

4.1 — Terminology & Concepts

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4.1.1 Understanding acronyms: F (Full Span), C (Cut to Cut), O (Oval)...

Understanding acronyms: F (Full Span), C (Cut to Cut), O (Oval)...

4.1.1 [glossary](#)

Spectre Cloud uses a set of standard acronyms throughout spec sheets, settings, and the oval calculator to refer to span types, measurement conventions, and drilling operations. Understanding what each acronym means — and when each applies — is essential for reading and creating spec sheets accurately. This page is a reference for the core acronyms used across the platform, with plain-language explanations of each.

Span Type Acronyms

The three most frequently encountered acronyms in Spectre Cloud are the span type identifiers. These appear on spec sheets, in settings, and throughout the oval calculator. Every spec sheet is associated with one of these three span types — the choice determines how distances between finger and thumb holes are measured and recorded.

F — Full Span

The **Full Span (F)** measurement is taken from the **tip of the middle finger** to the near edge of the thumb hole, with the fingers inserted to the correct depth for the bowler's grip style. It represents the total distance the thumb must travel to reach its hole from the fully inserted finger position.

- ☐ The most widely used span measurement convention in pro shop fitting.
- ☐ Intuitive for most bowlers to understand — it describes the actual reach from fingertip to thumb.
- ☐ IBPSIA-recognised standard; used as the reference measurement in most published fitting charts.
- ☐ Best for: general fitting across all skill levels; shops where most bowlers use fingertip or conventional grips.

C — Cut to Cut

The **Cut to Cut (C)** measurement is taken from the **near edge of the finger holes** to the near edge of the thumb hole — edge to edge rather than fingertip to edge. It describes the actual distance between the drilled openings of the finger and thumb holes as they sit on the ball.

- ☐ More directly related to the physical geometry of the drilled ball than Full Span.
- ☐ Particularly useful when inserts are in use — the hole edge position is directly relevant to insert seating.
- ☐ Preferred by some fitters who work primarily from physical hole measurements rather than hand-based fitting.
- ☐ Best for: insert-based fittings; shops that cross-reference measurements against drilled hole geometry.
- ☐ Less intuitive for bowlers to visualise than Full Span — the measurement is taken from the ball, not the hand.

O — Oval

The **Oval (O)** designation indicates that a hole has been drilled as an **oval shape** rather than a round hole. An oval hole extends the round cut in one or both directions to accommodate the bowler's finger or thumb geometry — particularly useful for bowlers who need more room for natural finger movement through the release.

- ☐ Oval holes are most commonly applied to the thumb — the thumb's range of motion during the release often benefits from an oval rather than a perfectly round hole.
- ☐ The oval's dimensions are defined by the starting (round) bit size and the additional cut in the vertical and/or horizontal direction — see the Oval Calculator section (Book 05) for full detail.
- ☐ In Spectre Cloud, a spec sheet field or measurement tagged with O indicates the oval calculator has been applied and an oval dimension is recorded.

- Not all holes require an oval — round holes are standard for most finger positions and for thumbs with sufficient clearance.

F, C, and O at a Glance

Acronym	Full Name	Measured From	Measured To	Most Common Use
F	Full Span	Tip of middle finger (inserted)	Near edge of thumb hole	General fitting; IBPSIA-standard charts
C	Cut to Cut	Near edge of finger holes	Near edge of thumb hole	Insert-based fitting; hole geometry reference
O	Oval	Round bit starting point	Extended oval cut direction(s)	Thumb oval drilling; finger oval where required


Additional Acronyms Used in Spectre Cloud

Beyond the three primary span type acronyms, Spectre Cloud uses a number of additional shorthand terms throughout its interface. The following reference covers the most commonly encountered.

Acronym	Full Name	Where Used	What It Refers To
PAP	Positive Axis Point	Bowler profile; layout fields	The point on the ball's surface at the end of the bowler's initial axis of rotation at release — the geometric anchor for all structured layout systems
VAL	Vertical Axis Line	Layout fields (VLS, Dual Angle)	The vertical line running through the bowler's PAP — used as a reference for pin and mass bias placement in VLS and Dual Angle layouts






Acronym	Full Name	Where Used	What It Refers To
MB	Mass Bias	Layout fields	The heaviest point of the ball's core — its placement relative to the grip center affects the ball's flare potential and backend motion
VLS	Versatile Layout System	Layout type selector; spec sheets	Storm Bowling's chart-based layout system for traditional thumb bowlers — see 2.5.1.1
2LS	Two-Layout System	Layout type selector; spec sheets	Storm Bowling's layout system designed for two-handed bowlers — see 2.5.1.2
PAL	Performance Axis Layout	Layout type selector; spec sheets	Three-input layout system (drilling angle, pin distance, VAL angle) — referred to as Dual Angle in Spectre Cloud's UI — see 2.5.1.3
CLT	Center Line Transformation	Bowler profile; Auto-CLT setting	A fitting measurement that defines how a bowler's finger centerline relates to the ball's grip center — used to derive lateral finger pitch — see 2.6.3
OD	Outside Diameter	Insert fields; spec sheets	The outer diameter of a finger insert — the drill bit must match this dimension for the insert to seat correctly — see 2.6.6
RG	Radius of Gyration	Arsenal Plus; ball detail fields	A measure of how the ball's mass is distributed relative to its axis — lower RG = earlier roll, higher RG = longer skid
diff / differential	Differential of RG	Arsenal Plus; ball detail fields	The difference between a ball's highest and lowest RG values — higher differential = more flare potential and stronger backend reaction
V	Vertical	Oval calculator; milling settings	The vertical axis of oval cut movement — see 2.3.5 and 2.3.6
H	Horizontal	Oval calculator; milling settings	The horizontal axis of oval cut movement — see 2.3.5 and 2.3.6

Acronym	Full Name	Where Used	What It Refers To
RPM	Revolutions Per Minute	Bowler profile (rev rate field)	The unit used to record a bowler's rev rate — how many times the ball rotates on its axis per minute during lane travel
RH / LH	Right-Handed / Left-Handed	Bowler profile; pitch settings; Auto-Invert	Shorthand for the bowler's dominant hand — affects pitch sign conventions, layout orientation, and Auto-Invert behaviour

Note:  Verify with your Spectre team: confirm the complete list of acronyms used in Spectre Cloud's UI and add any that are missing from this reference table. Also confirm whether any acronyms listed above are displayed differently in the app — for example, whether the app uses "Cut to Cut" or "CTC" rather than "C" in certain contexts.

