

AMERICAN NATIONAL STANDARD

General Purpose Tapered and Reduced Cross Section Retaining Rings

ANSI B27.7 - 1977

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SECRETARIAT

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FOREWORD

American National Standards Committee B27 for the standardization of plain and lock washers was organized in March 1926, as Sectional Committee B27 under the aegis of the American Standards Association (later the United States of America Standards Institute and, as of October 6, 1969, the American National Standards Institute Inc.), with the Society of Automotive Engineers and The American Society of Mechanical Engineers as joint secretariats. In 1950, this Committee has been designated responsibility for standardization of washers and machine rings.

At a meeting of ANSI B27 Standards Committee held on February 4, 1971 it was recommended to the secretariats (ASME and SAE) that subcommittee 1, 2 and 4 on washers be merged into ANSI B18 Standards Committee and that Subcommittee 3 on retaining rings become a separate Standards Committee retaining the B27 designation. This change was subsequently approved by ANSI.

Formation of Subcommittee 1 on tapered and reduced section retaining rings was authorized by Standards Committee B27 at its meeting on October 15, 1974. At this meeting, it was decided that no further effort should be expended on inch dimensional products and Subcommittee 1 was assigned the responsibility of preparing American metric standards for tapered and reduced section retaining rings.

Subcommittee 1 prepared a draft proposal, General Purpose Tapered and Reduced Cross Section Retaining Rings which was balloted on June 16, 1975. At a subcommittee meeting held on February 17, 1976 results from the letter ballot was reviewed. The proposal was accepted by the subcommittee and presented to the B27 Standards Committee at its May 7, 1976 meeting. At that meeting a letter ballot of the entire committee was authorized. The Standard was duly approved by the committee and its sponsors and submitted to the American National Standards Institute for designation as an American Standard. This was granted on October 20, 1977.

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Standardization of Retaining Rings, Retaining Clips and Similar Devices

(The following is the roster of the Committee at the time of approval of this standard)

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V. A. Stabile, Industrial Retaining Ring Company, Irvington, New Jersey

INDIVIDUAL MEMBER

E. D. Cowlin, Canton, Ohio

SUBCOMMITTEE 1
GENERAL PURPOSE TAPERED AND REDUCED SECTION RETAINING RINGS

PERSONNEL

Joseph Altman, Chairman, Waldes Kohinoor, Incorporated, Long Island City, New York
B. C. Allen, Pitney Bowes, Stamford, Connecticut
V. Stabile, Industrial Retaining Ring Company, Irvington, New Jersey
D. A. Clever, Deere & Company, Moline, Illinois
P. D'Anza, alternate, International Harvester Company, Hinsdale, Illinois
Phil Dulk, Singer Manufacturing Company, Elizabeth, New Jersey
John Hiddlestone, Anderton Darby, Incorporated, Clifton, New Jersey
James Jen, alternate, Rotor Clip Company, Incorporated, Somerset, New Jersey
John Long, General Motors Corporation, Warren, Michigan
Melvin Millheiser, alternate, Waldes Kohinoor, Incorporated, Long Island City, New York
A. G. Nauta, International Harvester Company, Hinsdale, Illinois
Robert Slass, Rotor Clip Company, Incorporated, Somerset, New Jersey
Roger Swajger, alternate, Industrial Retaining Ring Company, Irvington, New Jersey

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TAPERED AND REDUCED CROSS SECTION RETAINING RINGS

(External Type—3AM1; Internal Type—3BM1; E-Ring Type—3CM1)

1. INTRODUCTORY NOTES**1.1 Scope**

This standard is intended to cover complete general and dimensional data for three series of general purpose tapered and reduced cross section retaining rings which may be used with the nominal size shafts and housings listed and in grooves of the recommended dimensions listed. Also included are formulas and tolerances on which dimensional data are based. Three appendixes include guidance for assembly and recommended standard drawing formats.

The inclusion of dimensional data in this standard is not intended to imply that all of the products described are stock production sizes. Consumers should consult with manufacturers concerning lists of stock production sizes.

1.2 Ring Types

1.2.1 External Rings. Dimensions of basic external retaining rings, and grooves for various shaft sizes are given in Table 4.

1.2.2 Internal Rings. Dimensions for basic internal retaining rings, and grooves for various housing sizes are given in Table 5.

1.2.3 External E-Rings. Dimensions of E-Type external retaining rings, and grooves for various shaft sizes are given in Table 6.

1.2.4 Designations. It is recommended that the preferred type designations be used to identify these rings on drawings, parts list, and other engineering documentation. The basic external rings in this standard are Type 3AM1. The basic internal rings in this standard are Type 3BM1. The E-Type external rings in this standard are Type 3CM1.

1.3 Applicability

The rings denoted in this standard are intended primarily for use with the shaft, housing, and groove

sizes recommended; however, in certain cases these diameters may be altered somewhat to suit the requirements of a particular design. When such changes are made, care should be taken to not alter the shaft or housing size to such an extent that the ring will take enough permanent set to allow a loose fit after the ring has been assembled into the groove. Neither should the groove diameter be altered to the extent to permit the ring to fit loosely.

1.4 Dimensions

All dimensions in this standard are in millimetres unless otherwise stated.

1.5 Supplementary Information

Allowable loads, maximum radii and chamfers, clearance dimensions, gaging diameters and rpm limits for all 3 ring series are included in Appendix A, B and C.

2. GENERAL DATA**2.1 Basic Retaining Rings**

Type 3AM1 retaining rings covered by this standard are spread over a shaft by means of a pliers or special tool and allowed to relax and seat in a circumferential groove, thereby providing an external protruding shoulder which can be used for locating and retaining a part on the shaft.

Type 3BM1 retaining rings covered by this standard are compressed into a housing by means of a pliers or special tool and allowed to relax and seat in a circumferential groove, thereby providing an internal protruding shoulder which can be used for locating and retaining a part contained inside of the housing.

In both cases, the rings have a tapered section to provide a more uniform distribution of stresses during expansion or compression.