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# ISO 15783

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**AMENDMENT 1**
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# Seal-less rotodynamic pumps — Class II — Specification

## AMENDMENT 1

*Pompes rotodynamiques sans dispositif d'étanchéité d'arbre — Classe II — Spécifications*

*AMENDEMENT 1*

Reference number
ISO 15783:2002/Amd.1:2008(E)

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# Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

Amendment 1 to ISO 15783:2002 was prepared by Technical Committee ISO/TC 115, *Pumps*, Subcommittee SC 1, *Dimensions and technical specifications of pumps*.

# Seal-less rotodynamic pumps — Class II — Specification

## AMENDMENT 1

*Pages 40 and 41, Annex F*

Replace the existing “Table F.1 — Internationally and nationally accepted materials for pump parts” by the following:

## Table F.1 — Internationally and nationally accepted materials for pump parts

| Material class | Applications | International Standard | USA | | Europe | | | Japan |
|---|---|---|---|---|---|---|---|---|
| | | ISO | ASTM | UNS [a] | EN [b] | Designation | Number | JIS |
| Cast iron | Pressure castings | 185/ Gr. 250 | A 278 Class 30 | F12401 | EN 1561 | EN-GJL-250 | JL1040 | G 5501, Gr. FC 250 |
| | General castings | 185/ Gr. 300 | A 48 Class 25/30/40 | F11701/ F12101 | 1561 | EN-GJL-250<br>EN-GJL-300 | JL1040<br>JL1050 | G 5501, Gr. FC 250<br>G 5501, Gr. FC 300 |
| Ductile iron | General castings | 1083, 400-18 | A 536 Gr 60-40-18 | F32800 | 1563 | EN-GJS-400-18 | JS1020 | G5502, Gr.FCD400-18 |
| Ni-resist | Special castings | 2892, L-NiCuCr 15 6 3<br>2892, S-NiCr 20 2 | A 436 Type 1<br>A 439 Type D-2 | F41000<br>F43000 | 13835<br>13835 | EN-GJLA-XNiCuCr15-6-2<br>EN-GJSA-XNiCr20-2 | — | G5510, Gr.FCA-NiCuCr1563<br>G5510, Gr.FCDA-NiCr202 |
| Carbon steel | Pressure castings | 4991 C23-45AH | A 216 Gr WCB | J03002 | 10213-2 | GP 240 GH | 1.0619 | G 5151, Cl SCPH 2 |
| | Low-temperature castings | 4991, C23-45BL<br>4991, C43E2aL<br>4991, C43L | A 352 Gr LCB<br>A 352 Gr LC2<br>A 352 Gr LC3 | J 03003<br>J 22500<br>J 31550 | 10213-3<br>10213-3<br>10213-3<br>10213-3 | G18Mo5<br>G20Mo5<br>G9Ni10<br>G9Ni14 | 1.5422<br>1.6220<br>1.5636<br>1.5638 | G5152, Cl SCPL1<br>G5152, Cl SCPL11<br>G5152, Cl SCPL21<br>G5152, Cl SCPL31 |
| | Wrought/ forgings | 683-18-C25,<br>9327-2 - PH26-PH31,<br>9327-4 | A 266 Class 2 | K03506 | 10222-2 | P 280 GH | 1.0426 | G 3202, Cl SFVC 2A |
| | Bar stock: pressure | 683-18-C 25,<br>9327-2, PH26-PH31,<br>9327-4 | A 696 Gr B40 | G10200 | 10273 | P 295 GH | 1.0481 | G 4051, Cl S25C |
| | Bar stock: general | 683-18-C45e<br>9327-2 - PH26-PH31,<br>9327-4 | A 576 Gr 1045 | G10450 | 10083-2 | C 45 | 1.0503 | G 4051, Cl S45C |
| | Bolts and studs (general) | 9327-2-F31 | A 193 Gr B7 | G41400 | 10269 | 42 Cr Mo 4 | 1.7225 | G 4107, Class 2, SNB7 |
| | Nuts (general) | 683-1-C35e | A 194 Gr 2H | K04002 | 10269 | C 35 E | 1.1181 | G 4051, Cl S45C |
| | Plate | 9328-4,<br>P 355 TN/PL 355 TN | A 516 Gr 65/70 | K02403/ K02700 | 10028-3<br>10028-2 | P 355 N<br>P 355 NL1<br>P 295 GH<br>P 355 GH | 1.0562<br>1.0566<br>1.0481<br>1.0473 | G 3106, Gr. SM400B |