Acronyms on Spec Sheets — What You Will See

When reading a completed spec sheet in Spectre Cloud, acronyms appear as field labels, section headers, and value indicators. Knowing what each stands for prevents misreading a spec sheet under pressure — particularly when a sheet is being read at the drill press rather than at a desk.

-  The span type (**F**, **C**, or **O**) appears as a label alongside the span measurement value — a value labelled **F 3 7/8"** means a Full Span of 3 7/8".
-  Layout acronyms (**VLS**, **2LS**, **PAL**) appear as the layout type header above the layout input fields on the spec sheet.
-  **PAP**, **VAL**, and **MB** appear as field labels within the layout section.
-  **V** and **H** appear as column headers in the oval calculator output section.
-  **OD** appears as a field label in the insert section alongside the drill bit size.

Related Sections

- 4.1.2 — Spec sheet overview: sections and layout (*if applicable*)
- 2.3.2 — Span type configuration: Full Span, Edge, Center
- 2.5.1 — Default layout type: VLS, 2LS, Dual Angle, None
- 2.6.3 — Auto-CLT: lateral pitch of fingers based on CLT chart
- 2.6.6 — Autofill Insert OD: auto drill bit size per insert type and grip
- 5.x — Oval Calculator: overview
- 9.x — Tips and Troubleshooting: glossary of bowling fitting terms

Tip: Print this page and keep a copy at the drill press during onboarding of new staff. Acronym familiarity is one of the first barriers a new team member faces when reading a spec sheet under time pressure — having a quick reference to hand removes that barrier in the first few sessions and builds confidence faster than repeated explanation alone.

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4.1.2 Span types explained: Full Span vs. Cut to Cut vs. Oval Span

Span types explained: Full Span vs. Cut to Cut vs. Oval Span

4.1.2 concept

The **span type** setting on a Spectre Cloud spec sheet defines the measurement convention used to record the distance between the finger holes and the thumb hole. Choosing the right span type — and understanding what each one measures — ensures that spec sheet values are interpreted and drilled correctly every time. This page explains how each of the three span types works, how they differ from each other, and how to choose between them for a given bowler or fitting workflow.

Note: This page explains the span types conceptually. For the specific settings that control how each span type is configured in Spectre Cloud, see **chapter 2.3**. For the acronyms used to represent span types on spec sheets, see **4.1.1**.

☐☐ What Is a Span Measurement?

A span measurement records the distance between a bowler's finger holes and their thumb hole on a drilled bowling ball. It is the primary dimension that determines how far the thumb must reach —

and how comfortable and consistent the grip feels through the swing and release. All three span types measure this same fundamental distance, but they differ in **where on the hole the measurement begins and ends**.

- ☐ Span is one of the most important measurements on a spec sheet — an incorrect span produces a grip that is either too stretched or too cramped, directly affecting ball control and release consistency.
- ☐ The same bowler measured in two different span types will produce different numeric values — the numbers are not interchangeable without conversion.
- ☐ Spectre Cloud stores the span type alongside the measurement value on every spec sheet, ensuring the value is never interpreted without its corresponding convention.

☐ Full Span (F)

A **Full Span** measurement is taken from the **tip of the middle finger** — with the finger inserted to the correct depth for the bowler's grip style — to the **near edge of the thumb hole**. It measures the full distance the thumb must reach from the fingertip position to its hole.

How Full Span Is Measured

1. Have the bowler insert their middle and ring fingers into the finger holes to the correct depth for their grip style.
2. With the fingers seated, measure from the tip of the middle finger to the nearest edge of the thumb hole.
3. Record the measurement in inches, to the nearest 1/16" or in decimal as appropriate for your display setting.

When to Use Full Span

- ☐ The most widely used span convention in the industry — the default for most pro shops and IBPSIA-published fitting charts.
- ☐ Intuitive for bowlers to understand — describes the actual reach from finger to thumb.
- ☐ Best choice when using IBPSIA standard charts as a starting point, since most published values assume Full Span.
- ☐ Suitable for all grip styles — fingertip, conventional, and semi-fingertip.
- ☐ Requires the fingers to be physically inserted to the correct depth during measurement — measurement accuracy depends on consistent finger insertion.

☐ Cut to Cut (C)

A **Cut to Cut** measurement is taken from the **near edge of the finger holes** to the **near edge of the thumb hole** — edge to edge, entirely on the ball's surface. It does not involve the bowler's hand in the measurement itself; instead it measures the distance between the physical openings of the drilled holes.

How Cut to Cut Is Measured

1. With the ball on the fitting jig or bench, identify the near edge of the finger holes (the edge closest to the thumb hole).
2. Measure from that edge to the near edge of the thumb hole.
3. Record the measurement in inches, to the nearest 1/16" or in decimal.

When to Use Cut to Cut

- Preferred by fitters who work primarily from physical ball measurements rather than hand-based fitting.
- More reproducible across different fitters — the measurement point is fixed on the ball rather than dependent on finger insertion depth.
- Particularly useful when inserts are in use — the hole edge position is directly relevant to how inserts seat and the effective grip geometry.
- Useful for verifying a drilled ball against spec — the Cut to Cut can be measured post-drilling to confirm accuracy.
- Less intuitive for bowlers — the measurement is taken from the ball, not the hand, and does not directly describe the bowler's reach.
- Values are not directly comparable to Full Span values — converting between the two requires knowing the hole diameter and insertion depth.

Oval Span (O)

An **Oval Span** spec sheet is one where at least one hole — most commonly the thumb — has been drilled as an oval shape rather than a round hole. The oval designation does not replace the span measurement; rather it indicates that the hole dimensions include an oval cut, and that the oval calculator values (starting bit, oval width, V/H movement) are part of the spec.

What Makes a Span "Oval"

A standard round hole has a single diameter. An oval hole has been extended beyond the round cut in the vertical direction, the horizontal direction, or both — creating an elongated opening that accommodates the bowler's natural thumb movement through the release.

- □ The oval's dimensions are defined by the **starting bit size** (the round hole) and the **additional cut** in V and/or H directions.
- □ Oval spans are most common for the thumb — the thumb's rotation during release often benefits from an oval that follows the thumb's natural path.
- □ The span measurement itself (Full Span or Cut to Cut) is still recorded on an oval spec sheet — the oval designation adds the oval dimensions on top of the standard span record.
- □ In Spectre Cloud, the oval calculator (Book 05) generates the V/H movement values and oval width from the bowler's span and thumb measurements.
- □ Oval holes require additional care at the drill press — the movement direction, flip settings, and diff values must all be correctly configured before drilling.

