FRIM
TIMBER TECHNOLOGY BULLETIN
NO. 98, 2019
ISSN: 139-258

# THE EFFECTIVE TOOTH WIDTH OF A BANDSAW BLADE FOR SAWING MALAYSIAN TIMBERS

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## OVERVIEW

The tooth width of a bandsaw blade is referred to as the geometrical thickness of the stellite tip (Figure 1). In the sawmilling practice, a wear-resistant alloy termed stellite is welded directly on top of each swaged tooth prior to sharpening (Figure 2). A sharpened stellite tip forms an axe-shaped tooth, and the thickness of all teeth is made uniform all the way through the blade length using a side dressing machine (Figure 3). Sawing of hardwoods using a bandsaw blade of asymmetrical teeth could lead to a broken tooth, fractured blade or ruptured blade (Figures 4).

Selecting a tooth width in sawlog processing depends on the type and physical characteristics of the timber. For example, sawing timbers of high density requires a blade with a smaller tooth width to reduce mechanical abrasion and frictional heat. It is more energy-efficient to saw high-density timbers with lesser processing waste. On the contrary, sawing low-density timbers is more appropriate using a blade with a larger tooth width to speed-up the processing rate and increase the efficiency of discharging the waste. In general, an effective thickness of the stellite tip is essential to optimise the sawing process of a particular timber species.

The tooth width of a bandsaw blade is measured using a micrometer, a device widely used for accurate measurement of components in machining (Figure 5). Choosing the suitable tooth width for bandsaw blade is essential to ensure a reliable and efficient sawing. Using a wrong tooth width may lead to wasteful cutting, erroneous sawing sizes, increased maintenance frequency, sawing instability or operational disaster. This article provides a ready and easy reference for the effective tooth width of a bandsaw blade for sawing some popular Malaysian timbers.

