Playground under surfacing

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1. Synthetic
(unitary surfacing)

2. Loose fill

(Also, 3. Tiles)

AS/NZS 4422:2016 plus additional guidance in AS4486 part 0

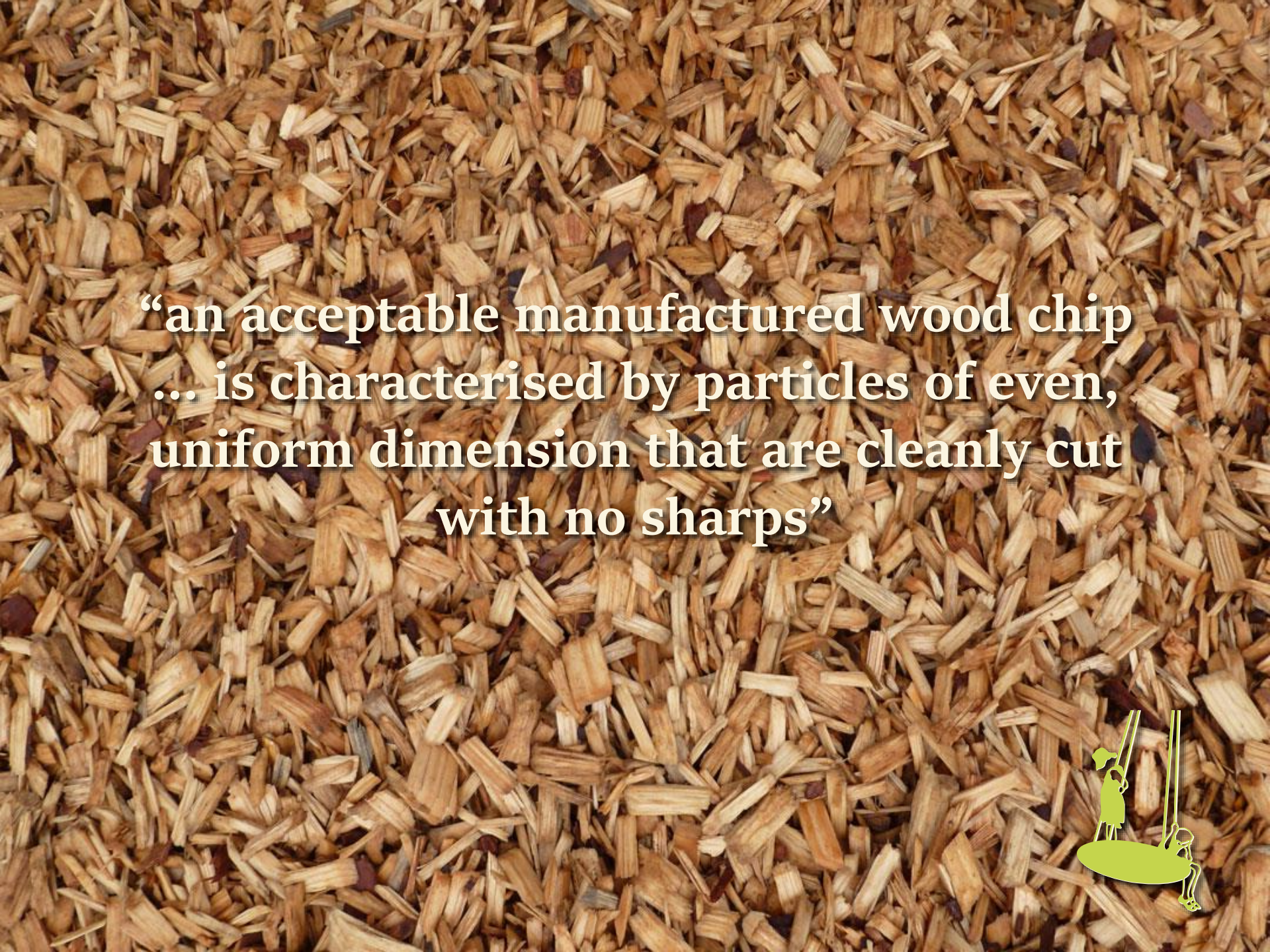
You do not need a copy of this standard


Is only designed to prevent head injury.
It will not prevent other types of injury (such as broken bones).
Arguably, it may even contribute to some types of injury due to unstable and/or slippery surfaces and trip hazards around edging.