When to Use Oval Span

- □ When a bowler's thumb does not clear a round hole cleanly through the release.
- □ When a bowler reports thumb discomfort, hanging, or inconsistent exit on a correctly sized round hole.
- □ When thumb swelling is a recurring issue — an oval provides more clearance without requiring a larger round hole that would be too loose when swelling subsides.
- □ For bowlers with a pronounced thumb rotation or side-roll through the release.

□□ Span Types Compared

	Full Span (F)	Cut to Cut (C)	Oval Span (O)
Measurement reference	Fingertip to thumb hole edge	Finger hole edge to thumb hole edge	As F or C, plus oval cut dimensions
Measured from	Bowler's hand (finger inserted)	Ball surface only	Ball surface; oval from calculator
Reproducibility	Depends on consistent finger insertion	High — fixed points on ball	Depends on base span type used
IBPSIA chart compatibility	Direct — charts assume Full Span	Requires conversion	Oval dimensions from calculator
Insert fitting suitability	Good	Best — directly references hole edge	Good; oval adds clearance for thumb
Common use	General fitting; most shops	Insert-based; post-drill verification	Thumb clearance; rotation accommodation

⚠ Do Not Mix Span Types Within a Bowler's History

Once a span type has been established for a bowler, it should be used consistently on all subsequent spec sheets. Mixing span types across a bowler's history makes values appear different when they are actually equivalent — or appear the same when they are actually different — depending on the conversion.

- ☐ Do not copy a Full Span value onto a Cut to Cut spec sheet without converting — the resulting span will be incorrect for the bowler's hand.
- ☐ Do not assume that because two span values are numerically close they represent the same physical measurement — the same bowler measured in F and C will produce different numbers.
- ☐ If a bowler's span type needs to change — for example, when transitioning from a shop that uses Full Span to one that uses Cut to Cut — measure the bowler fresh in the new convention rather than converting from the old value.
- ☐ Note the span type change in the bowler's profile notes with the date — future staff reviewing the history will understand why early spec sheets show different values.

☐☐ Span Type and Spectre Cloud's Auto-Suggestions

Spectre Cloud's auto-suggestion features — including Auto-Calculate Ring Span (2.6.8) and Autofill Cut to Cut (2.6.9) — are aware of the span type selected on the current spec sheet and apply their calculations accordingly. The 5/16" ring span offset and the Cut to Cut derivation both operate within the selected span type's convention.

- ☐ Selecting Full Span on a spec sheet triggers Full Span-appropriate autofill behaviour.
- ☐ Selecting Cut to Cut triggers the Autofill Cut to Cut calculation chain (see 2.6.9).
- ☐ Oval span sheets additionally trigger oval calculator fields — the V/H movement values, diff, and oval width appear as part of the spec. ⚠ *Verify with your Spectre team: confirm exactly how the oval span type selection interacts with the oval calculator fields in the spec sheet UI.*

Related Sections

- 4.1.1 — Understanding acronyms: F, C, O and other Spectre Cloud shorthand

- 4.1.3 — Creating a new spec sheet (*if applicable*)
- 2.3.2 — Span type configuration: Full Span, Edge, Center
- 2.6.8 — Auto-Calculate Ring Span: based on 5/16" rule
- 2.6.9 — Autofill Cut to Cut: based on insert type/size
- 5.x — Oval Calculator: overview and getting started
- 9.x — Tips and Troubleshooting: converting between span types

Tip: If your shop is establishing its span type convention for the first time, Full Span is the lowest-friction choice — it aligns with IBPSIA charts, is familiar to most experienced fitters, and is intuitive to explain to bowlers. Cut to Cut becomes the better choice when your workflow is heavily insert-based or when post-drill verification against the ball is part of your standard process. Oval is not an alternative to the other two — it is an addition to whichever base span type you use.

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4.1.3 Grip type definitions: Finger Tip vs. Conventional

Grip type definitions: Finger Tip vs. Conventional

4.1.3 concept

A bowler's **grip type** defines how deeply their fingers are inserted into the ball — and it is one of the most consequential decisions in a pro shop fitting. Grip type determines the standard span, pitch, bridge, and insert values that apply to a bowler, and it is the first meaningful fitting choice for any new bowler purchasing their first personal ball. This page explains the two primary grip types — **Fingertip** and **Conventional** — how they differ physically and in terms of ball motion, and how the choice is reflected throughout Spectre Cloud.

Note: Spectre Cloud also supports a **Semi-Fingertip** grip type, which falls between Fingertip and Conventional in insertion depth. Semi-Fingertip is covered briefly at the end of this page. The primary focus here is on Fingertip and Conventional, which together account for the overwhelming majority of fittings in most pro shops.

Fingertip Grip

In a **fingertip grip**, the middle and ring fingers are inserted into the ball **to the first knuckle only** — the fingertip. This is a shallower insertion than conventional, leaving the bulk of the finger outside the ball and relying on the fingertip's contact with the hole edge (or insert) to hold and release the ball.

Physical Characteristics

- ☐ Fingers inserted to the **first knuckle** — approximately to the first crease of the finger from the tip.
- ☐ Produces a longer lever arm from the wrist to the finger contact point — this increases the torque available at the moment of release.
- ☐ The thumb exits the ball before the fingers, allowing the fingers to impart lift and rotation — the primary source of revolutions and hook for most competitive bowlers.
- ☐ Almost universally used with **finger inserts** — the shallower insertion depth means the fingertip bears significant load, and inserts cushion this contact point and provide a consistent grip surface.

Ball Motion Characteristics

- ☐ Higher rev rate potential than conventional — the longer lever arm allows more rotation to be imparted at release.
- ☐ Greater hook potential — more axis rotation and tilt are achievable with a fingertip grip.
- ☐ More sensitive to release technique — small changes in finger lift angle produce noticeable changes in ball path.
- ☐ Preferred by the majority of league and competitive bowlers for its performance potential.

Fitting Standards — Fingertip

- ☐ **Standard bridge:** — the narrower bridge suits the shallower insertion depth and the extended finger position.
- ☐ **Standard forward pitch:** typically to forward — less forward pitch than conventional because the fingertip grip's lever arm naturally positions the finger for exit.
- ☐ **Inserts:** strongly recommended — most fingertip bowlers use inserts on both middle and ring fingers.
- ☐ **Span:** longer than an equivalent conventional span for the same hand — the shallower insertion places the fingertip further from the thumb hole.

☐☐ Conventional Grip

In a **conventional grip**, the middle and ring fingers are inserted into the ball **to the second knuckle** — past the first crease, with a deeper portion of the finger inside the hole. This is a more secure, fuller grip than fingertip.

