

# Safety and health alert

## 17/04 Wood chipper disk failures

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### Incident

The catastrophic failure in Western Australia of a 1650 mm diameter and 57 mm thick disk, fitted to an Austchip wood chipper, caused the death of one of the operators. The manufacturer Austchip refers to this wood chipper as a "600 mm chipping capacity" wood chipper. An investigation by WorkSafe found that the wood chipper disk had previously failed in the area of outer ligament (the metal from the blade pockets to the outer edge of the disk) along the axis of the two original square cornered blade pockets. The lengths of the ligaments were approximately 30 mm. The disk had been repaired by welding cover plates over the two outer blade positions and along the failure line. Two additional outer blade pockets had then been milled into the disk, at ninety degrees to the existing blade pockets. The oxy-cutting and welding work contributed to the fatigue cracking in the inner and outer ligament area of the disk.

The investigation also found that the wood chipper conveyor feed belt that provided a controlled feed rate to the wood chipper had been removed and replaced by a spiked roller feed system.

It was revealed that these modifications and repairs to the wood chipper disk were carried out without consulting the manufacturer.

The investigation also revealed that a similar disk failure in Victoria in 1999 involving a 450 mm (18 inch) chipping capacity Austchip wood chipper disk.

This disk also failed along the axis of the two blade pockets.

Consequentially, WorkSafe requested the disk manufacturer, Austchip to conduct design audits on current and previous disks to ensure that the designs were safe. The audits revealed that the 225 mm (9 inch) chipping capacity disk, based on its thickness, required greater than 30 mm ligament (metal) between the blade pocket and disk outer edge to satisfy the criteria for fatigue stresses. There are currently 225 mm model wood chippers in use where the ligament size is 30 mm or less.

### Factors

- Adequacy of ligament size:
  - The failed 600 mm chipping capacity Austchip disk was 57 mm thick with two blade pockets diagonally opposite each other with a narrow ligament of disk steel around the outer circumference (approximately 30 mm long ligaments).
- Oxy cutting and welding may accelerate the growth of fatigue cracking.
- Repairs and modifications were carried out without consultation with the manufacturer.



## Recommendations

1. Employers that operate plant, such as wood chippers, must maintain the plant on a regular basis. Critical load bearing components, such as disks, should be regularly inspected by competent persons in accordance with the manufacturers instructions.
2. Welding of plant subject to fatigue loading, such as wood chipper disks, should be carried out in accordance with AS/NZS1554.5 - Welding of steel structures subject to high levels of fatigue loading and in consultation with the manufacturer.
3. Modifications or alterations to critical components of wood chippers must not be carried out without consulting the manufacturer or other suitably qualified competent persons, such as engineers.
4. Designers, manufacturers and suppliers of new and second hand wood chippers have a duty to provide all available information, such as maintenance and operator's manuals, design specifications, maintenance records and hazards associated with the wood chippers, to the purchaser at the time of sale and thereafter when requested.
5. Designers, manufacturers and suppliers have duties, pursuant to Section 23 of the Occupational Safety and Health Act 1984, in relation to the design and construction of wood chippers, so that persons who maintain or use wood chippers are not exposed to hazards.
6. Designers, manufacturers and suppliers (importers) of wood chippers should ensure suitably qualified competent persons, such as engineers, carry out design calculations to ensure that the wood chipper designs are safe.
7. Owners and operators of Austchip wood chippers with square cornered blade pockets or a ligament size of 30 mm or less should contact Mr Jeffrey Neven of Austnev Fabrications Pty Ltd T/A Austchip on (03) 9764 5700.

## Further Information

Further information can be obtained from the WorkSafe internet site [www.worksafe.wa.gov.au](http://www.worksafe.wa.gov.au), or by contacting customer service on 1300 307 877 or email: [safety@docep.wa.gov.au](mailto:safety@docep.wa.gov.au).