# 5.1.4 How oval degree affects pitch inside the oval

# How oval degree affects pitch inside the oval

> 5.1.4 concept

When a thumb hole is round, vertical pitch and lateral pitch act independently — each one influences the thumb along its own axis without affecting the other. When the hole is oval, this independence breaks down. The elongated axis of the oval rotates the effective geometry of the hole wall, meaning the thumb no longer contacts a symmetric surface. The result is that a pitch value drilled at face value into an oval hole produces a **different felt angle** than the same value drilled into a round hole — and the degree of the difference depends directly on the oval degree angle.

Because Spectre Cloud does not automatically compensate for this interaction, the operator needs to understand it and adjust pitch entries accordingly before the spec sheet is finalised.

## □□ Why the Oval Changes How Pitch Feels

In a round hole, every point on the hole wall is equidistant from the center — the thumb contacts a uniform surface all the way around. Pitch tilts this uniform surface at a consistent angle, and the thumb feels exactly that angle regardless of where it contacts the wall.

In an oval hole, the wall is no longer uniform. Along the short axis (the starting bit dimension), the wall is close to the thumb surface. Along the long axis (the oval width dimension), the wall is further away. The thumb sits in an asymmetric space, and the angle at which it contacts the wall varies around its perimeter. When pitch is applied to this asymmetric hole, the thumb does not experience the pitch angle cleanly along a single axis — it experiences a **blended effect** that combines both vertical and lateral pitch influence in proportions determined by the oval degree.

# How Oval Degree Determines the Blend

The oval degree angle determines which pitch axis is most affected by the oval geometry — and by how much.

| Oval degree | Effect on vertical pitch | Effect on lateral pitch |
|---|---|---|
| `0°` / `180°` (oval along vertical axis) | Strongly amplified — the long axis of the oval runs in the same direction as vertical pitch, intensifying its effect | Largely unaffected — the short axis runs horizontally, leaving lateral pitch close to its drilled value |
| `90°` (oval along horizontal axis) | Largely unaffected — the short axis runs vertically, leaving vertical pitch close to its drilled value | Strongly amplified — the long axis of the oval runs in the same direction as lateral pitch, intensifying its effect |
| `45°` / `135°` | Moderately amplified — the long axis is diagonal, partially overlapping the vertical pitch axis | Moderately amplified — the long axis is diagonal, partially overlapping the lateral pitch axis equally |
| Any other angle | Amplified in proportion to how much the oval long axis aligns with the vertical pitch direction | Amplified in proportion to how much the oval long axis aligns with the lateral pitch direction |

**The key principle:** The more the oval long axis aligns with a pitch axis, the more that pitch is amplified by the oval geometry. At `45°` both pitches are affected equally. At `0°` or `180°` only vertical pitch is meaningfully affected. At `90°` only lateral pitch is meaningfully affected.

# How to Adjust Pitch Entries to Compensate

Because the oval amplifies pitch along the axis it aligns with, the operator should **reduce the intended pitch value** on the affected axis before entering it into Spectre Cloud. The goal is to enter a pitch value that, once amplified by the oval geometry, produces the pitch the bowler

actually wants to feel.

# General adjustment approach

1. Identify the bowler's intended pitch — the vertical and lateral values that would produce the correct feel in a round hole.
2. Note the oval degree value for the fitting.
3. Determine which pitch axis the oval long axis most closely aligns with — this is the axis most in need of downward adjustment.
4. Reduce the pitch entry on that axis to compensate for the amplification. The greater the oval width relative to the starting bit, the more amplification occurs and the more the pitch entry should be reduced.
5. For diagonal ovals (`45°`, `135°`, or similar), apply a moderate reduction to both vertical and lateral pitch entries.
6. Enter the adjusted values into the spec sheet — not the original intended pitch values.
7. Note the original intended pitch values and the adjustments made in the **Notes** field — this is critical context for future visits and re-drillings.

*Verify with Spectre team: confirm whether Spectre Cloud provides any on-screen guidance, suggested adjustment values, or a pitch correction calculator to assist operators with this compensation — or whether the adjustment is entirely at the operator's discretion based on experience and observation.*

# □□ Practical Adjustment Reference

| Oval degree | Vertical pitch adjustment | Lateral pitch adjustment |
|---|---|---|
| `0°` / `180°` | Reduce — vertical pitch is amplified by the oval long axis | None — lateral pitch is unaffected |
| `90°` | None — vertical pitch is unaffected | Reduce — lateral pitch is amplified by the oval long axis |
| `45°` / `135°` | Moderate reduction — partial overlap with vertical axis | Moderate reduction — partial overlap with lateral axis |
| Angles closer to `0°` or `180°` | Larger reduction — stronger alignment with vertical axis | Smaller reduction — weaker alignment with lateral axis |
| Angles closer to `90°` | Smaller reduction — weaker alignment with vertical axis | Larger reduction — stronger alignment with lateral axis |

**Note:** The exact amount of reduction depends on the specific oval dimensions — a large oval (wide width relative to starting bit) amplifies pitch more than a small oval. There is no universal formula that applies to all fittings. Experienced operators develop a feel for the adjustment over time; for new oval fitters, starting with a conservative reduction and refining based on bowler feedback is a

sound approach. *Verify with Spectre team: confirm whether specific adjustment increments or a calculation method will be documented in a later Book 05 section.*

# Practical Tips for Managing Pitch in Oval Fittings

- Always note the **original intended pitch values** in the Notes field alongside the adjusted values actually entered — if the bowler returns with fit feedback, knowing the starting intention makes it far easier to diagnose and correct.
- For a bowler's first oval thumb fitting, schedule a follow-up conversation after a few sessions — pitch feel in an oval hole sometimes takes a game or two to assess accurately, and having the adjustment notes on record makes any refinement straightforward.
- When cloning an oval spec sheet for a new ball, verify that the cloned pitch values are the **adjusted** values — they should be, since they were what was entered — but confirm the oval degree is unchanged before drilling. A different oval degree on the new ball requires a fresh pitch adjustment calculation.
- Do not enter the bowler's intended round-hole pitch values without adjustment when drilling an oval — the amplification effect is real and consistent, and ignoring it will produce a hole that feels different from what the bowler expects even if all other measurements are correct.
- Do not assume the same pitch adjustment applies across different oval sizes for the same bowler. A wider oval on a new ball requires a larger adjustment than a narrower oval, even at the same degree angle.

# Related Sections

- 5.1.2 — Oval terminology: Starting Bit, Oval Width, Degree, Taper
- 5.1.3 — Vertical cut (V) vs. Horizontal cut (H)
- 5.2 — Oval degrees — understanding hole orientation
- 4.3.3 — Inputting vertical and lateral pitch for fingers
- 4.4.4 — Entering vertical and lateral pitch for thumb
- 4.5.2 — Entering starting bit, oval width, oval degrees and taper

**Tip:** The pitch-oval interaction is one of the subtler aspects of oval thumb fitting — and one of the reasons experienced oval fitters produce consistently better results than those who apply oval drilling purely mechanically without accounting for it. A bowler who gets an oval fitting from an operator who understands this interaction will feel the difference immediately compared to one who does not.

```
```

Revision #2
Created 11 May 2026 16:04:41 by Admin
Updated 27 May 2026 20:32:50 by Art