Physical Characteristics

- ☐ Fingers inserted to the **second knuckle** — approximately to the second crease from the tip.
- ☐ Produces a shorter lever arm than fingertip — the deeper insertion places the contact point closer to the palm.
- ☐ The ball is held more securely in the hand — less reliance on finger strength to maintain the grip through the swing.
- ☐ Typically used **without inserts** — the deeper insertion provides sufficient grip surface from the ball hole itself, though inserts can be used if preferred.

Ball Motion Characteristics

- ☐ Lower rev rate than fingertip — the shorter lever arm limits the rotation imparted at release.
- ☐ Straighter ball path — less hook potential makes conventional grip better suited to targeting-based play styles.
- ☐ More forgiving of release inconsistency — the deeper, more secure grip reduces the sensitivity to finger angle variations at release.
- ☐ Preferred by beginners, youth bowlers, senior bowlers, and those prioritising control and consistency over hook potential.

Fitting Standards — Conventional

- ☐ **Standard bridge:** $\frac{3}{8}$ " — the wider bridge accommodates the deeper insertion depth and the more upright finger position.
- ☐ **Standard forward pitch:** typically $\frac{1}{4}$ " to $\frac{1}{2}$ " forward — more forward pitch than fingertip to accommodate the deeper finger angle and ease thumb extraction.
- ☐ **Inserts:** optional — many conventional bowlers use bare holes; inserts can be added for comfort or consistency.
- ☐ **Span:** shorter than an equivalent fingertip span for the same hand — the deeper insertion places the contact point closer to the thumb hole.

☐☐ Fingertip vs. Conventional — Side-by-Side

	Fingertip	Conventional
Insertion depth	To first knuckle	To second knuckle
Lever arm	Longer — more torque at release	Shorter — more secure hold

	Fingertip	Conventional
Rev rate potential	Higher	Lower
Hook potential	Higher	Lower
Release sensitivity	Higher — technique-dependent	Lower — more forgiving
Standard bridge	1/4"	3/8"
Standard forward pitch	0 to 1/4" forward	1/4" to 1/2" forward
Inserts	Strongly recommended	Optional
Typical bowler profile	League, competitive, performance-oriented	Beginner, youth, senior, recreational
Autofill Bridge in Spectre Cloud	1/4" (2.6.5)	3/8" (2.6.5)

☐☐ Semi-Fingertip Grip

The **semi-fingertip grip** positions the fingers at a depth **between the first and second knuckle** — deeper than fingertip but shallower than conventional. It is less commonly fitted than either primary grip type and is most often used as a transitional option for bowlers moving from conventional toward fingertip.

- ☐ Offers a middle ground between the security of conventional and the rev potential of fingertip.
- ☐ Can suit bowlers who find full fingertip insertion uncomfortable or technically difficult to maintain consistently.
- ☐ Less standardised than the two primary grip types — fitting charts and IBPSIA standards are less comprehensive for semi-fingertip.
- ☐ Less commonly requested — most bowlers transition from conventional to fingertip directly rather than spending significant time at semi-fingertip.
- ☐ Autofill Bridge and insert OD defaults for semi-fingertip in Spectre Cloud may be less precise than for the two primary grip types — verify with your Spectre team. [△ Verify with your Spectre team: confirm what autofill defaults Spectre Cloud applies for semi-fingertip grip, consistent with the question raised in 2.6.5.](#)

☐☐ Grip Type in Spectre Cloud

Grip type is recorded on the bowler's profile (see 3.1.2) and is used throughout Spectre Cloud to drive autofill defaults and IBPSIA-standard suggestions. Selecting the correct grip type at profile creation ensures every subsequent spec sheet starts with the right baseline values.

- **Autofill Bridge (2.6.5)** — applies 1/4" for fingertip, 3/8" for conventional.
- **Autofill Insert OD (2.6.6)** — insert OD lookup is grip-sensitive; fingertip and conventional grips may use different insert seating approaches for the same insert model.
- **Pitch Suggestion (2.6.2)** — forward pitch norms differ between grip types; the suggestion engine applies grip-appropriate starting values.
- **Span suggestions** — IBPSIA span starting points differ by grip type; selecting the correct type ensures span autofill applies the correct baseline.
- Grip type can be updated on the bowler's profile at any time — see 3.2.2 for editing guidance.

☐☐ Advising Bowlers on Grip Choice

For bowlers purchasing their first personal ball — particularly those transitioning from house balls — grip type is often the most impactful early decision in their development as a bowler. A few practical guidelines for the fitting conversation:

- A bowler who wants to develop a hook and improve their game long-term is almost always best served by starting with **fingertip** — even if it feels less secure initially, it is the grip that enables skill development.
- A bowler who prioritises comfort, security, and a straight ball path — or who is elderly, has grip strength limitations, or is fitting a child — is better served by **conventional**.
- There is no wrong answer for the right bowler — the grip that matches the bowler's goals and physical capability is always the correct choice.
- Grip type can be changed on a future ball if the bowler's goals or physical circumstances change — it is not a permanent commitment.

Related Sections

- 4.1.2 — Span types explained: Full Span vs. Cut to Cut vs. Oval Span
- 4.1.1 — Understanding acronyms: F, C, O and other Spectre Cloud shorthand
- 3.1.2 — Required fields: name, hand, grip type
- 2.6.5 — Autofill Bridge: auto standard bridge (1/4" fingertip, 3/8" conventional)
- 2.6.6 — Autofill Insert OD: auto drill bit size per insert type and grip
- 2.6.2 — Pitch suggestion: auto forward pitch based on hand flexibility
- 4.1.4 — Creating a new spec sheet (*if applicable*)

Tip: When a bowler is unsure which grip to choose, a useful demonstration is to have them hold a house ball with their fingers inserted to each depth in turn — without the thumb — and feel the difference in finger load and ball weight distribution. The grip that feels more natural and controllable in that static test is usually the better starting point for their first fitted ball.

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4.1.4 Pitch terminology: Forward, Reverse, Lateral, Zero pitch explained

Pitch terminology: Forward, Reverse, Lateral, Zero pitch explained

4.1.4 concept

Pitch is the angle at which a finger or thumb hole is drilled relative to the centre of the ball. Adjusting pitch changes how the bowler's finger or thumb sits in the hole — affecting grip comfort, ball retention through the swing, and the ease and consistency of the release. This page explains the four core pitch terms used throughout Spectre Cloud spec sheets and settings: **Forward**, **Reverse**, **Lateral**, and **Zero** pitch.