**Table F.1** (*continued*)

| Material class | Applications | International Standard | USA | | Europe | | | Japan |
|---|---|---|---|---|---|---|---|---|
| | | ISO | ASTM | UNS [a] | EN [b] | Designation | Number | JIS |
| Carbon steel (cont.) | Pipe | 9329-2, PH26-PH35 | A 106 GrB | K03006 | 10208-1 | L 245 GA | 1.0459 | G 3456, Gr. STPT 370/410 |
| | Fittings | — | A 105 | K03504 | — | — | — | G 4051, Cl S25C<br>G 3202, Cl SFVC 2A, SFVC2B |
| AISI 4140 Chromium steel | Bar stock | — | A 434 Class BB<br>A 434 Class BC | G41400 [c] | 10083-1 | 42 Cr Mo 4 | 1.7225 | G 4105, Cl SCM 440 |
| | Bolts and studs | — | A 193 Gr B7 | G41400 | 10269 | 42 Cr Mo 4 | 1.7225 | G 4107, Class 2, SNB7 |
| | Nuts | 9327-2-F31 | A 194 Gr 2H | K04002 | 10269<br>10269 | C 45 E<br>C 35 E | 1.1191<br>1.1181 | G 4051, Cl S45C |
| 12% Chromium steel | Pressure castings | — | A 217 Gr CA 15 | J91150 | 10213-2 | GX 8 Cr Ni 12 | 1.4107 | G 5121, Cl SCS 1 |
| | | — | A 487 Gr CA6NM | J91540 | 10213-2 | GX 4 Cr Ni 13-4 | 1.4317 | G 5121, Cl SCS 6, Cl SCS 6X |
| | General castings | — | A 743 Gr CA 15 | J91150 | 10283 | GX 12 Cr 12 | 1.4011 | G5121, Cl SCS1, Cl SCS1X |
| | | — | A 743 Gr CA6NM | J91540 | 10283 | GX 4 Cr Ni 13-4 | 1.4317 | G5121,Cl SCS6, Cl SCS6X |
| | Wrought/forgings: pressure | — | A 182 Gr F6a Cl 1<br>A 182 Gr F 6 NM | S41000<br>S41500 | 10250-4<br>10222-5 | X12 Cr 13<br>X 3 Cr NiMo 13-4-1 | 1.4006<br>1.4313 | G 3214, Gr. SUS 410-A<br>G 3214, Cl SUS F6 NM |
| | Wrought/forgings: general | — | A 473 Type 410 | S41000 | 10088-3 | X 12 Cr 13 | 1.4006 | G 3214, Gr. SUS 410-A |
| | Bar stock: pressure | — | A 479 Type 410 | S41000 | 10272 | X12 Cr 13 | 1.4006 | G 4303, Gr. SUS 410 or 403 |
| | Bar stock: general | — | A 276 Type 410 | S41400 | 10088-3 | X 12 Cr 13 | 1.4006 | G 4303, Gr. SUS 410 or 403 |
| | Bar stock: forgings [c] | — | A 276 Type 420<br>A 473 Type 416<br>A 582 Type 416 | S42000<br>S41600<br>S41600 | 10088-3 | X 20 Cr 13<br>X 20 Cr S 13<br>X 20 Cr S 13 | 1.4021<br>1.4005<br>1.4005 | G 4303, Gr. SUS 420J1 or 420J2 |

