

# Grades & Sizes

Carbon

|                                   | EQUIVALENT GRADES |                              |                                                                  |                            |                    | GRADES FOR POTENTIAL SUBSTITUTION |                                         |
|-----------------------------------|-------------------|------------------------------|------------------------------------------------------------------|----------------------------|--------------------|-----------------------------------|-----------------------------------------|
| Product<br>(Bold denotes stocked) | BS 970: 1955      | British Standards            | European                                                         | Werkstoff                  | SAE/AISI/AMS       | Lesser                            | Greater                                 |
| <b>230M07 (230)</b>               | EN1A              |                              | 11SMn30                                                          | 1.0715                     | 1113<br>1213       |                                   |                                         |
| <b>070M20 (070)</b>               | EN3A<br>EN32      | 080A15                       | C15<br>C20/C22<br>ST52-3 (ST5)<br>S235 (S23)<br>S275 (S27 & S28) | 1.0402<br>1.0401<br>1.1151 | 1020<br>1023       |                                   | LF2 (LF2)                               |
| <b>S355 (S36 &amp; S38)</b>       | EN14              | 150M19 (150)                 | ST52-3 (ST5)<br>S275 (S27 & S28)                                 | 1.1170                     | 1320<br>1024       | LF2 (LF2)                         |                                         |
| <b>080M40 (080)</b>               | EN8<br>EN8D       | 080A42 (08A)                 | C40                                                              | 1.0511                     | 1040               |                                   | <b>C45 (08B)</b><br><b>070M55 (07A)</b> |
| <b>C45 (08B)</b>                  |                   | 080M46 (08E)<br>080M50 (08I) |                                                                  |                            | 1050 (10M)         | <b>080M40 (080)</b><br>C40        | <b>070M55 (07A)</b>                     |
| <b>070M55 (07A)</b>               | EN9               | 080M50 (08I)                 | C55<br>C60 (C60)                                                 | 1.0535                     | 1050 (10M)<br>1055 | <b>C45 (08B)</b>                  |                                         |

Through Hardening

|                     |       |                     |                                         |                  |                                      |                                  |                                                                                      |
|---------------------|-------|---------------------|-----------------------------------------|------------------|--------------------------------------|----------------------------------|--------------------------------------------------------------------------------------|
| <b>605M36 (605)</b> | EN16  |                     |                                         |                  |                                      |                                  | 38MB5 (035)<br>4130 (41C)<br>945M38 (945)                                            |
| <b>709M40 (709)</b> | EN19  | <b>708M40 (708)</b> | <b>42CrMo4 (C44)</b><br><b>42CrMoS4</b> | 1.7225           | 4140 (41F & 41G)<br>4142<br>B7<br>L7 | 945M38 (945)<br>41CrS4 (C41)     | 4145 (41I)<br>4340 (43B)<br><b>817M40 (817)</b><br><b>826M40 (826)</b>               |
| <b>817M40 (817)</b> | EN24  |                     | 34CrNiMo6 (C36)<br>40CrNiMo6            | 1.6565<br>1.6582 | 4340 (43B)                           | <b>709M40 (709)</b><br>36CrNiMo4 | 4145 (41I)<br>4340 (43B)<br><b>E4340 (43X)</b><br><b>826M40 (826)</b><br>4330V (43V) |
| <b>826M40 (826)</b> | EN26  |                     | 40NiMoCr10-5                            | 1.6745           |                                      | 4340 (43B)                       | 4330V (43V)<br>S99                                                                   |
| <b>835M30 (83A)</b> | EN30B |                     | 30NiCrMo16-6                            | 1.6747           |                                      | 1.2767                           | 4330V (43V)                                                                          |
| <b>722M24 (722)</b> | EN40B |                     | 32CrMo12                                | 1.7361           |                                      | 31CrMoV9                         | S106 (72A)                                                                           |
| <b>100Cr6 (CC1)</b> | EN31  | <b>535A99 (535)</b> |                                         | 1.3505           | 52100                                |                                  | 100CrMo7-3 (CC3)                                                                     |