Note: This page covers pitch terminology conceptually. For the Spectre Cloud settings that control how pitch values are displayed and signed on spec sheets, see **chapter 2.4**. For the auto-suggestion settings that generate pitch recommendations, see **2.6.2** and **2.6.3**.

What Is Pitch?

When a hole is drilled straight through the ball toward its centre, the hole is said to have **zero pitch** — it is perpendicular to the ball's surface at that point. Pitch is introduced by angling the drill slightly in a specific direction, tilting the hole opening toward or away from the fingers, or laterally

toward or away from the adjacent finger hole. The amount of pitch is measured in fractions of an inch — specifically, the distance the hole's centreline at the ball's surface is offset from zero in the given direction.

- Pitch is applied to both the **thumb hole** and the **finger holes** — though thumb pitch is more frequently adjusted than finger pitch.
- Pitch values are small — typically ranging from to in either direction for most bowlers.
- Even small changes in pitch produce perceptible differences in grip feel and release timing — pitch is one of the most fine-tuned variables in pro shop fitting.
- Spectre Cloud stores forward/reverse pitch and lateral pitch as separate values on each spec sheet — they are independent adjustments that can be applied simultaneously.

Forward Pitch

Forward pitch tilts the hole opening **toward the fingers** — the hole leans in the direction of the fingertips rather than pointing straight toward the ball's centre. From the bowler's perspective, the opening faces slightly upward when the ball is held in the delivery position.

Physical Effect

- The thumb or finger is drawn deeper into the hole by gravity and grip pressure — forward pitch increases the security of the grip through the swing.
- Reduces the tendency for the thumb to fall out or feel loose at the top of the backswing.
- Can slow the thumb's exit slightly — the hole's angle works against the thumb's release path rather than with it.

When Forward Pitch Is Used

- Bowlers with less flexible thumbs — forward pitch compensates for a thumb that does not naturally align with a zero-pitch hole.
- Conventional grip bowlers — deeper insertion combined with forward pitch produces a secure, comfortable fit.
- Bowlers who report the ball feeling loose or dropping early — forward pitch increases grip security.
- Bowlers with thumb swelling or arthritis — more forward pitch eases insertion and extraction.

Typical Range

Most bowlers use between 0 and 1/2" forward pitch on the thumb. 1/4" forward is the most common IBPSIA starting point for average hand flexibility.

Reverse Pitch

Reverse pitch tilts the hole opening **away from the fingers** — the hole leans away from the fingertips, angling toward the back of the hand. From the bowler's perspective, the opening faces slightly downward when the ball is held in delivery position.

Physical Effect

- The hole's angle assists the thumb's exit path — the thumb is more easily expelled from the hole at the moment of release.
- Produces a faster, cleaner thumb exit — the ball transitions from thumb-in to thumb-out more quickly, increasing the window for finger lift.
- Can reduce grip security if overapplied — too much reverse pitch makes the ball feel insecure through the swing for bowlers without sufficient thumb control.

When Reverse Pitch Is Used

- Competitive and higher rev-rate bowlers seeking a faster, more consistent thumb exit.
- Bowlers with highly flexible thumbs — less forward pitch (or mild reverse pitch) accommodates a thumb that naturally sits at a flatter angle.
- Bowlers who report the thumb feeling stuck, hanging, or causing the ball to loft — reverse pitch promotes a cleaner exit.

Typical Range

Reverse pitch is less commonly applied than forward pitch. Most bowlers who use it fall between 1/16" and 1/4" reverse. Values beyond 3/8" reverse are rare and should be verified physically before drilling. *△ Verify with your Spectre team: confirm whether Spectre Cloud enforces any input range limits on reverse pitch values.*

Lateral Pitch

Lateral pitch tilts the hole opening **toward or away from the adjacent finger hole** — sideways rather than forward or backward. For the thumb, lateral pitch moves the opening toward

or away from the ring finger side. For the finger holes, lateral pitch moves the opening toward or away from the centre of the bridge.

Physical Effect

- Lateral pitch on the thumb adjusts the thumb's natural resting angle within the hole — reducing pinching or relieving pressure on one side of the thumb.
- Lateral pitch on the fingers adjusts how the finger loads against the hole edge during the release — affecting the direction and consistency of finger lift.
- Even small amounts of lateral pitch — as little as — can meaningfully relieve grip discomfort for a bowler whose thumb or finger geometry does not naturally align with the hole's centreline.

Direction Conventions

Lateral pitch direction is described relative to the **ring finger side** of the hand:

Direction	Right-Handed Bowler	Left-Handed Bowler
Toward ring finger	Tilts opening to the right	Tilts opening to the left
Away from ring finger	Tilts opening to the left	Tilts opening to the right

Note: This is why dominant hand is a required field on a bowler profile — lateral pitch direction is physically opposite for RH and LH bowlers, and the Auto-Invert setting (2.6.4) handles this automatically when cloning or templating across handedness.

When Lateral Pitch Is Used

- Derived from the bowler's CLT (Center Line Transformation) measurement — the Auto-CLT setting (2.6.3) automates this lookup.
- Bowlers who report finger or thumb pinching on one side of the hole — lateral pitch redistributes the contact pressure.
- Bowlers with a pronounced natural lateral alignment in their grip — lateral pitch aligns the hole with the bowler's actual thumb or finger geometry rather than forcing an adjustment.

Typical Range

Most lateral pitch applications fall between and in either direction. toward the ring finger is among the most common lateral pitch values for the thumb.

☐ Zero Pitch

Zero pitch — also referred to as **manufacturer's pitch** or **no added pitch** — means the hole is drilled perpendicular to the ball's surface at the chosen location, angled directly toward the ball's centre with no additional tilt in any direction. The ball's natural curvature provides a small inherent forward pitch from zero; zero pitch means no adjustment is added beyond this baseline.

- ☐ The simplest pitch configuration — no offset to calculate or communicate to the press.
- ☐ A valid and appropriate choice for many bowlers — not a placeholder or an incomplete spec.
- ☐ Common for both forward/reverse and lateral axes simultaneously — a bowler with zero forward/reverse pitch and zero lateral pitch has a fully defined pitch spec.
- ☐ Used as the starting point for a first fitting when no prior measurements are available.
- ☐ Not appropriate for all bowlers — the natural curvature of the ball surface means zero pitch does not suit every hand geometry; physical fitting should confirm zero pitch is comfortable before drilling.

