

**.308 Win - Berger JUG 30418 185gr - RS52**

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**LOT-TO-LOT VARIATIONS OF POWDERS, PRIMER SUBSTITUTION AND COMPONENT CHANGE OFTEN RAISE PRESSURES TO UNSAFE LEVELS. THE USER MUST ASSUME THE ENTIRE RISK OF USING THIS DATA FOR LOADING PURPOSES.**

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|                                   |  |                            |  |
|-----------------------------------|--|----------------------------|--|
| <b>User Data:</b>                 | <b>Date:10-Feb-2021</b>  | <b>Time:11:05:05</b>       | <b>File: *.dat</b>                               |
| <b>Comment</b>                    | <b>710mm barrel - 71.12mm COL - 40.0gr start load - 752m/s - 2828bar</b> |                            |  |
| <b>Cartridge / Caliber</b>        | <b>.308 Win. (CIP)</b>   | <b>Bullet</b>              | <b>.308, 185, Berger JUG #30418</b>              |
| Maximum Average Pressure, allowed | 4150 bar   | 60191 psi. (Piezo CIP)     | with boattail                                    |
| Groove Caliber                    | 7.82 mm  | 0.308 in.                  | 11.99 gm 185.0 gr.                               |
| Case Capacity, overflow           | 3.636 cm³  | 56.0 gr. H2O               | 34.14 mm 1.344 in.                               |
| Case Length                       | 51.16 mm   | 2.014 in.                  | Bullet Length                                    |
| Cartridge O.A. Length             | 71.12 mm   | 2.800 in.                  | Bullet Seating Depth                             |
| Shot Start / Init Pressure        | 250.0 bar  | 3626 psi.                  | Barrel/Tube Length                               |
|                                   |  | Cross Section Area of Bore | 710.0 mm 27.9528 in.                             |
|                                   |  |                            | 0.4751 cm² 0.07364 in.²                          |
| <b>Propellant type</b>            | <b>ReloadSwiss RS 52</b>   |                            |  |
| Charge Weight                     | 2.592 gm   | 40.0 gr.                   | Load Density 0.867 gm/cm³ 219.3 gr./in.³         |
| Heat of Explosion, Potential      | 3920 J/gm  | 254.0 J/gr.                | Energy Density of Charge 3398 J/cm³ 55683 J/in.³ |
| Propellant Solid Density          | 1.6 gm/cm³   | 404.63 gr./in.³            | Used Ratio of Specific Heats cp/cv 1.2309        |
| Burning Rate Factor Ba            | 0.505 1/s  |                            | Weighting Factor 0.5                             |
| Burning Function Limit Z1         | 0.52   |                            | Prog.-/ Degressivity Factor a0 1.375             |
| Factor b                          | 1.89   |                            | Bulk Density 0.950 gm/cm³ 240.2 gr./in.³         |

**Calculated and Estimated Data:**

|                                    |          |             |                                     |           |             |
|------------------------------------|----------|-------------|-------------------------------------|-----------|-------------|
| Bullet Shank Seating Depth         | 9.02 mm  | 0.355 in.   | Capacity Displaced by Seated Bullet | 0.646 cm³ | 0.0394 in.³ |
| Useable Case Capacity              | 2.99 cm³ | 0.1824 in.³ | Bullet Travel at Muzzle Exit        | 673.02 mm | 26.5 in.    |
| Loading Ratio("Density") / Filling | 91.3 %   |             | Charge Fraction Burnt at Shot Start | 1.46 %    |             |

**Predicted Data:**

|                          |            |              |                       |          |           |
|--------------------------|------------|--------------|-----------------------|----------|-----------|
| Maximum Chamber Pressure | 2828 bar   | 41021 psi.   | Bullet Travel at Pmax | 41.0 mm  | 1.61 in.  |
| <b>at Muzzle Exit:</b>   |            |              |                       |          |           |
| Bullet Velocity          | 752.2 m/s  | 2468 fps.    | Pressure at Muzzle    | 396 bar  | 5741 psi. |
| Bullet Energy            | 3392 Joule | 2502 ft.lbs. | Bullet Barrel Time    | 1.531 ms |           |
| Propellant Burnt         | 99.3 %     |              | Ballistic Efficiency  | 33.4 %   |           |

Check Loading Manuals for Safe Minimum Charge Weight to Avoid Hazardous Ignition Conditions like Secondary Explosion Effects !

Real maximum (peak) of pressure is reached while bullet moves within barrel.

End of combustion occurs after the bullet's base passes muzzle.

