



# STEEL HAND BOOK

INGOTS | ROLLED BARS | CONTINUOUS CAST BILLETS / BLOOMS



Bringing 35 years of excellence of  
steel manufacturing

INFO@KSL.IN | WWW.KSL.IN | +91 981 0112 977



**AMIT KUMAR JAIN, CEO**

Thank you for your interest and for taking the time to learn more about our business. We hope you will see how committed we are to our customers and the safety and craftsmanship standards we uphold.

The foundation of **Kesri Alloys** is honesty, mutual respect and commitment. We continually reinvest in our facilities and employees. In our business, innovation and continuous improvement are core values and taken as a way of life in our operations. We are an experienced, enthusiastic and engaged team with strong management, thanks to our dedication, to providing our customers with products and solutions of the highest possible quality.

Customer satisfaction is a top priority for us. At **Kesri Alloys**, we quickly adapt to the shifting requirements of our customers because we are flexible and adaptable to their needs.

## **FOR ENQUIRIES :**

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# KESRI ALLOYS PRIVATE LIMITED

| GRADE         | %C         | %Mn        | %S       | %P    | %Si       | %Cr         | %Ni         | %Mo         | Other Elements            |
|---------------|------------|------------|----------|-------|-----------|-------------|-------------|-------------|---------------------------|
| AISI 201      | 0.15 MAX   | 5.50-7.50  | 0.03     | 0.06  | 1.00 MAX  | 16.00-18.00 | 3.50-5.50   |             | N= .25 MAX                |
| AISI 202      | 0.15 MAX   | 7.50-10.00 | 0.03     | 0.06  | 1.00 MAX  | 17.00-19.00 | 4.00-6.00   |             | N=.25 MAX                 |
| AISI 301      | 0.15 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 16.00-18.00 | 6.00-8.00   |             |                           |
| AISI 302      | 0.15 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 17.00-19.00 | 8.00-10.00  |             |                           |
| AISI 302 B    | 0.15 MAX   | 2.00 MAX   | 0.03     | 0.045 | 2.00-3.00 | 17.00-19.00 | 8.00-10.00  |             |                           |
| AISI 303      | 0.15 MAX   | 2.00 MAX   | 0.15 MIN | 0.2   | 1.00 MAX  | 17.00-19.00 | 8.00-10.00  |             | Zr/Mo=0.6 MAX             |
| AISI 303 SE   | 0.15 MAX   | 2.00 MAX   | 0.06     | 0.2   | 1.00 MAX  | 17.00-19.00 | 8.00-10.00  |             | Se=0.15 MIN               |
| AISI 304      | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 18.00-20.00 | 8.00-10.00  |             |                           |
| AISI 304 L    | 0.03 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 18.00-20.00 | 8.00-10.00  |             |                           |
| AISI 304 H    | 0.04-0.08  | 2.00 MAX   | 0.03     | 0.04  | 1.00 MAX  | 18.00-20.00 | 8.00-11.00  |             |                           |
| AISI 304 N    | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 18.00-20.00 | 8.00-10.50  |             | N=0.10-0.16               |
| AISI 304 LN   | 0.03 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 18.00-20.00 | 8.00-10.50  |             | N=0.10-0.16               |
| AISI 305      | 0.12 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 17.00-19.00 | 10.50-13.00 |             |                           |
| AISI 308      | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 19.00-21.00 | 10.00-12.00 |             |                           |
| AISI 309      | 0.20 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 22.00-24.00 | 12.00-15.00 |             |                           |
| AISI 309 S    | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 22.00-24.00 | 12.00-15.00 |             |                           |
| AISI 310      | 0.25 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.50 MAX  | 24.00-26.00 | 19.00-22.00 |             |                           |
| AISI 310 S    | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.50 MAX  | 24.00-26.00 | 19.00-22.00 |             |                           |
| AISI 314      | 0.25 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.50-3.00 | 23.00-26.00 | 19.00-22.00 |             |                           |
| AISI 316      | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 16.00-18.00 | 10.00-14.00 | 2.00-3.00   |                           |
| AISI 316 L    | 0.03 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 16.00-18.00 | 10.00-14.00 | 2.00-3.00   |                           |
| AISI 316 H    | 0.04-0.08  | 2.00 MAX   | 0.03     | 0.04  | 1.00 MAX  | 16.00-18.00 | 10.00-14.00 | 2.00-3.00   |                           |
| AISI 316 N    | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 16.00-18.00 | 10.00-14.00 | 2.00-3.00   | N=0.10-0.16               |
| AISI 316 LN   | 0.03 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 16.00-18.00 | 10.00-14.00 | 2.00-3.00   | N=0.10-0.16               |
| AISI 317      | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 18.00-20.00 | 11.00-15.00 | 3.00-4.00   |                           |
| AISI 317 L    | 0.03 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 18.00-20.00 | 11.00-15.00 | 3.00-4.00   |                           |
| AISI 321      | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 17.00-19.00 | 9.00-12.00  |             | Ti=5 X C MIN (0.70MAX)    |
| AISI 347      | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 17.00-19.00 | 9.00-12.00  |             | Cb-Ta=10 X C MIN (1.0MAX) |
| AISI 348      | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 17.00-19.00 | 9.00-13.00  |             | Cb=10 X C MIN Ta=0.1 MAX  |
| AISI 384      | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 15.00-17.00 | 17.00-19.00 |             |                           |
| AISI 385      | 0.08 MAX   | 2.00 MAX   | 0.03     | 0.045 | 1.00 MAX  | 11.50-13.50 | 14.00-16.00 |             |                           |
| AISI 403      | 0.15 MAX   | 1.00 MAX   | 0.03     | 0.04  | 0.50 MAX  | 11.50-13.00 |             |             |                           |
| AISI 405      | 0.08 MAX   | 1.00 MAX   | 0.03     | 0.04  | 1.00 MAX  | 11.50-14.50 |             |             | Al=0.10-0.30              |
| AISI 409      | 0.08 MAX   | 1.00 MAX   | 0.045    | 0.045 | 1.00 MAX  | 10.50-11.75 | 0.50 MAX    |             | Ti=6XC / MAX 0.75 Ferem   |
| AISI 410      | 0.15 MAX   | 1.00 MAX   | 0.03     | 0.04  | 1.00 MAX  | 11.50-13.50 |             |             |                           |
| AISI 414      | 0.15 MAX   | 1.00 MAX   | 0.03     | 0.04  | 1.00 MAX  | 11.50-13.50 | 1.25-2.50   |             |                           |
| AISI 416      | 0.15 MAX   | 1.25 MAX   | 0.15 MIN | 0.060 | 1.00 MAX  | 12.00-14.00 |             |             | Zr/Mo=0.60 MAX            |
| AISI 416 SE   | 0.15 MAX   | 1.25 MAX   | 0.060    | 0.060 | 1.00 MAX  | 12.00-14.00 |             |             | Se=0.15 MIN               |
| AISI 420      | 0.15 MIN   | 1.00 MAX   | 0.030    | 0.040 | 1.00 MAX  | 12.00-14.00 |             |             |                           |
| AISI 420 F    | 0.15 MIN   | 1.25 MAX   | 0.15 MIN | 0.060 | 1.00 MAX  | 12.00-14.00 |             | 0.60 Max    |                           |
| AISI 420 F Se | 0.30-0.45  | 1.25 MAX   | 0.060    | 0.060 | 1.00 MAX  | 12.00-14.00 |             |             | Se =0.15Min               |
| AISI 429      | 0.12 MAX   | 1.00 MAX   | 0.030    | 0.040 | 1.00 MAX  | 14.00-16.00 |             |             |                           |
| AISI 430      | 0.12 MAX   | 1.00 MAX   | 0.030    | 0.040 | 1.00 MAX  | 16.00-18.00 |             |             |                           |
| AISI 430 F    | 0.12 MAX   | 1.25 MAX   | 0.15 MIN | 0.060 | 1.00 MAX  | 16.00-18.00 |             | 0.60 Max    |                           |
| AISI 430 F Se | 0.12 MAX   | 1.25 MAX   | 0.060    | 0.060 | 1.00 MAX  | 16.00-18.00 |             |             | Se =0.15Min               |
| AISI 431      | 0.20 MAX   | 1.00 MAX   | 0.030    | 0.040 | 1.00 MAX  | 15.00-17.00 | 1.25-2.50   |             |                           |
| AISI 434      | 0.12 MAX   | 1.00 MAX   | 0.030    | 0.040 | 1.00 MAX  | 16.00-18.00 |             | 0.75 -1.25  |                           |
| AISI 436      | 0.12 MAX   | 1.00 MAX   | 0.030    | 0.040 | 1.00 MAX  | 16.00-18.00 |             | 0.75 -1.25  |                           |
| AISI 440 A    | 0.60-0.75  | 1.00 MAX   | 0.030    | 0.040 | 1.00 MAX  | 16.00-18.00 |             | 0.75Max     |                           |
| AISI 440 B    | 0.75-0.95  | 1.00 MAX   | 0.030    | 0.040 | 1.00 MAX  | 16.00-18.00 |             | 0.75Max     |                           |
| AISI 440 C    | 0.95-1.20  | 1.00 MAX   | 0.030    | 0.040 | 1.00 MAX  | 16.00-18.00 |             | 0.75Max     |                           |
| AISI 440 F    | 0.95-1.20  | 1.25 MAX   | 0.15 MIN | 0.060 | 1.00 MAX  | 16.00-18.00 |             | 0.75Max     | Zr = 0.75Max              |
| AISI 440 F Se | 0.95-1.20  | 1.25 MAX   | 0.060    | 0.060 | 1.00 MAX  | 16.00-18.00 |             |             | Se =0.15Min               |
| AISI 442      | 0.20 MAX   | 1.00 MAX   | 0.030    | 0.040 | 1.00 MAX  | 18.00-23.00 |             |             |                           |
| AISI 446      | 0.20 MAX   | 1.50 MAX   | 0.030    | 0.040 | 1.00 MAX  | 23.00-27.00 |             |             | N = 0.25                  |
| AISI 501      | 0.10 MIN   | 1.00 MAX   | 0.030    | 0.040 | 1.00 MAX  | 4.00-6.00   |             | 0.40 - 0.65 |                           |
| AISI 502      | 0.10 MAX   | 1.00 MAX   | 0.030    | 0.040 | 1.00 MAX  | 5.00-6.00   |             | 0.40 - 0.65 |                           |
| DIN 1.4541    | 0.080 MAX  | 2.00 MAX   | 0.030    | 0.045 | 1.00 MAX  | 17.00-19.00 | 9.00-12.00  |             | Ti = 5X%-0.70             |
| DIN 1.4571    | 0.080 MAX  | 2.00 MAX   | 0.030    | 0.045 | 1.00 MAX  | 16.50-18.50 | 10.50-13.50 | 2.00 - 2.50 | Ti = 5X%-0.70             |
| DIN 1.4057    | 0.12-0.220 | 1.50 MAX   | 0.030    | 0.040 | 1.00 MAX  | 15.00-17.00 | 1.50-2.50   |             |                           |
| DIN 1.4000    | 0.080 MAX  | 1.00 MAX   | 0.030    | 0.045 | 1.00 MAX  | 12.00-14.00 |             |             |                           |
| DIN 1.4021    | 0.17-0.220 | 1.00 MAX   | 0.030    | 0.045 | 1.00 MAX  | 12.00-14.00 |             |             |                           |
| DIN 1.4512    | 0.080 MAX  | 1.00 MAX   | 0.030    | 0.045 | 1.00 MAX  | 10.50-12.50 |             |             | Ti = 6X%-1.0              |

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| GRADE    | %C        | %Mn        | %S         | %P       | %Si        | %Cr       | %Ni       | %Mo | Other Elements |
|----------|-----------|------------|------------|----------|------------|-----------|-----------|-----|----------------|
| EN 1A    | 0.07-0.15 | 0.80-1.20  | 0.20/0.30  | 0.07     | 0.10 MAX   |           |           |     |                |
| EN 1B    | 0.07-0.15 | 1.00-1.40  | 0.30/0.60  | 0.06     | 0.10 MAX   |           |           |     |                |
| EN 2     | 0.20 MAX  | 0.80 MAX   | 0.06       | 0.06     |            |           |           |     |                |
| EN 2A    | 0.12 MAX  | 0.50 MAX   | 0.05       | 0.05     |            |           |           |     |                |
| EN 2A/I  | 0.10 MAX  | 0.50 MAX   | 0.04       | 0.04     |            |           |           |     |                |
| EN 2B    | 0.15 MAX  | 0.50 MAX   | 0.05       | 0.05     |            |           |           |     |                |
| EN 2C    | 0.15-0.25 | 0.40-0.60  | 0.05       | 0.05     |            |           |           |     |                |
| EN 2D    | 0.15-0.30 | 0.40-0.70  | 0.05       | 0.05     |            |           |           |     |                |
| EN 2E    | 0.15 MAX  | 0.50 MAX   | 0.05       | 0.05     | 0.10-0.35  |           |           |     |                |
| EN 3     | 0.25 MAX  | 1.00 MAX   | 0.06       | 0.06     | 0.05-0.35  |           |           |     |                |
| EN 3A    | 0.15-0.25 | 0.40-0.90  | 0.06       | 0.06     | 0.05-0.35  |           |           |     |                |
| EN 3B    | 0.25 MAX  | 1.00 MAX   | 0.06       | 0.06     | 0.35 MAX   |           |           |     |                |
| EN 3C    | 0.17-0.23 | 0.60-1.00  | 0.06       | 0.05     | 0.05-0.35  |           |           |     |                |
| EN 3D    | 0.15-0.25 | 0.60-1.00  | 0.06       | 0.06     | 0.05-0.35  |           |           |     |                |
| EN 4     | 0.30 MAX  | 1.00 MAX   | 0.06       | 0.06     | 0.05-0.35  |           |           |     |                |
| EN 4A    | 0.30 MAX  | 1.00 MAX   | 0.06       | 0.06     | 0.05-0.35  |           |           |     |                |
| EN 5     | 0.25-0.35 | 0.60-1.00  | 0.06       | 0.06     | 0.05-0.35  |           |           |     |                |
| EN 8K    | 0.35-0.45 | 0.60-1.00  | 0.050      | 0.050    | 0.05-0.35  |           |           |     |                |
| EN 5A    | 0.25-0.30 | 0.70-0.90  | 0.06       | 0.06     | 0.05-0.35  |           |           |     |                |
| EN 5B    | 0.28-0.33 | 0.70-0.90  | 0.06       | 0.06     | 0.05-0.35  |           |           |     |                |
| EN 5C    | 0.30-0.30 | 0.70-0.90  | 0.06       | 0.06     | 0.05-0.35  |           |           |     |                |
| EN 5D    | 0.25-0.35 | 0.60-1.00  | 0.06       | 0.06     | 0.05-0.35  |           |           |     |                |
| EN 6     | 0.40 MAX  | 0.50-0.90  | 0.06       | 0.06     | 0.05-0.35  |           |           |     |                |
| EN 6K    | 0.40 MAX  | 0.50-0.90  | 0.05       | 0.05     | 0.05-0.35  |           |           |     |                |
| EN 6A    | 0.40 MAX  | 0.50-0.90  | 0.06       | 0.06     | 0.05-0.35  |           |           |     |                |
| EN 7     | 0.10-0.30 | 1.00-1.30  | 0.10-0.18  | 0.06     | 0.25 MAX   |           |           |     |                |
| EN 7A    | 0.12-0.18 | 1.0-1.5    | 0.10-0.18  | 0.06     | 0.25 MAX   |           |           |     |                |
| EN 8     | 0.35-0.45 | 0.60-1.00  | 0.060      | 0.060    | 0.05-0.35  |           |           |     |                |
| EN 8A    | 0.33-0.38 | 0.70-0.90  | 0.060      | 0.060    | 0.05-0.035 |           |           |     |                |
| EN 8B    | 0.35-0.40 | 0.70-0.90  | 0.060      | 0.060    | 0.05-0.35  |           |           |     |                |
| EN 8C    | 0.38-0.43 | 0.70-0.90  | 0.060      | 0.060    | 0.05-0.35  |           |           |     |                |
| EN 8D    | 0.40-0.45 | 0.70-0.90  | 0.060      | 0.060    | 0.05-0.35  |           |           |     |                |
| EN 8E    | 0.35-0.40 | 0.90-1.10  | 0.060      | 0.060    | 0.05-0.35  |           |           |     |                |
| EN 5K    | 0.25-0.35 | 0.60-1.00  | 0.05       | 0.05     | 0.05-0.35  |           |           |     |                |
| EN 8M    | 0.35-0.45 | 1.00-1.30  | 0.12/0.20  | 0.060    | 0.25 MAX   |           |           |     |                |
| EN 8 DM  | 0.40-0.45 | 0.90-1.30  | 0.12/0.20  | 0.060    | 0.25 MAX   |           |           |     |                |
| EN 9     | 0.50-0.60 | 0.50-0.80  | 0.060      | 0.060    | 0.05-0.35  |           |           |     |                |
| EN 9K    | 0.50-0.60 | 0.50-0.80  |            |          | 0.05-0.35  |           |           |     |                |
| EN 10    | 0.50-0.60 | 0.50-0.80  |            |          | 0.05-0.35  |           | 0.50-0.80 |     |                |
| EN 11    | 0.50-0.70 | 0.50-0.80  |            |          | 0.10-0.35  | 0.50-0.80 |           |     |                |
| EN 12    | 0.30-0.45 | 0.1.50 MAX |            |          | 0.10-0.35  |           | 0.60-1.00 |     |                |
| EN 12A   | 0.30-0.35 | 0.70-0.90  |            |          | 0.10-0.35  |           | 0.60-1.00 |     |                |
| EN 12B   | 0.35-0.40 | 0.70-0.90  |            |          | 0.10-0.35  |           | 0.60-1.00 |     |                |
| EN 12C   | 0.40-0.45 | 0.70-0.90  |            |          | 0.10-0.35  |           | 0.60-1.00 |     |                |
| EN 13    | 0.15-0.25 | 1.40-1.80  |            |          | 0.10-0.35  |           | 0.40-0.70 |     |                |
| EN 14 A  | 0.15-0.25 | 1.30-1.70  | 0.060      | 0.060    | 0.10-0.35  | 0.25 MAX  | 0.40 MAX  |     |                |
| EN 14 B  | 0.20-0.30 | 1.30-1.70  | 0.060      | 0.060    | 0.10-0.35  |           | 0.40 MAX  |     |                |
| EN 15    | 0.30-0.40 | 1.30-1.70  | 0.050      | 0.050    | 0.10-0.35  |           |           |     |                |
| EN 13    | 0.15-0.25 | 1.40-1.80  |            |          | 0.10-0.35  |           | 0.40-0.70 |     |                |
| EN 14 A  | 0.15-0.25 | 1.30-1.70  | 0.060      | 0.060    | 0.10-0.35  | 0.25 MAX  | 0.40 MAX  |     |                |
| EN 14 B  | 0.20-0.30 | 1.30-1.70  | 0.060      | 0.060    | 0.10-0.35  |           | 0.40 MAX  |     |                |
| EN 15    | 0.30-0.40 | 1.30-1.70  | 0.050      | 0.050    | 0.10-0.35  |           |           |     |                |
| EN 15A   | 0.30-0.40 | 1.30-1.70  |            |          | 0.10-0.35  |           |           |     |                |
| EN 15 AM | 0.30-0.40 | 1.30-1.70  | 0.020/0.20 | 0.060    | 0.25 MAX   |           |           |     |                |
| EN 15 B  | 0.35-0.40 | 1.10-1.30  | 0.060      | 0.060    | 0.05-0.35  |           |           |     |                |
| EN 16    | 0.30-0.40 | 1.30-1.80  | 0.050      | 0.050    | 0.10-0.35  |           | 0.20-0.35 |     |                |
| EN 16A   | 0.25-0.30 | 1.30-1.80  |            |          | 0.10-0.35  |           | 0.20-0.35 |     |                |
| EN 16B   | 0.30-0.35 | 1.30-1.80  |            |          | 0.10-0.35  |           | 0.20-0.35 |     |                |
| EN 16 C  | 0.35-0.40 | 1.30-1.80  | 0.050      | 0.050    | 0.10-0.35  |           | 0.20-0.35 |     |                |
| EN 16M   | 0.30-0.40 | 1.30-1.80  | 0.12-0.20  | 0.05 MAX | 0.25 MAX   |           | 0.20-0.35 |     |                |
| EN 16 D  | 0.25-0.35 | 1.30-1.80  | 0.050      | 0.050    | 0.10-0.35  |           | 0.20-0.35 |     |                |



