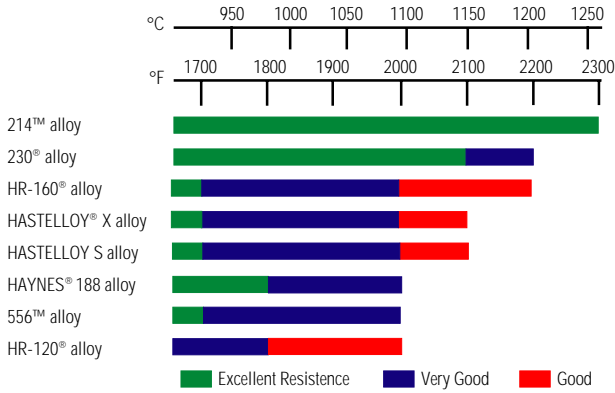


ALLOYS FOR OXIDIZING ENVIRONMENTS



ALLOYS FOR SULFUR-BEARING ENVIRONMENTS

- EXCELLENT RESISTANCE:**
HR-160 alloy
- VERY GOOD RESISTANCE:**
HAYNES 188 alloy
556 alloy
HR-120 alloy
- GOOD RESISTANCE:**
HASTELLOY X alloy
230 alloy

ALLOYS FOR CARBURIZING ENVIRONMENTS

- EXCELLENT RESISTANCE:**
214 alloy
- VERY GOOD RESISTANCE:**
HR-120 alloy
HR-160 alloy
556 alloy
230 alloy
- GOOD RESISTANCE:**
HASTELLOY X alloy
HAYNES 188 alloy
HASTELLOY S alloy

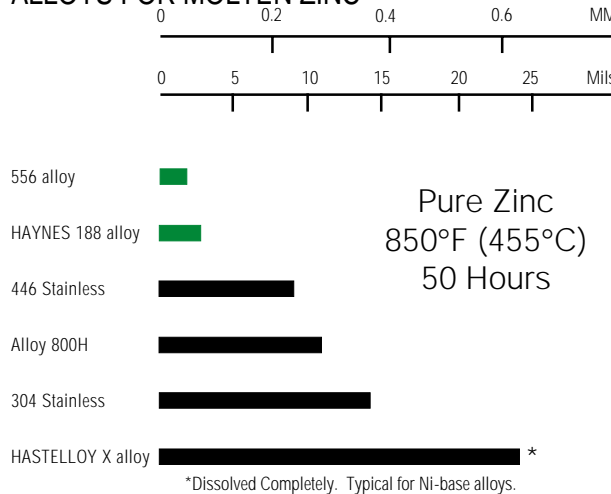
ALLOYS FOR NITRIDING ENVIRONMENTS

- EXCELLENT RESISTANCE:**
230® alloy
214™ alloy
242™ alloy
- VERY GOOD RESISTANCE:**
HR-160® alloy
HASTELLOY® S alloy
HAYNES® 188 alloy
- GOOD RESISTANCE:**
HASTELLOY X alloy

ALLOYS FOR MOLTEN CHLORIDE SALTS

- EXCELLENT RESISTANCE:**
HAYNES 188 alloy
242 alloy
- VERY GOOD RESISTANCE:**
HR-160 alloy
HASTELLOY S alloy
556 alloy
- GOOD RESISTANCE:**
HASTELLOY X alloy
214 alloy

ALLOYS FOR MOLTEN ZINC



ALLOYS FOR OXIDIZING, CHLORINE-BEARING ENVIRONMENTS

- EXCELLENT RESISTANCE:**
214™ alloy
HR-160® alloy
556™ alloy
- VERY GOOD RESISTANCE:**
HASTELLOY® X alloy
- GOOD RESISTANCE:**
HR-120® alloy

ALLOYS FOR REDUCING, CHLORINE-BEARING ENVIRONMENTS

- EXCELLENT RESISTANCE:**
242™ alloy
HASTELLOY S alloy
- VERY GOOD RESISTANCE:**
214 alloy
HR-160 alloy
- GOOD RESISTANCE:**
HASTELLOY X alloy
556 alloy
HR-120 alloy

ALLOYS FOR REDUCING, FLUORINE-BEARING ENVIRONMENTS

- EXCELLENT RESISTANCE:**
242 alloy
- VERY GOOD RESISTANCE:**
HASTELLOY S alloy
HASTELLOY N alloy
- GOOD RESISTANCE:**
HR-160 alloy
230® alloy

POCKET GUIDE
TO
MATERIALS PERFORMANCE
IN

INDUSTRIAL
HIGH-TEMPERATURE
ENVIRONMENTS

HAYNES
International

Long-Term Performance
IS
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Haynes International, Inc.
Kokomo, Indiana

