

| Standards & Regulations for Elastomeric & Polymeric Seals |          |         |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                          |          |              |                      | 28.05.2020      |                  |
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| Standard I.D.                                             | Revision | Edition | Standard Title                                                                                                                                                            | Description                                                                                                                                                                                                                                                                                                                              | Type     | Jurisdiction | Applicable Region(s) | Standard Status | Status & Comment |
| EN 1514-8                                                 | 2005     | 2       | Flanges and their Joints - Polymeric O-Ring Gaskets for Grooved Flanges                                                                                                   | Specifies the dimensions of polymeric O-Ring gaskets for use with grooved flanges complying with EN 1092 for PN 10, PN 16, PN 25, PN 40.                                                                                                                                                                                                 | Industry | Europe       | Europe               | Active          |                  |
| EN 6111                                                   | 2020     | 1       | Aerospace series - Ethylene-propylene elastomer (EPM/EPDM) - Hardness 80 IRHD for static seal elements in hydraulic systems for long-term application - Material standard | Material standard for EPM/EPDM used in aircraft hydraulic systems                                                                                                                                                                                                                                                                        | Industry | Europe       | Europe               | Standard Draft  |                  |
| ISO 34-1                                                  | 2015     | 4       | Rubber, vulcanized or thermoplastic — Determination of tear strength — Part 1: Trouser, angle and crescent test pieces                                                    | ISO 34-1:2010 specifies three test methods for the determination of the tear strength of vulcanized or thermoplastic rubber, namely: method A, using a trouser test piece; method B, using an angle test piece, with or without a nick of specified depth; method C, using a crescent test piece with a nick.                            | Industry | World wide   | World wide           | Active          |                  |
| ISO 37                                                    | 2017     | 6       | Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties                                                                                   | ISO 37:2017 specifies a method for the determination of the tensile stress-strain properties of vulcanized and thermoplastic rubbers.                                                                                                                                                                                                    | Industry | World wide   | World wide           | Active          |                  |
| ISO 48-1                                                  | 2018     | 1       | Rubber, vulcanized or thermoplastic — Determination of hardness — Part 1: Introduction and guidance                                                                       | This document provides guidance on the determination of the hardness of vulcanized and thermoplastic rubbers.                                                                                                                                                                                                                            | Industry | World wide   | World wide           | Active          |                  |
| ISO 48-2                                                  | 2018     | 1       | Rubber, vulcanized or thermoplastic — Determination of hardness — Part 2: Hardness between 10 IRHD and 100 IRHD                                                           | This document specifies four methods for the determination of the hardness of vulcanized or thermoplastic rubbers on flat surfaces (standard-hardness methods) and four methods for the determination of the apparent hardness of curved surfaces (apparent-hardness methods).                                                           | Industry | World wide   | World wide           | Active          |                  |
| ISO 188                                                   | 2011     | 5       | Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests                                                                                        | ISO 188:2011 specifies accelerated ageing or heat resistance tests on vulcanized or thermoplastic rubbers.                                                                                                                                                                                                                               | Industry | World wide   | World wide           | Active          |                  |
| ISO 815-1                                                 | 2019     | 3       | Rubber, vulcanized or thermoplastic — Determination of compression set — Part 1: At ambient or elevated temperatures                                                      | This document specifies methods for the determination of the compression set characteristics of vulcanized and thermoplastic rubbers at ambient (one method) or elevated temperatures (three methods, A, B, and C, depending on the way the test piece is released at the end of the test).                                              | Industry | World wide   | World wide           | Active          |                  |