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| GRADE   | %C        | %Mn       | %S        | %P       | %Si       | %Cr       | %Ni       | %Mo       | Other Elements |
|---------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|----------------|
| EN 17   | 0.30-0.40 | 1.30-1.80 |           |          | 0.10-0.35 |           |           | 0.35-0.35 |                |
| EN 18   | 0.35-0.45 | 0.60-0.95 | 0.050     | 0.050    | 0.10-0.35 | 0.85-1.15 |           |           |                |
| EN 18A  | 0.27-0.32 | 0.65-0.80 |           |          | 0.10-0.35 | 0.85-1.15 |           |           |                |
| EN 18B  | 0.30-0.35 | 0.65-0.80 |           |          | 0.10-0.35 | 0.85-1.15 |           |           |                |
| EN 18 C | 0.35-0.38 | 0.65-0.80 | 0.050     | 0.050    | 0.10-0.35 | 0.85-1.15 |           |           |                |
| EN 18 D | 0.38-0.43 | 0.65-0.80 | 0.050     | 0.050    | 0.10-0.35 | 0.85-1.15 |           |           |                |
| EN 19   | 0.35-0.45 | 0.50-0.80 | 0.050     | 0.050    | 0.10-0.35 | 0.90-1.50 |           | 0.20-0.40 |                |
| EN 19 A | 0.35-0.45 | 0.50-0.80 | 0.050     | 0.050    | 0.10-0.35 | 0.90-1.20 |           | 0.20-0.35 |                |
| EN 19 B | 0.35-0.40 | 0.50-0.80 | 0.050     | 0.050    | 0.10-0.35 | 0.90-1.20 |           | 0.20-0.35 |                |
| EN 19 C | 0.40-0.45 | 0.50-0.80 | 0.050     | 0.050    | 0.10-0.35 | 0.90-1.20 |           | 0.20-0.35 |                |
| EN 20A  | 0.20-0.30 | 0.40-0.70 |           |          | 0.10-0.35 | 0.50-1.00 |           | 0.50-0.80 |                |
| EN 20B  | 0.35-0.45 | 0.40-0.70 |           |          | 0.10-0.35 | 1.00-1.50 |           | 0.50-0.90 |                |
| EN 21   | 0.25-0.35 | 0.35-0.75 | 0.050     | 0.050    | 0.10-0.35 | 0.30 MAX  | 2.75-3.25 |           |                |
| EN 21A  | 0.20-0.30 | 0.60 MAX  |           |          | 0.10-0.35 |           | 2.50-3.50 |           |                |
| EN 22   | 0.35-0.45 | 0.50-0.80 | 0.050     | 0.050    | 0.10-0.35 | 0.30 MAX  | 3.25-3.75 |           |                |
| EN 23   | 0.25-0.45 | 0.45-0.70 |           |          | 0.10-0.35 | 0.50-1.00 | 2.75-3.50 |           |                |
| EN 24   | 0.35-0.45 | 0.45-0.70 | 0.050     | 0.050    | 0.10-0.35 | 0.90-1.40 | 1.30-1.80 | 0.20-0.35 |                |
| EN 25   | 0.27-0.35 | 0.50-0.70 | 0.050     | 0.050    | 0.10-0.35 | 0.50-0.80 | 2.30-2.80 | 0.40-0.70 |                |
| EN 26   | 0.36-0.44 | 0.50-0.70 | 0.050     | 0.050    | 0.10-0.35 | 0.50-0.80 | 2.30-2.80 | 0.40-0.70 |                |
| EN 27   | 0.25-0.35 | 0.70 MAX  |           |          | 0.10-0.35 | 0.50-1.30 | 3.00-3.75 | 0.20-0.65 |                |
| EN 28   | 0.25-0.40 | 0.70 MAX  |           |          | 0.10-0.35 | 0.75-1.50 | 3.00-4.50 | 0.20-0.65 |                |
| EN 29A  | 0.15-0.25 | 0.65 MAX  |           |          | 0.10-0.35 | 2.50-3.50 | 0.40 MAX  | 0.30-0.70 |                |
| EN 29B  | 0.25-0.35 | 0.65 MAX  |           |          | 0.10-0.35 | 2.50-3.50 | 0.40 MAX  | 0.30-0.70 |                |
| EN 30A  | 0.26-0.34 | 0.40-0.80 |           |          | 0.10-0.35 | 1.10-1.40 | 3.90-4.30 |           |                |
| EN 30 B | 0.26-0.34 | 0.40-0.60 | 0.050     | 0.050    | 0.10-0.35 | 1.00-1.40 | 3.90-4.30 | 0.20-0.40 |                |
| EN 31   | 0.90-1.20 | 0.30-0.75 | 0.050     | 0.050    | 0.10-0.35 | 1.00-1.60 |           |           |                |
| EN 32A  | 0.15 MAX  | 0.40-0.70 |           |          | 0.05-0.35 |           |           |           |                |
| EN 32 B | 0.10-0.18 | 0.60-1.00 | 0.07 MAX  | 0.05 MAX | 0.05-0.35 |           |           |           |                |
| EN 32 C | 0.10-0.18 | 0.60-1.00 | 0.050     | 0.050    | 0.05-0.35 |           |           |           |                |
| EN 32 M | 0.10-0.18 | 0.90-1.20 | 0.05-0.15 | 0.050    | 0.05-0.35 |           |           |           |                |
| EN 33   | 0.10-0.15 | 0.30-0.60 |           |          | 0.10-0.35 | 0.30 MAX  | 2.75-3.50 |           |                |
| EN 34   | 0.14-0.20 | 0.30-0.60 |           |          | 0.10-0.35 |           | 1.50-2.00 | 0.20-0.30 |                |
| EN 35   | 0.20-0.28 | 0.30-0.60 | 0.050     | 0.050    | 0.10-0.35 |           | 1.50-2.00 | 0.20-0.30 |                |
| EN 36 A | 0.15 MAX  | 0.30-0.60 | 0.050     | 0.050    | 0.10-0.35 | 0.60-1.10 | 3.00-3.75 |           |                |
| EN 36 B | 0.12-0.18 | 0.30-0.60 | 0.050     | 0.050    | 0.10-0.35 | 0.60-1.10 | 3.00-3.75 |           |                |
| EN 36 C | 0.12-0.18 | 0.30-0.60 | 0.050     | 0.050    | 0.10-0.35 | 0.60-1.10 | 3.00-3.75 | 0.10-0.25 |                |
| EN 37   | 0.16 MAX  | 0.45 MAX  |           |          | 0.10-0.35 | 0.30 MAX  | 4.50-5.20 |           |                |
| EN 38   | 0.16 MAX  | 0.60 MAX  |           |          | 0.10-0.35 | 0.30 MAX  | 4.50-5.50 | 0.15-0.30 |                |
| EN 39A  | 0.12-0.18 | 0.50 MAX  |           |          | 0.10-0.35 | 1.00-1.40 | 3.80-4.50 |           |                |
| EN 39 B | 0.12-0.18 | 0.50 MAX  | 0.050     | 0.050    | 0.10-0.35 | 1.00-1.40 | 3.80-4.50 | 0.15-0.35 |                |
| EN 40A  | 0.10-0.20 | 0.40-0.65 |           |          | 0.10-0.35 | 2.90-3.50 | 0.40 MAX  | 0.40-0.70 |                |
| EN 40 B | 0.20-0.30 | 0.40-0.65 | 0.050     | 0.050    | 0.10-0.35 | 2.90-3.50 | 0.40 MAX  | 0.40-0.70 |                |
| EN 40C  | 0.30-0.50 | 0.40-0.80 |           |          | 0.10-0.35 | 2.50-3.50 | 0.40 MAX  | 0.70-1.20 |                |
| EN 41A  | 0.25-0.35 | 0.65 MAX  |           |          | 0.10-0.45 | 1.40-1.80 | 0.40 MAX  | 0.10-0.25 |                |
| EN 41 B | 0.35-0.45 | 0.65 MAX  | 0.050     | 0.050    | 0.10-0.35 | 1.40-1.80 | 0.40 MAX  | 0.10-0.25 | Al = 0.90-1.30 |
| EN 42   | 0.70-0.85 | 0.55-0.75 | 0.050     | 0.050    | 0.10-0.35 |           |           |           |                |
| EN 42 B | 0.60-0.70 | 0.55-0.80 | 0.050     | 0.050    | 0.35 MAX  |           |           |           |                |
| EN 42 C | 0.70-0.80 | 0.55-0.80 | 0.050     | 0.050    | 0.35 MAX  |           |           |           |                |
| EN 42D  | 0.80-0.90 | 0.55-0.80 |           |          | 0.35 MAX  |           |           |           |                |
| EN 42E  | 0.60-0.75 | 0.30-0.60 |           |          | 0.35 MAX  |           |           |           |                |
| EN 42F  | 0.60-0.75 | 0.60-0.90 |           |          | 0.35 MAX  |           |           |           |                |
| EN 42G  | 0.75-0.90 | 0.30-0.60 |           |          | 0.35 MAX  |           |           |           |                |
| EN 42I  | 0.75-0.90 | 0.60-0.90 |           |          | 0.35 MAX  |           |           |           |                |
| EN 43   | 0.45-0.60 | 0.60-0.80 | 0.050     | 0.050    | 0.10-0.40 |           |           |           |                |
| EN 43 A | 0.45-0.55 | 0.70-1.00 | 0.060     | 0.060    | 0.05-0.35 |           |           |           |                |
| EN 43 B | 0.45-0.50 | 0.70-1.00 | 0.060     | 0.060    | 0.05-0.35 |           |           |           |                |
| EN 43C  | 0.50-0.55 | 0.70-1.00 |           |          | 0.05-0.35 |           |           |           |                |
| EN 43 D | 0.60-0.65 | 0.40-0.60 | 0.060     | 0.060    | 0.05-0.35 |           |           |           |                |
| EN 43 E | 0.65-0.70 | 0.70-0.90 | 0.060     | 0.060    | 0.05-0.35 |           |           |           |                |
| EN 43G  | 0.45-0.60 | 0.30-0.60 |           |          | 0.35 MAX  |           |           |           |                |
| EN 43J  | 0.45-0.60 | 0.60-0.90 |           |          | 0.35 MAX  |           |           |           |                |
| EN 44   | 0.90-1.20 | 0.45-0.70 | 0.050     | 0.050    | 0.30 MAX  |           |           |           |                |