For More Information Contact:

Midwest Service Center
1020 W. Park Avenue
P.O. Box 9013
Kokomo, Indiana 46904-9013
Tel: 765-456-6012
800-354-0806
Fax: 765-456-6905

Southern Service Center
The Northwood Industrial Park
12241 FM 529
Houston, Texas 77041
Tel: 713-937-7597
800-231-4548
Fax: 713-937-4596

Tubular Products
3786 Second Street
Arcadia, Louisiana 71001-9701
Tel: 318-263-9571
800-648-8823
Fax: 318-263-8088

Eastern Service Center
430 Hayden Station Road
Windsor, Connecticut 06095
Tel: 860-688-7771
800-426-1963
Fax: 860-688-5550

Western Service Center
Stadium Plaza
1520 South Sinclair Street
Anaheim, California 92806
Tel: 714-978-1775
800-531-0285
Fax: 714-978-1743

England
Haynes International, Ltd.
P.O. Box 10
Parkhouse Street
Openshaw
Manchester, M11 2ER
Tel: **44-161-230-7777**
Fax: 44-161-223-2412

France
Haynes International, S.A.R.L.
P.A. des Bellevues
Avenue de la Patelle -
Voie de l'Olivier
BP 70303 Eragny/Oise
95617 Cergy Pontoise Cedex
Tel: **33-1-34-48-3100**
Fax: 33-1-30-37-8022

Singapore
Haynes Pacific PTE LTD
15 McCallum Street
#05-03 Natwest Centre
Singapore 069045
Tel: **65-6-222-3213**
Fax: 65-6-222-3280

Italy
Haynes International, S.R.L.
Viale Brianza, 8
20127 Milano
Italy
Tel: **39-02-2614-1331**
Fax: 39-02-282-8273

Switzerland
Nickel Contor AG
Hohlstrasse 534
CH-8048 Zurich
Switzerland
Tel: **41-1-434-7080**
Fax: 41-1-431-8787

China
Haynes International, Inc.
Jiushi Tower, Suite 803
28 Zhongshan Rd (S)
Shanghai
P.R. 200010
Tel: **86-21-6330-2399**
Fax: 86-21-6330-5298

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NOMINAL COMPOSITIONS OF ALLOYS

| | Weight Percent | | | | | | | | | | |
|--------------------|-----------------|-----------------|-----------------|----|------|------|-------|------|-------|------|---------------------------------|
| | Ni | Co | Fe | Cr | Mo | W | Mn | Si | C | La | Others |
| HAYNES® 188 alloy | 22 | 39 ^a | 3* | 22 | - | 14 | 1.25* | 0.35 | 0.10 | 0.03 | - |
| 214™ alloy | 75 ^a | - | 3 | 16 | - | - | 0.5* | 0.2* | 0.05 | - | 4.5 Al, 0.01 Y, 0.1* Zr |
| 230® alloy | 57 ^a | 5* | 3* | 22 | 2 | 14 | 0.5 | 0.4 | 0.10 | 0.02 | 0.3 Al |
| 242™ alloy | 65 ^a | 1* | 2* | 8 | 25 | - | 0.8* | 0.8* | 0.03* | - | 0.5* Al, 0.006* B, 0.5* Cu |
| 556™ alloy | 20 | 18 | 31 ^a | 22 | 3 | 2.5 | 1 | 0.4 | 0.10 | 0.02 | 0.6 Ta, 0.2 Al, 0.20 N, 0.02 Zr |
| HR-120® alloy | 37 | 3* | 33 ^a | 25 | 2.5* | 2.5* | 0.7 | 0.6 | 0.05 | - | 0.7 Cb, 0.20 N, 0.1 Al, 0.004 B |
| HR-160® alloy | 37 ^a | 29 | 2* | 28 | 1* | 1* | 0.5 | 2.75 | 0.05 | - | - |
| HASTELLOY® N alloy | 71 ^a | 0.2* | 5* | 7 | 16 | 0.5* | 0.8* | 1* | 0.08* | - | 0.35* Cu, 0.5* (Al + Ti)* |
| HASTELLOY S alloy | 67 ^a | 2* | 3* | 16 | 15 | 1* | 0.5 | 0.4 | 0.02* | 0.02 | 0.25 Al, 0.015* B |
| HASTELLOY X alloy | 47 ^a | 1.5 | 18 | 22 | 9 | 0.6 | 1* | 1* | 0.10 | - | 0.008* B |

* Maximum

^aAs balance