| ISO 815-2                                                 | 2019     | 3       | Rubber, vulcanized or thermoplastic — Determination of compression set — Part 2: At low temperatures                                                                      | This document specifies two methods for the determination of the compression set characteristics of vulcanized and thermoplastic rubbers at low temperatures.                                                                                                                                                                            | Industry | World wide   | World wide           | Active          |                  |
| ISO 1431-1                                                | 2005     | 5       | Rubber, vulcanized or thermoplastic — Resistance to ozone cracking — Part 1: Static and dynamic strain testing                                                            | ISO 1431-1:2012 specifies procedures intended for use in estimating the resistance of vulcanized or thermoplastic rubbers to cracking when exposed, under static or dynamic tensile strain, to air containing a definite concentration of ozone and at a definite temperature in circumstances that exclude the effects of direct light. | Industry | World wide   | World wide           | Active          |                  |

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| ISO 1431-2 | 1994 | 2 | Rubber, vulcanized or thermoplastic — Resistance to ozone cracking — Part 2: Dynamic strain test                                                                                        | Specifies a method intended for use in estimating the resistance of vulcanized or thermoplastic rubbers to cracking when exposed, under dynamic tensile strain, to air containing a definite concentration of ozone and at a definite temperature in circumstances that exclude the effects of direct light.   | Industry | World wide | World wide | Withdrawn    |  |
| ISO 1431-3 | 2017 | 2 | Rubber, vulcanized or thermoplastic — Resistance to ozone cracking — Part 3: Reference and alternative methods for determining the ozone concentration in laboratory test chambers      | ISO 1431-3:2017 describes three types of method for the determination of ozone concentration in laboratory test chambers.                                                                                                                                                                                      | Industry | World wide | World wide | Active       |  |
| ISO 2285   | 2019 | 8 | Rubber, vulcanized or thermoplastic — Determination of tension set under constant elongation, and of tension set, elongation and creep under constant tensile load                      | This document specifies a number of methods of determining the dimensional changes in test pieces of vulcanized or thermoplastic rubber during and after tensile loading for relatively short periods under constant elongation or constant loading.                                                           | Industry | World wide | World wide | Active       |  |
| ISO 2781   | 2018 | 5 | Rubber, vulcanized or thermoplastic — Determination of density                                                                                                                          | This document specifies two methods of                                                                                                                                                                                                                                                                         | Industry | World wide | World wide | Active       |  |
| ISO 2921   | 2019 | 6 | Rubber, vulcanized — Determination of low-temperature characteristics — Temperature-retraction procedure (TR test)                                                                      | ISO 2921:2011 specifies a method for the determination of the temperature-retraction characteristics of stretched vulcanized rubber.                                                                                                                                                                           | Industry | World wide | World wide | Active       |  |
| ISO 3934   | 2002 | 2 | Rubber, vulcanized and thermoplastic — Preformed gaskets used in buildings — Classification, specifications and test methods                                                            | This International Standard specifies a system of classification of materials used in preformed gaskets for buildings.                                                                                                                                                                                         | Industry | World wide | World wide | Under review |  |
| ISO 3939   | 1977 | 2 | Fluid power systems and components — Multiple lip packing sets — Methods for measuring stack heights                                                                                    | Specifies methods for measuring sealing devices having more than one seal in the set. Specifies methods for measuring stack height in order to determine that the sets are to an acceptable dimensional standard.                                                                                              | Industry | World wide | World wide | Confirmed    |  |
| ISO 4633   | 2015 | 4 | Rubber seals — Joint rings for water supply, drainage and sewerage pipelines — Specification for materials                                                                              | ISO 4633:2015 specifies requirements for materials used in vulcanized rubber seals for the cold drinking water as well as drainage, sewerage, and rainwater systems.                                                                                                                                           | Industry | World wide | World wide | Under review |  |
| ISO 4927   | 2008 | 2 | Road vehicles — Elastomeric boots for cylinders for drum type hydraulic brake wheel cylinders using a non-petroleum base hydraulic brake fluid (Service temperature 120 degrees C max.) | ISO 4927:2005 specifies performance tests for moulded rubber boots used at end closures on drum type wheel brake cylinders. These boots prevent the entrance of dirt and moisture which could cause corrosion and otherwise impair wheel brake operation.                                                      | Industry | World wide | World wide | Confirmed    |  |