☐ Pitch Summary Table

Pitch Type	Direction	Primary Effect	Typical Use Case	Typical Range
Forward	Toward fingers	Increases grip security; slows exit	Less flexible thumbs; conventional grip; ball feels loose	0 to 1/2" forward
Reverse	Away from fingers	Faster, cleaner thumb exit	Competitive bowlers; flexible thumbs; thumb hangs	1/16" to 1/4" reverse
Lateral	Toward/away from ring finger	Relieves lateral pinch; aligns with hand geometry	CLT-based fitting; finger or thumb side pressure	0 to 3/8" either direction
Zero	None — perpendicular to surface	Neutral; no added adjustment	First fittings; bowlers whose geometry suits zero pitch	0 (by definition)

⚙️ How Pitch Appears in Spectre Cloud

On a Spectre Cloud spec sheet, forward/reverse pitch and lateral pitch are stored as separate fields for both the thumb and fingers. The sign and direction indicators that appear alongside pitch values depend on the settings configured in chapter 2.4:

- Whether forward pitch displays as positive or negative is controlled by **2.4.2**.
- Whether right lateral pitch displays as positive or negative is controlled by **2.4.1**.
- Whether directional arrows or labels appear alongside pitch values is controlled by **2.4.3**.
- The auto-suggestion engine proposes forward pitch values based on hand flexibility (**2.6.2**) and lateral pitch based on CLT (**2.6.3**).
- All pitch values on a spec sheet respect the dominant hand setting — lateral pitch directions are correctly oriented for RH and LH bowlers automatically when Auto-Invert (**2.6.4**) is enabled.

Related Sections

- 4.1.3 — Grip type definitions: Fingertip vs. Conventional
- 4.1.2 — Span types explained: Full Span vs. Cut to Cut vs. Oval Span
- 2.4.1 — Does your machine display right pitch as positive? Y/N
- 2.4.2 — Does your machine display forward thumb pitch as positive? Y/N
- 2.4.3 — Display +/- in pitch tiles: showing direction arrows to avoid errors
- 2.6.2 — Pitch suggestion: auto forward pitch based on hand flexibility
- 2.6.3 — Auto-CLT: lateral pitch of fingers based on CLT chart
- 2.6.4 — Auto-invert standard lateral pitches when changing from RH to LH
- 4.1.5 — Creating a new spec sheet (*if applicable*)

Tip: When explaining pitch to a bowler, a useful analogy is a door hinge. A door hung at zero pitch swings equally easily in both directions. Forward pitch is like a door that is easier to push open than to pull — it naturally wants to stay closed (the thumb stays in). Reverse pitch is the opposite — the door swings open easily in one direction, making exit effortless. The fitter's job is to find the hinge angle that matches the bowler's natural motion.

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4.1.5 Bridge: standard bridge sizes and their purpose

Bridge: standard bridge sizes and their purpose

4.1.5 concept

The **bridge** is the distance between the near edges of the middle and ring finger holes on a drilled bowling ball. It is one of the smallest measurements on a spec sheet — typically between $\frac{3}{16}$ " and $\frac{1}{2}$ " — but it directly influences finger comfort, grip stability, and the consistency of the release. This page explains what the bridge does, what the standard sizes are and why they differ by grip type, and when a non-standard bridge is appropriate.

□□ What the Bridge Does

The bridge serves two related purposes: it provides the structural integrity of the land area between the two finger holes, and it determines how closely the middle and ring fingers sit together on the ball during the grip and release.

- A correctly sized bridge allows both fingers to load evenly against their respective hole edges — or insert surfaces — without crowding or spreading.
- Too narrow a bridge risks weakening the land area between the holes, potentially causing cracking under repeated impact — particularly in harder coverstock materials.
- Too wide a bridge forces the fingers apart, reducing the sense of a unified two-finger contact point and potentially affecting the angle of finger lift at release.

- The bridge measurement is recorded on every Spectre Cloud spec sheet and is used by the **Autofill Bridge** setting (2.6.5) to pre-populate the correct standard value based on grip type.

Standard Bridge Sizes

Two standard bridge widths are recognised by IBPSIA and used as the default starting points in Spectre Cloud:

Grip Type	Standard Bridge	Rationale
Fingertip	1/4"	The shallower insertion depth of a fingertip grip places the fingers closer together on the ball surface — a narrower bridge maintains comfortable finger proximity without crowding
Conventional	3/8"	The deeper insertion depth of a conventional grip positions the fingers at a wider natural spacing — a slightly broader bridge accommodates this without creating a gap that feels unnatural

Note: These standard values suit the overwhelming majority of bowlers in each grip category. In Spectre Cloud, the **Autofill Bridge** setting (2.6.5) applies these values automatically when grip type is recorded on the bowler's profile — the fitter is only required to intervene when a non-standard bridge is needed.

The Full Bridge Size Range

While 1/4" and 3/8" are the standard starting points, bridge sizes can be adjusted in both directions to suit individual bowler anatomy. The table below covers the common range and the fitting scenarios each size typically addresses.

Bridge Size	Typical Use Case	Notes
3/16"	Bowlers with very closely spaced fingers; youth bowlers with small hands	Narrowest commonly used bridge — verify land area integrity before drilling, particularly on reactive resin balls
1/4"	Standard fingertip grip	IBPSIA standard for fingertip; default in Spectre Cloud for fingertip bowlers

Bridge Size	Typical Use Case	Notes
5/16"	Fingertip bowlers with slightly wider natural finger spacing; transitional semi-fingertip	One step wider than fingertip standard — a common adjustment for bowlers who find 1/4" slightly cramped
3/8"	Standard conventional grip; wider fingertip fittings	IBPSIA standard for conventional; default in Spectre Cloud for conventional bowlers
7/16"	Conventional bowlers with wide finger spacing; larger hands	Less common — verify that the wider bridge does not create an uncomfortable gap between fingers during delivery
1/2"	Largest hands; specific anatomical requirements	Uncommon — used only when smaller bridges consistently produce finger crowding or discomfort; physical fitting essential

Note: ⚠ Verify with your Spectre team: confirm the full range of bridge values supported as input in Spectre Cloud's spec sheet bridge field, and whether values outside the common range require manual text entry or are available as selectable increments.

☐ Factors That Influence Bridge Size Selection

For the majority of bowlers, the standard bridge for their grip type is the correct choice and requires no adjustment. The following factors are the most common reasons a fitter might deviate from the standard:

Finger Spacing

The natural spacing between a bowler's middle and ring fingers at rest — before any intentional spreading — is the primary driver of non-standard bridge selection. Bowlers whose fingers naturally sit closer together than average benefit from a narrower bridge; those whose fingers naturally sit further apart may prefer a wider one.

- ☐ Observe the bowler's natural hand position before measuring — do the fingers sit together, or is there a visible gap between them?
- ☐ A quick physical test: have the bowler grip a fitted ball and note whether the middle and ring fingers appear crowded against each other or comfortably separated.