# KESRI ALLOYS PRIVATE LIMITED

| GRADE    | %C        | %Mn       | %S        | %P        | %Si       | %Cr         | %Ni         | %Mo       | Other Elements               |
|----------|-----------|-----------|-----------|-----------|-----------|-------------|-------------|-----------|------------------------------|
| EN 44 B  | 0.90-1.00 | 0.40-0.70 | 0.050     | 0.050     | 0.35 MAX  |             |             |           |                              |
| EN 44C   | 1.00-1.20 | 0.40-0.70 |           |           | 0.35 MAX  |             |             |           |                              |
| EN 44D   | 0.90-1.05 | 0.30-0.70 |           |           | 0.35 MAX  |             |             |           |                              |
| EN 44E   | 1.05-1.25 | 0.30-0.70 |           |           | 0.35 MAX  |             |             |           |                              |
| EN 45    | 0.55-0.60 | 0.70-1.00 | 0.050     | 0.050     | 1.50-2.00 |             |             |           |                              |
| EN 45 A  | 0.55-0.65 | 0.70-1.00 | 0.050     | 0.050     | 1.70-2.00 |             |             |           |                              |
| EN 46    | 0.35-0.45 | 0.70-1.00 |           |           | 1.50-2.00 |             |             |           |                              |
| EN 47    | 0.45-0.55 | 0.50-0.80 | 0.050     | 0.050 MAX | 0.50 MAX  | 0.80-1.20   |             |           | V=0.15MIN                    |
| EN 48    | 0.45-0.55 | 0.50-0.80 | 0.050     | 0.050     | 0.10-0.50 | 1.00-1.40   |             |           |                              |
| EN 48 A  | 0.50-0.60 | 0.60-0.90 | 0.050     | 0.050     | 1.35-1.65 | 0.55-0.85   |             |           |                              |
| EN 49 A  | 0.48-0.85 | 1.00 MAX  |           |           | 0.30 MAX  |             |             |           |                              |
| EN 49 B  | 0.45-0.85 | 1.00 MAX  |           |           | 0.30 MAX  |             |             |           |                              |
| EN 49 C  | 0.55-0.85 | 0.75 MAX  |           |           | 0.30 MAX  |             |             |           |                              |
| EN 49 D  | 0.65-0.85 | 0.75 MAX  |           |           | 0.30 MAX  |             |             |           |                              |
| EN 50    | 0.40-0.50 | 0.50-0.70 | 0.040     | 0.040     | 0.10-0.35 | 1.00-1.50   |             |           | V=0.15MIN                    |
| EN 51    | 0.25-0.35 | 0.35-0.75 |           |           | 0.10-0.35 | 0.30 MAX    | 2.75-3.25   |           |                              |
| EN 52    | 0.40-0.50 | 0.30-0.60 | 0.040     | 0.040     | 3.00-3.75 | 7.50-9.50   | 0.50 MAX    |           |                              |
| EN 53    | 0.55-0.65 | 0.30-0.60 |           |           | 1.40-1.70 | 5.75-6.75   | 0.50 MAX    |           |                              |
| EN 54    | 0.35-0.50 | 1.50 MAX  |           |           | 1.00-2.50 | 12.00-16.00 | 10.00 MIN   |           | W = 2.00-4.00                |
| EN 54 A  | 0.37-0.47 | 0.50-0.80 |           |           | 1.00-2.00 | 13.00-15.00 | 13.00-15.00 | 0.40-0.60 | W = 2.20-3.00/Nb = 0.16-0.22 |
| EN 55    | 0.18-0.45 | 1.00 MAX  |           |           | 1.00-2.50 | 17.00       | 6.00-12.00  |           | W = 2.00-4.00                |
| EN 56 A  | 0.12 MAX  | 1.00 MAX  | 0.045     | 0.045     | 1.00 MAX  | 12.00-14.00 | 1.00 MAX    |           |                              |
| EN 56 B  | 0.12-0.18 | 1.00 MAX  | 0.045     | 0.045     | 1.00 MAX  | 12.00-14.00 | 1.00 MAX    |           |                              |
| EN 56 C  | 0.18-0.25 | 1.00 MAX  | 0.045     | 0.045     | 1.00 MAX  | 12.00-14.00 | 1.00 MAX    |           |                              |
| EN 56 D  | 0.25-0.35 | 1.00 MAX  | 0.045     | 0.045     | 1.00 MAX  | 12.00-14.00 | 1.00 MAX    |           |                              |
| EN 56 AM | 0.12 MAX  | 1.50 MAX  | 0.75 MAX  | 0.045 MAX | 1.00 MAX  | 12.00-14.00 | 1.00 MAX    | 0.6 MAX   | Se=0.6 MAX                   |
| EN 57    | 0.25 MAX  | 1.00 MAX  | 0.045 MAX | 0.045 MAX | 1.00 MAX  | 15.50-20.00 | 1.00-3.00   |           |                              |
| EN 58 A  | 0.16 MAX  | 2.00 MAX  |           |           | 0.20 MIN  | 17.00-20.00 | 7.00-10.00  |           |                              |
| EN 58B   | 0.15 MAX  | 2.00 MAX  |           |           | 0.20 MIN  | 17.00-20.00 | 7.00-10.00  |           |                              |
| EN 58C   | 0.15 MAX  | 2.00 MAX  |           |           | 0.20 MIN  | 17.00-20.00 | 9.00-12.00  |           |                              |
| EN 58D   | 0.16 MAX  | 2.00 MAX  |           |           | 0.20 MIN  | 11.00-14.00 | 11.00-14.00 |           |                              |
| EN 58E   | 0.08 MAX  | 2.00 MAX  |           |           | 0.20 MIN  | 17.50-20.00 | 8.00-11.00  |           |                              |
| EN 58F   | 0.15 MAX  | 2.00 MAX  |           |           | 0.20 MIN  | 17.00-20.00 | 7.00-10.00  |           |                              |
| EN 58G   | 0.15 MAX  | 2.00 MAX  |           |           | 0.20 MIN  | 17.00-20.00 | 9.00-12.00  |           |                              |
| EN 58H   | 0.12 MAX  | 2.00 MAX  |           |           | 0.20 MIN  | 17.00-20.00 | 8.00-12.00  | 1.50-2.50 |                              |
| EN 58J   | 0.12 MAX  | 2.00 MAX  |           |           | 0.20 MIN  | 17.00-20.00 | 8.00-12.00  | 2.50-3.50 |                              |
| EN 59    | 0.78-0.84 | 0.20-0.60 |           |           | 1.75-2.25 | 19.00-20.50 | 1.15-1.65   |           |                              |
| EN 60    | 0.12 MAX  | 1.00 MAX  |           |           | 1.00 MAX  | 16.00-18.00 | 0.50 MAX    |           |                              |
| EN 61    | 0.12 MAX  | 1.00 MAX  |           |           | 1.00 MAX  | 20.00-22.00 | 0.50 MAX    |           |                              |
| EN 100   | 0.35-0.45 | 1.20-1.50 |           |           | 0.50 MAX  | 0.30-0.60   | 0.50-1.00   | 0.15-0.25 |                              |
| EN 100A  | 0.25-0.30 | 1.20-1.50 |           |           | 0.10-0.50 | 0.30-0.60   | 0.50-1.00   | 0.15-0.25 |                              |
| EN 100B  | 0.30-0.35 | 1.20-1.50 |           |           | 0.10-0.50 | 0.30-0.60   | 0.50-1.00   | 0.15-0.25 |                              |
| EN 100C  | 0.35-0.40 | 1.20-1.50 |           |           | 0.10-0.50 | 0.30-0.60   | 0.50-1.00   | 0.15-0.25 |                              |
| EN 100D  | 0.40-0.45 | 1.20-1.50 |           |           | 0.10-0.50 | 0.30-0.60   | 0.50-1.00   | 0.15-0.25 |                              |
| EN 100E  | 0.25-0.35 | 1.20-1.50 |           |           | 0.50 MAX  | 0.30-0.60   | 0.50-1.00   | 0.15-0.25 |                              |
| EN 111   | 0.30-0.40 | 0.60-0.90 |           |           | 0.10-0.35 | 0.45-0.75   | 1.00-1.50   |           |                              |
| EN 111A  | 0.33-0.38 | 0.60-0.90 |           |           | 0.10-0.35 | 0.45-0.75   | 1.00-1.50   |           |                              |
| EN 160   | 0.35-0.45 | 0.30-0.60 |           |           | 0.10-0.35 |             | 1.50-2.00   | 0.20-0.35 |                              |
| EN 160A  | 0.38-0.43 | 0.30-0.60 |           |           | 0.10-0.35 |             | 1.50-2.00   | 0.20-0.35 |                              |
| EN 201   | 0.18 MAX  | 1.10-1.50 |           |           | 0.05-0.35 |             |             |           |                              |
| EN 202   | 0.18 MAX  | 1.20-1.50 |           | 0.050     | 0.05-0.35 |             |             |           |                              |
| EN 206   | 0.12-0.17 | 0.30-0.50 |           |           | 0.10-0.35 | 0.30-0.50   |             |           |                              |
| EN 207   | 0.16-0.21 | 0.60-0.80 | 0.050     | 0.050     | 0.10-0.35 | 0.60-0.80   |             |           |                              |
| EN 325   | 0.22 MAX  | 0.45-0.65 |           | 0.050     | 0.10-0.35 | 0.40-0.60   | 1.50-2.00   | 0.20-0.30 |                              |
| EN 351   | 0.20 MAX  | 0.60-1.00 | 0.050     | 0.050     | 0.35 MAX  | 0.40-0.80   | 0.60-1.00   | 0.10 MAX  |                              |
| EN 352   | 0.20 MAX  | 0.50-1.00 | 0.050     | 0.050     | 0.35 MAX  | 0.60-1.00   | 0.85-1.25   | 0.10 MAX  |                              |
| EN 353   | 0.20 MAX  | 0.50-1.00 | 0.050     | 0.050     | 0.35 MAX  | 0.75-1.25   | 1.00-1.50   | 0.08-0.15 |                              |
| EN 354   | 0.20 MAX  | 0.50-1.00 | 0.050     | 0.050     | 0.35 MAX  | 0.75-1.25   | 1.50-2.00   | 0.10-0.20 |                              |
| EN 355   | 0.20 MAX  | 0.40-0.70 | 0.050     | 0.050     | 0.35 MAX  | 1.40-1.70   | 1.80-2.20   | 0.15-0.25 |                              |
| EN 361   | 0.13-0.17 | 0.70-1.00 |           |           | 0.35 MAX  | 0.55-0.80   | 0.40-0.70   | 0.08-0.15 |                              |
| EN 362   | 0.18-0.23 | 0.70-1.00 |           |           | 0.35 MAX  | 0.55-0.80   | 0.40-0.70   | 0.08-0.15 |                              |
| EN 363   | 0.22-0.26 | 0.70-1.00 |           |           | 0.35 MAX  | 0.55-0.80   | 0.40-0.70   | 0.08-0.15 |                              |

# KESRI ALLOYS PRIVATE LIMITED

| GRADE       | %C        | %Mn       | %S          | %P        | %Si       | %Cr         | %Ni       | %Mo       | Other Elements               |
|-------------|-----------|-----------|-------------|-----------|-----------|-------------|-----------|-----------|------------------------------|
| CL 1        | 0.10-0.18 | 0.40-0.70 | 0.050 MAX   | 0.050 MAX | 0.10-0.30 |             |           |           |                              |
| CL 2        | 0.15-0.25 | 0.60-0.90 | 0.050 MAX   | 0.050 MAX | 0.15-0.35 |             |           |           |                              |
| CL 3        | 0.25-0.35 | 0.60-0.90 | 0.050 MAX   | 0.050 MAX | 0.15-0.35 |             |           |           |                              |
| CL 4A       | 0.30-0.40 | 0.60-0.90 | 0.050 MAX   | 0.050 MAX | 0.15-0.35 |             |           |           |                              |
| CL 4        | 0.40-0.50 | 0.60-0.90 | 0.050 MAX   | 0.050 MAX | 0.15-0.35 |             |           |           |                              |
| C 14        | 0.10-0.18 | 0.40-0.70 | 0.055 MAX   | 0.055 MAX | 0.15-0.35 |             |           |           |                              |
| C 15        | 0.12-0.18 | 0.30-0.60 | 0.045 MAX   | 0.045 MAX | 0.15-0.35 |             |           |           |                              |
| C 22        | 0.17-0.24 | 0.30-0.60 | 0.045 MAX   | 0.045 MAX | 0.15-0.35 |             |           |           |                              |
| C 30        | 0.25-0.35 | 0.60-0.90 | 0.050 MAX   | 0.050 MAX | 0.05-0.35 |             |           |           |                              |
| C 35        | 0.30-0.40 | 0.60-0.90 | 0.050 MAX   | 0.050 MAX | 0.05-0.35 |             |           |           |                              |
| C 40        | 0.35-0.45 | 0.60-0.90 | 0.050 MAX   | 0.050 MAX | 0.05-0.35 |             |           |           |                              |
| C 45        | 0.40-0.50 | 0.60-0.90 | 0.050 MAX   | 0.050 MAX | 0.05-0.35 |             |           |           |                              |
| C 60        | 0.57-0.65 | 0.50-0.80 | 0.045 MAX   | 0.045 MAX | 0.15-0.35 |             |           |           |                              |
| I4 Mn IS 14 | 0.10-0.18 | 1.20-1.50 | 0.10-0.18   | 0.055 MAX | 0.05-0.30 |             |           |           |                              |
| C 15 Mn 75  | 0.10-0.20 | 0.60-0.90 | 0.050 MAX   | 0.050 MAX | 0.15-0.35 |             |           |           |                              |
| C 25 Mn 75  | 0.20-0.30 | 0.60-0.90 | 0.050 MAX   | 0.050 MAX | 0.15-0.35 |             |           |           |                              |
| 40 Cr 4     | 0.38-0.44 | 0.60-0.90 | 0.035 MAX   | 0.035 MAX | 0.10-0.35 | 0.90-1.20   |           |           |                              |
| 40 Cr 4B    | 0.35-0.45 | 0.60-0.90 |             |           | 0.10-0.35 | 0.90-1.20   |           |           |                              |
| 20 Mn2      | 0.16-0.24 | 1.30-1.70 | 0.050 MAX   | 0.050 MAX | 0.10-0.35 |             |           |           |                              |
| 37 Mn6      | 0.32-0.42 | 1.30-1.70 | 0.035 MAX   | 0.035 MAX | 0.10-0.35 |             |           |           |                              |
| 815 M - 17  | 0.14-0.20 | 0.60-0.90 | 0.035 MAX   | 0.035 MAX | 0.10-0.35 | 0.80-1.20   | 1.20-1.70 | 0.10-0.20 |                              |
| 40 Ni 14    | 0.38-0.45 | 0.50-0.80 | 0.035 MAX   | 0.035 MAX | 0.10-0.35 | 0.30 MAX    | 3.20-3.60 |           |                              |
| 37 C 15     | 0.32-0.42 | 1.30-1.70 |             |           | 0.10-0.35 |             |           |           |                              |
| 45 C 8      | 0.40-0.50 | 0.60-0.90 | 0.050 MAX   | 0.050 MAX | 0.15-0.35 |             |           |           |                              |
| 35 C 8      | 0.30-0.40 | 0.60-0.90 | 0.050 MAX   | 0.050 MAX | 0.15-0.35 |             |           |           |                              |
| I6MnC5      | 0.14-0.19 | 1.00-1.30 | 0.035 MAX   | 0.035 MAX | 0.10-0.40 | 0.80-1.10   |           |           |                              |
| 20MnC5      | 0.17-0.22 | 1.10-1.40 | 0.035 MAX   | 0.035 MAX | 0.15-0.40 | 1.00-1.30   |           |           |                              |
| 15CrNi6     | 0.12-0.17 | 0.40-0.60 | 0.035 MAX   | 0.035 MAX |           | 0.15-0.40   | 1.40-1.70 |           |                              |
| 34Cr4       | 0.30-0.37 | 0.60-0.90 | 0.030 MAX   | 0.035 MAX | 0.40 MAX  | 0.90-1.20   |           |           |                              |
| Ck 35       | 0.32-0.39 | 0.50-0.80 | 0.035 MAX   | 0.035 MAX | 0.40 MAX  |             |           |           |                              |
| Ck 45       | 0.42-0.50 | 0.50-0.80 | 0.030 MAX   | 0.035 MAX | 0.15-0.35 |             |           |           |                              |
| 40Mn4       | 0.36-0.44 | 0.80-1.10 | 0.035 MAX   | 0.035 MAX | 0.25-0.50 |             |           |           |                              |
| 40Cr 4B     | 0.35-0.40 | 0.60-0.90 | 0.020-0.035 | 0.035 MAX | 0.10-0.35 | 1.05-2.00   |           |           |                              |
| 42Cr Mo4    | 0.38-0.45 | 0.50-0.80 | 0.030 MAX   | 0.035 MAX | 0.40 MAX  | 0.90-1.20   |           | 0.15-0.30 |                              |
| ST 37       | 0.12 MAX  | 0.08-0.70 | 0.040 MAX   | 0.040 MAX | 0.10-0.30 |             |           |           |                              |
| ST C - 60   | 0.57-0.65 | 0.60-0.80 | 0.035 MAX   | 0.035 MAX | 0.25-0.35 |             |           |           |                              |
| T 70-71     | 0.55-0.60 | 0.70-0.80 | 0.045 MAX   | 0.045 MAX | 0.15-0.30 |             |           |           |                              |
| ST 50-11    | 0.32-0.40 | 0.40-0.70 | 0.045 MAX   | 0.045 MAX | 0.15-0.35 |             |           |           |                              |
| ST 52-3     | 0.15-0.20 | 1.15-1.30 | 0.045 MAX   | 0.045 MAX | 0.55 MAX  |             |           |           |                              |
| Cr 20       | 0.18-0.23 | 0.60-0.85 | 0.030 MAX   | 0.030 MAX | 0.15-0.35 | 0.90-1.20   |           |           |                              |
| Cr 40       | 0.38-0.43 | 0.60-0.85 | 0.030 MAX   | 0.030 MAX | 0.15-0.35 | 0.90-1.20   |           |           |                              |
| 61 Sc 7     | 0.57-0.64 | 0.60-0.90 | 0.035 MAX   | 0.035 MAX | 1.60-2.00 | 0.20-0.45   |           |           |                              |
| AISI D - 1  | 0.90-1.00 | 0.30-0.50 | 0.030 MAX   | 0.030 MAX | 0.30-0.50 | 11.00-13.00 |           |           |                              |
| AISI D - 2  | 1.40-1.60 | 0.20-0.60 | 0.030 MAX   | 0.030 MAX | 0.10-0.60 | 11.00-13.00 |           | 0.70-1.20 | V = 0.50-1.10, Co = 1.00MAX  |
| AISI D - 3  | 2.00-2.35 | 0.20-0.60 | 0.030 MAX   | 0.030 MAX | 0.10-0.60 | 11.00-13.50 |           |           | V = 1.00MAX, W = 1.00MAX     |
| AISI D - 4  | 2.05-2.40 | 0.10-0.60 | 0.030 MAX   | 0.030 MAX | 0.10-0.60 | 11.00-13.00 |           | 0.70-1.20 | V = 0.15-1.00                |
| AISI D - 5  | 1.40-1.60 | 0.20-0.60 | 0.030 MAX   | 0.030 MAX | 0.10-0.60 | 11.00-13.00 |           | 0.70-1.20 | V = 1.00MAX, Co = 2.50-3.50  |
| AISI D - 7  | 2.15-2.50 | 0.10-0.60 | 0.030 MAX   | 0.030 MAX | 0.10-0.60 | 11.50-13.50 |           | 0.70-1.20 | V = 3.80-4.40                |
| AISI A - 2  | 0.95-1.05 | 0.40-1.00 | 0.030 MAX   | 0.030 MAX | 0.10-0.50 | 4.75-5.50   |           | 0.90-1.40 | V = 0.15-0.50                |
| AISI A - 3  | 1.20-1.30 | 0.40-0.60 | 0.030 MAX   | 0.030 MAX | 0.10-0.50 | 4.75-5.50   |           | 0.90-1.40 | V = 0.80-1.40                |
| AISI A - 4  | 0.95-1.05 | 1.80-2.20 | 0.030 MAX   | 0.030 MAX | 0.10-0.50 | 0.90-1.20   |           | 0.90-1.40 |                              |
| AISI A - 5  | 0.95-1.05 | 2.80-3.20 | 0.030 MAX   | 0.030 MAX | 0.10-0.50 | 0.90-1.20   |           | 0.90-1.40 |                              |
| AISI A - 6  | 0.65-0.75 | 1.80-2.50 | 0.030 MAX   | 0.030 MAX | 0.20-0.50 | 0.90-1.20   |           | 0.90-1.40 |                              |
| AISI A - 7  | 2.00-2.85 | 0.20-0.80 | 0.030 MAX   | 0.030 MAX | 0.10-0.50 | 5.00-5.75   |           | 0.90-1.40 | V = 3.90-5.15, W = 0.50-1.50 |
| AISI A - 8  | 0.50-0.60 | 0.20-0.50 | 0.030 MAX   | 0.030 MAX | 0.75-1.10 | 4.75-5.50   |           | 1.15-1.65 | W = 1.00-1.50                |
| AISI A - 9  | 0.45-0.55 | 0.20-0.50 | 0.030 MAX   | 0.030 MAX | 0.95-1.15 | 4.75-5.50   | 1.25-1.75 | 1.30-1.80 | V = 0.80-1.40                |
| AISI A - 10 | 1.25-1.50 | 1.60-2.10 | 0.030 MAX   | 0.030 MAX | 1.00-1.50 |             | 1.55-2.05 | 1.25-1.75 |                              |
| AISI O1     | 0.85-1.00 | 1.00-1.40 | 0.030 MAX   | 0.030 MAX | 0.10-0.50 | 0.40-0.60   |           |           | V = 0.30MAX, W = 0.40-0.60   |
| AISI O2     | 0.85-0.95 | 1.40-1.80 | 0.030 MAX   | 0.030 MAX | 0.50 MAX  | 0.50 MAX    |           | 0.30 MAX  | V = 0.10-0.30                |
| AISI O6     | 1.25-1.55 | 0.30-1.10 | 0.030 MAX   | 0.030 MAX | 0.55-1.50 | 0.30 MAX    |           | 0.20-0.30 |                              |
| AISI O7     | 1.10-1.30 | 0.20-1.00 | 0.030 MAX   | 0.030 MAX | 0.10-0.60 | 0.35-0.85   |           | 0.30 MAX  | V = 0.15-0.40, W = 1.00-2.00 |
| ASTM A 105  | 0.22-0.30 | 0.60-0.80 | 0.040 MAX   | 0.040 MAX | 0.35 MAX  |             |           |           |                              |
| AISI O2     | 0.85-0.95 | 1.90-2.20 | 0.035 MAX   | 0.035 MAX | 0.20-0.40 | 0.20-0.50   |           |           | V = 0.05-0.20                |