| ISO 4928   | 2006 | 3 | Road vehicles — Elastomeric cups and seals for cylinders for hydraulic braking systems using a non-petroleum base hydraulic brake fluid (Service temperature 120 degrees C max.)        | ISO 4928:2006 specifies performance tests of brake cups and seals for hydraulic braking systems for road vehicles; it does not include requirements relating to chemical composition, tensile strength and elongation of the rubber compound. Disc brake seals are not covered by this International Standard. | Industry | World wide | World wide | Under review |  |
| ISO 4930   | 2006 | 2 | Road vehicles — Elastomeric seals for hydraulic disc brake cylinders using a non-petroleum base hydraulic brake fluid (Service temperature 150 degrees C max.)                          | ISO 4930:2006 specifies the performance test methods and requirements for elastomeric seals used in road vehicle disc brake cylinders.                                                                                                                                                                         | Industry | World wide | World wide | Under review |  |

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| ISO 5892   | 2013 | 2 | Rubber building gaskets — Materials for preformed solid vulcanized structural gaskets — Specification                                                                           | ISO 5892:2013 specifies material requirements for preformed, solid vulcanized rubber structural gaskets in sealing and supporting applications for buildings.                                                                                                                                                  | Industry | World wide | World wide | Confirmed    |  |
| ISO 6117   | 2005 | 2 | Road vehicles — Elastomeric boots for drum-type, hydraulic brake wheel cylinders using a non-petroleum base hydraulic brake fluid (service temperature 100 degrees C max.)      | ISO 6117:2005 specifies performance tests for moulded rubber boots used at end closures on drum type wheel brake cylinders; these boots prevent the entrance of dirt and moisture which could cause corrosion and otherwise impair wheel brake operation.                                                      | Industry | World wide | World wide | Confirmed    |  |
| ISO 6118   | 2006 | 2 | Road vehicles — Elastomeric cups and seals for cylinders for hydraulic braking systems using a non-petroleum base hydraulic brake fluid (service temperature 70 degrees C max.) | ISO 6118:2006 specifies performance tests of brake cups and seals for hydraulic braking systems for road vehicles. It does not include requirements relating to chemical composition, tensile strength and elongation of the rubber compound. Disc brake seals are not covered by this International Standard. | Industry | World wide | World wide | Under review |  |
| ISO 6119   | 2006 | 2 | Road vehicles — Elastomeric seals for hydraulic disc brake cylinders using a non-petroleum base hydraulic brake fluid (Service temperature 120 degrees C max.)                  | ISO 6119:2006 specifies the performance test methods and requirements for elastomeric seals used in road vehicle disc brake cylinders.                                                                                                                                                                         | Industry | World wide | All        | Under review |  |
| ISO 6194-1 | 2007 | 2 | Rotary shaft lip-type seals incorporating elastomeric sealing elements — Part 1: Nominal dimensions and tolerances                                                              | ISO 6194-1:2007 describes seals utilising elastomeric sealing elements. They are considered suitable for use under low-pressure conditions.                                                                                                                                                                    | Industry | World wide | All        | Confirmed    |  |
| ISO 6194-2 | 2007 | 2 | Rotary shaft lip-type seals incorporating elastomeric sealing elements — Part 2: Vocabulary                                                                                     | ISO 6194-2:2009 establishes the appropriate vocabulary for seals utilizing elastomeric sealing elements where the terms and definitions given in ISO 5598 apply. These seals are considered suitable for use under low-pressure conditions.                                                                    | Industry | World wide | All        | Under review |  |
| ISO 6194-3 | 2009 | 2 | Rotary shaft lip-type seals incorporating elastomeric sealing elements — Part 3: Storage, handling and installation                                                             | ISO 6194-3:2009 describes seals utilizing elastomeric sealing elements. They are considered suitable for use under low-pressure condition.                                                                                                                                                                     | Industry | World wide | All        | Under review |  |
| ISO 6194-4 | 2009 | 3 | Rotary shaft lip-type seals incorporating elastomeric sealing elements — Part 4: Performance test procedures                                                                    | ISO 6194 describes seals utilizing elastomeric sealing elements. They are considered suitable for use under low-pressure conditions.                                                                                                                                                                           | Industry | World wide | All        | Under review |  |
| ISO 7630   | 1985 | 1 | Road vehicles — Elastomeric O-rings for hydraulic drum brake wheel cylinders using a petroleum base hydraulic brake fluid (service temperature 120 degrees C max.)              | Specifies the performance test methods and requirements for elastomeric O-rings used in brake wheel cylinders.                                                                                                                                                                                                 | Industry | World wide | All        | Confirmed    |  |
