Teeth Per Inch — Technical Reference for Professional Blade Selection

Technical Reference Guide for Professional Buyers

Oscillating · Reciprocating · Jigsaw Blades

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This guide helps distributors, OEM partners, and professional buyers select the correct Teeth Per Inch (TPI) for DURASAWS oscillating, reciprocating, and jigsaw blades. Proper TPI selection directly affects cut quality, cutting speed, blade life, and material compatibility.

TPI refers to the number of teeth per inch (25.4 mm) along the cutting edge. The general rule: **Lower TPI = Faster, rougher cuts in thicker materials. Higher TPI = Slower, cleaner cuts in thinner materials.**

Always match TPI to material thickness: at least 3 teeth should engage the material at all times for stable cutting.

Tooth Geometry Fundamentals

Tooth pitch (distance between teeth) determines chip load and clearance. Variable pitch (e.g., 6/10 TPI) reduces vibration by breaking harmonic resonance. DURASAWS uses precision-ground tooth profiles optimized for each material class.

Kerf Width & Set

Kerf = blade thickness + tooth set. Wider kerf = faster material removal but more power required. DURASAWS blades feature optimized set patterns for each TPI range to balance speed and finish quality.

Rake Angle & Hook

Positive rake (hook) angles aggressively pull into material — ideal for wood. Neutral/negative rake angles provide control in metal. DURASAWS specifies the correct geometry per application.

3.1 Oscillating Blades — TPI Reference

Oscillating blades use shorter strokes (3–4° oscillation angle). TPI selection focuses on material hardness and desired finish.

TPI Range	Tooth Pitch	Best For	Materials	Typical DURASAWS Models

10–14 TPI	1.8–2.5 mm	Fast cutting, thicker stock	Wood, plywood, soft plastics, gypsum	DS-OS-CRV-44-W02 (14 TPI)
14–18 TPI	1.4–1.8 mm	General purpose, clean cuts	Wood, nail-embedded wood, soft metals	DS-OS-HCS-34-W01 (14 TPI), DS-OS-BIM-68-W04 (18 TPI)
18–24 TPI	1.0–1.4 mm	Fine finish, thin materials	Sheet metal, thin profiles, finish cuts	DS-OS-BIM-32-W06 (18 TPI)
24–32 TPI	0.8–1.0 mm	Precision, very thin metal	Thin sheet metal, non-ferrous, finishing	DS-OS-CARB-34-W05 (24 TPI)

Table 1: Oscillating Blade TPI Selection

3.2 Reciprocating Blades — TPI Reference

Reciprocating blades use longer strokes (19–32 mm). Variable pitch (e.g., 6/10, 10/14) is standard for demolition to reduce vibration.

TPI Range	Tooth Pitch	Best For	Materials	Typical DURASAWS Models
3–6 TPI	4.2–8.5 mm	Aggressive demolition, thick wood	Logs, timber, pallets, pruning	DS-RC-CRV-300-R01 (6 TPI)
6–10 TPI	2.5–4.2 mm	General demolition, nail-embedded wood	Demolition, renovation, pallets	DS-RC-BIM-230-R03 (6/12 TPI)
10–14 TPI	1.8–2.5 mm	Mixed metal/wood, pipe, ductwork	Thin metal, pipe, HVAC duct	DS-RC-BIM-215-R07 (10-14 TPI)
14–18 TPI	1.4–1.8 mm	Medium metal, stainless	Sheet metal, conduit, profiles	DS-RC-BIM-230-R02 (20/24 TPI)
18–24 TPI	1.0–1.4 mm	Thin metal, finish cuts	Sheet metal < 3 mm, profiles	DS-RC-BIM-230-R02 (20/24 TPI)

Table 2: Reciprocating Blade TPI Selection

3.3 Jigsaw Blades — TPI Reference

Jigsaw blades cut on the upstroke (T-shank). TPI selection is critical for curve radius and edge quality.

