

23 May 2025

Reharvest Timber Products  
41A Hunua Road  
Papakura  
Auckland 2110

**Re:** Playground Surfacing Impact Attenuation Testing & Certification

**Surface Media Tested:** Cushionfall Woodchip (Expiry 19/5/2028)

**Scope of Work:**

Evaluate the provided sample materials for their ability to absorb impact, this involves using Head Impact Criterion (HIC) surface impact testing equipment to determine the Critical Fall Height (CFH) of the material. Generate a data acquisition and analysis report in compliance with the standards outlined in NZS5828:2015 + EN1177:2008. Upon successful completion of the testing, issue a product certificate that is valid for three years, ensuring that the material can be repeatedly used with confidence.

**Understanding:**

Playsafe Consulting Ltd provides its services with the understanding that clients acknowledge the following: As a certified provider of RPII Playground Compliance services, we specialize in inspecting, training, and conducting impact testing on playground equipment and surfacing in accordance with NZS 5828:2015, EN 1176, and EN 1177 standards.

**Disclaimer:**

Playsafe Consulting Ltd is not an AS/ISO agency or an accredited testing laboratory. However, we are a recognized testing facility specializing in playground compliance and surface impact attenuation testing. We are not structural engineers and do not provide structural calculations. For any structural advice, we recommend consulting a chartered professional engineer.

I am pleased to provide you with the following independent certification document for the product/s tested.

The Impact Attenuating Certificate (CFH) is included in this document for you to provide to your clients along with the formal testing report. We have also added your product/s to our **Certified Play Surface Register**

If you have any questions, please don't hesitate to contact me.

Yours sincerely



**Adam Stride**

Director | RPII L3 Outdoor & L4 Enclosed Play Area Inspector M#1074A / M#1023AF

# Certificate of Compliance

NZS 5828:2015 / EN 1177:2018 Impact Attenuating  
Playground Surfacing Critical Fall Height Certificate



Issued to:

## Reharvest Timber Products

41A Hunua Road, Papakura, Auckland 2110

IAS Surface Material Tested

## Cushionfall Woodchip

Based on our assessment we are satisfied that the playground surface specified surfacing type will satisfy the impact attenuation requirements of NZS 5828:2015 up to the stated critical fall height of:

**CRITICAL FALL HEIGHT (CFH)**  
**MAX 3.0m @ MIN 300mm Depth**

For optimal performance, it is recommended that the material be installed with proper drainage and an initial uncompacted depth of 350mm, including a 50mm allowance for initial compaction. Regular maintenance is necessary to ensure a minimum depth of 300mm is consistently maintained.

We, Playsafe Consulting Ltd of Auckland, New Zealand, certify that the surface material referenced in this document meets the impact attenuation requirements of NZS5828:2015 (EN1176 and EN1177) for the specified critical fall height, provided it is installed and maintained correctly at the required uncompacted installation depth. We have also evaluated its suitability according to the guidance criteria for Organic Loosefill Particulates as outlined in AS 4685.0:2016.

The testing process involved measuring the HIC (Head Injury Criterion) and  $g_{max}$  values against the drop height to determine the critical fall height at each test location. For maximum HIC values below 1000 and  $g_{max}$  values below 200g, the highest recorded value was used. If HIC was equal to or exceeded 1000, or  $g_{max}$  was equal to or exceeded 200g, the time/acceleration curve from a single impact was considered.

While the material meets impact attenuation standards, there remains a risk of skin protrusion or puncture due to the variation in particle shape, size, and potential contaminants within the material. However, this risk is comparable to that associated with similar materials used in play surfaces.

Please note that the performance of this material is significantly affected by factors such as temperature, moisture, and degradation. The test results reflect the critical fall height under the specific conditions present at the time of testing. The uncertainty of the results under controlled laboratory conditions is  $\pm 7\%$ , and this uncertainty may be greater in actual site conditions. This certificate is valid for three years from the date of issue, provided there is no change in the material composition of the tested surfacing.