# KESRI ALLOYS PRIVATE LIMITED

| GRADE       | %C        | %Mn       | %S          | %P        | %Si       | %Cr       | %Ni       | %Mo | Other Elements      |
|-------------|-----------|-----------|-------------|-----------|-----------|-----------|-----------|-----|---------------------|
| AISI 1008   | 0.10 MAX  | 0.30-0.50 | 0.050 MAX   | 0.040 MAX | 0.20 MAX  |           |           |     |                     |
| AISI 1010   | 0.08-0.13 | 0.30-0.60 | 0.05        | 0.04      | 0.10 MAX  |           |           |     |                     |
| AISI 1015   | 0.13-0.19 | 0.30-0.60 | 0.05        | 0.04      | 0.10 MAX  |           |           |     |                     |
| AISI 1016   | 0.13-0.18 | 0.60-0.90 | 0.050 MAX   | 0.040 MAX | 0.10-0.20 |           |           |     |                     |
| AISI 1018   | 0.15-0.20 | 0.60-0.90 | 0.050 MAX   | 0.040 MAX | 0.10-0.20 |           |           |     |                     |
| AISI 1020   | 0.18-0.23 | 0.30-0.60 | 0.050 MAX   | 0.040 MAX | 0.10-0.20 |           |           |     |                     |
| AISI 1025   | 0.21-0.28 | 0.30-0.60 | 0.05        | 0.04      | 0.20-0.30 |           |           |     |                     |
| AISI 1026   | 0.22-0.28 | 0.60-0.90 | 0.050 MAX   | 0.040 MAX | 0.10-0.20 |           |           |     |                     |
| AISI 1029   | 0.25-0.31 | 0.60-0.90 | 0.050 MAX   | 0.040 MAX | 0.15-0.30 |           |           |     |                     |
| AISI 1030   | 0.28-0.34 | 0.60-0.90 | 0.050 MAX   | 0.040 MAX | 0.10-0.20 |           |           |     |                     |
| AISI 1034   | 0.31-0.39 | 0.50-0.80 | 0.05        | 0.04      | 0.20-0.35 |           |           |     |                     |
| AISI 1035   | 0.32-0.38 | 0.60-0.90 | 0.050 MAX   | 0.040 MAX | 0.10-0.20 |           |           |     |                     |
| AISI 1036 B | 0.32-0.37 | 1.20-1.40 | 0.030 MAX   | 0.030 MAX | 0.15-0.35 | 0.20 MAX  |           |     | Boron = 0.0005-0.01 |
| AISI 1038   | 0.35-0.42 | 0.60-0.90 | 0.050 MAX   | 0.040 MAX | 0.10-0.20 |           |           |     |                     |
| AISI 1040   | 0.37-0.44 | 0.60-0.90 | 0.050 MAX   | 0.040 MAX | 0.10-0.20 |           |           |     |                     |
| AISI 1041   | 0.36-0.44 | 1.35-1.65 | 0.050 MAX   | 0.040 MAX | 0.10-0.20 |           |           |     |                     |
| AISI 1045   | 0.43-0.50 | 0.60-0.90 | 0.050 MAX   | 0.040 MAX | 0.10-0.20 |           |           |     |                     |
| AISI 1046   | 0.43-0.50 | 0.70-1.00 | 0.050 MAX   | 0.040 MAX | 0.10-0.20 |           |           |     |                     |
| AISI 1050   | 0.47-0.56 | 0.60-0.90 | 0.05        | 0.04      | 0.20-0.35 |           |           |     |                     |
| AISI 1052   | 0.47-0.55 | 1.20-1.50 | 0.050 MAX   | 0.040 MAX | 0.15-0.20 |           |           |     |                     |
| AISI 1055   | 0.50-0.60 | 0.60-0.90 | 0.05        | 0.04      | 0.20-0.35 |           |           |     |                     |
| AISI 1060   | 0.54-0.66 | 0.60-0.90 | 0.05        | 0.04      | 0.20-0.35 |           |           |     |                     |
| AISI 1065   | 0.59-0.71 | 0.60-0.90 | 0.05        | 0.04      | 0.20-0.35 |           |           |     |                     |
| AISI 1070   | 0.64-0.76 | 0.60-0.90 | 0.05        | 0.04      | 0.20-0.35 |           |           |     |                     |
| AISI 1109   | 0.08-0.13 | 0.60-0.90 | 0.13        | 0.04      | 0.10 MAX  |           |           |     |                     |
| AISI 1111   | 0.13 MAX  | 0.60-0.90 | 0.15        | 0.12      | 0.10 MAX  |           |           |     |                     |
| AISI 1112   | 0.13 MAX  | 0.70-0.90 | 0.23        | 0.12      | 0.10 MAX  |           |           |     |                     |
| AISI 1113   | 0.13 MAX  | 0.70-1.00 | 0.33        | 0.12      | 0.10 MAX  |           |           |     |                     |
| AISI 1114   | 0.10-0.16 | 1.00-1.30 | 0.13        | 0.04      | 0.20 MAX  |           |           |     |                     |
| AISI 1115   | 0.13-0.18 | 0.60-0.90 | 0.13        | 0.04      | 0.20 MAX  |           |           |     |                     |
| AISI 1116   | 0.14-0.20 | 1.10-1.40 | 0.23        | 0.04      | 0.20 MAX  |           |           |     |                     |
| AISI 1117   | 0.14-0.20 | 1.00-1.30 | 0.13        | 0.04      | 0.20 MAX  |           |           |     |                     |
| AISI 1118   | 0.14-0.20 | 1.30-1.60 | 0.13        | 0.04      | 0.20 MAX  |           |           |     |                     |
| AISI 1120   | 0.18-0.23 | 0.70-1.00 | 0.13        | 0.04      | 0.20 MAX  |           |           |     |                     |
| AISI 1126   | 0.23-0.29 | 0.70-1.00 | 0.13        | 0.04      | 0.20 MAX  |           |           |     |                     |
| AISI 1132   | 0.27-0.34 | 1.35-1.65 | 0.13        | 0.04      | 0.20 MAX  |           |           |     |                     |
| AISI 1137   | 0.32-0.39 | 1.35-1.65 | 0.13        | 0.040 MAX | 0.20 MAX  |           |           |     |                     |
| AISI 1138   | 0.34-0.40 | 0.70-1.00 | 0.13        | 0.04      | 0.20 MAX  |           |           |     |                     |
| AISI 1140   | 0.37-0.44 | 0.70-1.00 | 0.080-0.130 | 0.040 MAX | 0.20 MAX  |           |           |     |                     |
| AISI 1141   | 0.37-0.45 | 1.35-1.65 | 0.080-0.130 | 0.040 MAX | 0.20 MAX  |           |           |     |                     |
| AISI 1144   | 0.40-0.48 | 1.35-1.65 | 0.33        | 0.04      | 0.20 MAX  |           |           |     |                     |
| AISI 1320   | 0.18-0.23 | 1.60-1.90 | 0.04        | 0.04      | 0.20-0.35 |           |           |     |                     |
| AISI 1321   | 0.17-0.32 | 1.80-2.10 | 0.05        | 0.05      | 0.20-0.35 |           |           |     |                     |
| AISI 1330   | 0.28-0.33 | 1.60-1.90 | 0.04        | 0.04      | 0.20-0.35 |           |           |     |                     |
| AISI 1335   | 0.33-0.38 | 1.60-1.90 | 0.04        | 0.04      | 0.20-0.35 |           |           |     |                     |
| AISI 1340   | 0.38-0.43 | 1.60-1.90 | 0.04        | 0.04      | 0.20-0.35 |           |           |     |                     |
| AISI 1345   | 0.43-0.48 | 1.60-1.90 | 0.04        | 0.04      | 0.20-0.35 |           |           |     |                     |
| AISI 1552   | 0.47-0.55 | 1.20-1.50 | 0.050 MAX   | 0.040 MAX | 0.15-0.35 |           |           |     |                     |
| AISI 2317   | 0.15-0.20 | 0.40-0.60 | 0.04        | 0.04      | 0.20-0.35 |           | 3.25-3.75 |     |                     |
| AISI 2330   | 0.28-0.33 | 0.60-0.80 | 0.04        | 0.04      | 0.20-0.35 |           | 3.25-3.75 |     |                     |
| AISI 2335   | 0.33-0.38 | 0.60-0.80 | 0.04        | 0.04      | 0.20-0.35 |           | 3.25-3.75 |     |                     |
| AISI 2340   | 0.38-0.43 | 0.70-0.90 | 0.04        | 0.04      | 0.20-0.35 |           | 3.25-3.75 |     |                     |
| AISI 2345   | 0.43-0.48 | 0.70-0.90 | 0.04        | 0.04      | 0.20-0.35 |           | 3.25-3.75 |     |                     |
| AISI 2512   | 0.09-0.14 | 0.45-0.60 | 0.025       | 0.025     | 0.20-0.35 |           | 4.75-5.25 |     |                     |
| AISI 2515   | 0.12-0.17 | 0.40-0.60 | 0.04        | 0.04      | 0.20-0.35 |           | 4.75-5.25 |     |                     |
| AISI 2517   | 0.15-0.20 | 0.45-0.60 | 0.025       | 0.025     | 0.20-0.35 |           | 4.75-5.25 |     |                     |
| AISI 3115   | 0.13-0.18 | 0.40-0.60 | 0.04        | 0.04      | 0.20-0.35 | 0.55-0.75 | 1.10-1.40 |     |                     |
| AISI 3120   | 0.17-0.22 | 0.60-0.80 | 0.04        | 0.04      | 0.20-0.35 | 0.55-0.75 | 1.10-1.40 |     |                     |
| AISI 3130   | 0.28-0.33 | 0.60-0.80 | 0.04        | 0.04      | 0.20-0.35 | 0.55-0.75 | 1.10-1.40 |     |                     |
| AISI 3135   | 0.33-0.38 | 0.60-0.80 | 0.04        | 0.04      | 0.20-0.35 | 0.55-0.75 | 1.10-1.40 |     |                     |
| AISI 3140   | 0.38-0.43 | 0.70-0.90 | 0.04        | 0.04      | 0.20-0.35 | 0.55-0.75 | 1.10-1.40 |     |                     |
| AISI 3141   | 0.38-0.43 | 0.70-0.90 | 0.04        | 0.04      | 0.20-0.35 | 0.70-0.90 | 1.10-1.40 |     |                     |

# KESRI ALLOYS PRIVATE LIMITED

| GRADE     | %C        | %Mn       | %S    | %P    | %Si       | %Cr       | %Ni       | %Mo       | Other Elements |
|-----------|-----------|-----------|-------|-------|-----------|-----------|-----------|-----------|----------------|
| AISI 3145 | 0.43-0.48 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.70-0.90 | 1.10-1.40 |           |                |
| AISI 3150 | 0.48-0.53 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.70-0.90 | 1.10-1.40 |           |                |
| AISI 3310 | 0.08-0.13 | 0.45-0.60 | 0.025 | 0.025 | 0.20-0.35 | 1.40-1.75 | 3.25-3.75 |           |                |
| AISI 3316 | 0.14-0.19 | 0.45-0.60 | 0.025 | 0.025 | 0.20-0.35 | 1.40-1.75 | 3.25-3.75 |           |                |
| AISI 4017 | 0.15-0.20 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 |           |           | 0.20-0.30 |                |
| AISI 4023 | 0.20-0.25 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 |           |           | 0.20-0.30 |                |
| AISI 4024 | 0.20-0.25 | 0.70-0.90 | 0.05  | 0.04  | 0.20-0.35 |           |           | 0.20-0.30 |                |
| AISI 4027 | 0.25-0.30 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 |           |           | 0.20-0.30 |                |
| AISI 4028 | 0.25-0.30 | 0.70-0.90 | 0.05  | 0.04  | 0.20-0.35 |           |           | 0.20-0.30 |                |
| AISI 4032 | 0.30-0.35 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 |           |           | 0.20-0.30 |                |
| AISI 4037 | 0.35-0.40 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 |           |           | 0.20-0.30 |                |
| AISI 4042 | 0.40-0.45 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 |           |           | 0.20-0.30 |                |
| AISI 4047 | 0.45-0.50 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 |           |           | 0.20-0.30 |                |
| AISI 4053 | 0.50-0.56 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 |           |           | 0.20-0.30 |                |
| AISI 4063 | 0.60-0.67 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 |           |           | 0.20-0.30 |                |
| AISI 4068 | 0.63-0.70 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 |           |           | 0.20-0.30 |                |
| AISI 4118 | 0.18-0.23 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 |           | 0.08-0.15 |                |
| AISI 4130 | 0.28-0.33 | 0.40-0.60 | 0.04  | 0.04  | 0.20-0.30 | 0.80-1.10 |           | 0.15-0.25 |                |
| AISI 4140 | 0.38-0.43 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 | 0.80-1.10 |           | 0.15-0.25 |                |
| AISI 4142 | 0.40-0.45 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 | 0.80-1.10 |           | 0.15-0.25 |                |
| AISI 4145 | 0.43-0.48 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 | 0.80-1.10 |           | 0.15-0.25 |                |
| AISI 4147 | 0.45-0.50 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 | 0.80-1.10 |           | 0.15-0.25 |                |
| AISI 4317 | 3.15-0.20 | 0.45-0.65 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 1.65-2.00 | 0.20-0.30 |                |
| AISI 4320 | 0.17-0.22 | 0.45-0.65 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 1.65-2.00 | 0.20-0.30 |                |
| AISI 4337 | 0.35-0.40 | 0.60-0.80 | 0.04  | 0.04  | 0.20-0.35 | 0.70-0.90 | 1.65-2.00 | 0.20-0.30 |                |
| AISI 4340 | 0.38-0.43 | 0.60-0.80 | 0.04  | 0.04  | 0.20-0.35 | 0.70-0.90 | 1.65-2.00 | 0.20-0.30 |                |
| AISI 4608 | 0.06-0.11 | 0.25-0.45 | 0.04  | 0.04  | 0.25 MAX  |           | 1.40-1.75 | 0.15-0.25 |                |
| AISI 4615 | 0.13-0.18 | 0.45-0.65 | 0.04  | 0.04  | 0.20-0.35 |           | 1.65-2.00 | 0.20-0.30 |                |
| AISI 4620 | 0.17-0.22 | 0.45-0.65 | 0.04  | 0.04  | 0.20-0.35 |           | 1.65-2.00 | 0.20-0.30 |                |
| AISI 4621 | 0.18-0.23 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 |           | 1.65-2.00 | 0.20-0.30 |                |
| AISI 4640 | 0.38-0.43 | 0.60-0.80 | 0.04  | 0.04  | 0.20-0.35 |           | 1.65-2.00 | 0.20-0.30 |                |
| AISI 4812 | 0.10-0.15 | 0.40-0.60 | 0.04  | 0.04  | 0.20-0.35 |           | 3.25-3.75 | 0.20-0.30 |                |
| AISI 4815 | 0.13-0.18 | 0.40-0.60 | 0.04  | 0.04  | 0.20-0.35 |           | 3.25-3.75 | 0.20-0.30 |                |
| AISI 4817 | 0.15-0.20 | 0.40-0.60 | 0.04  | 0.04  | 0.20-0.35 |           | 3.25-3.75 | 0.20-0.30 |                |
| AISI 4820 | 0.18-0.23 | 0.50-0.70 | 0.04  | 0.04  | 0.20-0.35 |           | 3.25-3.75 | 0.20-0.30 |                |
| AISI 5015 | 0.12-0.17 | 0.30-0.50 | 0.04  | 0.04  | 0.20-0.35 | 0.30-0.50 |           |           |                |
| AISI 5045 | 0.43-0.48 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.55-0.75 |           |           |                |
| AISI 5046 | 0.43-0.50 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 |           |           |           |                |
| AISI 5120 | 0.17-0.22 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.70-0.90 |           |           |                |
| AISI 5130 | 0.28-0.33 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.80-1.10 |           |           |                |
| AISI 5132 | 0.30-0.35 | 0.60-0.80 | 0.04  | 0.04  | 0.20-0.35 | 0.75-1.00 |           |           |                |
| AISI 5135 | 0.33-0.38 | 0.60-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.80-1.05 |           |           |                |
| AISI 5140 | 0.38-0.43 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.70-0.90 |           |           |                |
| AISI 5145 | 0.43-0.48 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.70-0.90 |           |           |                |
| AISI 5147 | 0.45-0.52 | 0.70-0.95 | 0.04  | 0.04  | 0.20-0.35 | 0.85-1.15 |           |           |                |
| AISI 5150 | 0.48-0.53 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.70-0.90 |           |           |                |
| AISI 5152 | 0.48-0.55 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.90-1.20 |           |           |                |
| AISI 5155 | 0.50-0.60 | 0.70-1.00 | 0.04  | 0.04  | 0.20-0.35 | 0.70-0.90 |           |           |                |
| AISI 5160 | 0.55-0.65 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 | 0.70-0.90 |           |           |                |
| AISI 6117 | 0.15-0.20 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.70-0.90 |           |           | V> 0.15        |
| AISI 6120 | 0.17-0.22 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.80-1.10 |           |           | V> 0.15        |
| AISI 6145 | 0.43-0.48 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.80-1.10 |           |           | V> 0.15        |
| AISI 6150 | 0.48-0.53 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.70-0.90 |           |           | V> 0.15        |
| AISI 6152 | 0.48-0.55 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.80-1.10 |           |           | V> 0.10        |
| AISI 8615 | 0.13-0.18 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 0.40-0.70 | 0.15-0.25 |                |
| AISI 8617 | 0.15-0.20 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 0.40-0.70 | 0.15-0.25 |                |
| AISI 8620 | 0.18-0.23 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 0.40-0.70 | 0.15-0.25 |                |
| AISI 8622 | 0.22-0.25 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 0.40-0.70 | 0.15-0.25 |                |
| AISI 8625 | 0.23-0.28 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 0.40-0.70 | 0.15-0.25 |                |
| AISI 8627 | 0.25-0.30 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 0.40-0.70 | 0.15-0.25 |                |
| AISI 8630 | 0.28-0.33 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 0.40-0.70 | 0.15-0.25 |                |
| AISI 8632 | 0.30-0.35 | 0.70-0.90 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 0.40-0.70 | 0.15-0.25 |                |
| AISI 8635 | 0.33-0.38 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 0.40-0.70 | 0.15-0.25 |                |
| AISI 8637 | 0.35-0.40 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 0.40-0.70 | 0.15-0.25 |                |
| AISI 8640 | 0.38-0.43 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 0.40-0.70 | 0.15-0.25 |                |
| AISI 8641 | 0.38-0.43 | 0.75-1.00 | 0.04  | 0.04  | 0.20-0.35 | 0.40-0.60 | 0.40-0.70 | 0.15-0.25 |                |

