PITCH DESIGN CHART - MLB AVERAGES (RHP DATA SHOWN)

PITCH TYPE	3D SPIN	SPIN RATE (RPM)	SPIN DIRECTION	GYRO (DEGREES)	SPIN EFFICIENCY	VERTICAL BREAK	HORIZONTAL BREAK
FB		2250 - 2350	12:30 - 1:30	<10°	>95%	20″	12″
2S FB		2150 - 2200	1:00 - 2:00	10° - 20°	90%	13″	18″
SINKER		2100 - 2150	1:00 - 2:00	20° - 30°	85%	10″	18″
CUTTER		2350 - 2450	11:00 - 12:00	40° - 50°	45%	8″	-2″ : +2″
GYRO SLIDER		2400 - 2500	11:00 - 12:00	>85°	<10%	-1″	-1″
TOPSPIN SLIDER		2400 - 2500	11:00 - 12:00	65° - 75°	35%	-5″	-2″
SIDESPIN SLIDER		2400 - 2500	10:00 - 11:00	65° - 74°	35%	-2″	-8″
CURVEBALL 12-6		2500 - 2600	6:00 - 7:00	20° - 30°	78%	-16″	-10″
SLURVE		2500 - 2600	7:00 - 8:00	30° - 40°	60%	-13″	-12″
CURVEBALL SWEEPING		2500 - 2600	8:00 - 9:00	30° - 40°	68%	-10″	-16″
CIRCLE CHANGEUP		1700 - 1800	12:00 - 3:00	40° - 50°	65%	10″	15″
THREE FINGER CHANGEUP		1700 - 1800	12:30 - 1:30	<15°	90%	15″	10″
FRISBEE CHANGEUP		1700 - 1800	2:30 - 3:30	10° - 20°	85%	0″	20″
SPLITTER		1400 - 1500	12:00 - 12:30	<10°	90%	10″	2″

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measure to master.

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1 VELOCITY AVERAGES (MPH)

MLB	RHP	LHP
FB	93.5	92.2
2S	93	90.8
CT	89.3	87.4
CB	79	76.7
SL	84.8	83.1
CH	84.7	83.3
SP	85.3	83.9
KN	75.9	N/A

4 SPIN RATE (RPM)

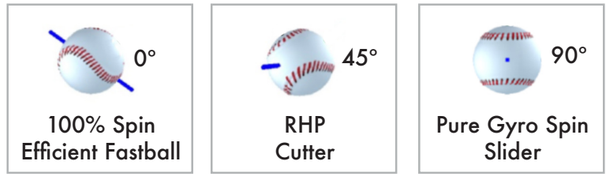
TOTAL SPIN		
MLB	RHP	LHP
FB	2275	2230
2S	2164	2123
CT	2393	2248
CB	2516	2443
SL	2416	2344
CH	1749	1819
SP	1431	1363
KN	1441	N/A

Total RPM from Side, Top/Back, and Gyro Spin
High RPM = Plays up in the zone ("Life" to the pitch)
Low RPM = Natural sink ("Heavy ball")

SPIN EFFICIENCY (TRUE SPIN/TOTAL SPIN)	
MLB	SPIN EFFICIENCY RANGE
FB	85-100%
2S	75-100%
CT	45-65%
CB	65-100%
SL	0-30%
CH	40-100% (varies based on type)

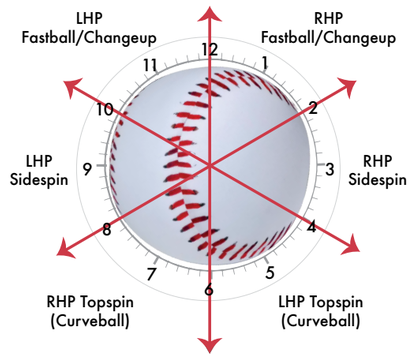
TRUE SPIN
RPM's that contribute to spin related movement
Top/back = vertical movement
Side spin = horizontal movement
Gyro/rifle spin = no spin related movement

2 GYRO DEGREE



3 SPIN DIRECTION

Spin direction averages vary by player

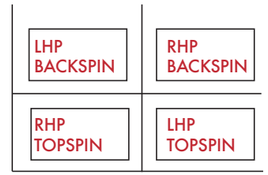


7 VERTICAL AND HORIZONTAL BREAK

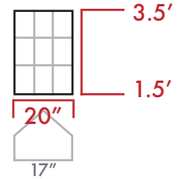
Vertical Break – Created from back/top spin RPMs. Higher spin efficiency results in higher Vertical Break

Horizontal Break – Created from side spin RPMs. Horizontal break is maximized at spin directions 3:00 and 9:00

Break Chart – Shown from pitcher point of view. Spin induced break is shown in inches.



8 STRIKE ZONE

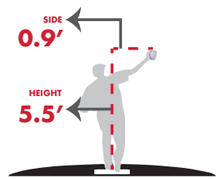


9 3D BALL FLIGHT

Dashed line shows ball path with no spin related movement
Solid line is actual ball path

Break Markers - Show the 1st inch of spin related break and the 2nd inch of substantial movement.

5 RELEASE HEIGHT AND RELEASE SIDE



Release Side represents the distance from the center of rubber at release from the pitchers point of view

Release Height - Vertical height above the ground when pitch is released

6 RELEASE ANGLE AND HORIZONTAL ANGLE

Release Angle = Vertical degree when the ball leaves the hand
Horizontal Angle = Directional degree when the ball leaves the hand (left is negative and right is positive) This is true no matter LHP vs RPH.

Ranges will vary depending upon strikezone position. Typical ranges are 0:-2 for fastballs and 1-3 for breaking balls.

Example: +3 CB for a strike vs –1 CB for spiked pitch

10 RECORD VIDEO

Point and shoot slow-mo video directly from the Rapsodo iPad application, including data overlay and auto-cropping.