

PWHT Risks: Lo-C, High Strength Steels

These steels if welded and thermally stress relieved can suffer significant material degradation. These side effects fall into four categories, that can be seen in such publications as Arcelor Mittal's plate spec guide.

The categories are accumulative, i.e., Cat 2 steels have Cat 1's risks, plus those denoted in the list below

- Category 1 steels: Reduced strength & toughness in HAZ's
- Category 2 steels: Cat 1's risks plus increased susceptibility to cracking
- Category 3 steels: Cat 2's risks plus “not recommended for service < -50F or > 800F”
- Category 4 steels: PWHT reduces abrasion resistance

Cat 1 Steels

A225 Grade C

A225 Grade D

A242 Type 1

A514 Grade A

A514 Grade E

A514 Grade P

A517 Grade A

A517 Grade E

A517 Grade P

A572 Grade 42/Type 2#

A572 Grade 50/Type 2#

A572 Grade 55/Type 2#

A572 Grade 60/Type 2

A588 Grade A

A572 Grade 65/Type 2#

A588 Grade B

A612

A633 Grade A

A633 Grade C

A633 Grade E

A656 Grade 50/Type 3

A656 Grade 50/Type 7

A656 Grade 60/Type 7

A656 Grade 70/Type 7

A656 Grade 80/Type 7

A678 Grade D

A709 Grade HPS 50W

A709 Grade HPS 70W

A724 Grade A

A724 Grade B

A724 Grade C

A737 Grade B

A737 Grade C

A738 Grade A

A738 Grade B

A808

Cat 1 Steels (con't)

A841 Grade A/Class 1

A841 Grade A/Class 2

A841 Grade B/Class 1

A841 Grade B/Class 2

A852

A871 Grade 60/Type II#

A871 Grade 65/Type II#

A945 Grade 50

A945 Grade 65

API2H Grade 42

API 2H Grade 50

API 2Y Grade 50

API 2Y Grade 50T

API 2Y Grade 60

API-2MT-1

API-2W Grade 42

API-2W Grade 50

API-2W Grade 50T API-2W
Grade 60

Cat 2 & Cat 3 Steels

| | |
|----------------------|------------------------|
| A514 Grade B | SPA-90 |
| A514 Grade F | T-1 |
| A514 Grade H | T-1 Type A |
| A514 Grade Q | T-1 Type B |
| A517 Grade B | T-1 Type C LQ-130 |
| A517 Grade F | LQ-690Z |
| A517 Grade H | Spartan I |
| A517 Grade Q | Spartan II |
| A709 Grade HPS 100W | Spartan III |
| A710 Grade A/Class 3 | HSLA 80 MIL-S-24645A |
| A736 Grade A/Class 3 | HSLA 100 MIL-S-24645A |

Cat 4 Steels

T-1 Grade 321 HB

T-1 Grade 340 HB

T-1 Grade 360 HB

T-1 Type A Grade 321 HB

T-1 Type A Grade 340 HB

T-1 Type A Grade 360 HB