**Table of incremented charges ranging from +10.0% to -20.0% of above specified charge**

**D A N G E R !** : Table data may exceed maximum average pressures ! Pressures exceeding SAAMI or CIP specs are printed underlined!

| Diff.<br>%     | Charge Weight<br>Gramm | Grains      | Muzzle Vel.<br>m/s | fps         | Muzzle Energy<br>Joule | ft.lbs      | Max. Pressure<br>bar | psi          | Muzzle Pressure<br>bar | psi         | Prop.Burnt<br>% | B_Time<br>ms | L.R./Filling<br>% |
|----------------|------------------------|-------------|--------------------|-------------|------------------------|-------------|----------------------|--------------|------------------------|-------------|-----------------|--------------|-------------------|
| -20.0          | 2.07                   | 32.0        | 610                | 2003        | 2234                   | 1648        | 1563                 | 22667        | 319                    | 4621        | 92.0            | 1.964        | 73                |
| -18.0          | 2.13                   | 32.8        | 625                | 2050        | 2341                   | 1726        | 1658                 | 24041        | 328                    | 4760        | 93.1            | 1.916        | 75                |
| -16.0          | 2.18                   | 33.6        | 639                | 2097        | 2449                   | 1806        | 1758                 | 25499        | 337                    | 4894        | 94.1            | 1.869        | 77                |
| -14.0          | 2.23                   | 34.4        | 653                | 2144        | 2560                   | 1888        | 1865                 | 27047        | 346                    | 5023        | 95.0            | 1.823        | 78                |
| -12.0          | 2.28                   | 35.2        | 668                | 2191        | 2673                   | 1972        | 1978                 | 28692        | 355                    | 5146        | 95.9            | 1.779        | 80                |
| -10.0          | 2.33                   | 36.0        | 682                | 2238        | 2788                   | 2057        | 2099                 | 30441        | 363                    | 5263        | 96.6            | 1.735        | 82                |
| -8.0           | 2.38                   | 36.8        | 696                | 2284        | 2906                   | 2143        | 2227                 | 32302        | 370                    | 5373        | 97.3            | 1.693        | 84                |
| -6.0           | 2.44                   | 37.6        | 710                | 2330        | 3025                   | 2231        | 2364                 | 34280        | 378                    | 5477        | 98.0            | 1.652        | 86                |
| -4.0           | 2.49                   | 38.4        | 724                | 2377        | 3146                   | 2320        | 2509                 | 36386        | 384                    | 5572        | 98.5            | 1.613        | 88                |
| -2.0           | 2.54                   | 39.2        | 738                | 2422        | 3268                   | 2410        | 2663                 | 38629        | 390                    | 5661        | 99.0            | 1.571        | 89                |
| <b>Nominal</b> | <b>2.59</b>            | <b>40.0</b> | <b>752</b>         | <b>2468</b> | <b>3392</b>            | <b>2502</b> | <b>2828</b>          | <b>41021</b> | <b>396</b>             | <b>5741</b> | <b>99.3</b>     | <b>1.531</b> | <b>91</b>         |
| +2.0           | 2.64                   | 40.8        | 766                | 2513        | 3518                   | 2594        | 3004                 | 43570        | 401                    | 5812        | 99.6            | 1.491        | 93                |
| +4.0           | 2.70                   | 41.6        | 780                | 2558        | 3644                   | 2688        | 3192                 | 46291        | 405                    | 5875        | 99.8            | 1.453        | 95                |
| +6.0           | 2.75                   | 42.4        | 793                | 2603        | 3772                   | 2782        | 3392                 | 49199        | 409                    | 5929        | 100.0           | 1.416        | 97                |
| <b>+8.0</b>    | <b>2.80</b>            | <b>43.2</b> | <b>807</b>         | <b>2647</b> | <b>3901</b>            | <b>2878</b> | <b>3607</b>          | <b>52308</b> | <b>412</b>             | <b>5974</b> | <b>100.0</b>    | <b>1.381</b> | <b>99</b>         |
| <b>+10.0</b>   | <b>2.85</b>            | <b>44.0</b> | <b>820</b>         | <b>2690</b> | <b>4032</b>            | <b>2974</b> | <b>3835</b>          | <b>55625</b> | <b>415</b>             | <b>6013</b> | <b>100.0</b>    | <b>1.346</b> | <b>100</b>        |

**Results caused by ±10% powder lot-to-lot burning rate variation using nominal charge**

|  |      |      |     |      |      |      |      |       |     |      |       |       |    |
|--|------|------|-----|------|------|------|------|-------|-----|------|-------|-------|----|
| Data for burning rate increased by 10% relative to nominal value : |      |      |     |      |      |      |      |       |     |      |       |       |    |
| Nominal  | 2.59 | 40.0 | 785 | 2577 | 3699 | 2728 | 3460 | 50186 | 379 | 5494 | 100.0 | 1.419 | 91 |
| Data for burning rate decreased by 10% relative to nominal value : |      |      |     |      |      |      |      |       |     |      |       |       |    |
| Nominal  | 2.59 | 40.0 | 705 | 2312 | 2977 | 2195 | 2284 | 33127 | 391 | 5678 | 94.1  | 1.668 | 91 |