| ISO 7631   | 1985 | 1 | Road vehicles — Elastomeric cups and seals for cylinders for hydraulic braking systems using a petroleum base hydraulic brake fluid (service temperature 120 degrees C max.)    | Specifies performance tests of brake cups and seals for braking systems.                                                                                                                                                                                                                                       | Industry | World wide | All        | Confirmed    |  |
| ISO 7632   | 1985 | 1 | Road vehicles — Elastomeric seals for hydraulic disc brake cylinders using a petroleum base hydraulic brake fluid (service temperature 120 degrees C max.)                      | Specifies the performance test methods and requirements for seals used in disc brake cylinders.                                                                                                                                                                                                                | Industry | World wide | All        | Confirmed    |  |
| ISO 7633   | 1985 | 1 | Road vehicles — Elastomeric boots for drum type hydraulic brake wheel cylinders using a petroleum base hydraulic brake fluid (service temperature 120 degrees C max.)           | Specifies performance tests for moulded rubber boots used as end closures on drum type brake cylinders.                                                                                                                                                                                                        | Industry | World wide | All        | Confirmed    |  |
| ISO 7986   | 1997 | 1 | Hydraulic fluid power — Sealing devices — Standard test methods to assess the performance of seals used in oil hydraulic reciprocating applications                             | This standard describes test methods for performance tests of sealing sets used in oil hydraulic reciprocating applications                                                                                                                                                                                    | Industry | World wide | All        | Confirmed    |  |

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| ISO 9553    | 1997 | 1 | Solar energy — Methods of testing preformed rubber seals and sealing compounds used in collectors                                                         | his International Standard gives requirements for the classification and testing of rubbers used to seal solar energy collectors in order to aid selection for specific applications.                                                                                                 | Industry | World wide | All              | Confirmed    |  |
| ISO 9631    | 2018 | 3 | Rubber seals — Joint rings for pipelines for hot-water supply up to 110 °C — Specification for the material                                               | ISO 9631:2018 specifies material requirements for vulcanized rubber seals for hot drinking and non-drinking water supply (up to 110 °C).                                                                                                                                              | Industry | World wide | All              | Active       |  |
| ISO 16010   | 2019 | 2 | Elastomeric seals — Material requirements for seals used in pipes and fittings carrying gaseous fuels and hydrocarbon fluids                              | This document specifies requirements for elastomeric materials used in seals for supply pipes and fittings, ancillaries and valves at operating temperatures.                                                                                                                         | Industry | World wide | All              | Active       |  |
| ISO 16589-1 | 2011 | 2 | Rotary shaft lip-type seals incorporating thermoplastic sealing elements — Part 1: Nominal dimensions and tolerances                                      | ISO 16589-1:2011 shows seal types and examples. It also specifies the nominal dimensions and tolerance of the seals, shafts and housings, as well as a dimensional identification code.                                                                                               | Industry | World wide | All              | Confirmed    |  |
| ISO 16589-2 | 2011 | 2 | Rotary shaft lip-type seals incorporating thermoplastic sealing elements — Part 2: Vocabulary                                                             | This part of ISO 16589 establishes the appropriate vocabulary, where the terms and definitions given in ISO 5598 apply.                                                                                                                                                               | Industry | World wide | All              | Confirmed    |  |
| ISO 16589-3 | 2011 | 2 | Rotary shaft lip-type seals incorporating thermoplastic sealing elements — Part 3: Storage, handling and installation                                     | ISO 16589-3:2011 gives users of lip-type seals guidance on the careful storage and handling and proper installation of rotary shaft lip-type seals                                                                                                                                    | Industry | World wide | All              | Confirmed    |  |
| ISO 16589-4 | 2011 | 2 | Rotary shaft lip-type seals incorporating thermoplastic sealing elements — Part 4: Performance test procedures                                            | ISO 16589-4:2011 specifies general performance tests which can be used for seal qualification purposes. Materials quality control, dynamic testing, and supplementary low-temperature testing requirements are covered.                                                               | Industry | World wide | All              | Confirmed    |  |
| ISO 16589-5 | 2011 | 2 | Rotary shaft lip-type seals incorporating thermoplastic sealing elements — Part 5: Identification of visual imperfections                                 | ISO 16589-5:2011 defines and classifies typical surface imperfections that could impair the function of the seals, and is intended as a convenience for purchasers and manufacturers in their discussions concerning the importance of these imperfections in different applications. | Industry | World wide | All              | Confirmed    |  |