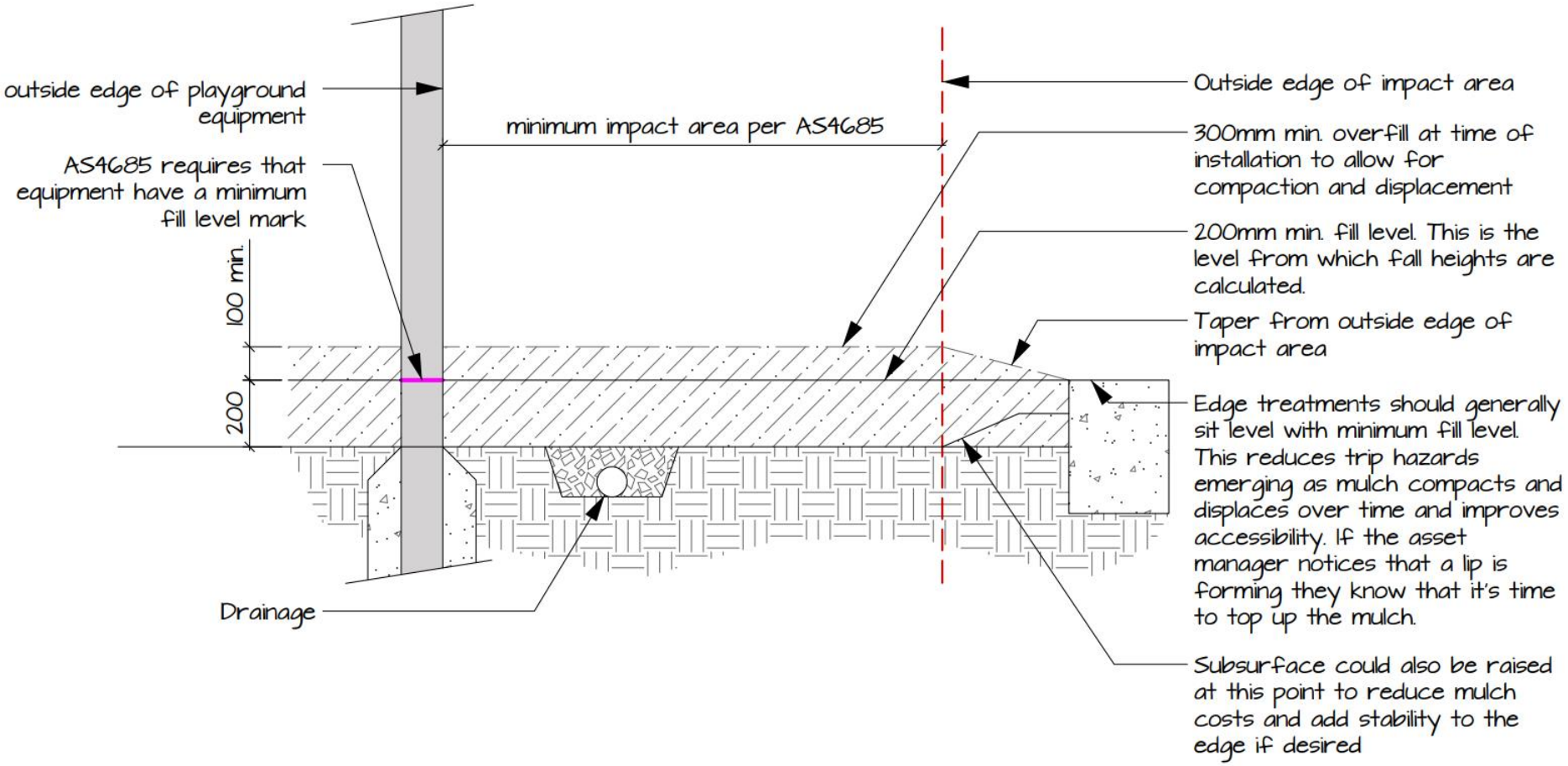
"The objective of this Standard is to provide a test method to measure compliance with thresholds that if exceeded are more likely to lead to death associated with brain injury resulting from a fall or impact onto surfaces. The thresholds contained within this Standard only relate to acute brain injuries." (AS4422 PREFACE)