**Table F.1** (*continued*)

| Material class | Applications | International Standard | USA | | Europe | | | Japan |
|---|---|---|---|---|---|---|---|---|
| | | ISO | ASTM | UNS [a] | EN [b] | Designation | Number | JIS |
| 12% Chromium steel (cont.) | Bolts and studs [d] | 3506-1, C4-70 | A 193 Gr B6 | S41000 | 10269 | X22CrMoV 12-1 | 1.4923 | G 4303, Gr. SUS 410 or 403 |
| | Nuts [d] | 3506-2, C4-70 | A 194 Gr 6 | S41000 | 10269 | X22CrMoV 12-1 | 1.4923 | G 4303, Gr. SUS 410 or 403 |
| | Plate | — | A 240 Type 410 | S41000 | 10088-2 | X 12 Cr 13 | 1.4006 | G 4304/4305 Gr. SUS 410 or 403 |
| Austenitic stainless steel | Pressure castings | 11972, GX2CrNi18-10 | A 351 Gr CF3 | J92500 | 10213-4 | GX2 Cr Ni 19-11 | 1.4309 | G 5121, Cl SCS 19A |
| | | 11972, GX2CrNiMo19-11-2 | A 351 Gr CF3M | J92800 | 10213-4 | GX2 Cr Ni Mo 19-11-2 | 1.4409 | G 5121, Cl SCS 16A<br>G5121, Cl SCS16AX |
| | General castings | 11972, GX2CrNi18-10 | A 743 Gr CF3 | J92500 | 10283 | GX2 Cr Ni 19-11 | 1.4309 | G 5121, Cl SCS 19A |
| | | 11972, GX2CrNiMo19-11-2 | A 743 Gr CF3M | J92800 | 10283 | GX2 Cr Ni Mo 19-11-2 | 1.4409 | G 5121, Cl SCS 16A<br>G5121, Cl SCS16AX |
| | Wrought/ forgings | 9327-5, XCrNi18-10 | A 182 Gr F 304L | S30403 | 10222-5 | X2 Cr Ni 19-11 | 1.4306 | G 3214, Gr. SUS F 304 L |
| | | 9327-5, XCrNiMo17-12 | A 182 Gr F 316L | S31603 | 10222-5<br>10250-4 | X2 Cr Ni Mo 17-12-2 | 1.4404 | G 3214, Gr. SUS F 316 L |
| | Bar stock [e] | 9327-5, X2CrNi18-10<br>9327-5, X2CrNiMo17-12 | A 479 Type 304L<br>A 479 Type 316L<br>A 479 Type 317<br>A 479 Type XM19 | S30403<br>S31603<br>S31700<br>S20910 | 10088-3<br>10088-3<br>10088-3 | X2 Cr Ni 19-11<br>X2 Cr Ni Mo 17-12-2<br>X2 Cr Ni Mo 18-15-4 | 1.4306<br>1.4404<br>1.4361 | G 4303, Gr. SUS 304 L<br>G 4303, Gr. SUS 316 L |
| | | — | A 240 Type XM19 | S20910 | — | — | — | — |
| | Plate | — | A 240 Gr 304L / 316L | S30403<br>S31603 | 10028-7<br>10028-7 | X2 Cr Ni 19-11<br>X2 Cr Ni Mo 17-12-2 | 1.4306<br>1.4404 | G 4304/4305, Gr. SUS 304L/316L |
| | Pipe | 9329-4, X2CrNi18-10,<br>9329-4, X2CrNiMo17-13, | A 312 Type<br>304L<br>316L | S30403<br>S31603 | — | — | — | G 3459, Gr. SUS 304LTP/316LTP |

**Table F.1** (*continued*)

| Material class | Applications | International Standard | USA | | Europe | | | Japan |
|---|---|---|---|---|---|---|---|---|
| | | ISO | ASTM | UNS [a] | EN [b] | Designation | Number | JIS |
| Austenitic stainless steel | Fittings | 9327-5, X2CrNi18-10<br>9327-5, X2CrNiMo17-12 | A 182<br>Gr F304L, Gr 316L | S30403<br>S31603 | 10222-5 | X2 Cr Ni 19-11<br>X2 Cr Ni Mo 17-12-2 | 1.4306<br>1.4404 | G 3214, Gr. SUS F304L/F316L |
| | Bolts and studs | 3506-1, A4-70 | A 193 Gr B8M | S31600 | 10250-4 | X6 Cr Ni Mo Ti 17-12-2 | 1.4571 | G 4303, Gr. SUS 316 |
| | Nuts | 3506-2, A4-70 | A 194 Gr B8M | S31600 | 10250-4 | X6 Cr Ni Mo Ti 17-12-2 | 1.4571 | G 4303, Gr. SUS 316 |
| Precipitation hardened stainless steel | Pressure forgings | — | A 705 (“15-5 PH”)<br>A 705 (“17-4 PH”) | S 15500<br>S 17400 | — | — | — | — |
| Duplex stainless steel | Pressure castings | 11972, GX2CrNiCuMoN 26 5 3 3 | A 351 Gr CD4 MCu<br>A 890 Gr 1 B | J93370<br>J93372 | 10213-4 | GX2 CrNiMoCuN 25-6-3-3 | 1.4517 | |
| | | 11972, GX2CrNiMoN 26 5 3 | A 890 Gr 3A [c] | J93371 | — | — | — | G 5121, Gr. SCS 11 |
| | | — | A 890 Gr 4A [c] | J92205 | 10213-4 | GX2 CrNiMoN 22-5-3 | 1.4470 | G 5121, Gr. SCS 10 |
| | Wrought/forgings | 9327-5, X2CrNiMoN22-5-3 | A 182 Gr F 51 | S31803 | 10250-4<br>10222-5 | X2 Cr Ni Mo N 22-5-3 | 1.4462 | |
| | | — | A 479 | S32550 | 10088-3 | X2 Cr Ni Mo Cu N 25-6-3 | 1.4507 | |
| | Bar stock | 9327-5, X2CrNiMoN22-5-3 | A 276-S31803 | S31803 | 10088-3 | X2 Cr Ni Mo N 22-5-3 | 1.4462 | G 4303, Gr. SUS 329J3L |
| | Plate | — | A 240-S31803 | S31803 | 10028-7 | X2 Cr Ni Mo N 22-5-3 | 1.4462 | G 4304/G 4305, Gr. SUS 329J3L |
| | Pipe | — | A 790-S31803 | S31803 | — | — | — | G 3459, Gr. SUS 329J3LTP |
| | Fittings | 9327-5, X2CrNiMoN22-5-3 | A 182 Gr F 51 | S31803 | 10250-4<br>10222-5 | X2 Cr Ni Mo N 22-5-3 | 1.4462 | B 2312/B 2316 Gr. SUS329J3L |
| Duplex stainless steel | Bolts and studs | 9327-5, X2CrNiMoN22-5-3 | A 276-S31803 | S31803 | 10088-3 | X2 Cr Ni Mo N 22-5-3 | 1.4462 | G 4303, Gr. SUS 329J3L |
| | Nuts | 9327-5, X2CrNiMoN22-5-3 | A 276-S31803 | S31803 | 10088-3 | X2 Cr Ni Mo N 22-5-3 | 1.4462 | G 4303, Gr. SUS 329J3L |