| ISO 23711   | 2003 | 1 | Elastomeric seals — Requirements for materials for pipe joint seals used in water and drainage applications — Thermoplastic elastomers                    | ISO 23711:2003 specifies requirements for materials used for moulded seals made of thermoplastic elastomers (TPEs) for joints.                                                                                                                                                        | Industry | World wide | All              | Under review |  |
| ISO 23936-2 | 2011 |   | Petroleum, petrochemical and natural gas industries — Non-metallic materials in contact with media related to oil and gas production — Part 2: Elastomers | Requirements and procedures for qualification of elastomeric material used in equipment for oil and gas production.                                                                                                                                                                   | Industry | World wide | World wide       |              |  |
| ISO 27996   | 2009 | 1 | Aerospace fluid systems — Elastomer seals — Storage and shelf life                                                                                        | ISO 27996:2009 is applicable to the general requirements for data recording procedures, packaging, and storing of elastomeric seals and seal assemblies which include an elastomeric element prior to the seal being assembled into hardware components.                              | Industry | World wide | All              | Under review |  |
| DIN 53504   | 2017 | 3 | Testing of rubber - Determination of tensile strength at break, tensile stress at yield, elongation at break and stress values in a tensile test          | This standard defines test conditions for tensile stress testing                                                                                                                                                                                                                      | Industry | Europe     | Primarily Europe | Active       |  |
| DIN 53508   | 2000 |   | Testing of rubber - Accelerated ageing                                                                                                                    | This standard describes ageing tests for rubber materials                                                                                                                                                                                                                             | Industry | Europe     | Primarily Europe | Active       |  |

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| DIN 53536       | 1992 |    | Testing of rubber; determination of gas permeability                                                  | The standard describes the determination of gas permeability in rubber seals                                                                                                                                                                                                                                                                                                       | Industry | Europe     | Primarily Europe                             | Active |                                                       |
| Norsok M-710    |      |    | Qualification of non-metallic materials and manufacturers – Polymers                                  | Methodology for establishing long term chemical compatibility for polymers based on an accelerated testing in hydrocarbon fluids and for testing rapid gas decompression resistance.                                                                                                                                                                                               | Industry | Norway     | Norway but generally referenced worldwide    | Active | Widely specified by Oil & Gas equipment manufacturers |
| API 6A          | 2018 | 21 | Specification for Wellhead and Tree Equipment                                                         | This standard specifies requirements and gives recommendations for the performance, dimensional and functional interchangeability, design, materials, testing, inspection, welding, marking, handling, storing, shipment, purchasing, repair and remanufacture of wellhead and christmas tree equipment for use in the petroleum and natural gas industries.                       | Industry | World wide | Primarily U.S. and petro-chemical industries | Active |                                                       |
| ASTM D 395      | 2018 | 10 | Standard Test Methods for Rubber Property—Compression Set                                             | Compression set test methods of rubber intended for use in applications in which the rubber will be subjected to compressive stresses in air or liquid media.                                                                                                                                                                                                                      | Industry | USA        | Primarily U.S. and petro-chemical industries | Active |                                                       |
| ASTM D 412      | 2016 | 11 | Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension                      | These test methods cover procedures used to evaluate the tensile (tension) properties of vulcanized thermoset rubbers and thermoplastic elastomers. These methods are not applicable to ebonite and similar hard, low elongation materials.                                                                                                                                        | Industry | USA        | Primarily U.S. and petro-chemical industries | Active |                                                       |
| ASTM D 471      | 2016 | 12 | Standard Test Method for Rubber Property—Effect of Liquids                                            | This test method covers the required procedures to evaluate the comparative ability of rubber and rubber-like compositions to withstand the effect of liquids.                                                                                                                                                                                                                     | Industry | USA        | Primarily U.S. and petro-chemical industries | Active |                                                       |