"Long-bone fractures involving the growth plate can also lead to permanent disability, but unfortunately impact attenuation of playground surfaces is not a particularly effective countermeasure for these. Playground surfaces that pass the minimum threshold values that also have an inherent bounce property are known to increase the likelihood of long-bone fractures. Playground surfaces that bring the child to rest over a short period of time or over a short distance (penetration) are also associated with a higher likelihood of injury associated with falls." (AS4422 FOREWORD)


Loose fill surfacing


“an acceptable manufactured wood chip
... is characterised by particles of even,
uniform dimension that are cleanly cut
with no sharps”

200mm minimum thickness. (Install at 300mm to allow for compaction and displacement.)



7.3.2 *Compaction, deterioration and displacement of loose-fill material*

To allow for compaction and dispersion, loose-fill material shall be installed to a minimum depth of 300 mm and not allowed to drop below 200 mm.

NOTE: As a supplement to loose fill, in intensively used areas, unitary surfacing may be installed to reduce the impact of wear under equipment, e.g. under the swing seats, at the end of a slide and the base of a fireman's pole. These should be placed with care and be large enough to avoid catching the feet of users in motion.

AS 4685.0:2017

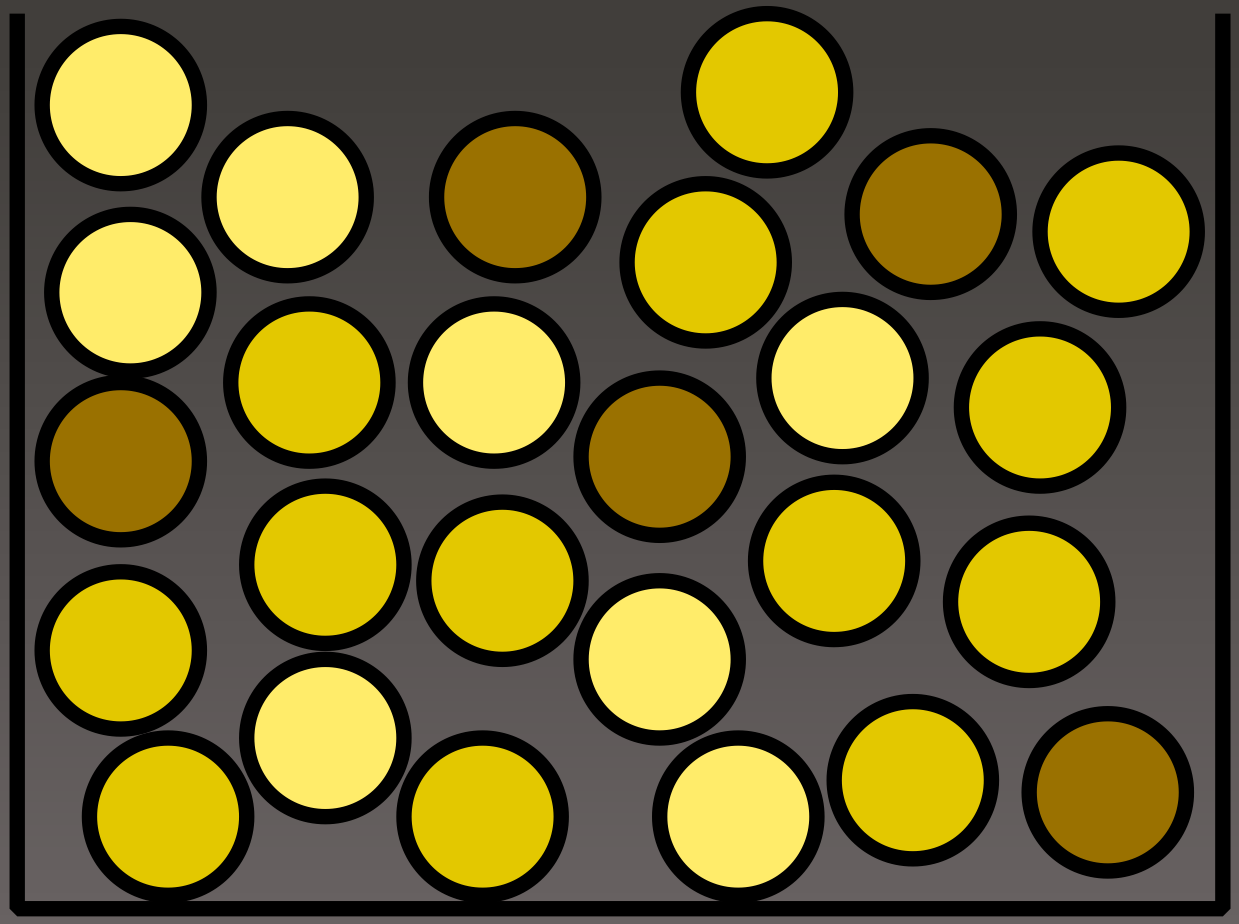
Examples for commonly used impact attenuating materials are given in Table 4 with the related maximum free heights of fall, tested in accordance with EN 1177 and measured partly on site and partly in the laboratory with different test conditions. Where the installed surfacing can be verified as being in accordance with Table 4, no additional testing is required.