**Table F.1** (*continued*)

| Material class | Applications | International Standard | USA | | Europe | | | Japan |
|---|---|---|---|---|---|---|---|---|
| | | ISO | ASTM | UNS [a] | EN [b] | Designation | Number | JIS |
| Super duplex stainless steel [f] | Pressure castings | — | A 351 Gr CD3MWCuN | J93380 | — | — | — | — |
| | | — | A 890 Gr 5A | J93404 | 10213-4 | GX2 Cr Ni Mo N 26-7-4 | 1.4469 | — |
| | | — | A 890 Gr 6A | J93380 | — | — | — | — |
| | Wrought/forgings | — | A 182 Gr 55 | S32760 | 10250-4<br>10088-3 | X2 Cr Ni Mo Cu WN 25-7-4 | 1.4501 | — |
| | Bar Stock | — | A 276-S32760<br>A 479-S32760 | S32760 | 10088-3 | X2 Cr Ni Mo Cu WN 25-7-4 | 1.4501 | G 4303, Gr. SUS 329J4L |
| | Plate | — | A 240-S32760 | S32760 | 10028-7 | X2 Cr Ni Mo Cu WN 25-7-4 | 1.4501 | G 4304/G 4305, Gr. SUS 329J4L |
| | Pipe | — | A 790-S32760 | S32760 | — | — | — | G 3459, Gr. SUS 329 J4LTP |
| | Fittings | — | A 182 Gr F55 | S32760 | 10250-4<br>10088-3 | X2 Cr Ni Mo Cu WN 25-7-4 | 1.4501 | B 2312/B 2316 Gr. SUS329J4L |
| | Bolts and studs | — | A 276-S32760 | S32760 | 10088-3 | X2 Cr Ni Mo Cu WN 25-7-4 | 1.4501 | G 4303, Gr. SUS 329J4L |
| | Nuts | — | A 276-S32760 | S32760 | 10088-3 | X2 Cr Ni Mo Cu WN 25-7-4 | 1.4501 | G 4303, Gr. SUS 329J4L |

**Table F.1** (*continued*)

| Material class | Applications | International Standard | USA | | Europe | | | Japan |
|---|---|---|---|---|---|---|---|---|
| | | ISO | ASTM | UNS [a] | EN [b] | Designation | Number | JIS |
| Monel | Wrought/forgings | 9725, NiCu30 - NW4400 | B 164<br>B 564 | N04400<br>N04400 | — | — | — | — |
| K-Monel | | 9725, NiCu30Al3Ti | — | — | — | — | — | — |
| Inconel 625 | | 9725, NiCr22Mo9Nb - NW6625 | B 446 | N06625 | EN 10095 | NiCr22Mo9Nb | 2.4856 | — |
| Inconel 718 | | 9725, NiCr19Fe19Nb5Mo3 - NW7718 | — | N07718 | — | — | — | — |

[a] Unified numbering system (UNS) designation for chemistry only.

[b] Where European Union (EN) standards do not yet exist, there are available European national standards, e.g. AFNOR, BS, DIN, etc.

[c] Do not use for shafts in the hardened condition (over 302 HBW).

[d] Special, normally use AISI 4140.

[e] For shafts, standard grades of 304 and 316 may be substituted in place of low-carbon (L) grades.

[f] Super duplex stainless steel classified with a pitting resistance equivalent number (PREN), greater than or equal to 40. A typical empirical formula for PREN is given by Equation (F.1):

$$X_{PREN} = [(w_{Cr} - (14{,}5 \times w_C)] + (3{,}3 \times w_{Mo}) + (2 \times w_{Cu}) + (2 \times w_W) + (16 \times w_N) \quad \text{(F.1)}$$

where

$w_{Cr}$ is the percent mass fraction of chromium;

$w_C$ is the percent mass fraction of carbon;

$w_{Mo}$ is the percent mass fraction of molybdenum;

$w_{Cu}$ is the percent mass fraction of copper;

$w_W$ is the percent mass fraction of tungsten;

$w_N$ is the percent mass fraction of nitrogen.

ICS 23.080

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