Case Hardening

|                          |       |                        |                        |        |              |                                                 |                                                                 |
|--------------------------|-------|------------------------|------------------------|--------|--------------|-------------------------------------------------|-----------------------------------------------------------------|
| 665M17 (665)             | EN34  |                        |                        |        | 4615<br>4617 |                                                 | 655M13 (655)                                                    |
| <b>655M13 (655)</b>      | EN36B | <b>832M13 (832)</b>    | 14NiCr4                | 1.5752 | 3415<br>3310 | <b>18CrNiMo7-6 (C18)</b>                        | <b>832M13 (832)</b><br><b>835M15 (835)</b><br>S157              |
| <b>832M13 (832)</b>      | EN36C | <b>655M13 (655)</b>    |                        |        |              | <b>655M13 (655)</b><br><b>18CrNiMo7-6 (C18)</b> | S157                                                            |
| <b>835M15 (835)</b>      | EN39  |                        | 15NiCrMo16-5           | 1.6723 |              |                                                 | <b>S156</b>                                                     |
| <b>8620 (86B)</b>        | EN351 | 635M15 (635)<br>805M20 | 21NiCrMo2-2<br>16NiCr4 | 1.6543 | 8617         | 16MnCr5 (M15)                                   | 8630 (86D)<br><b>655M13 (655)</b><br><b>18CrNiMo7-6 (C18)</b>   |
| <b>18CrNiMo7-6 (C18)</b> |       |                        |                        |        |              |                                                 |                                                                 |
| <b>16MnCr5 (M15)</b>     |       | 590M17                 | 20MnCr5 (M25)          | 1.7131 | 5115<br>5117 |                                                 | 8620 (86B)<br>635M15 (635)<br>655M13 (655)<br>18CrNiMo7-6 (C18) |

Oil & Gas

|                      |       |                                            |                      |                  |                         |              |              |
|----------------------|-------|--------------------------------------------|----------------------|------------------|-------------------------|--------------|--------------|
| 4130 mod (41C)       |       |                                            | 25CrMo4<br>34CrMo4   | 1.7218<br>1.7220 | 4135                    |              |              |
| 4140 mod (41F & 41G) | EN19  | <b>708M40 (708)</b><br><b>709M40 (709)</b> | <b>42CrMo4 (C44)</b> | 1.7225           | 4142<br>B7 (B7A)<br>L7  |              | 4340 (43B)   |
| 4145 mod (41I)       |       |                                            |                      |                  |                         | 817M40 (817) | 4340 (43B)   |
| 4330V (43V)          |       |                                            |                      |                  |                         | 826M40 (826) | 835M30 (83A) |
| 420M (Y42)           | EN56C | 420S29<br>420S37                           | X15Cr13<br>X20Cr13   | 1.4021<br>1.4024 | 420 (Y42)<br>13Cr (Y42) |              |              |

Tool

|              |  |      |               |  |     |  |  |
|--------------|--|------|---------------|--|-----|--|--|
| 1.2510 (T10) |  | BO1  | 100MnCrW4     |  | O1  |  |  |
| 1.2344 (T44) |  | BH13 | X40CrMoV5-1   |  | H13 |  |  |
| 1.2379 (T79) |  | BD2  | X155CrVMo12-1 |  | D2  |  |  |