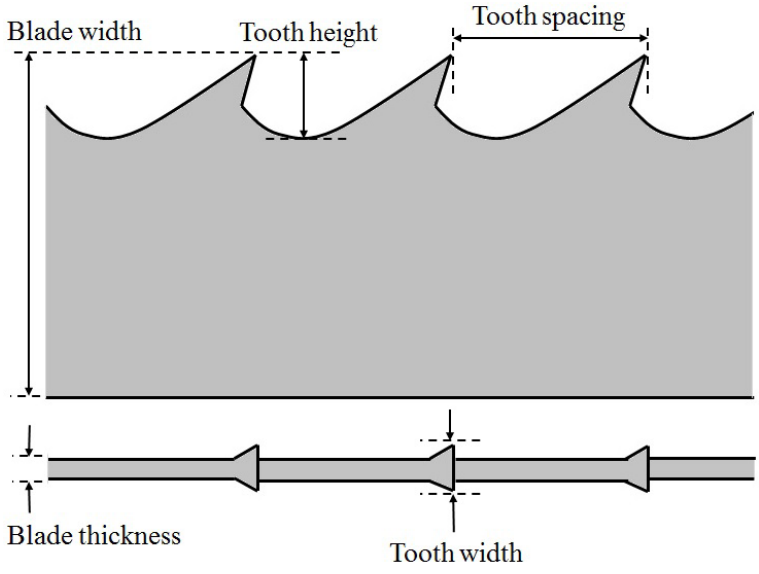



**Figure 1** The geometrical measurements of a bandsaw blade

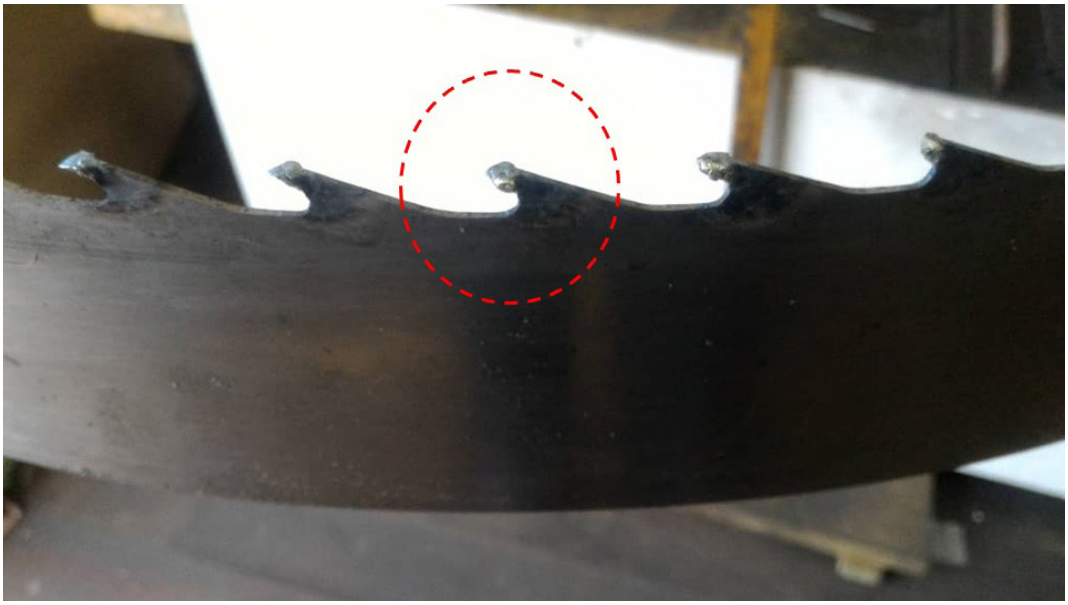
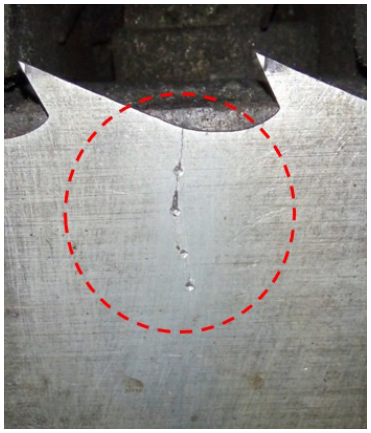


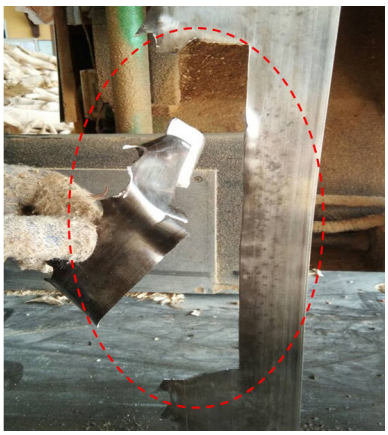
**Figure 2** A swaged tooth with stellite tipping before sharpening

**Figure 3** A side dressing machine

(a) A broken tooth



(b) A fractured blade



(c) A ruptured blade

**Figure 4** Failures of bandsaw blade during sawing due to asymmetrical teeth

**Figure 5** Measuring tooth width using a micrometer

## TOOTH WIDTH OF A BANDSAW BLADE FOR SAWING MALAYSIAN TIMBERS

The effective tooth width of a bandsaw blade for sawing Malaysian timbers are presented in Table 1, sorted from the lowest measurement (leftmost column) to the highest measurement (rightmost column). The engineering tolerance is recommended at ±0.05 mm accuracy. Most timbers are listed in the table based on Standard Malaysian Names. Timbers in each column are arranged in alphabetical orders. The classification is generally based on timber density and sawing data from the previous assessments (Wong 2002). Some information was derived from the routine operations and daily records of Log Processing Workshop of FRIM. The presented table is a straightforward and practical guide to determine the suitable tooth width of a bandsaw blade in timber processing. Additionally, suitable tooth width for some non-wood species is incorporated.