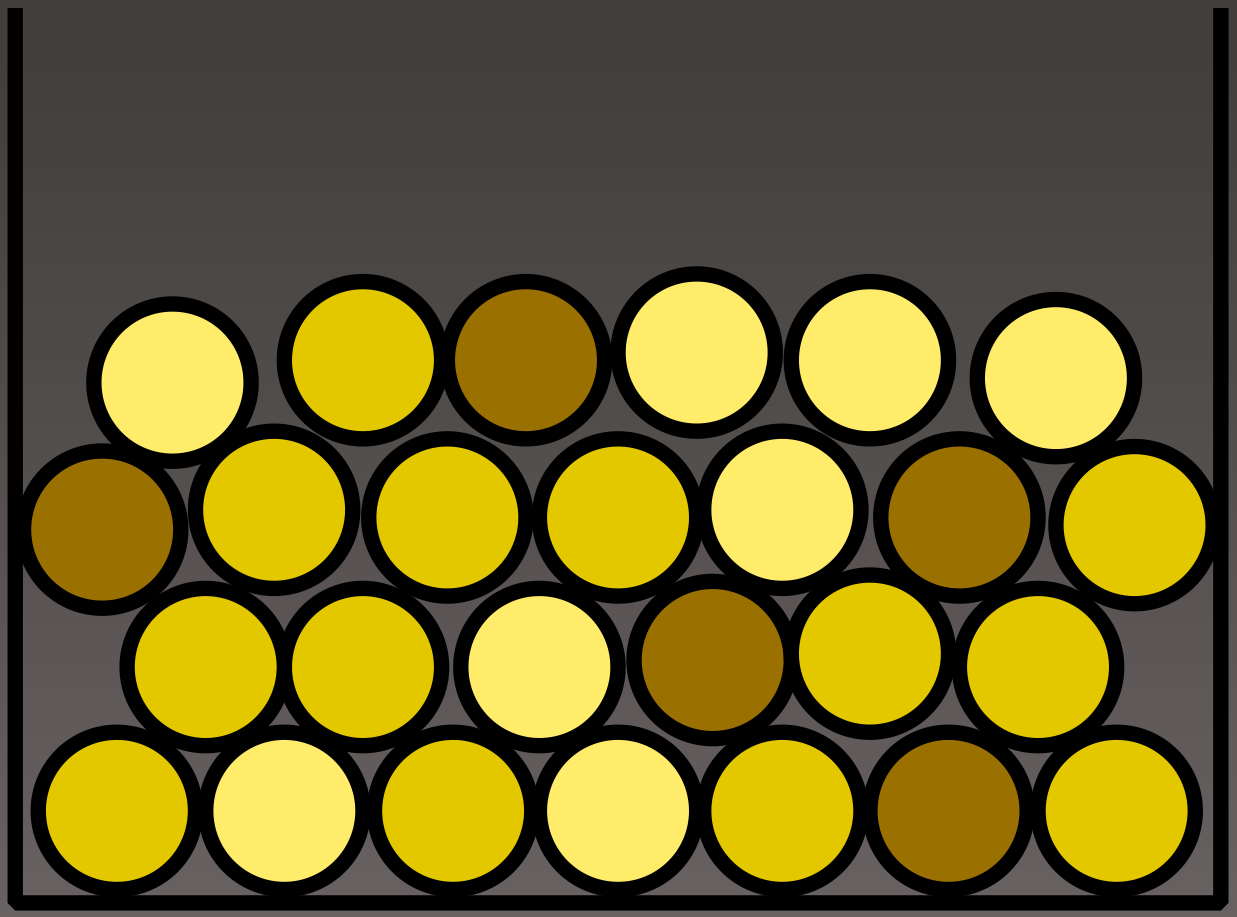
Material[a]	Description	Minimum depth[b]	Maximum free heights of fall
Where the installed surfacing is verified (e.g. sieve test) as being in accordance with this table or carries a test report according to EN 1177, no additional testing is required	mm	mm	mm
Turf/topsoil	—	—	≤ 1 000[d]
Bark	20 to 80 particle size	200	≤ 2 000
		300	≤ 3 000
Woodchip	5 to 30 particle size	200	≤ 2 000
		300	≤ 3 000
Sand or gravel[c]	0,25 to 8 grain size	200	≤ 2 000
		300	≤ 3 000
Other materials and other depths	As tested according to EN 1177		Critical fall height as tested