| ASTM D 573 - 04 | 2019 | 5  | Standard Test Method for Rubber—Deterioration in an Air Oven                                          | This test method covers a procedure to determine the influence of elevated temperature on the physical properties of vulcanized rubber.                                                                                                                                                                                                                                            | Industry | USA        | Primarily U.S. and petro-chemical industries | Active |                                                       |
| ASTM D 624      | 2020 | 5  | Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers | This test method describes procedures for measuring a property of conventional vulcanized rubber and thermoplastic elastomers called tear strength.                                                                                                                                                                                                                                | Industry | USA        | Primarily U.S. and petro-chemical industries | Active |                                                       |
| ASTM D 1149     | 2018 | 7  | Standard Test Methods for Rubber Deterioration—Cracking in an Ozone Controlled Environment            | These test methods are used to estimate the effect of exposure, under surface tensile strain conditions, either dynamic or static, in an atmosphere containing specified levels of ozone concentration, expressed as partial pressure, on vulcanized rubber, rubber compounds, molded or extruded soft rubber, and other specified materials, or as may be determined empirically. | Industry | USA        | Primarily U.S. and petro-chemical industries | Active |                                                       |
| ASTM D 1329     | 2016 | 4  | Standard Test Method for Evaluating Rubber Property—Retraction at Lower Temperatures (TR Test)        | This test method describes a temperature-retraction procedure for rapid evaluation of crystallization effects and for comparing viscoelastic properties of rubber and rubber-like materials at low temperatures.                                                                                                                                                                   | Industry | USA        | Primarily U.S. and petro-chemical industries | Active |                                                       |

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| ASTM D 1414        | 2015    | 5  | Standard Test Methods for Rubber O-Rings                                                                                                    | These test methods describe the procedures for determining the physical properties of O-rings and changes in these properties due to aging.                                                                                                                   | Industry | USA | Primarily U.S. and petrochemical industries | Active |                             |
| ASTM D 1415        | 2018    | 8  | Standard Test Method for Rubber Property—International Hardness                                                                             | This test method covers a procedure for measuring the hardness of vulcanized or thermoplastic rubber.                                                                                                                                                         | Industry | USA | Primarily U.S. and petrochemical industries | Active |                             |
| ASTM D 1817 - 05   | 2016    | 6  | Standard Test Method for Rubber Chemicals—Density                                                                                           | This test method covers the determination of the density of solid chemicals used as rubber additives during processing and manufacture.                                                                                                                       | Industry | USA | Primarily U.S. and petrochemical industries | Active |                             |
| ASTM D 2000        | 2018    | 15 | Stan+E66dard Classification System for Rubber Products in Automotive Applications                                                           | This classification system covers the properties of vulcanized rubber materials (natural rubber, reclaimed rubber, synthetic rubbers, alone or in combination) that are intended for, but not limited to, use in rubber products for automotive applications. | Industry | USA | Primarily U.S. and petrochemical industries | Active |                             |
| ASTM D 2240 - 15e1 | 2015    | 11 | Standard Test Method for Rubber Property—Durometer Hardness                                                                                 | This test method covers twelve types of rubber hardness measurement devices known as durometers: Types A, B, C, D, DO, E, M, O, OO, OOO, OOO-S, and R.                                                                                                        | Industry | USA | Primarily U.S. and petrochemical industries | Active |                             |
| ASTM D 6546        | 2015    | 4  | Standard Test Methods for and Suggested Limits for Determining Compatibility of Elastomer Seals for Industrial Hydraulic Fluid Applications | These test methods cover the procedure for measuring physical properties of elastomer seals in the form of O-rings after exposure to industrial hydraulic fluids and thermal aging.                                                                           | Industry | USA | Primarily U.S. and petrochemical industries | Active |                             |