**Table 1** The effective tooth width of a bandsaw blade for sawing Malaysian timbers

| No. | Tooth width (±0.05 mm) | | | | |
|---|---|---|---|---|---|
| | 2.1 | 2.2–2.4 | 2.5–2.7 | 2.8–3.0 | 3.1–3.3 |
| 1. | Bakau | Bekak | Acacia | Ara | Damar minyak |
| 2. | Balau | Buluh semantan | Berangan | Balek angin | Jelutong |
| 3. | Balau, red | Bungor | Bintangor | Batai | Karas |
| 4. | Bayas | Kandis | Brazil nut | Geronggang | Mahang |
| 5. | Belian | Kapur | Cempedak | Kelempayan | Oil palm |
| 6. | Bitis | Keladan | Durian | Kelumpang | Podo |
| 7. | Chengal | Kulim | Gerutu | Kembang semangkok | Pulai |
| 8. | Coconut | Machang | Kasah | Kungkur | Sesenduk |
| 9. | Giam | Mahogany | Kasai | Petai | |
| 10. | Kekatong | Meranti bakau | Kedondong | Sempilor | |
| 11. | Kempas | Merawan | Kelat | Terap | |
| 12. | Keranji | Merpauh | Keledang | Terentang | |
| 13. | Mata ulat | Mersawa | Keruing | | |
| 14. | Merbatu | Mertas | Ketapang | | |
| 15. | Merbau | Nyalin | Khaya | | |
| 16. | Nibong | Pauh kijang | Maesopsis eminii | | |
| 17. | Penaga | Perah | Medang | | |
| 18. | Pinang palm | Rengas | Mempisang | | |
| 19. | Resak | Surian batu | Meransi | | |
| 20. | Ru | Tembusu | Meranti, dark red | | |
| 21. | | Tualang | Meranti, light red | | |
| 22. | | | Meranti, white | | |
| 23. | | | Meranti, yellow | | |
| 24. | | | Nangka | | |
| 25. | | | Nyatoh | | |
| 26. | | | Penarahan | | |
| 27. | | | Penyau | | |
| 28. | | | Perupok | | |
| 29. | | | Petaling | | |
| 30. | | | Pine | | |
| 31. | | | Ramin | | |
| 32. | | | Rubberwood | | |
| 33. | | | Sentang | | |
| 34. | | | Sepetir | | |
| 35. | | | Simpoh | | |
| 36. | | | Tampoi | | |
| 37. | | | Teak | | |

Note: Tooth width measurements are based on bandsaw blade of 1.24 mm thick

## SUMMARY

The specific tooth width of a bandsaw blade is recommended for sawing timbers of different physical properties. A table of suitable tooth width for sawing Malaysian timbers is provided to assist engineers and sawmillers in ensuring reliable and efficient processing. Ultimately, sawing timbers using a bandsaw blade of an accurate and appropriate thickness can minimise maintenance works and cost plus reduce the risk of injury.

## REFERENCES

Wong TM. 2002. A Dictionary of Malaysian Timbers. Second edition. Revised by Lim SC & Chung RCK. *Malayan Forest Records* No. 30. Forest Department Peninsular Malaysia, Kuala Lumpur.

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The tooth width of the bandsaw blade for sawlog processing depends on the type and physical characteristics of the timber. Selecting the suitable tooth width is essential to ensure a reliable, efficient and safe sawing process. Using a wrong tooth width may lead to wasteful cutting, erroneous sawing sizes, increased maintenance frequency, sawing instability or operational disaster. This article provides an easy reference for the effective tooth width of a bandsaw blade for sawing Malaysian timbers.



Series Editor : Mohamad Omar MK
Managing Editor : Vimala S
Typesetter : Rohayu Y

Set in Times New Roman 11

Printed by Publications Branch, Forest Research Institute Malaysia
52109 Kepong, Selangor