# KESRI ALLOYS PRIVATE LIMITED

| GRADE      | %C         | %Mn       | %S        | %P        | %Si         | %Cr         | %Ni       | %Mo       | Other Elements                                      |
|------------|------------|-----------|-----------|-----------|-------------|-------------|-----------|-----------|-----------------------------------------------------|
| AISI 8642  | 0.40-0.45  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.15-0.25 |                                                     |
| AISI 8645  | 0.43-0.48  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.15-0.25 |                                                     |
| AISI 8647  | 0.45-0.50  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.15-0.25 |                                                     |
| AISI 8650  | 0.48-0.53  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.15-0.25 |                                                     |
| AISI 8653  | 0.50-0.56  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.50-0.80   | 0.40-0.70 | 0.15-0.25 |                                                     |
| AISI 8655  | 0.50-0.60  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.15-0.25 |                                                     |
| AISI 8660  | 0.55-0.65  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.15-0.25 |                                                     |
| AISI 8715  | 0.13-0.18  | 0.70-0.90 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.20-0.30 |                                                     |
| AISI 8717  | 0.15-0.20  | 0.70-0.90 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.20-0.30 |                                                     |
| AISI 8719  | 0.18-0.23  | 0.60-0.80 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.20-0.30 |                                                     |
| AISI 8720  | 0.18-0.23  | 0.70-0.90 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.20-0.30 |                                                     |
| AISI 8735  | 0.33-0.38  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.20-0.30 |                                                     |
| AISI 8740  | 0.38-0.43  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.20-0.30 |                                                     |
| AISI 8742  | 0.40-0.45  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.20-0.30 |                                                     |
| AISI 8745  | 0.43-0.48  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.20-0.30 |                                                     |
| AISI 8747  | 0.45-0.50  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.20-0.30 |                                                     |
| AISI 8750  | 0.48-0.53  | 0.75-1.00 | 0.04      | 0.04      | 0.20-0.35   | 0.40-0.60   | 0.40-0.70 | 0.20-0.30 |                                                     |
| AISI 9225  | 0.50-0.60  | 0.70-0.95 | 0.04      | 0.04      | 1.80-2.20   |             |           |           |                                                     |
| AISI 9260  | 0.55-0.65  | 0.70-1.00 | 0.04      | 0.04      | 1.80-2.20   |             |           |           |                                                     |
| AISI 9261  | 0.55-0.65  | 0.75-1.00 | 0.04      | 0.04      | 1.80-2.20   | 0.10-0.25   |           |           |                                                     |
| AISI 9262  | 0.55-0.65  | 0.75-1.00 | 0.04      | 0.04      | 1.80-2.20   | 0.25-0.40   |           |           |                                                     |
| AISI 9437  | 0.35-0.40  | 0.90-1.20 | 0.04      | 0.04      | 0.20-0.35   | 0.30-0.50   | 0.30-0.60 | 0.08-0.15 |                                                     |
| AISI 9440  | 0.38-0.43  | 0.90-1.20 | 0.04      | 0.04      | 0.20-0.35   | 0.30-0.50   | 0.30-0.60 | 0.08-0.15 |                                                     |
| AISI 9442  | 0.40-0.45  | 1.00-1.30 | 0.04      | 0.04      | 0.20-0.35   | 0.30-0.50   | 0.30-0.60 | 0.08-0.15 |                                                     |
| AISI 9445  | 0.43-0.48  | 1.00-1.30 | 0.04      | 0.04      | 0.20-0.35   | 0.30-0.50   | 0.30-0.60 | 0.08-0.15 |                                                     |
| AISI 9747  | 0.45-0.50  | 0.50-0.80 | 0.04      | 0.04      | 0.20-0.35   | 0.10-0.25   | 0.40-0.70 | 0.15-0.25 |                                                     |
| AISI 9763  | 0.60-0.67  | 0.50-0.80 | 0.04      | 0.04      | 0.20-0.35   | 0.10-0.25   | 0.40-0.70 | 0.15-0.25 |                                                     |
| AISI 9840  | 0.38-0.43  | 0.70-0.90 | 0.04      | 0.04      | 0.20-0.35   | 0.70-0.90   | 0.85-1.15 | 0.20-0.30 |                                                     |
| AISI 9845  | 0.43-0.48  | 0.70-0.90 | 0.04      | 0.04      | 0.20-0.35   | 0.70-0.90   | 0.85-1.15 | 0.20-0.30 |                                                     |
| AISI 9850  | 0.48-0.53  | 0.70-0.90 | 0.04      | 0.04      | 0.20-0.35   | 0.70-0.90   | 0.85-1.15 | 0.20-0.30 |                                                     |
| F - 1      | 0.28 MAX   | 0.60-0.90 | 0.045 MAX | 0.045 MAX | 0.15-0.35   |             |           | 0.44-0.65 |                                                     |
| F - 2      | 0.050-0.21 | 0.30-0.80 | 0.040 MAX | 0.040 MAX | 0.10-0.60   | 0.500-0.810 |           | 0.44-0.65 |                                                     |
| F - 5      | 0.15 MAX   | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50 MAX    | 4.00-6.00   | 0.50 MAX  | 0.44-0.65 |                                                     |
| F - 6      | 0.15 MAX   | 1.00 MAX  | 0.035 MAX | 0.035 MAX | 1.00 MAX    | 11.50-13.50 |           |           |                                                     |
| F - 6NM    | 0.05 MAX   | 0.50-1.00 | 0.030 MAX | 0.030 MAX | 0.60 MAX    | 11.50-14.00 | 3.50-5.50 | 0.50-1.00 |                                                     |
| F - 6A     | 0.15 MAX   | 1.00 MAX  | 0.030 MAX | 0.040 MAX | 1.00 MAX    | 11.50-13.50 | 0.50 MAX  |           |                                                     |
| F - 9      | 0.15 MAX   | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50-1.00   | 8.00-10.00  |           | 0.90-1.10 |                                                     |
| F - 11     | 0.10-0.20  | 0.30-0.80 | 0.040 MAX | 0.040 MAX | 0.50-1.00   | 1.00-1.50   |           | 0.44-0.65 |                                                     |
| F - 12     | 0.10-0.20  | 0.30-0.60 | 0.040 MAX | 0.040 MAX | 0.10-0.60   | 0.80-1.25   |           | 0.44-0.65 |                                                     |
| F - 21     | 0.05-0.15  | 0.30-0.60 | 0.040 MAX | 0.040 MAX | 0.50 MAX    | 2.70-3.30   |           | 0.80-1.06 |                                                     |
| F - 22     | 0.05-0.15  | 0.30-0.60 | 0.040 MAX | 0.040 MAX | 0.50 MAX    | 2.00-2.50   |           | 0.87-1.13 |                                                     |
| F - 50     | 0.030 MAX  | 2.00 MAX  | 0.030 MAX | 0.045 MAX | 1.00 MAX    | 24.00-26.00 | 5.50-6.50 | 1.20-2.00 | N=0.1400-0.2000                                     |
| F - 51     | 0.030 MAX  | 2.00 MAX  | 0.020 MAX | 0.030 MAX | 1.00 MAX    | 21.00-23.00 | 4.50-6.50 | 2.50-3.50 | N=0.0800-0.2000                                     |
| F - 53     | 0.030 MAX  | 1.20 MAX  | 0.020 MAX | 0.035 MAX | 0.80 MAX    | 24.00-26.00 | 6.00-8.00 | 3.00-5.00 | Cu = 0.50 MAX, N = 0.24-0.32                        |
| F - 55     | 0.030 MAX  | 1.00 MAX  | 0.010 MAX | 0.030 MAX | 1.00 MAX    | 24.00-26.00 | 6.00-8.00 | 3.00-4.00 | (Cu = 0.50-1.00, N = 0.20-0.30, W=0.50-1.00)        |
| F - 59     | 0.030 MAX  | 1.50 MAX  | 0.020 MAX | 0.035 MAX | 0.80 MAX    | 24.00-26.00 | 5.50-8.00 | 3.00-5.00 | Cu = 0.50-3.00, N = 0.20-0.35                       |
| F - 60     | 0.030 MAX  | 2.00 MAX  | 0.020 MAX | 0.030 MAX | 1.00 MAX    | 22.00-23.00 | 4.50-6.50 | 3.00-3.50 | N = 0.1400-0.2000                                   |
| F - 91     | 0.08-0.12  | 0.30-0.60 | 0.010 MAX | 0.020 MAX | 0.20-0.50   | 8.00-9.50   | 0.40 MAX  | 0.85-1.05 | (Nb=0.06-0.10, N=0.03-0.07, Al=0.04 MAX, V=18-0.25) |
| 41Cr4      | 0.38-0.45  | 0.60-0.90 | 0.030 MAX | 0.035 MAX | 0.40 MAX    | 0.90-1.20   |           |           | V=0.07-0.12                                         |
| 37CrV3     | 0.34-0.41  | 0.60-0.90 | 0.035 MAX | 0.035 MAX | 0.15-0.40   | 0.90-1.20   |           |           | V=0.07-0.12                                         |
| 31CrV3     | 0.28-0.35  | 0.40-0.60 | 0.030 MAX | 0.030 MAX | 0.25-0.40   | 0.40-0.70   |           |           | V=0.15-0.30                                         |
| 50CrV4     | 0.46-0.54  | 0.50-0.80 | 0.035 MAX | 0.035 MAX | 0.10-0.30   | 0.90-1.20   |           |           | V=0.10-0.20                                         |
| 50CrV4     | 0.47-0.55  | 0.70-1.10 | 0.030 MAX | 0.035 MAX | 0.40 MAX    | 0.90-1.20   |           |           | V=0.10-0.20                                         |
| 58CrV4     | 0.55-0.62  | 0.70-1.10 | 0.035 MAX | 0.035 MAX | 0.15-0.40   | 0.90-1.20   |           |           | V=0.10-0.20                                         |
| 42CrV6     | 0.38-0.46  | 0.50-0.80 | 0.035 MAX | 0.035 MAX | 0.15-0.35   | 1.40-1.70   |           |           | V=0.07-0.12                                         |
| 25Cr Mo4   | 0.22-0.29  | 0.60-0.90 | 0.030 MAX | 0.035 MAX | 0.40 MAX    | 0.90-1.20   |           | 0.15-0.30 |                                                     |
| File Steel | 1.25-1.40  | 0.40 MAX  | 0.030 MAX | 0.030 MAX | 0.30 MAX    | 0.50-0.80   |           |           |                                                     |
| 60 Cr4 V2  | 0.55-0.65  | 0.80-1.10 | 0.035 MAX | 0.035 MAX | 0.15-0.35   | 0.90-1.20   |           |           | V=0.07-0.15                                         |
| EN 110     | 0.35-0.45  | 0.40-0.80 |           |           | 0.10-0.35   | 0.90-1.40   |           | 1.20-1.60 | 0.10-0.20                                           |
| ST 42      | 0.20 MAX   | 0.40-0.70 | 0.050 MAX | 0.050 MAX | 0.10-0.35   |             |           |           |                                                     |
| CF 53      | 0.50-0.60  | 0.50-0.70 | 0.050 MAX | 0.050 MAX | 0.150-0.350 |             |           |           |                                                     |
| SUP-9      | 0.52-0.60  | 0.65-0.95 | 0.035 MAX | 0.035 MAX | 0.15-0.35   | 0.65-0.95   |           |           |                                                     |
| ST 50-2    | 0.27-0.35  | 0.00-1.00 | 0.040 MAX | 0.040 MAX | 0.10-0.40   |             |           |           |                                                     |



