

# MP35N

UNS R30035

Co–Ni–Cr–Mo multiphase alloy

Ultra-high strength with excellent corrosion, fatigue and stress-corrosion resistance.

## 01 PRODUCT INTRODUCTION

MP35N is a nonmagnetic cobalt-nickel-chromium-molybdenum alloy capable of very high strength through cold work followed by aging. Nickel and cobalt provide toughness and phase stability, chromium contributes corrosion resistance, and molybdenum improves strength and localized-corrosion resistance. The alloy is widely used in sour oil and gas, aerospace fasteners, marine cable, medical devices and precision springs. Strength, ductility and corrosion performance must be specified together with cold-reduction level and aging treatment. Final selection should consider product form, manufacturing route, heat treatment, wear mechanism, temperature, stress and governing specification.

## 02 ENGINEERING POSITION

|                |                                                                                                 |
|----------------|-------------------------------------------------------------------------------------------------|
| Core advantage | High strength, fatigue, seawater, chloride SCC and sour-service resistance                      |
| Applications   | Oil-well components · aerospace fasteners · medical wire · marine cable · high-strength springs |
| Material class | Co–Ni–Cr–Mo multiphase alloy                                                                    |

## 03 COMMON INDUSTRY USE

|                |                                                                                                 |
|----------------|-------------------------------------------------------------------------------------------------|
| Industry focus | Oil-well components · aerospace fasteners · medical wire · marine cable · high-strength springs |
| Design note    | Separate cast, wrought, overlay and medical-grade product data.                                 |

# Composition & Physical Data

## 04 CHEMICAL COMPOSITION

|    |          |       |            |
|----|----------|-------|------------|
| Co | Balance  | Ni    | 33–37%     |
| Cr | 19–21%   | Mo    | 9–10.5%    |
| Fe | ≤ 1%     | Ti    | ≤ 1%       |
| C  | ≤ 0.025% | Mn/Si | Low limits |

## 05 PHYSICAL PROPERTIES

|               |                                                      |
|---------------|------------------------------------------------------|
| Density       | 8.43 g/cm <sup>3</sup>                               |
| Product route | Wrought / cast / deposited as identified             |
| Data status   | Typical reference; specification controls acceptance |

## 06 MATERIAL IDENTITY

|                 |                                                                         |
|-----------------|-------------------------------------------------------------------------|
| Common name     | MP35N                                                                   |
| UNS             | R30035                                                                  |
| Alloy family    | Co–Ni–Cr–Mo multiphase alloy                                            |
| Reference specs | ASTM F562 · AMS 5844 / 5845 · NACE / customer sour-service requirements |

# Mechanical, Wear & Service Performance

## 07 MECHANICAL PROPERTIES

|                |                                                                                  |
|----------------|----------------------------------------------------------------------------------|
| Strength basis | Product form, cold work, microstructure and heat treatment determine properties. |
| Acceptance     | Use specification minimums for tensile, yield, elongation and hardness.          |

## 08 SERVICE PERFORMANCE

|                 |                                                                            |
|-----------------|----------------------------------------------------------------------------|
| Primary service | High strength, fatigue, seawater, chloride SCC and sour-service resistance |
| Wear mode       | Identify galling, abrasion, erosion, cavitation or fretting separately.    |
| Corrosion       | Review chlorides, sour media, hot gases and galvanic coupling.             |
| Temperature     | Use grade-specific hot hardness, creep and oxidation data.                 |

## 09 APPLICATIONS

|                 |                                                                                                 |
|-----------------|-------------------------------------------------------------------------------------------------|
| Typical use     | Oil-well components · aerospace fasteners · medical wire · marine cable · high-strength springs |
| Critical review | Confirm section size, surface finish, manufacturing route and inspection plan.                  |

# Fabrication, Joining & Heat Treatment

## 10 MACHINING & FORMING

|           |                                                                                |
|-----------|--------------------------------------------------------------------------------|
| Machining | Use rigid carbide-alloy practice; wear grades may require grinding.            |
| Forming   | Wrought grades require superalloy forming practice and work-hardening control. |

## 11 JOINING GUIDANCE

|             |                                                                    |
|-------------|--------------------------------------------------------------------|
| Welding     | Use qualified cobalt-alloy procedures and compatible filler metal. |
| Overlay     | Control dilution, cracking, preheat and deposit thickness.         |
| Cleanliness | Remove sulfur, grease, oxides and iron contamination.              |
| Inspection  | Use NDE and hardness checks appropriate to the product route.      |

## 12 HEAT TREATMENT

Cold work develops strength; controlled aging further increases strength and stability.

|                 |                                                                       |
|-----------------|-----------------------------------------------------------------------|
| Quality control | Confirm procedure qualification, hardness, NDE and full traceability. |
|-----------------|-----------------------------------------------------------------------|

# Product Forms, Standards & Procurement

13

REFERENCE STANDARDS

|           |                                                                         |
|-----------|-------------------------------------------------------------------------|
| Standards | ASTM F562 · AMS 5844 / 5845 · NACE / customer sour-service requirements |
|-----------|-------------------------------------------------------------------------|

14

PRODUCT FORMS

|       |                                                                             |
|-------|-----------------------------------------------------------------------------|
| Forms | Sheet · plate · bar · wire · castings · wear plate · overlay · custom parts |
| Route | Specify wrought, cast, HIP, deposited or medical-grade product              |

15

RFQ INFORMATION

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| Material   | MP35N · UNS R30035 · governing specification                        |
| Dimensions | Form, thickness, tolerances, length and quantity                    |
| Testing    | Chemistry, tensile, hardness, NDE, microstructure and special tests |
| Documents  | MTR, heat/lot traceability and compliance certificates              |

16

TECHNICAL DISCLAIMER

Values shown are nominal or typical references and may vary by product form, manufacturing route and heat treatment. They do not replace design calculations, wear testing, medical validation, applicable codes or the certified material test report.

|         |                                             |
|---------|---------------------------------------------|
| Contact | sales@nickelalloy.net · www.nickelalloy.net |
|---------|---------------------------------------------|