# Grades & Sizes Continued

Aero/Motorsport

|                                   | EQUIVALENT GRADES |                   |                                |                  |                                                         | GRADES FOR POTENTIAL SUBSTITUTION                 |         |
|-----------------------------------|-------------------|-------------------|--------------------------------|------------------|---------------------------------------------------------|---------------------------------------------------|---------|
| Product<br>(Bold denotes stocked) | BS 970: 1955      | British Standards | European                       | Werkstoff        | SAE/AISI/AMS                                            | Lesser                                            | Greater |
| <b>300M (300)</b>                 |                   | <b>S155</b>       |                                |                  | AMS6417 (VAR)<br>AMS6419 (VAR)<br>AMS6257 (VAR)         | E4340                                             |         |
| <b>E4340 (43X)</b>                |                   |                   |                                |                  | AMS6414 (VAR)<br>AMS6415 (EAF/ESR)                      |                                                   |         |
| S99                               |                   | S98               |                                |                  |                                                         | <b>826M40 (826)</b>                               |         |
| S98                               |                   |                   | 40NiMoCr10-5                   | 1.6745           |                                                         | <b>826M40 (826)</b>                               | S99     |
| S97                               | EN25              | 826M31            | 30NiCrMo12                     | 1.6743           |                                                         |                                                   |         |
| S154                              | EN25              | 826M31            | 30NiCrMo12                     | 1.6655           |                                                         |                                                   |         |
| S142                              |                   |                   | 25CrMo4<br>25CD4               | 1.7218           | 4130<br>AMS6346<br>UNSG41300                            |                                                   |         |
| <b>S156 (83D)</b>                 |                   |                   | (E)16NCD17                     |                  |                                                         | <b>835M15<br/>EN39<br/>S82</b>                    |         |
| S82                               | EN39              | 835M15            | 16NCD17                        | 1.6722<br>1.6723 | AMS6264 (EAF/ESR)                                       |                                                   | S156    |
| S157                              |                   |                   |                                |                  |                                                         | <b>832M13<br/>EN36C</b>                           |         |
| 9310                              |                   |                   |                                |                  | AMS6265 (VAR)<br>AMS6267 (ESR/VAR)                      |                                                   |         |
| <b>Hy-Tuf (HYT)</b>               |                   |                   |                                |                  | AMS6425 (VAR)                                           |                                                   |         |
| S132                              |                   |                   | 40CDV12<br>40CrMoV13-9         | 1.8523           |                                                         |                                                   |         |
| S106 (72A)                        | EN40B             | 722M24            | 32CrMo12                       | 1.7361<br>1.7365 |                                                         | <b>722M24/EN40B</b>                               |         |
| S157                              |                   |                   |                                |                  | AMS6260 (EAF/ESR)<br>AMS6265 (VAR)<br>AMS6267 (ESR/VAR) | <b>655M13 (655)<br/>832M13 (832)<br/>SAE 9310</b> |         |
| 15-5 (Y15)                        |                   |                   |                                | 1.4545           | AMS5659 (ESR/VAR)                                       | Grade XM-12 ASTM<br>A564<br>S15500 (UNS)          |         |
| 17-4 (Y17)                        |                   |                   | X5CrNiCuNb16-4                 | 1.4542           | AMS5622 (ESR/VAR)<br>AMS5643 (EAF/ESR)                  | Grade 630 ASTM A564<br>S17400 (UNS)               |         |
| 13/8 (13/8Mo)                     |                   |                   | X3CrNiMoAl13-8-2               | 1.4534           | AMS5629 (VIM/VAR/<br>ESR)                               |                                                   |         |
| S143<br>S144<br>S145              |                   |                   | XCrNiMoC-<br>uNb14-5<br>FV520B | 1.4594           |                                                         |                                                   |         |
| S130                              |                   | 347S31            | X5CrNiNb18-10                  | 1.4546           | AMS 5646 (ESR)                                          |                                                   |         |
| S151                              |                   | Jethete M152      | X12CrNiMoV12-3                 | 1.4938           | AMS 5719 (ESR/VAR)                                      |                                                   |         |
| 440C                              |                   |                   | X105CrMo17                     | 1.4125           |                                                         |                                                   |         |
| S80                               |                   | 431S29            | X15CrNi17-3                    | 1.4044           | AMS 5628<br>431                                         |                                                   |         |
| M50                               |                   |                   | 80MoCrV42-16                   | 1.3551<br>1.3352 | AMS6490 (VAR)<br>AMS6491 (VIM/VAR)                      |                                                   |         |
| S162                              |                   | C250              | X2NiCoMo18-8-5                 | 1.6539           | AMS 6512                                                |                                                   |         |

## Equivalent Grades

Grades of equivalent (not identical) chemistry. Please note the equivalent grades are based on chemistry only, and may not meet the necessarily mechanical properties (in the standard 'as stocked' state).

## Grades for Potential Substitution

Grades capable of achieving similar mechanical properties (material may need further treatment to achieve the desired properties).  
The potential substitution grades are based on capability to achieve mechanical properties, and are not necessarily similar in chemical analysis.

## For Internal Reference Only

### NOTES

- 1) Items in bold denote stocked item.
- 2) Three digit codes shown in brackets denotes grade reference for product code within Chorus.
- 3) Where queries exist regarding offering equivalent or substituted grades, these should be verified by the customer and/or Technical.

## For External Reference Only

### NOTES

- 1) Items in bold denote stocked item. All other grades available to source.
- 2) Where queries exist regarding offering equivalent or substituted grades, please refer to the Sales Team.

**For full details on grades, service and technical data, please call 0114 233 11 33 or visit [www.hillfoot.com](http://www.hillfoot.com)**

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