| ASTM D 7216        | 2019    | 10 | Standard Test Method for Determining Automotive Engine Oil Compatibility with Typical Seal Elastomers                                       | This test method covers quantitative procedures for the evaluation of the compatibility of automotive engine oils with several reference elastomers typical of those used in the sealing materials in contact with these oils.                                | Industry | USA | Primarily U.S. and petrochemical industries | Active |                             |
| ASTM F2523         | 2020    | 6  | Standard Practice for Blowout Resistance of Room-Temperature Vulcanized Elastomers                                                          | This practice provides a means to determine the blowout resistance of a room-temperature vulcanized elastomer system (RTV) using a standard fixture.                                                                                                          | Industry | USA | Primarily U.S. and petrochemical industries | Active |                             |
| TM0187             | 2011-SG |    | Evaluating Elastomeric Materials in Sour Gas Environments                                                                                   | Test method to measure the ability of elastomeric materials to withstand static exposure to elevated pressure and vapor-phase sour gas environments. Tests O-rings or specimens of elastomeric vulcanites.                                                    | Industry | USA | World wide                                  | Active | NACE International Standard |
| NAS 1613           | 2012    | 6  | Packing, Preformed, Ethylene Propylene Rubber                                                                                               | This specification establishes requirements for elastomer seal elements for use in hydraulic systems using phosphate ester fluids.                                                                                                                            | Industry | USA | World wide                                  | Active |                             |

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| VDI 2440     |      |  | Emission Control Mineral Oil Refineries | VDI 2440 is a German guideline created by experts from industry, universities and public bodies for emission control in mineral oil refineries. The sources of gaseous emissions are stated and the relevant best available technologies (BAT) for emission reduction are described. Also specific leakage rates for the emissions from valves and flanges are defined as well as the specific testing methods. These leakage rates have been implemented into the German emission directive "TA-Luft" | National | Germany     | Germany and Europe    | Active |                                                                                            |
| BAM          |      |  |                                         | German approval for articles to be used in oxygen applications                                                                                                                                                                                                                                                                                                                                                                                                                                         | National | Germany     | Germany and Europe    | Active |                                                                                            |
| EC 1935/2004 | 2004 |  | Food safety — safe packaging            | Covers materials and articles intended to come into contact with food                                                                                                                                                                                                                                                                                                                                                                                                                                  | National | Europe      | Europe                | Active |                                                                                            |
| ACS          |      |  |                                         | French Drinking Water Approval                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | National | France      | France                | Active | A E.U. working group is working on alignment of all individual water approvals in the E.U. |
| WRAS         |      |  |                                         | U.K. Drinking Water Approval                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          | U.K.        | UK                    | Active |                                                                                            |
| KTW          |      |  |                                         | German Drinking Water Approval                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | National | Germany     | Germany               | Active | A E.U. working group is working on alignment of all individual water approvals in the E.U. |
| DVGW         |      |  |                                         | German Approval for use of articles in Water and Gas applications                                                                                                                                                                                                                                                                                                                                                                                                                                      | National | Germany     | Germany               | Active |                                                                                            |
| KIWA         |      |  |                                         | Netherlands Drinking Water Approval                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | National | Netherlands | Netherlands           | Active | A E.U. working group is working on alignment of all individual water approvals in the E.U. |
| FDA          |      |  | Food safety                             | Food Safety Approvals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | National | USA         | USA and International | Active |                                                                                            |