Hand Size and Age

- ☐ Youth bowlers with small hands often benefit from a narrower bridge — $\frac{3}{16}$ " is common for younger children.
- ☐ Adult bowlers with very large hands may find the standard bridge too narrow regardless of grip type — a wider bridge provides more comfortable finger separation.

Insert Type

- ☐ Some insert styles — particularly those with wider flanges or non-standard profiles — can affect the effective finger spacing. ⚠ *Verify with your Spectre team: confirm whether Spectre Cloud's Autofill Insert OD setting (2.6.6) accounts for insert flange width when suggesting a bridge value, or whether bridge and OD are calculated independently.*

Injury or Physical Condition

- ☐ Bowlers recovering from finger injuries, or those with joint conditions affecting finger mobility, may require a non-standard bridge to reduce stress on the affected joint.
- ☐ Record any injury-related bridge adjustments in the bowler's profile notes — future fittings should reference this context rather than defaulting to the standard value without checking.

⚠ Land Area Integrity

The **land area** is the surface of the ball between the two finger holes. As the bridge narrows, the land area shrinks — and below a certain width, the land area may not provide sufficient structural support between the holes under the repeated impact of bowling.

- ☐ The land area concern is most relevant at bridge sizes of $\frac{3}{16}$ " or below — at these widths, verify that the ball's coverstock and construction can support the narrow land before drilling.
- ☐ Harder, denser coverstock materials (urethane, particle) are generally more tolerant of narrow bridges than softer reactive resin covers.
- ☐ The total land area also depends on finger hole diameter — larger holes on a narrow bridge produce a smaller land area than smaller holes on the same bridge. Account for both dimensions when evaluating a narrow bridge spec. ⚠ *Verify with your Spectre team: confirm whether Spectre Cloud displays or calculates land area from the bridge and hole diameter values on a spec sheet, or whether this calculation is left to the fitter.*
- ☐ Do not drill a bridge narrower than $\frac{3}{16}$ " without careful assessment of the specific ball and coverstock — some ball manufacturers publish minimum land area guidelines for their

products.

☐☐ Bridge and the Auto-Suggestion Chain

The bridge measurement is one of several values that feed into Spectre Cloud's downstream calculations. It is part of the input set used by **Autofill Cut to Cut (2.6.9)** to derive the Cut to Cut span from insert dimensions — a correct bridge value is essential for an accurate Cut to Cut autofill result.

- ☐ If a non-standard bridge is entered manually on a spec sheet, the Cut to Cut autofill will use the manually entered value — not the standard default.
- ☐ If the bridge is changed after the Cut to Cut has been autofilled, confirm whether the Cut to Cut value updates automatically. *△ Verify with your Spectre team: confirm live update behaviour for Cut to Cut when bridge is changed on an in-progress spec sheet, consistent with the question raised in 2.6.9.*

☐☐ Bridge on the Spec Sheet

The bridge field appears in the insert and finger hole section of the Spectre Cloud spec sheet. When **Autofill Bridge (2.6.5)** is enabled and grip type is recorded, the field is pre-populated with the standard value for the bowler's grip. The value can be overridden at any time by entering a different measurement directly.

- ☐ The autofilled bridge value is displayed in whatever unit and format is set for the account — fractional or decimal, consistent with chapter 2.3 display settings.
- ☐ A manually entered bridge is saved to the spec sheet history and is visible when the sheet is reviewed or cloned.
- ☐ When cloning a spec sheet, the bridge value carries forward — confirm it is still appropriate for the new ball before saving. *△ Verify with your Spectre team: confirm that bridge is included in the cloned field set, consistent with the clone behaviour questions raised in 3.2.4.*

Related Sections

- 4.1.4 — Pitch terminology: Forward, Reverse, Lateral, Zero pitch explained
- 4.1.3 — Grip type definitions: Fingertip vs. Conventional
- 4.1.2 — Span types explained: Full Span vs. Cut to Cut vs. Oval Span

- 2.6.5 — Autofill Bridge: auto standard bridge (1/4" fingertip, 3/8" conventional)
- 2.6.9 — Autofill Cut to Cut: based on insert type/size
- 4.1.6 — Creating a new spec sheet (*if applicable*)
- 9.x — Tips and Troubleshooting: land area and narrow bridge considerations

Tip: The bridge is the one spec sheet measurement that is as much about the ball as it is about the bowler. When in doubt, default to the IBPSIA standard for the grip type — it is the value that works correctly for the widest range of bowlers and ball constructions, and it is the value Spectre Cloud will suggest automatically. Non-standard bridges should always be the result of a specific observed fitting need, not a default assumption.

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4.1.6 Insert OD: drill bit sizing for STD and VACU grips

Insert OD: drill bit sizing for STD and VACU grips

4.1.6 concept

When drilling finger holes for bowlers who use inserts, the drill bit must match the insert's **Outside Diameter (OD)** — the outer dimension of the insert that determines the hole size required for a correct fit. Two insert seating systems are widely used in pro shops: **STD (Standard)** and **VACU (Vacuum)**. Each system uses a different seating mechanism, and the drill bit sizing approach differs accordingly. This page explains both systems, how OD sizing works for each, and how Spectre Cloud's **Autofill Insert OD** setting (2.6.6) handles the distinction.

□□ What Is Insert OD?

The **Outside Diameter (OD)** of a finger insert is the outer measurement of the insert — the dimension that must match the drilled hole for the insert to seat correctly. If the hole is drilled too small, the insert cannot be pressed in without risk of cracking the ball. If the hole is drilled too large, the insert will be loose and may spin, fall out, or produce an inconsistent grip surface.

- □ OD is a physical property of the insert — it is published by the insert manufacturer and is specific to each insert model and size.
- □ The drill bit size used for an insert hole must match the insert's OD — not the bowler's finger size.

- □ The bowler's finger size determines the insert's **inner diameter (ID)** — the measurement used to select the correct insert size for the bowler's finger.
- □ OD and ID are related but independent — a larger finger requires a larger insert ID, but the OD for any given insert model is fixed regardless of the ID selected.

Note: △ *Verify with your Spectre team: confirm whether Spectre Cloud stores and displays both OD and ID for inserts on spec sheets, or whether only OD (the drill bit dimension) is recorded.*

□ STD (Standard) Inserts

Standard inserts are press-fit into the finger hole — the insert is pushed into the hole and held in place by friction between the insert's outer surface and the ball's coverstock. The hole must be drilled to the insert's exact OD for the press-fit to work correctly.

