DIAMOND SOLUTIONS
QUANTIFIED PERFORMANCE

Rapsodo Data Pitch Summaries (High School Scale 1.0)

Normalized (Total Spin/Velocity) and Total Spin Rate (RPM)

Pitch Type	Red	Green	Green (Raw Spin)
FB	< 17	≥ 21	≥ 1325
DB	< 16	≥ 20	≥ 1200
RS	< 19	≥ 23	≥ 1500
CB	< 19	≥ 23	≥ 1425
SB	< 17	≥ 21	≥ 1350
CH	> 23.5	≤ 18.5	N/A

***In most cases, low spin is better for CH—see explanation on CH spin in "Notes" section**

Spin Efficiency (%)

Pitch Type	Low	Average	High
FB	30%	50%	70%
DB	54%	72%	90%
RS	18%	36%	54%
CB	21%	39%	57%
SB	21%	39%	57%
CH	46%	68%	90%

***Use chart as a guide to shape pitches. This is not an evaluation metric—see "Notes" for explanation**

Vertical Break (Inches)

Pitch Type	Red	Green
FB	> -2.5	≤ -5.5
DB	> -2.5	≤ -7.0
RS	< -1.0	≥ 2.0
CB	< -2.5	≥ 2.0
SB	< -2.0	≥ 1.5
CH*	> -0.5	≤ -5.5

***See explanation on CH VB in "Notes" section**

Horizontal Break (Inches)

Pitch Type	Red	Green
FB	N/A	≥ 2.7
DB	N/A	≥ 2.7
RS	N/A	≥ 3.2
CB	N/A	≥ 3.2
SB	N/A	≥ 3.0
CH*	>5.0	≤ 2.0

***CH numbers above represent horizontal blend benchmarks (difference in horizontal break between FB/DB and CH)—the lower the HZ blend number, the better. See "Notes" for explanation.**

DIAMOND SOLUTIONS
QUANTIFIED PERFORMANCE

Rapsodo Data Pitch Summaries (High School Scale 2.0)

Normalized (Total Spin/Velocity) and Total Spin Rate (RPM)

Pitch Type	Red	Green	Green (Raw Spin)
FB	< 17	≥ 21	≥ 1325
DB	< 16	≥ 20	≥ 1200
RS	< 19	≥ 23	≥ 1500
CB	< 19	≥ 23	≥ 1425
SB	< 17	≥ 21	≥ 1350
CH	> 23.5	≤ 18.5	N/A

***In most cases, low spin is better for CH—see explanation on CH spin in "Notes" section**

Spin Efficiency (%)

Pitch Type	Low	Average	High
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SB	21%	39%	57%
CH	46%	68%	90%

***Use chart as a guide to shape pitches. This is not an evaluation metric—see "Notes" for explanation**

Vertical Break (Inches)

Pitch Type	Red	Green
FB	> -2.8	≤ -5.8
DB	> -2.8	≤ -7.3
RS	< -1.3	≥ 2.3
CB	< -2.8	≥ 2.3
SB	< -2.3	≥ 1.8
CH*	> -0.5	≤ -5.8

***See explanation on CH VB on next page**

Horizontal Break (Inches)

Pitch Type	Red	Green
FB	N/A	≥ 3.7
DB	N/A	≥ 3.7
RS	N/A	≥ 4.2
CB	N/A	≥ 4.2
SB	N/A	≥ 4.0
CH*	>5.0	≤ 2.0

***CH numbers above represent horizontal blend benchmarks (difference in horizontal break between FB/DB and CH)—the lower the HZ blend number, the better. See "Notes" for explanation.**

Expected Velocity Ranges (MPH)

Freshman	Sophomore	Junior	Senior
Low to mid 50s (52-55+)	Mid to upper 50s (55-57+)	Upper 50s (57+)	Low 60s (60+)

