSA and TSA Systems are substantially equivalent to the previously cleared ReUnion RFX, RSA and TSA Systems (K181742) in regards to intended use, material, design, and operational principles.

### Non-Clinical Testing

The following non-clinical laboratory testing was performed to determine substantial equivalence:

1. Material Testing per ASTM F648, ASTM F2565, and Draft FDA Guidance, "Characterization of Ultrahigh Molecular Weight Polyethylene (UHMWPE) Used in Orthopedic Devices" (February 12, 2016).
2. Biocompatibility Testing per ISO 10993-1:2009, ISO 10993-7:2008, and FDA Guidance, "Use of International Standard ISO 10993-1, "Biological evaluation of medical devices - Part 1: Evaluation and testing within a risk management process" (June 16, 2016)

3. Ethylene Oxide Sterilization Validation per ISO 11135:2014
4. Dynamic Evaluation of Glenoid Loosening per ASTM F2028
5. Static Test of Humeral Insert / Humeral Cup Junction
6. Multi-Axis Fatigue Test
7. LAL testing has been performed to establish that the subject device meets the specified 20EU/device limit
8. MR Compatibility:
  - a. Magnetically Induced Displacement Force per ASTM F2052
  - b. Magnetically Induced Torque per ASTM F2213
  - c. Heating by RF Fields per ASTM F2182
  - d. Image Artifacts per ASTM F2119

An engineering rationale has been provided to demonstrate equivalence of the subject ReUnion S humeral stem to the predicate with respect to fatigue, taper fatigue and fracture potting fatigue.

### **Clinical Testing**

Clinical testing was not required for this submission.

### **Conclusion**

The addition of the ReUnion S humeral stems and X3® UHMWPE Glenoids and Inserts are substantially equivalent to the currently cleared (K181742) existing ReUnion RSA, ReUnion TSA and ReUnion RFX Systems in intended use, materials, and performance characteristics to the predicate device. The proposed modifications do not affect safety or effectiveness.

Therefore, subject ReUnion RFX, RSA and TSA Systems are substantially equivalent to the predicate ReUnion RFX, RSA and TSA Systems previously cleared via K181742.