# KESRI ALLOYS PRIVATE LIMITED

| GRADE         | %C        | %Mn       | %Si       | %Cr       | %Mo       | %V          | %W          | %Co       | Other Elements                         |                        |
|---------------|-----------|-----------|-----------|-----------|-----------|-------------|-------------|-----------|----------------------------------------|------------------------|
| M 1           | 0.75-0.88 | 0.20-0.40 | 0.20-0.40 | 3.75-4.50 | 7.95-9.25 | 0.90-1.30   | 1.15-1.85   |           |                                        |                        |
| M 2           | 0.75-0.88 | 0.20-0.40 | 0.20-0.40 | 3.75-4.50 | 4.50-5.50 | 1.60-2.20   | 5.50-6.75   |           |                                        |                        |
| M 3 CL-1      | 1.00-1.10 | 0.20-0.40 | 0.20-0.40 | 3.75-4.50 | 4.75-6.25 | 2.25-3.25   | 5.50-6.75   |           |                                        |                        |
| M 3 CL-2      | 1.10-1.25 | 0.20-0.40 | 0.20-0.40 | 3.75-4.50 | 4.75-6.25 | 2.25-3.25   | 5.50-6.75   |           |                                        |                        |
| M 4           | 1.25-1.40 | 0.20-0.40 | 0.20-0.40 | 4.00-4.75 | 4.50-5.50 | 3.90-4.50   | 5.25-6.50   |           |                                        |                        |
| M 6           | 0.8 MAX   | 0.20-0.40 | 0.20-0.40 | 4.00      | 5.00 MAX  | 1.50        | 4.00 MAX    | 12.00     |                                        |                        |
| M 7           | 1 MAX     | 0.20-0.40 | 0.20-0.40 | 4.00      | 8.75 MAX  | 2.00        | 1.75        |           |                                        |                        |
| M 10          | 0.85-1.00 | 0.20-0.40 | 0.20-0.40 | 4.00      | 8.00 MAX  | 2.00        |             |           |                                        |                        |
| M 15          | 1.5 MAX   | 0.20-0.40 | 0.20-0.40 | 4.00      | 8.50 MAX  | 5.00        | 6.5         | 5.00      |                                        |                        |
| M 30          | 0.8 MAX   | 0.20-0.40 | 0.20-0.40 | 4.00      | 8.00 MAX  | 1.25        | 2.00        | 5.00      |                                        |                        |
| M 33          | 0.9 MAX   | 0.20-0.40 | 0.20-0.40 | 4.00      | 9.50 MAX  | 1.25        | 1.50        | 8.00      |                                        |                        |
| M 34          | 0.9 MAX   | 0.20-0.40 | 0.20-0.40 | 4.00      | 8.00 MAX  | 2.00        | 2.00        | 8.00      |                                        |                        |
| M 35          | 0.8 MAX   | 0.20-0.40 | 0.20-0.40 | 4.00      | 5.00 MAX  | 2.00        | 6.00        | 5.00      |                                        |                        |
| M 36          | 0.8 MAX   | 0.20-0.40 | 0.20-0.40 | 4.00      | 5.00 MAX  | 2.00        | 6.00        | 8.00      |                                        |                        |
| T 1           | 0.65-0.75 | 0.20-0.40 | 0.20-0.40 | 3.75-4.50 |           | 0.90-1.30   | 17.25-18.75 |           |                                        |                        |
| T 2           | 0.75-0.80 | 0.20-0.40 | 0.20-0.40 | 3.75-4.50 | 0.70-1.00 | 1.80-2.40   | 17.50-19.00 |           |                                        |                        |
| T 4           | 0.70-0.80 | 0.20-0.40 | 0.20-0.40 | 3.75-4.50 | 0.70-1.00 | 0.80-1.20   | 17.25-18.75 | 4.25-5.75 |                                        |                        |
| T 5           | 0.75-0.85 | 0.20-0.40 | 0.20-0.40 | 3.75-4.50 | 0.70-1.00 | 1.80-2.40   | 17.50-19.00 | 7.00-9.00 |                                        |                        |
| T 6           | 0.8 MAX   | 0.20-0.40 | 0.20-0.40 | 4.50      |           | 1.50        | 20.00       | 12.00     |                                        |                        |
| T 7           | 0.75 MAX  | 0.20-0.40 | 0.20-0.40 | 3.75-4.50 |           | 1.80-2.40   | 13.25-14.75 |           |                                        |                        |
| T 8           | 0.75-0.85 | 0.20-0.40 | 0.20-0.40 | 3.75-4.50 | 0.70-1.00 | 1.80-2.40   | 13.25-14.75 | 4.25-5.75 |                                        |                        |
| T 9           | 1.2 MAX   | 0.20-0.40 | 0.20-0.40 | 3.75-4.50 |           | 4.00        | 18.00       |           |                                        |                        |
| T 15          | 1.5 MAX   | 0.20-0.40 | 0.20-0.40 | 4.00      |           | 5.00        | 12.00       | 5.00      |                                        |                        |
| GRADE         | %C        | %Mn       | %S        | %P        | %Si       | %Cr         | %Mo         |           | Other Elements                         |                        |
| H 10          | 0.35-0.45 | 0.25-0.70 | 0.030 MAX | 0.030 MAX | 0.80-1.20 | 3.00-3.75   | 2.00-3.00   |           | V=0.25-0.75                            |                        |
| H 11          | 0.33-0.43 | 0.20-0.50 | 0.030 MAX | 0.030 MAX | 0.80-1.20 | 4.75-5.50   | 1.10-1.60   |           | V=0.30-0.60                            |                        |
| H 12          | 0.30-0.40 | 0.20-0.50 | 0.030 MAX | 0.030 MAX | 0.80-1.20 | 4.75-5.50   | 1.25-1.75   |           | V=0.20-0.50, W=1.00-1.70               |                        |
| H 13          | 0.32-0.45 | 0.20-0.50 | 0.030 MAX | 0.030 MAX | 0.80-1.20 | 4.75-5.50   | 1.10-1.75   |           | V=0.80-1.20                            |                        |
| H 14          | 0.35-0.45 | 0.20-0.50 | 0.030 MAX | 0.030 MAX | 0.80-1.20 | 4.75-5.50   |             |           | W=4.00-5.25                            |                        |
| H 16          | 0.55 MAX  | 0.20-0.40 | 0.030 MAX | 0.030 MAX | 0.20-0.40 | 7.00 MAX    |             |           | W=7.00                                 |                        |
| H 19          | 0.32-0.45 | 0.20-0.50 | 0.030 MAX | 0.030 MAX | 0.20-0.50 | 4.00-4.75   | 0.30-0.55   |           | V=1.75-2.20, W=3.75-4.50, Co=4.00-4.50 |                        |
| H 20          | 0.30-0.40 | 0.20-0.40 | 0.030 MAX | 0.030 MAX | 0.20-0.40 | 2.00 MAX    |             |           | W=9.00                                 |                        |
| H 21          | 0.26-0.36 | 0.15-0.40 | 0.030 MAX | 0.030 MAX | 0.15-0.50 | 3.00-3.75   |             |           | V=0.30-0.60, W=8.50-10.00              |                        |
| H 22          | 0.30-0.40 | 0.15-0.40 | 0.030 MAX | 0.030 MAX | 0.15-0.40 | 1.75-3.75   |             |           | V=0.25-0.50, W=10.00-11.75             |                        |
| H 23          | 0.25-0.35 | 0.15-0.40 | 0.030 MAX | 0.030 MAX | 0.15-0.60 | 11.00-12.75 |             |           | V=0.75-1.25, W=10.00-12.75             |                        |
| H 24          | 0.42-0.53 | 0.15-0.40 | 0.030 MAX | 0.030 MAX | 0.15-0.40 | 2.50-3.50   |             |           | V=0.40-0.60, W=14.00-16.00             |                        |
| H 25          | 0.22-0.32 | 0.15-0.40 | 0.030 MAX | 0.030 MAX | 0.15-0.40 | 3.75-4.50   |             |           | V=0.40-0.60, W=14.00-16.00             |                        |
| H 26          | 0.45-0.55 | 0.15-0.40 | 0.030 MAX | 0.030 MAX | 0.15-0.40 | 3.75-4.50   |             |           | V=0.75-1.25, W=17.50-19.00             |                        |
| H 41          | 0.60-0.75 | 0.15-0.40 | 0.030 MAX | 0.030 MAX | 0.20-0.45 | 3.50-4.00   | 8.20-9.20   |           | V=1.00-1.30, W=1.40-2.10               |                        |
| H 42          | 0.55-0.70 | 0.15-0.40 | 0.030 MAX | 0.030 MAX | 0.20-0.45 | 3.75-4.50   | 4.50-5.50   |           | V=1.75-2.20, W=5.50-6.75               |                        |
| H 43          | 0.50-0.65 | 0.15-0.40 | 0.030 MAX | 0.030 MAX | 0.20-0.45 | 3.75-4.50   | 7.75-8.50   |           | V=1.80-2.20                            |                        |
| GRADE         | %Ni       | %Cr       | %Co       | %Mo       | %C        | %Ti         | %Al         | %Cu       | %Fe                                    | Other Elements         |
| Incoloy 800   | 32.00     | 20.50     |           |           | 0.10      | 0.40        | 0.40        |           | 46.00                                  |                        |
| Incoloy 801   | 32.00     | 20.50     |           |           |           | 1.10        |             |           | 45.00                                  |                        |
| Incoloy 802   | 32.50     | 21.00     |           |           | 0.35      | 0.75        | 0.60        |           | 45.00                                  |                        |
| Incoloy 825   | 42.00     | 21.50     |           | 3.00      | 0.50      | 1.00        | 0.20        | 2.00      | BAL                                    |                        |
| Incoloy 840   | 21.00     | 19.00     |           |           | 0.03      |             |             |           | 58.00                                  |                        |
| Incoloy 901   | 42.50     | 12.50     |           | 6.00      | 0.50      | 2.70        | 0.35        | 0.10      | 34.00                                  |                        |
| Inconel 600   | 75.50     | 15.50     |           |           | 0.04      |             |             | 0.10      | 8.00                                   |                        |
| Inconel 601   | 60.50     | 23.00     |           |           | 0.50      |             | 1.35        | 0.50      | 14.00                                  |                        |
| Inconel 617   | 54.00     | 22.00     | 12.50     | 9.00      | 0.07      |             | 1.00        |           |                                        |                        |
| Inconel 625   | 61.00     | 20.50     |           | 9.00      | 0.05      |             |             |           | 2.50                                   | Cb=4.02                |
| Inconel 700   | 46.00     | 15.00     | 28.50     |           |           | 3.75        | 2.20        | 3.00      | 0.50                                   |                        |
| Inconel 702   | 79.50     | 16.00     |           |           | 0.05      | 0.50        | 3.50        | 0.25      | 1.00                                   |                        |
| Inconel 713   | 71.00     | 13.40     | 1.00      | 4.50      | 0.12      | 1.00        | 6.20        |           | 2.50                                   |                        |
| Inconel 713LC | 72.00     | 13.00     |           | 4.50      | 0.20      | 0.60        | 6.00        |           | 1.00                                   | Cb=2.25                |
| Inconel 718   | 52.50     | 19.00     |           | 3.05      | 0.40      | 0.90        | 0.05        | 0.15      | 18.50                                  | Cb+Ta 5.13             |
| Inconel 721   | 71.00     | 16.00     |           |           | 0.40      | 3.50        |             | 0.10      | 7.00                                   | Mn=2.25                |
| Inconel 722   | 75.00     | 15.50     |           |           | 0.40      | 2.40        | 0.70        | 0.05      | 7.00                                   |                        |
| Inconel 738   | 61.00     | 16.00     | 8.50      | 1.70      | 0.17      | 3.40        | 3.40        |           |                                        | Cb=1.90, Ta=1.7 W=2.60 |
| Inconel 750   | 73.00     | 15.50     |           |           | 0.04      | 2.50        | 0.70        | 0.50      | 7.00                                   | Cb+Ta=0.95             |
| Inconel 751   | 72.50     | 15.50     |           |           | 0.05      | 2.50        | 1.20        | 0.50      | 7.00                                   | Cb+Ta=1.00             |

# KESRI ALLOYS PRIVATE LIMITED

| GRADE         | %C        | %Mn       | %S    | %P   | %Si       | %Cr         | %Ni        | %Mo       | Other Elements  |
|---------------|-----------|-----------|-------|------|-----------|-------------|------------|-----------|-----------------|
| ASTM-A216     |           |           |       |      |           |             |            |           |                 |
| WCA           | 0.25      | 0.70      | 0.045 | 0.04 | 0.60      |             |            |           |                 |
| WCB           | 0.3       | 1.00      | 0.045 | 0.04 | 0.60      |             |            |           |                 |
| WCC           | 0.25      | 1.20      | 0.045 | 0.04 | 0.60      |             |            |           |                 |
| ASTM-A27      |           |           |       |      |           |             |            |           |                 |
| N-1           | 0.25      | 0.75      | 0.06  | 0.05 | 0.80      |             |            |           |                 |
| N-2           | 0.35      | 0.60      | 0.06  | 0.05 | 0.80      |             |            |           |                 |
| U-60-30       | 0.25      | 0.75      | 0.06  | 0.05 | 0.80      |             |            |           |                 |
| 60-30         | 0.30      | 0.60      | 0.06  | 0.05 | 0.80      |             |            |           |                 |
| 65-35         | 0.30      | 0.70      | 0.06  | 0.05 | 0.80      |             |            |           |                 |
| 70-36         | 0.35      | 0.70      | 0.06  | 0.05 | 0.80      |             |            |           |                 |
| 70-40         | 0.25      | 1.20      | 0.06  | 0.05 | 0.80      |             |            |           |                 |
| ASTM-A352     |           |           |       |      |           |             |            |           |                 |
| LCA           | 0.25      | 0.70      | 0.045 | 0.04 | 0.60      |             |            |           |                 |
| LCB           | 0.30      | 1.00      | 0.045 | 0.04 | 0.60      |             |            |           |                 |
| LCC           | 0.25      | 1.20      | 0.045 | 0.04 | 0.60      |             |            |           |                 |
| LC1           | 0.25      | 0.50-0.80 | 0.045 | 0.04 | 0.60      |             |            | 0.45-0.65 |                 |
| LC2           | 0.25      | 0.50-0.80 | 0.045 | 0.04 | 0.60      |             | 2.00-3.00  |           |                 |
| LC2-I         | 0.22      | 0.55-0.75 | 0.045 | 0.04 | 0.50      | 1.35-1.85   | 2.50-3.50  | 0.30-0.60 |                 |
| LC3           | 0.15      | 0.50-0.80 | 0.045 | 0.04 | 0.60      |             | 3.00-4.00  |           |                 |
| LC4           | 0.15      | 0.50-0.80 | 0.045 | 0.04 | 0.60      |             | 4.00-5.00  |           |                 |
| LC9           | 0.13      | 0.90      | 0.045 | 0.04 | 0.45      | 0.50        | 8.50-10.00 | 0.20      | Cu=0.30, V=0.03 |
| CA6NM         | 0.06      | 1.00      | 0.03  | 0.04 | 1.00      | 11.5-14.0   | 3.50-4.50  | 0.40-1.00 |                 |
| ASTM-A148     |           |           |       |      |           |             |            |           |                 |
| 80-40         |           |           | 0.06  | 0.05 |           |             |            |           |                 |
| 80-50         |           |           | 0.06  | 0.05 |           |             |            |           |                 |
| 90-60         |           |           | 0.06  | 0.05 |           |             |            |           |                 |
| 105-85        |           |           | 0.06  | 0.05 |           |             |            |           |                 |
| 115-95        |           |           | 0.06  | 0.05 |           |             |            |           |                 |
| 130-115       |           |           | 0.06  | 0.05 |           |             |            |           |                 |
| 135-125       |           |           | 0.06  | 0.05 |           |             |            |           |                 |
| 150-135       |           |           | 0.06  | 0.05 |           |             |            |           |                 |
| 160-145       |           |           | 0.06  | 0.05 |           |             |            |           |                 |
| ASTM-A217     |           |           |       |      |           |             |            |           |                 |
| WC1           | 0.25 MAX  | 0.50-0.80 | 0.045 | 0.04 | 0.6 MAX   |             |            | 0.45-0.65 |                 |
| WC4           | 0.05-0.20 | 0.50-0.80 | 0.045 | 0.04 | 0.6 MAX   | 0.50-0.80   | 0.70-1.10  | 0.45-0.65 |                 |
| WC5           | 0.05-0.20 | 0.40-0.70 | 0.045 | 0.04 | 0.60      | 0.50-0.90   | 0.60-1.00  | 0.90-1.20 |                 |
| WC6           | 0.05-0.20 | 0.50-0.80 | 0.045 | 0.04 | 0.60      | 1.00-1.50   |            | 0.45-0.65 |                 |
| WC9           | 0.05-0.18 | 0.40-0.70 | 0.045 | 0.04 | 0.60      | 2.00-2.75   |            | 0.90-1.20 |                 |
| C5            | 0.20      | 0.40-0.70 | 0.045 | 0.04 | 0.75      | 4.00-6.50   |            | 0.45-0.65 |                 |
| CI2           | 0.20      | 0.35-0.65 | 0.045 | 0.04 | 1.00      | 8.00-10.00  |            | 0.90-1.20 |                 |
| CA15          | 0.15      | 1.00      | 0.04  | 0.04 | 1.50      | 11.5-14.0   | 1.00       | 0.5       |                 |
| ASTM A426-92+ |           |           |       |      |           |             |            |           |                 |
| CP1           | 0.25      | 0.30-0.80 | 0.045 | 0.04 | 0.10-0.50 |             |            | 0.44-0.65 |                 |
| CP2           | 0.10-0.20 | 0.30-0.61 | 0.045 | 0.04 | 0.10-0.50 | 0.50-0.81   |            | 0.44-0.65 |                 |
| CP5           | 0.20      | 0.30-0.70 | 0.045 | 0.04 | 0.75      | 4.00-6.50   |            | 0.45-0.65 |                 |
| CP5b          | 0.15      | 0.30-0.60 | 0.045 | 0.04 | 1.00-2.00 | 4.00-6.00   |            | 0.45-0.65 |                 |
| CP9           | 0.20      | 0.30-0.65 | 0.045 | 0.04 | 0.25-1.00 | 8.00-10.00  |            | 0.90-1.20 |                 |
| CP11          | 0.05-0.20 | 0.30-0.80 | 0.045 | 0.04 | 0.60      | 1.00-1.50   |            | 0.44-0.65 |                 |
| CP12          | 0.05-0.15 | 0.30-0.61 | 0.045 | 0.04 | 0.50      | 0.80-1.25   |            | 0.44-0.65 |                 |
| CP15          | 0.15      | 0.30-0.60 | 0.045 | 0.04 | 0.15-1.65 |             |            | 0.44-0.65 |                 |
| CP21          | 0.05-0.15 | 0.30-0.60 | 0.045 | 0.04 | 0.50      | 2.65-3.35   |            | 0.80-1.06 |                 |
| CP22          | 0.05-0.15 | 0.30-0.70 | 0.045 | 0.04 | 0.60      | 2.00-2.75   |            | 0.90-1.20 |                 |
| CPCA15        | 0.15      | 1.00      | 0.04  | 0.04 | 1.50      | 11.50-14.00 |            | 0.50      |                 |
| ASTM-A487     |           |           |       |      |           |             |            |           |                 |
| 1B            | 0.30      | 1.00      | 0.045 | 0.04 | 0.80      |             |            |           |                 |
| 1C+           | 0.30      | 1.00      | 0.045 | 0.04 | 0.80      |             |            |           |                 |
| 2A            | 0.30      | 1.00-1.40 | 0.045 | 0.04 | 0.80      |             |            | 0.10-0.30 |                 |
| 2B            | 0.30      | 1.00-1.40 | 0.045 | 0.04 | 0.80      |             |            | 0.10-0.30 |                 |
| 2C+           | 0.30      | 1.00-1.40 | 0.045 | 0.04 | 0.80      |             |            | 0.10-0.30 |                 |
| 4A            | 0.30      | 1.00      | 0.045 | 0.04 | 0.80      | 0.40-0.80   | 0.40-0.80  | 0.15-0.30 |                 |
| 4B            | 0.30      | 1.00      | 0.045 | 0.04 | 0.80      | 0.40-0.80   | 0.40-0.80  | 0.15-0.30 |                 |
| 4C+           | 0.30      | 1.00      | 0.045 | 0.04 | 0.80      | 0.40-0.80   | 0.40-0.80  | 0.15-0.30 |                 |