Drill Bit Sizing for STD Inserts

- □ The drill bit size equals the insert's published OD — a direct, one-to-one match.
- □ Most STD insert manufacturers publish their OD in fractions of an inch — the drill bit is selected to match this value exactly.
- □ A correctly fitted STD insert requires firm hand pressure or a seating tool to press into the hole — it should not drop in freely, nor should it require excessive force.
- □ If the insert spins freely after seating, the hole was drilled slightly too large — insert adhesive can be used as a remediation, but re-drilling to the correct size is preferable for a new ball.
- □ STD inserts that are too tight — drilled fractionally undersized — risk cracking the ball surface when pressed in. Never undersize an STD hole.

Common STD OD Values

STD insert OD values vary by manufacturer and model. The following represents the general range — always verify against the specific insert's published specification before drilling. △ *Verify with your Spectre team: confirm STD OD values for the insert brands carried by your shop and populate this reference with verified figures.*

Insert Brand / Model	System	Published OD
Storm Sure-Fit	STD	△ <i>Verify with Spectre team</i>
Vise IT	STD	△ <i>Verify with Spectre team</i>
Turbo Switch Grip	STD	△ <i>Verify with Spectre team</i>
Vise VACU Grip	VACU	△ <i>Verify with Spectre team</i>

Insert Brand / Model	System	Published OD
<i>Additional brands</i>	—	—

Note: OD values have been left blank pending verification — publishing incorrect OD figures would directly cause drilling errors. Do not fill in these values without confirmation from the Spectre team or the relevant manufacturer's current specification sheet, consistent with the note in 2.6.6.

☐ VACU (Vacuum) Inserts

VACU inserts use a vacuum-seal seating mechanism rather than a simple press-fit. The insert incorporates a sealing flange that creates a partial vacuum when seated — this vacuum holds the insert in place without relying solely on friction between the insert OD and the hole wall. As a result, VACU holes are typically drilled **slightly larger** than the insert's nominal OD to allow the vacuum seal to engage correctly.

Drill Bit Sizing for VACU Inserts

- ☐ VACU holes are drilled to a size specified by the insert manufacturer — typically fractionally larger than the insert's body OD to allow the sealing flange to engage.
- ☐ The exact drill bit size for a VACU insert is published by the manufacturer — do not assume it is the same as the insert's body OD.
- ☐ A correctly drilled VACU hole allows the insert to be pressed in and seated with the sealing tool — the vacuum is created when the insert is fully seated and released.
- ☐ VACU inserts can be removed and resealed — this is one of their primary advantages for bowlers whose thumb size fluctuates or who share equipment across sessions.
- ☐ Drilling a VACU hole to the body OD rather than the specified seating size will prevent the vacuum mechanism from engaging — the insert will either not seat correctly or will not hold.

STD vs. VACU — Key Differences

	STD (Standard)	VACU (Vacuum)
Seating mechanism	Friction press-fit	Vacuum seal with seating flange
Drill bit size	Equals insert OD exactly	Specified by manufacturer — typically slightly larger than body OD
Removability	Permanent once seated — removal risks damage	Removable and reusable — designed for removal

	STD (Standard)	VACU (Vacuum)
Thumb swelling accommodation	Fixed size — no adjustment after drilling	Inserts can be swapped for a different size as thumb changes
Seating tool required	Typically seated by hand or with a press tool	Requires VACU seating tool to engage vacuum correctly
Common use case	General fingertip fitting; most insert-based fittings	Bowlers with thumb size variability; thumbless-compatible setups

⚙️ How Spectre Cloud Handles STD vs. VACU

The **Autofill Insert OD** setting (2.6.6) populates the drill bit size field on a spec sheet based on the insert type and grip style recorded for the bowler. For the autofill to produce the correct drill bit size for VACU inserts, the insert type must be recorded as VACU — not simply by brand name — so that Spectre Cloud can apply the manufacturer's specified seating size rather than the body OD.

- When insert type is recorded as STD, Autofill Insert OD applies the insert's published OD as the drill bit size.
- When insert type is recorded as VACU, Autofill Insert OD applies the manufacturer's specified seating size — which accounts for the vacuum flange geometry. *△ Verify with your Spectre team: confirm whether Spectre Cloud distinguishes between STD and VACU insert types in its autofill logic, and whether VACU seating sizes are stored separately from body OD values in the insert database.*
- If the insert type is not recorded or is not in Spectre Cloud's database, the OD field will remain blank — manual entry is required. See 2.6.6 for guidance on unlisted inserts.

Insert OD and the Spec Sheet Record

The drill bit size — whether autofilled or manually entered — is saved as part of the spec sheet record. For shops that re-drill or refit inserts, having the correct OD on record ensures future sessions start from a verified figure rather than a guess.

- The OD is visible in the spec sheet detail view and in the bowler's drilling history.
- When a spec sheet is cloned for a new ball, the insert type and OD carry forward — confirm both are still correct for the new ball before saving.

- ☐ If a bowler switches insert systems — from STD to VACU, for example — create a new spec sheet rather than editing an existing one, so the historical record accurately reflects which system was drilled on each ball.

☐ Tips for Accurate Insert OD Drilling

- ☐ Always verify OD against the current manufacturer specification before drilling — insert dimensions can change between product generations even when the product name remains the same.
- ☐ Keep a physical reference card at the drill press listing the OD for each insert brand and model your shop carries — this provides a fast cross-check against the spec sheet value before drilling.
- ☐ For VACU inserts, confirm the seating tool is in good condition before drilling — a worn or damaged seating tool produces an unreliable vacuum seal even when the hole is correctly sized.
- ☐ Test-seat the insert before the ball leaves the shop — a quick press-fit or vacuum test confirms the hole size is correct before the bowler throws their first game.

Related Sections

- 4.1.5 — Bridge: standard bridge sizes and their purpose
- 4.1.4 — Pitch terminology: Forward, Reverse, Lateral, Zero pitch explained
- 4.1.3 — Grip type definitions: Fingertip vs. Conventional
- 2.6.6 — Autofill Insert OD: auto drill bit size per insert type and grip
- 2.6.7 — Auto-Repeat Insert Size: mirror size from ring to middle finger
- 4.1.7 — Creating a new spec sheet (*if applicable*)
- 9.x — Tips and Troubleshooting: insert seating issues and OD mismatches

Tip: The single most common insert-related drilling error is using the body OD for a VACU hole. If a shop is transitioning from STD to VACU inserts — or adding VACU to its product offering for the first time — brief every driller on the size difference before the first VACU ball is drilled. One clear conversation at the press prevents a class of errors that is entirely avoidable.

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