TPI Range	Tooth Pitch	Best For	Materials	Typical DURASAWS Models
6–8 TPI	3.2–4.2 mm	Fast curves, thick wood	Softwood, construction timber > 20 mm	DS-JS-BIM-116-J07 (6 TPI)
8–12 TPI	2.1–3.2 mm	General woodworking, clean curves	Hardwood, plywood, laminates 10–30 mm	DS-JS-CRV-100-J01 (18 TPI), DS-JS-HCS-100-J02 (10 TPI)
12–18 TPI	1.4–2.1 mm	Fine finish, thin sheet	Thin wood, veneer, plastic, non-ferrous	DS-JS-HCS-100-J04 (8 TPI), DS-JS-HCS-100-J02 (10 TPI)
18–24 TPI	1.0–1.4 mm	Metal, very fine finish	Sheet metal, steel, aluminum < 5 mm	DS-JS-COB-150-J06 (14 TPI), DS-JS-COB-150-J08 (18 TPI)

Table 3: Jigsaw Blade TPI Selection

Quick Reference: Minimum 3 Teeth Engagement Rule

To prevent tooth stripping and ensure stable cutting, maintain at least 3 teeth in the material at all times. Use this formula: **TPI ≥ 3 / Material Thickness (inches)** or **TPI ≥ 76 / Material Thickness (mm)**.

Material Thickness	Min TPI (Wood/Plastic)	Min TPI (Metal)	Recommended DURASAWS Range
< 3 mm (1/8")	14–18	18–24	18–24 TPI
3–6 mm (1/8–1/4")	10–14	14–18	14–18 TPI
6–13 mm (1/4–1/2")	8–12	10–14	10–14 TPI
13–25 mm (1/2–1")	6–10	8–12	6–10 TPI
25–50 mm (1–2")	4–8	6–10	6–8 TPI
> 50 mm (> 2")	3–6	4–8	3–6 TPI

Table 4: Minimum TPI by Material Thickness (3-teeth rule)

Variable Pitch (e.g., 6/10, 10/14, 20/24)

Alternating tooth spacing breaks harmonic vibration, reducing chatter in demolition and metal cutting. DURASAWS Bi-Metal reciprocating blades use variable pitch as standard for smoother cuts and longer life.

Wavy Set / Milled Teeth

Wavy tooth pattern (e.g., DS-JS-BIM-116-J07) creates wider kerf for chip clearance in soft materials (plastic, foam, insulation). Prevents binding and melting.

Grit Edge (Carbide/Diamond)

No traditional TPI — cutting action by abrasive grit. Rated by grit size (mesh). Carbide grit for fiberglass, cement board; Diamond grit for tile, stone, glass.

- **Start with higher TPI** if unsure — better to cut slower with clean finish than strip teeth.
- **Match blade length to cut depth** — blade should extend 25–50 mm beyond workpiece.
- **Use cutting fluid/oil for metal** — extends blade life 3–5×, especially above 14 TPI.
- **Reduce feed pressure on curves** (jigsaw) — let teeth do the work; forcing causes deflection.
- **Check tooth engagement** — if < 3 teeth in cut, switch to higher TPI or slower feed.
- **Variable pitch for mixed materials** — ideal for demolition with unknown nail/metal content.

TPI

Teeth Per Inch — number of teeth per 25.4 mm

Tooth Pitch

Distance between adjacent tooth tips (mm)

Kerf

Width of cut = blade body + tooth set

Set

Lateral offset of teeth to create clearance

Rake Angle

Angle of tooth face relative to radial line

Gullet

Space between teeth for chip evacuation

Variable Pitch

Alternating tooth spacing to reduce vibration

References:

- **Bosch Professional Accessories Catalog — TPI Selection Charts**
- **Fein Multimaster Application Guide — Oscillating Blade Selection**
- **ISO 1054 / DIN 6494 — Reciprocating Saw Blade Standards**
- **DURASAWS Product Catalog — 229 Models Across 3 Lines**