# KESRI ALLOYS PRIVATE LIMITED

| GRADE         | %C        | %Mn         | %S       | %P       | %Si       | %Cr         | %Ni         | %Mo       | Other Elements            |
|---------------|-----------|-------------|----------|----------|-----------|-------------|-------------|-----------|---------------------------|
| 4D+           | 0.30      | 1.00        | 0.045    | 0.04     | 0.80      | 0.40-0.80   | 0.40-0.80   | 0.15-0.30 |                           |
| 4E            | 0.30      | 1.00        | 0.045    | 0.04     | 0.80      | 0.40-0.80   | 0.40-0.80   | 0.15-0.30 |                           |
| 8A            | 0.05-0.20 | 0.50-0.90   | 0.045    | 0.04     | 0.80      | 2.00-2.75   |             | 0.90-1.10 |                           |
| 8B            | 0.05-0.20 | 0.50-0.90   | 0.045    | 0.04     | 0.80      | 2.00-2.75   |             | 0.90-1.10 |                           |
| 8C+           | 0.05-0.20 | 0.50-0.90   | 0.045    | 0.04     | 0.80      | 2.00-2.75   |             | 0.90-1.10 |                           |
| 9A            | 0.05-0.33 | 0.60-1.00   | 0.045    | 0.04     | 0.80      | 0.75-1.10   |             | 0.15-0.30 |                           |
| 9B            | 0.05-0.33 | 0.60-1.00   | 0.045    | 0.04     | 0.80      | 0.75-1.10   |             | 0.15-0.30 |                           |
| 9C+           | 0.05-0.33 | 0.60-1.00   | 0.045    | 0.04     | 0.80      | 0.75-1.10   |             | 0.15-0.30 |                           |
| 9D+           | 0.05-0.33 | 0.60-1.00   | 0.045    | 0.04     | 0.80      | 0.75-1.10   |             | 0.15-0.30 |                           |
| 10A           | 0.30      | 0.60-1.00   | 0.045    | 0.04     | 0.80      | 0.55-0.90   | 1.40-2.00   | 0.20-0.40 |                           |
| 10B           | 0.30      | 0.60-1.00   | 0.045    | 0.04     | 0.80      | 0.55-0.90   | 1.40-2.00   | 0.20-0.40 |                           |
| 11A           | 0.05-0.20 | 0.50-0.80   | 0.045    | 0.04     | 0.60      | 0.50-0.80   | 0.70-1.10   | 0.45-0.65 |                           |
| 12A           | 0.05-0.20 | 0.40-0.70   | 0.045    | 0.04     | 0.60      | 0.50-0.90   | 0.60-1.00   | 0.90-1.20 |                           |
| CA6NMA        | 0.06      | 1.00        | 0.03     | 0.04     | 1.00      | 11.50-14.00 | 3.50-4.50   | 0.40-1.00 |                           |
| CA15B         | 0.15      | 1.00        | 0.04     | 0.04     | 1.50      | 11.50-14.00 | 1.00        | 0.50      |                           |
| CA15C+        | 0.15      | 1.00        | 0.04     | 0.04     | 1.50      | 11.50-14.00 | 1.00        | 0.50      |                           |
| ASTM-A128     |           |             |          |          |           |             |             |           |                           |
| A             | 1.05-1.35 | 11.00-14.00 | 0.05     | 0.07     | 1.00      |             |             |           |                           |
| B1            | 0.90-1.05 | 11.00-14.00 | 0.05     | 0.07     | 1.00      |             |             |           |                           |
| C             | 1.05-1.35 | 11.50-14.00 | 0.05     | 0.07     | 1.00      | 1.50-2.50   |             |           |                           |
| D             | 0.70-1.30 | 11.50-14.00 | 0.05     | 0.07     | 1.00      |             | 3.00-4.00   |           |                           |
| E             | 1.05-1.40 | 11.50-14.00 | 0.05     | 0.07     | 1.00      |             |             | 1.80-2.10 |                           |
| F             | 1.05-1.35 | 6.00-8.00   |          | 0.07     | 1.00      |             |             | 0.90-1.20 | Fe=Bal                    |
| ASTM-A743     |           |             |          |          |           |             |             |           |                           |
| CA15          | 0.15 MAX  | 1.00 MAX    | 0.04 MAX | 0.04 MAX | 1.50 MAX  | 11.50-14.00 | 1.00 MAX    | 0.50 MAX  |                           |
| CF3           | 0.03 MAX  | 1.50 MAX    | 0.04 MAX | 0.04 MAX | 2.00 MAX  | 17.00-21.00 | 8.00-12.00  |           |                           |
| CF3M          | 0.03 MAX  | 1.50        | 0.04     | 0.04     | 1.50      | 17.00-21.00 | 9.00-13.00  | 2.00-3.00 |                           |
| CF8           | 0.08 MAX  | 1.50        | 0.04     | 0.04     | 2.00      | 18.00-21.00 | 8.00-11.00  |           |                           |
| CF8M          | 0.08 MAX  | 1.50        | 0.04     | 0.04     | 2.00      | 18.00-21.00 | 9.00-12.00  | 2.00-3.00 |                           |
| CA6NM         | 0.06 MAX  | 1.00        | 0.03     | 0.04     | 1.00      | 11.50-14.00 | 3.50-4.50   | 0.40-1.00 |                           |
| ASTM-A297     |           |             |          |          |           |             |             |           |                           |
| HH            | 0.20-0.50 | 2.00        | 0.04     | 0.04     | 2.00      | 24.00-28.00 | 11.00-14.00 | 0.50      |                           |
| HK            | 0.20-0.60 | 2.00        | 0.04     | 0.04     | 2.00      | 24.00-28.00 | 18.00-22.00 | 0.50      |                           |
| HN            | 0.40      | 0.30        |          |          | 1.00      | 20.00       | 25.00       |           |                           |
| HT            | 0.35-0.75 | 2.50        | 0.04     | 0.04     | 2.00      | 15.00-19.00 | 33.00-37.00 | 0.50      |                           |
| HU            | 0.40      | 0.30        |          |          | 1.00      | 19.00       | 39.00       |           |                           |
| ASTM-A351     |           |             |          |          |           |             |             |           |                           |
| CF8C          | 0.08 MAX  | 1.50 MAX    | 0.04 MAX | 0.04 MAX | 2.00 MAX  | 18.00-21.00 | 9.00-12.00  | 2.00-3.00 |                           |
| CD4MnCu       | 0.04 MAX  |             |          |          |           | 24.50-26.50 | 4.75-6.00   | 1.75-2.25 | Cu=2.75-3.25, N=0.10-0.25 |
| ASTM-A747     |           |             |          |          |           |             |             |           |                           |
| CB7Cu-1       | 0.04      | 0.30        |          |          | 0.70      | 16.00       | 4.10        |           | Cu=2.70, Cb=0.18          |
| CB7Cu-2       | 0.04      | 0.30        |          |          | 0.70      | 15.00       | 5.00        |           | Cu=2.70, Cb=0.18          |
| ASTM-A532     |           |             |          |          |           |             |             |           |                           |
| IA            | 2.80-3.60 | 0.30-0.60   | 0.15     | 0.30     | 0.30-0.60 | 1.50-2.50   | 3.00-5.50   | 0.50      | Fe=Bal                    |
| IB            | 2.50-3.00 | 1.30 MAX    | 0.15 MAX | 0.30 MAX | 0.8 MAX   | 1.40-4.00   | 3.30-5.00   | 1.00 MAX  | Fe=Bal                    |
| IC            | 2.90-3.70 | 1.30 MAX    | 0.15 MAX | 0.30 MAX | 0.8 MAX   | 1.10-1.50   | 2.70-4.00   | 1.00 MAX  | Fe=Bal                    |
| ID            | 2.50-3.60 | 1.30 MAX    | 0.15 MAX | 0.10 MAX | 1.00-2.20 | 7.00-11.00  | 4.50-7.00   | 1.00 MAX  | Fe=Bal                    |
| I1A           | 2.40-2.80 | 0.50-1.50   | 0.06 MAX | 0.10 MAX | 1.00 MAX  | 11.00-14.00 | 0.50 MAX    | 0.50-1.00 | Cu=1.20, Fe=Bal           |
| I1B           | 2.40-2.80 | 0.50-1.50   | 0.06 MAX | 0.10 MAX | 1.00 MAX  | 14.00-18.00 | 0.50 MAX    | 1.00-3.00 | Cu=1.20, Fe=Bal           |
| I1C           | 2.80-3.60 | 0.50-1.50   | 0.06 MAX | 0.10 MAX | 1.00 MAX  | 14.00-18.00 | 0.50 MAX    | 2.30-3.50 | Cu=1.20, Fe=Bal           |
| I1D           | 2.00-2.60 | 0.50-1.50   | 0.06 MAX | 0.10 MAX | 1.00 MAX  | 18.00-23.00 | 1.50 MAX    | 1.50 MAX  | Cu=1.20, Fe=Bal           |
| I1E           | 2.60-3.20 | 0.50-1.50   | 0.06 MAX | 0.10 MAX | 1.00 MAX  | 18.00-23.00 | 1.50 MAX    | 1.00-2.00 | Cu=1.20, Fe=Bal           |
| I1IA          | 2.30-3.00 | 0.50-1.50   | 0.06 MAX | 0.10 MAX | 1.00 MAX  | 23.00-28.00 | 1.50 MAX    | 1.50 MAX  | Cu=1.20, Fe=Bal           |
| ASTM A597-87  |           |             |          |          |           |             |             |           |                           |
| CA-2          | 0.95-1.05 | 0.75        | 0.03     | 0.03     | 1.50      | 4.75-5.50   |             | 0.90-1.40 | V=0.20-0.50               |
| CD-2          | 1.40-1.60 | 1.00        | 0.03     | 0.03     | 1.50      | 11.00-13.00 |             | 0.70-1.20 | V & Co                    |
| CS-5          | 0.50-0.65 | 0.60-1.00   | 0.03     | 0.03     | 1.75-2.25 | 0.35        |             | 0.20-0.80 | V=0.35                    |
| CS-7          | 0.45-0.55 | 0.40-0.80   | 0.03     | 0.03     | 0.60-1.00 | 3.00-3.50   |             | 1.20-1.60 |                           |
| CH-13         | 0.30-0.42 | 0.75        | 0.03     | 0.03     | 1.50      | 4.75-5.75   |             | 1.25-1.75 | V=0.75-1.20               |
| ASTM A660-91a |           |             |          |          |           |             |             |           |                           |
| WCA           | 0.25      | 0.70 (a)    | 0.035    | 0.035    | 0.60      |             |             |           |                           |
| WCB           | 0.3       | 1.00        | 0.035    | 0.035    | 0.60      |             |             |           |                           |
| WCC           | 0.25      | 0.20 (b)    | 0.035    | 0.035    | 0.60      |             |             |           |                           |

# KESRI ALLOYS PRIVATE LIMITED

| GRADE                  | %C        | %Mn       | %S        | %P        | %Si       | %Cr        | %Ni | %Mo       | Other Elements |
|------------------------|-----------|-----------|-----------|-----------|-----------|------------|-----|-----------|----------------|
| ASTM A 53/A            | 0.25 MAX  | 0.95 MAX  | 0.060 MAX | 0.050 MAX |           |            |     |           |                |
| ASTM A 53/B            | 0.30 MAX  | 1.20 MAX  | 0.060 MAX | 0.050 MAX |           |            |     |           |                |
| ASTM A 106/A           | 0.25 MAX  | 0.27-0.93 | 0.025 MAX | 0.025 MAX | 0.10 MIN  | 0.40 MAX   |     | 0.15 MAX  |                |
| ASTM A 106/B           | 0.30 MAX  | 0.29-1.06 | 0.025 MAX | 0.025 MAX | 0.10 MIN  | 0.40 MAX   |     | 0.15 MAX  |                |
| ASTM A 106/C           | 0.35 MAX  | 0.29-1.06 | 0.025 MAX | 0.025 MAX | 0.10 MIN  | 0.40 MAX   |     | 0.15 MAX  |                |
| ASTM A 179             | 0.06-0.18 | 0.27-0.63 | 0.048 MAX | 0.048 MAX |           |            |     |           |                |
| ASTM A 214             | 0.18 MAX  | 0.27-0.63 | 0.050 MAX | 0.050 MAX |           |            |     |           |                |
| ASTM A 192             | 0.06-0.18 | 0.27-0.63 | 0.048 MAX | 0.048 MAX | 0.25 MAX  |            |     |           |                |
| ASTM A 209/T1          | 0.10-0.20 | 0.30-0.80 | 0.045 MAX | 0.045 MAX | 0.10-0.50 |            |     | 0.44-0.65 |                |
| ASTM A 209/T1a         | 0.15-0.25 | 0.30-0.80 | 0.045 MAX | 0.045 MAX | 0.10-0.50 |            |     | 0.44-0.65 |                |
| ASTM A 209/T1B0.14 MAX | 0.30-0.80 | 0.30-0.80 | 0.045 MAX | 0.045 MAX | 0.10-0.50 |            |     | 0.44-0.65 |                |
| ASTM A 210/A-1         | 0.27 MAX  | 0.93 MAX  | 0.058 MAX | 0.048 MAX | 0.10 MIN  |            |     |           |                |
| ASTM A 210/C           | 0.35 MAX  | 0.29-1.06 | 0.058 MAX | 0.048 MAX | 0.10 MIN  |            |     |           |                |
| ASTM A 213/T2          | 0.10-0.20 | 0.30-0.61 | 0.045 MAX | 0.045 MAX | 0.10-0.30 | 0.50-0.81  |     | 0.44-0.65 |                |
| ASTM A 213/T5          | 0.15 MAX  | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50 MAX  | 4.00-6.00  |     | 0.44-0.65 |                |
| ASTM A 213/T11         | 0.15 MAX  | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50-1.00 | 1.00-1.50  |     | 0.44-0.65 |                |
| ASTM A 213/T120.15 MAX | 0.30-0.61 | 0.30-0.61 | 0.045 MAX | 0.045 MAX | 0.50 MAX  | 0.80-1.25  |     | 0.44-0.65 |                |
| ASTM A 213/T220.15 MAX | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.030 MAX | 0.50 MAX  | 1.90-2.60  |     | 0.87-1.13 |                |
| ASTM A 333/I           | 0.30 MAX  | 0.40-1.06 | 0.025 MAX | 0.025 MAX |           |            |     |           |                |
| ASTM A 333/6           | 0.30 MAX  | 0.29-1.06 | 0.025 MAX | 0.025 MAX | 0.10 MIN  |            |     |           |                |
| ASTM A 334/I           | 0.30 MAX  | 0.40-1.06 | 0.025 MAX | 0.025 MAX |           |            |     |           |                |
| ASTM A 334/6           | 0.30 MAX  | 0.29-1.06 | 0.025 MAX | 0.025 MAX | 0.10 MIN  |            |     |           |                |
| ASTM A 335/P1          | 0.10-0.20 | 0.30-0.80 | 0.025 MAX | 0.025 MAX | 0.10-0.50 |            |     | 0.44-0.65 |                |
| ASTM A 335/P2          | 0.10-0.20 | 0.30-0.61 | 0.025 MAX | 0.025 MAX | 0.10-0.30 | 0.50-0.81  |     | 0.44-0.65 |                |
| ASTM A 335/P5          | 0.15 MAX  | 0.30-0.60 | 0.025 MAX | 0.025 MAX | 0.50 MAX  | 4.00-6.00  |     | 0.45-0.65 |                |
| ASTM A 335/P9          | 0.15 MAX  | 0.30-0.60 | 0.025 MAX | 0.025 MAX | 0.25-1.00 | 8.00-10.00 |     | 0.09-1.10 |                |
| ASTM A 335/P11         | 0.15 MAX  | 0.30-0.60 | 0.025 MAX | 0.025 MAX | 0.50-1.00 | 1.00-1.50  |     | 0.44-0.65 |                |
| ASTM A 335/P12         | 0.15 MAX  | 0.30-0.61 | 0.025 MAX | 0.025 MAX | 0.50 MAX  | 0.80-1.25  |     | 0.44-0.65 |                |
| ASTM A 335/P22         | 0.15 MAX  | 0.30-0.60 | 0.025 MAX | 0.025 MAX | 0.50 MAX  | 1.90-2.60  |     | 0.87-1.13 |                |
| ASTM A 199/T5          | 0.50-0.15 | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50 MAX  | 4.00-6.00  |     | 0.45-0.65 |                |
| ASTM A 199/T11         | 0.50-0.15 | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50-1.00 | 1.00-1.50  |     | 0.44-0.65 |                |
| ASTM A 199/T22         | 0.50-0.15 | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50 MAX  | 1.90-2.60  |     | 0.87-1.13 |                |
| ASTM A 199/T4          | 0.15 MAX  | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50-1.00 | 2.15-2.85  |     | 0.44-0.65 |                |
| ASTM A 199/T7          | 0.15 MAX  | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50-1.00 | 6.00-8.00  |     | 0.45-0.65 |                |
| ASTM A 200/T5          | 0.15 MAX  | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50-1.00 | 4.00-6.00  |     | 0.45-0.65 |                |
| ASTM A 200/T11         | 0.50-0.15 | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50-1.00 | 1.00-1.50  |     | 0.44-0.65 |                |
| ASTM A 200/T22         | 0.50-0.15 | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50 MAX  | 1.90-2.60  |     | 0.87-1.13 |                |
| ASTM A 200/T4          | 0.50-0.15 | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50-1.00 | 2.15-2.85  |     | 0.44-0.65 |                |
| ASTM A 200/T7          | 0.15 MAX  | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.50-1.00 | 6.00-8.00  |     | 0.45-0.65 |                |
| ASTM A 199/T9          | 0.15 MAX  | 0.30-0.60 | 0.030 MAX | 0.030 MAX | 0.25-1.00 | 8.00-10.00 |     | 0.90-1.10 |                |

| From                        | To     | Multiply by |
|-----------------------------|--------|-------------|
| TABLE OF CONVERSION FACTORS |        |             |
| mm                          | Inches | 0.039       |
| Mt.                         | Feet   | 3.281       |
| Km.                         | Miles  | 0.621       |
| Inches                      | mm     | 25.400      |
| Feet                        | Mt.    | 0.305       |
| Mile                        | Km.    | 1.609       |
| Round                       | Hex.   | 1.104       |
| Round                       | Square | 1.273       |

|                                            |                 |         |
|--------------------------------------------|-----------------|---------|
| MEASURE OF SURFACE AND AREA FOR CONVERSION |                 |         |
| mm <sup>2</sup>                            | Sq.Inches       | 0.00155 |
| cm <sup>2</sup>                            | Sq.Inches       | 0.155   |
| mt <sup>2</sup>                            | Sq.Ft.          | 10.764  |
| Sq.Inches                                  | mm <sup>2</sup> | 645.1   |
| Sq.Feet                                    | cm <sup>2</sup> | 6.45    |
| Sq.Ft.                                     | mt <sup>2</sup> | 0.093   |
| Kg.                                        | Pound           | 2.205   |
| Pound                                      | Kg.             | 0.454   |