***Chart does not include CH**

Notes

- Ranges are approximate and could change when we track more pitches.
- Red signifies the pitch metric is below-average/low on a **high school scale**, green signifies the pitch is above-average on a **collegiate scale**.
- The velocity chart represents the progression we would like to see for a legitimate Division 1 prospect. These numbers can obviously vary depending upon the quality of the movement/spin numbers.
- Since it is reasonable to infer that a high school pitcher will not spin the ball as well as a college pitcher, we use the normalized spin rate (spin rate/velocity) to evaluate pitchers. This metric gives us a better understanding of what a below-average, average, and above-average spin rate should be when controlling for velocity (i.e., for every 1 MPH, the pitcher produces 17 RPM of spin). Additionally, the normalized spin rate allows us to directly compare a high school pitcher's spin rate to a college pitcher.
- For a college pitcher, riseballs typically generate slightly more spin than curveballs. Given that most high school pitchers struggle to throw a true riseball, we lowered the above-average threshold (normalized spin rate) by a small amount to properly account for this gap in performance.
- We use the same spin efficiency table for high school and college players since it is not uncommon for high school pitchers to generate similar spin efficiency numbers as college pitchers.
- The spin efficiency table should not be used for evaluation purposes. It is meant to show how the metric varies within our sample and also serves as a guide when designing a particular pitch shape. Different pitch shapes require different levels of spin efficiencies, which is why it is difficult to create cutoffs for a range. For example, a pitcher can throw a very effective riseball with a lower spin efficiency. To use this chart correctly, identify the pitcher's target movement profile for the pitch, and determine whether that profile requires spin efficiencies in the low, average, or high range.
- It is important to note that sink pitches typically have higher spin efficiencies than rise pitches. Curveballs and screwballs are more prone to sink than riseballs, which explains why their spin efficiencies are slightly higher on the chart.
- The average difference in movement from a high school pitcher to a college pitcher is not that large (about 1-2 inches), which is why we decided to go with a hybrid grading scale for vertical and horizontal break (reward/downgrade the two extreme sides of the bell curve).
- If a pitcher is generating plus sink (vertical break) on a fastball, the pitch should most likely be classified as a dropball. Overall, if a pitcher is generating at least 5.5 inches of sink (≤-5.5), it is considered a good sinking pitch (≤-5.8 for a 2.0 unit). However, an average dropball vertical break range for advanced pitchers is between -5.5 and -7.0 inches (-5.8 - -7.3 for 2.0 unit).

- Changeups with sink and lower total spin rank better than changeups with rise and higher total spin. If a pitcher backspins a changeup, the pitch will generate positive vertical break (rise) and most likely a higher spin rate which will grade less favorably (red shade) to a changeup that has topspin and a lower spin rate (green shade). Additionally, the changeup vertical break box will shade green if it is generating more sink than the FB or DB. There are rare instances when a high spin/flip CH can work, but it depends on the movement/spin profile of her core pitches.
- Typically, horizontal break numbers are either positive or negative. Negative represents glove-side movement for a RHP and arm-side movement for a LHP, positive represents glove-side movement for a LHP and arm-side movement for a RHP. For the charts, I took the absolute value of the horizontal break numbers in order to compare RHPs and LHPs properly.
- For the FB, DB, RS, CB, and SB horizontal break color scale, I did not set a range for a below-average shade (red). The reason for this is because softball pitches do not have much horizontal break to begin with, and different levels of horizontal break work better for different types of repertoires. For example, a pitcher with up to down movement would fare better with less horizontal break because it allows her more opportunity to tunnel her pitches properly. If a pitcher was able to generate above-average horizontal break on a pitch, then the horizontal break box on the analytical profile will be green.
- Changeups are the one exception to the horizontal break rule mentioned above. If a changeup generates significantly more horizontal break (greater than 5 inches) than her FB or DB, it will trigger a red shade on the analytical profile. A pitch that has significantly more sidespin than the rest of the pitches will be easier for a hitter to recognize, especially at a lower velocity. If a changeup has a good horizontal blend with a FB or DB (less than 2 inches of separation), then the horizontal break box on the analytical profile will be green.

Questions?

Feel free to reach out to me via email (nhwalker34@gmail.com) or Twitter (@DomiNate34).