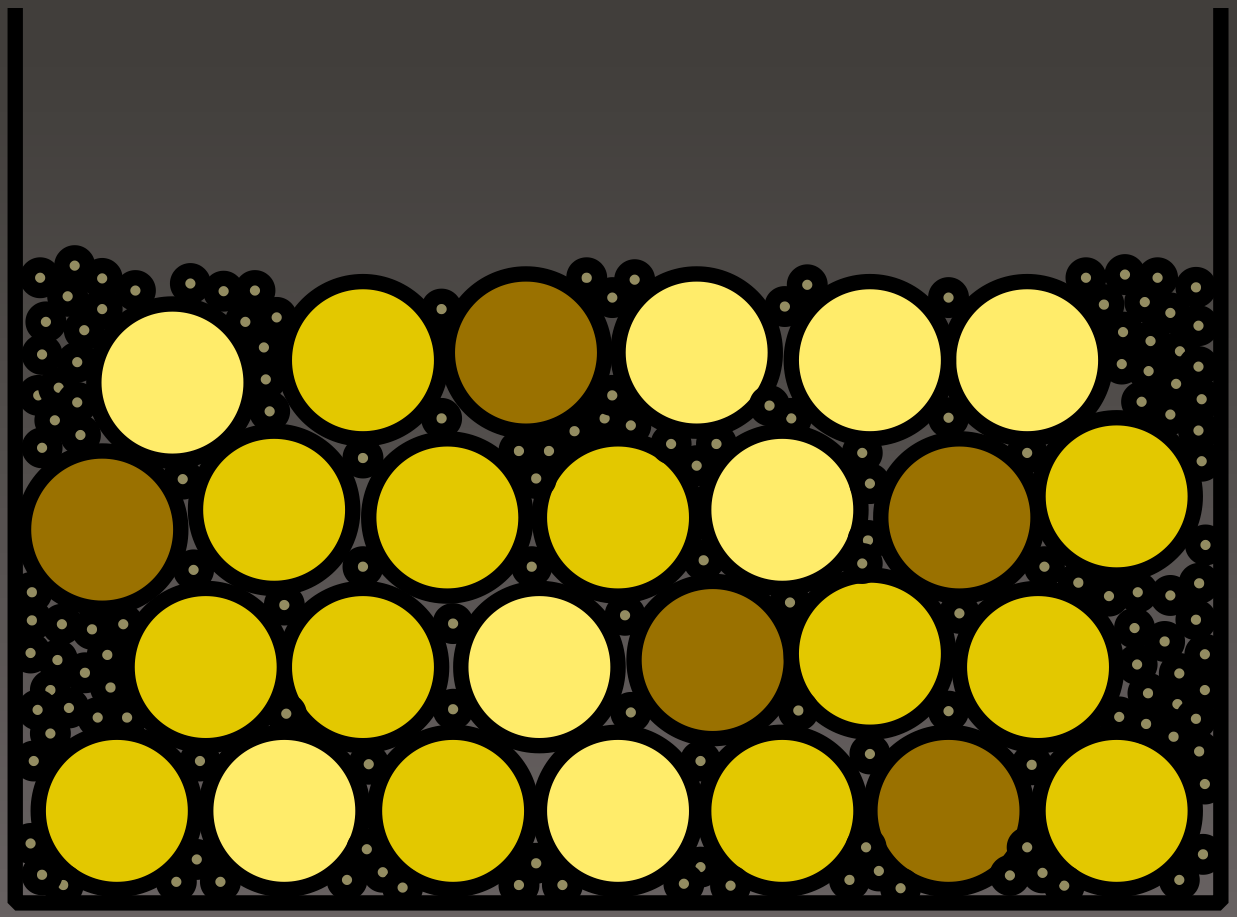
[a] For further information on specific material properly prepared for use in children's playgrounds see CEN/TR 16598 (Collection of Rationales for EN 1176–1 requirements).