## KESRI ALLOYS PRIVATE LIMITED

| MULTIPLE          | BY        | TOOBTAIN           |
|-------------------|-----------|--------------------|
| Acres             | 0.404686  | Hectares           |
| B.T Units         | 1055      | Joules             |
| Centimeter        | 0.393701  | Inches             |
| Cubic Centimeter  | 0.061024  | Cubic Inches       |
| Cubic Feet        | 6.228     | Callons            |
| Cubic Feet        | 0.02832   | Cubic Meters       |
| Cubic Inches      | 16.3871   | Cubic Centimeters  |
| Cubic Meters      | 35.31445  | Cubic Feet         |
| Cubic Meters      | 1.30794   | Cubic Yard         |
| Cubic Yard        | 0.76456   | Cubic Meters       |
| Feet              | 0.3048    | Meters             |
| Gallons           | 0.1606    | Cubic Feet         |
| Gallons (U.K)     | 4.536     | Litres             |
| Grams             | 0.03527   | Ounces             |
| Hactares          | 2.47105   | Acress             |
| Horse Power       | 0.7457    | Kilowatts          |
| Inches            | 2.539998  | Centimeters        |
| Inches            | 25.39998  | Millimeters        |
| Kilograms         | 2.20462   | Pounds             |
| Kilograms         | 0.0009842 | Tons (U.K)         |
| Kilometers        | 0.621372  | Miles              |
| Kilowatts         | 1.341     | Horsepower         |
| Litres            | 0.22009   | Gallons (U.K)      |
| Litres            | 1.76072   | Pints              |
| Meters            | 3.2808    | Feet               |
| Metric Tones      | 0.98421   | Tons (U.K)         |
| Miles             | 1.609343  | Kilometers         |
| Millimeters       | 0.03937   | Inches             |
| Ounces            | 28.34953  | Grams              |
| Pints             | 0.56795   | Litres             |
| Pounds            | 0.4536    | Kilogram           |
| Square Feet       | 0.09290   | Square Meters      |
| Square Inches     | 6.45163   | Square Centimeters |
| Square Kilometers | 0.386102  | Square Miles       |
| Square Meters     | 0.0002471 | Acres              |
| Tons (U.K)        | 1.60105   | Metric Tons        |
| Tons (U.K)        | 1016.0470 | Kilogram           |
| Yards             | 0.914399  | Meters             |
| Square Meters     | 1.19599   | Square Yards       |
| Square Miles      | 640.00    | Acres              |
| Square Miles      | 2.58999   | Square Kilometers  |
| Square Yards      | 0.83613   | Square Meters      |

## WEIGHT FORMULA

|                                          |                                    |
|------------------------------------------|------------------------------------|
| 1. Weight of S.S.Sheet-Plate (Kg./Meter) | : Width (mm)X Thick (mm) X 0.00785 |
| 2. Weight of Square Bar (Kg./Meter)      | : Side (mm)X0.00785                |
| 3. Weight of Round Bar (Kg./Meter)       | : Dia <sup>2</sup> (mm)X0.00616    |
| 4. Weight of Hexagonal Bar (Kg./Meter)   | : Size <sup>2</sup> (mm)X0.0068    |

# KESRI ALLOYS PRIVATE LIMITED

| No. of Gauge        | Inch   | mm    |
|---------------------|--------|-------|
| STANDARD WIRE GAUGE |        |       |
| 0                   | 0.324  | 8.229 |
| 1                   | 0.300  | 7.620 |
| 2                   | 0.276  | 7.010 |
| 3                   | 0.252  | 6.400 |
| 4                   | 0.232  | 5.892 |
| 5                   | 0.212  | 5.384 |
| 6                   | 0.192  | 4.876 |
| 7                   | 0.176  | 4.470 |
| 8                   | 0.160  | 4.064 |
| 9                   | 0.144  | 3.657 |
| 10                  | 0.128  | 3.251 |
| 11                  | 0.116  | 2.946 |
| 12                  | 0.104  | 2.641 |
| 13                  | 0.092  | 2.336 |
| 14                  | 0.080  | 2.032 |
| 15                  | 0.072  | 1.828 |
| 16                  | 0.064  | 1.625 |
| 17                  | 0.056  | 1.422 |
| 18                  | 0.048  | 1.219 |
| 19                  | 0.040  | 1.016 |
| 20                  | 0.036  | 0.914 |
| 21                  | 0.032  | 0.812 |
| 22                  | 0.028  | 0.711 |
| 23                  | 0.024  | 0.609 |
| 24                  | 0.022  | 0.558 |
| 25                  | 0.020  | 0.508 |
| 26                  | 0.018  | 0.457 |
| 27                  | 0.016  | 0.416 |
| 28                  | 0.0148 | 0.375 |
| 29                  | 0.0136 | 0.345 |
| 30                  | 0.0124 | 0.314 |
| 31                  | 0.0116 | 0.299 |
| 32                  | 0.0108 | 0.274 |
| 33                  | 0.0100 | 0.254 |
| 34                  | 0.0092 | 0.233 |
| 35                  | 0.0084 | 0.213 |
| 36                  | 0.0076 | 0.193 |
| 37                  | 0.0068 | 0.172 |
| 38                  | 0.0060 | 0.152 |
| 38                  | 0.0060 | 0.152 |
| 39                  | 0.0050 | 0.132 |
| 40                  | 0.0048 | 0.121 |
| 41                  | 0.0044 | 0.111 |
| 42                  | 0.0040 | 0.101 |
| 43                  | 0.0036 | 0.091 |
| 44                  | 0.0032 | 0.081 |
| 45                  | 0.0028 | 0.071 |
| 46                  | 0.0024 | 0.061 |
| 47                  | 0.0020 | 0.051 |
| 48                  | 0.0016 | 0.041 |
| 49                  | 0.0012 | 0.030 |
| 50                  | 0.0010 | 0.025 |



# KESRI ALLOYS PRIVATE LIMITED

| Diameter                | Round  | Square  | Hexagonal | Octagonal |
|-------------------------|--------|---------|-----------|-----------|
| SECTIONAL WEIGHT (Kg/m) |        |         |           |           |
| 8                       | 0.395  | 0.502   | 0.435     | 0.416     |
| 9                       | 0.499  | 0.636   | 0.551     | 0.527     |
| 10                      | 0.617  | 0.785   | 0.680     | 0.650     |
| 11                      | 0.746  | 0.950   | 0.823     | 0.787     |
| 12                      | 0.888  | 1.130   | 0.979     | 0.936     |
| 13                      | 1.042  | 1.327   | 1.149     | 1.099     |
| 14                      | 1.208  | 1.539   | 1.332     | 1.275     |
| 15                      | 1.387  | 1.766   | 1.530     | 1.463     |
| 16                      | 1.578  | 2.010   | 1.740     | 1.665     |
| 17                      | 1.782  | 2.269   | 1.965     | 1.879     |
| 18                      | 1.998  | 2.543   | 2.203     | 2.107     |
| 19                      | 2.226  | 2.834   | 2.454     | 2.348     |
| 20                      | 2.466  | 3.140   | 2.719     | 2.601     |
| 21                      | 2.719  | 3.462   | 2.998     | 2.868     |
| 22                      | 2.984  | 3.799   | 3.290     | 3.184     |
| 23                      | 3.261  | 4.153   | 3.596     | 3.440     |
| 24                      | 3.551  | 4.522   | 3.916     | 3.740     |
| 25                      | 3.853  | 4.906   | 4.249     | 4.065     |
| 26                      | 4.163  | 5.307   | 4.596     | 4.396     |
| 27                      | 4.495  | 5.723   | 4.956     | 4.741     |
| 28                      | 4.824  | 6.154   | 5.330     | 5.299     |
| 29                      | 5.180  | 6.602   | 5.717     | 5.469     |
| 30                      | 5.549  | 7.065   | 6.118     | 5.853     |
| 31                      | 5.925  | 7.544   | 6.533     | 6.259     |
| 32                      | 6.313  | 8.038   | 6.961     | 6.659     |
| 33                      | 6.714  | 8.549   | 7.403     | 7.082     |
| 34                      | 7.127  | 9.075   | 7.859     | 7.518     |
| 35                      | 7.553  | 9.616   | 8.328     | 7.966     |
| 36                      | 7.990  | 10.174  | 8.811     | 8.428     |
| 37                      | 8.440  | 10.747  | 9.307     | 8.903     |
| 38                      | 8.903  | 11.335  | 9.817     | 9.391     |
| 39                      | 9.378  | 11.940  | 10.340    | 9.891     |
| 40                      | 9.865  | 12.560  | 10.877    | 10.405    |
| 41                      | 10.364 | 13.196  | 11.428    | 10.932    |
| 42                      | 10.876 | 13.847  | 11.992    | 11.472    |
| 43                      | 11.400 | 14.520  | 12.570    | 12.024    |
| 44                      | 11.936 | 15.198  | 13.162    | 12.590    |
| 45                      | 12.485 | 15.900  | 13.770    | 13.196    |
| 46                      | 13.046 | 16.611  | 14.385    | 13.761    |
| 47                      | 13.619 | 17.341  | 15.017    | 14.263    |
| 48                      | 14.205 | 18.086  | 15.663    | 14.986    |
| 49                      | 14.803 | 18.848  | 16.323    | 15.614    |
| 50                      | 15.414 | 19.625  | 17.000    | 15.614    |
| 51                      | 16.036 | 20.418  | 17.682    | 16.915    |
| 52                      | 16.671 | 21.226  | 18.383    | 17.585    |
| 53                      | 17.319 | 22.0512 | 19.098    | 18.267    |
| 54                      | 17.978 | 22.891  | 19.824    | 18.963    |
| 55                      | 18.650 | 23.746  | 20.565    | 19.672    |
| 56                      | 19.335 | 24.618  | 21.319    | 20.394    |
| 57                      | 20.031 | 25.505  | 22.088    | 21.129    |
| 58                      | 20.740 | 26.407  | 22.869    | 21.877    |
| 59                      | 21.462 | 27.326  | 23.665    | 22.638    |
| 60                      | 22.195 | 28.260  | 24.474    | 23.412    |
| 61                      | 22.941 | 29.210  | 25.296    | 24.198    |
| 62                      | 23.700 | 30.175  | 26.133    | 24.998    |
| 63                      | 24.470 | 31.154  | 26.989    | 25.811    |
| 64                      | 25.253 | 32.154  | 27.846    | 26.637    |
| 65                      | 26.049 | 33.166  | 28.723    | 27.476    |
| 66                      | 26.856 | 34.195  | 29.614    | 28.327    |
| 67                      | 27.676 | 35.239  | 30.518    | 29.192    |
| 68                      | 28.509 | 36.298  | 31.436    | 30.070    |
| 69                      | 29.353 | 37.374  | 32.367    | 30.961    |
| 70                      | 30.210 | 38.465  | 33.312    | 31.865    |

# KESRI ALLOYS PRIVATE LIMITED

| Name              | Symbol | AtomicNumber | AtomicWeight | MeltingPoint°F | MeltingPoint°C | BoilingPoint°C |
|-------------------|--------|--------------|--------------|----------------|----------------|----------------|
| CHEMICAL ELEMENTS |        |              |              |                |                |                |
| Aluminium         | Al     | 13           | 26.9815      | 1220.4         | 660.2          | 2451           |
| Antimony          | Sb     | 51           | 121.76       | 1166.9         | 630.5          | 1637           |
| Argon             | Ar     | 18           | 39.944       | -308.9         | -189.4         | -186           |
| Arsenic           | As     | 33           | 74.916       | 1497           | 814            |                |
| Boron             | B      | 5            | 10.82        | 4200           | 2037+37        | 3925           |
| Calcium           | Ca     | 20           | 40.08        | 1560           | 850            | 1490           |
| Carbon            | C      | 6            | 12.010       | 6700           | 3700           |                |
| Chlorine          | Cl     | 17           | 35.46        | -150           | -101           | -34.6          |
| Chromium          | Cr     | 24           | 52.01        | 3430           | 1890           | 2642           |
| Cobalt            | Co     | 27           | 58.94        | 2723           | 1495           | 2880           |
| Columbium/Niobium | Cb/Nb  | 41           | 92.91        | 4380           | 2415           | 4930           |
| Copper            | Cu     | 29           | 63.54        | 1981.4         | 1083           | 2582           |
| Hydrogen          | H      | 1            | 1.008        | -434.6         | -259.4         | -252.77        |
| Iron              | Fe     | 26           | 55.85        | 2802           | 1539           | 2885           |
| Lead              | Pb     | 82           | 207.21       | 621.3          | 327.4          | 1750           |
| Magnesium         | Mg     | 12           | 24.32        | 1202           | 650            | 1117           |
| Manganese         | Mn     | 25           | 54.93        | 2273           | 1245           | 2040           |
| Mercury           | Hg     | 80           | 200.61       | -37.97         | -38.87         | 356.73         |
| Molybdenum        | Mo     | 42           | 95.95        | 4760           | 2625           | 4835           |
| Nickel            | Ni     | 28           | 58.69        | 2651           | 1455           | 2835           |
| Niobium/Columbium | Nb/Cb  | 41           | 92.91        | 4380           | 2415           | 4930           |
| Nitrogen          | N      | 7            | 14.0080      | -346           | -210           | -196           |
| Oxygen            | O      | 8            | 16.0000      | -361.8         | -218.8         | -183           |
| Phosphorous       | P      | 15           | 30.98        | 1111.4         | 44.1           | 280            |
| Platinum          | Pt     | 78           | 195.23       | 3224.3         | 1773.5         | 3825           |
| Potassium         | K      | 19           | 39.096       | 145            | 63             | 759            |
| Radium            | Ra     | 88           | 226.05       | 1300           | 700            | 1525           |
| Radon             | Rn     | 86           | 222.00       | -96            | -71            | -61.8          |
| Rubidium          | Rb     | 37           | 85.48        | 102            | 39             | 701            |
| Selenium          | Se     | 34           | 78.96        | 428            | 220            | 736            |
| Silicon           | Si     | 14           | 28.06        | 2605           | 1410           | 2675           |
| Silver            | Ag     | 47           | 107.880      | 1760.9         | 960.5          | 2193           |
| Sodium            | Na     | 11           | 22.997       | 207.9          | 97.7           | 889            |
| Sulfur            | S      | 16           | 32.066       | 246.2          | 119            | 444.6          |
| Tantalum          | Ta     | 73           | 180.88       | 5425           | 2996           | 5425           |
| Tin               | Sn     | 50           | 118.70       | 449.4          | 231.9          | 2687           |
| Titanium          | Ti     | 22           | 47.90        | 3300           | 1820           | 3277           |
| Tungsten          | W      | 74           | 183.92       | 6170           | 3410           | 5530           |
| Uranium           | U      | 92           | 328.07       | 2065           | 1130           | 3925           |
| Vanadium          | V      | 23           | 50.95        | 3150           | 1917           | 3375           |
| Zinc              | Zn     | 30           | 65.38        | 787.03         | 419.46         | 907            |
| Zirconium         | Zr     | 40           | 91.22        | 3200           | 1852           | 4375           |



## INDUSTRIES SERVED

- ✓ Steel Plants
- ✓ Power Sector
- ✓ Oil Field Industry
- ✓ Cement Industry
- ✓ Heavy Engineering Industry
- ✓ Crushing Industry
- ✓ Shipping Industry
- ✓ Automobile Industry
- ✓ Earth Moving Industry
- ✓ Mining & Mineral Industry

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INGOTS | ROLLED BARS | CONTINUOUS CAST BILLETS / BLOOMS

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