deleted

NOTE 2 Turf as well as having aesthetic appeal also has some useful impact attenuating properties. Experience has shown that, if well maintained, it is normally effective for fall heights up to 1 m and can be used without the need to conduct a test. For fall heights above 1 m, the performance of turf as an impact attenuating surfacing is dependent upon local climatic conditions. Therefore, as there are significant regional variations in climate throughout Europe it is advised that guidelines are given at a national level. Turf/topsoil is not intended to be tested in accordance with EN 1177.








Top up regularly
Rake back wear points
Monitor contamination
Not great for disability access

Good drainage is recommended

AS4685 Part 0, Appendix D

Examples of Organic Impact-Attenuating Surfacing and Guidance on Pass/Fail Selection

Figure D1 - uniform particle size, few sharps

Figure D10 - large pencil-like pieces and sharp points with potential for splintering and puncture injuries

Figure D2 - uniform particle size, few sharps

Figure D11 – large pencil-like pieces and sharp points with potential for splintering and puncture injuries

Figure D4 - uniform particle size, few sharps

Figure D9 – many needle-like slender sharps with potential for splintering and puncture injuries

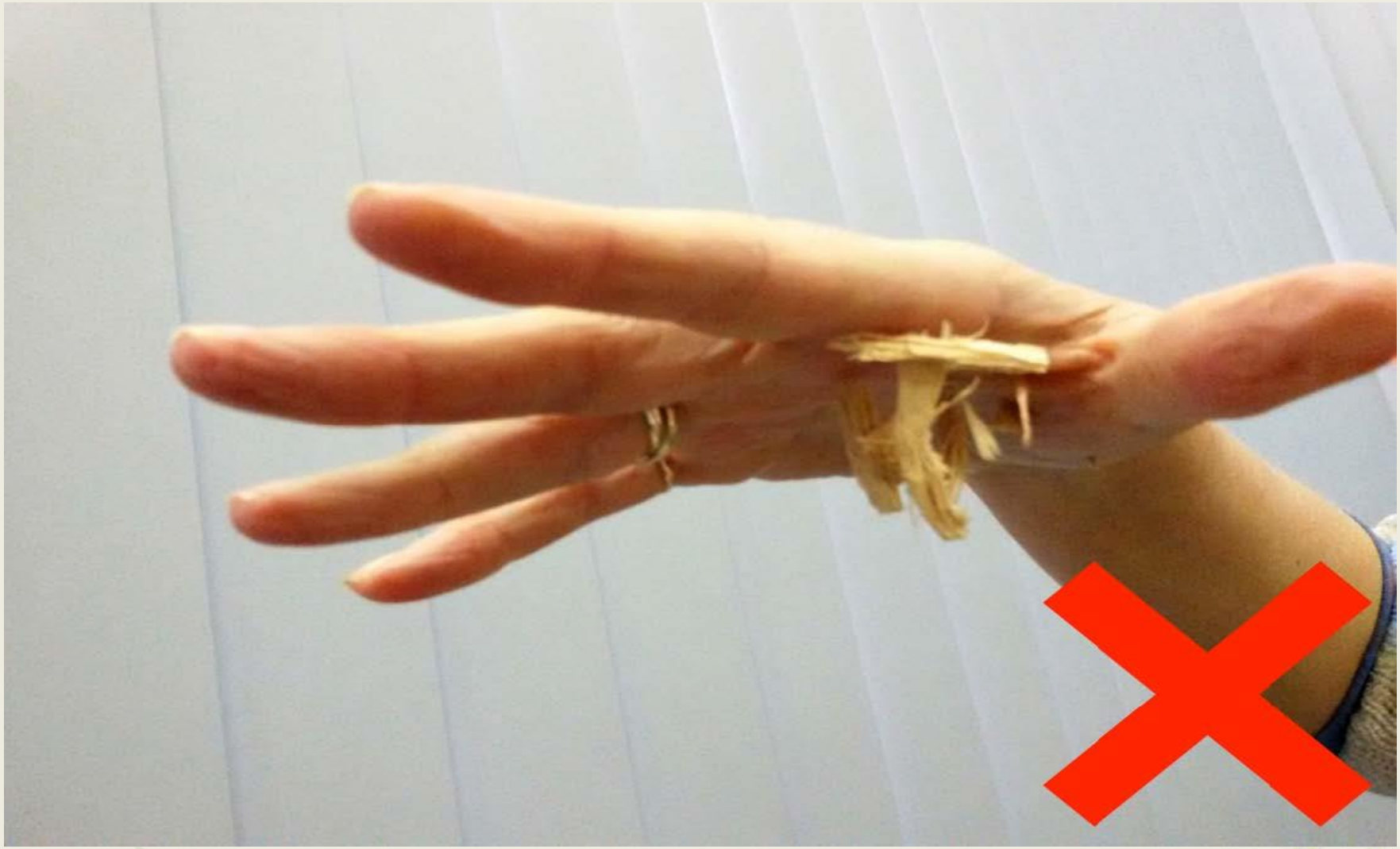


Figure D12 – depicts an example of a unacceptable manufactured wood chip with sharp particles.

Commercial product 1

Commercial product 2

Commercial product 3

Synthetic (unitary) surfacing (usually ‘wet pour’)

SBR Rubber (shredded/granulated tyres), ususally with a finer grain (dyed) SBR Rubber or EPDM granule wearing course, bound with Polyurethane on a concrete (or occasionally) crushed rock base.


Rotatub 60
Makita

- Costly to install (10x loose fill)
- Costly to repair
- Costly to demolish
- Will harden over time
- Moderately easy to damage (max warranty 2 years)
- Gets hot
- Can get slippery (particularly near sand)

Synthetic Tiles

- Costly to install (more than wet pour?)
- Easier to repair
- Costly to demolish

Thank you!

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