### Loosefill Suitability Assessment Sample Size and Consistency

**Overall Assessment Result: D4 – GOOD**

Based on the visual grading of shape, particle uniformity, and the absence of sharp projections or splinter risks, this sample is considered acceptable for use as impact-attenuating loose particulate surfacing in children's play environments under the Playsafe qualitative grading system in consideration of AS 4685.0:2016.



**ADAM STRIDE**

RPII ANNUAL OUTDOOR / INDOOR  
PLAY INSPECTOR + CERTIFIED IMPACT TESTING  
SPECIALIST - M#1074A / M#1023AF

Test Date	<b>20 May 2025</b>	Cert Expiry	<b>19 May 2028</b>
HIC Meter	<b>HC22023</b>	Certificate #	<b>#1006188</b>

## MATERIAL SAMPLES

**Impact Attenuating Surface Media:** Reharvest Cushionfall Woodchip #1006188 (Expiry 19/05/2028)

**Timber Type:** Pine woodchip, recycled foodgrade pallet, non-treated, non-toxic, grinder cut, screened.



## MOISTURE CONTENT

The test sample presented for testing was 'DRY' on the 20 May 2025 (approx 0.00% moisture content tested using moisture meter).



## TEST SAMPLE – IMPACT ATTENUATION TEST

**Impact Attenuating Surface Media:** Reharvest Cushionfall Woodchip #1006188 (Expiry 19/05/2028)



## METHOD

The particulate material was evenly distributed within the test frame, placed over a level concrete substrate at a depth of 300mm. The test was conducted using an HIC lab surface impact tester to measure the material's critical fall height. Multiple impact drops including compaction were performed at various heights and locations within the test bed, generating an HIC curve used to determine the critical fall height.

During the testing process, a 4.6kg accelerometer headform with a diameter of 160mm ± 5mm was dropped from different heights, measuring the deceleration as it impacted the sample. Each drop involved a new test location and height within the sample. Compaction testing was also conducted over four consecutive drops in each set.

The results were evaluated according to EN1177 Method 1, which defines the critical fall height of the surfacing based on the drop heights at which an HIC of 1000 and a gmax of 200 are achieved.

**Product:** Reharvest Cushionfall Woodchip #1006188 (Expiry 19/05/2028)

**Test Date:** 20/05/2025

**Test Location:** Playsafe HQ, 3/35 Pacific Rise, Auckland NZ

**Test Sample:** The test sample measured 1mtr x 1mtr x 300mm

**Temperature:** Testing was completed at 15 C +/- 3c

**Sample Dry/ Wet:** Test sample was DRY (0.00% moisture content) and clean.

# PARTICLE SIZE COMPLIANCE ASSESSMENT

**Impact Attenuating Surface Media:** Reharvest Cushionfall Woodchip #1006188 (Expiry 19/05/2028)

## Specification Requirement (NZS5828:2015 / EN1176):

- At least 70% of the material should be within 5–30 mm in length.
- Standard recommends particle size is verified by sieve test; no tolerance limits are provided for non-conforming sizes.

## Visual Observation:

Upon review of the sample images (with scale reference), the majority of visible particles appear to fall within the 5–30 mm length range. The chip sizes are varied but generally short and compact, with minimal long, linear strands.

- Estimated compliance with 5–30 mm length: Approximately 75–80% by visual estimate.
- Very few particles exceed 30 mm, and those observed are not dominant in the mix.

## Loose Particulate Grading – Sharp Projections / Ergonomic Suitability

Standards Referenced: NZS5828:2015 / EN1176 + AS4685.0:2016 (Appendix D)

Visual Risk Review Based on Supplied Guidance (D1–D12 Rating Matrix):

- Particle edges are generally blunt, fibrous, and do not appear needle-like or splinter-prone.
- There is a consistent chip form throughout – some irregularity, but no major presence of sharp, spear-shaped, or pencil-like projections.
- Appearance is consistent with images and characteristics of a D3–D4 (GOOD) classification:
  - Even, uniform dimension
  - Minimal slender or sharp-edged particles
  - Low splintering risk

## Result:

- ✓ Meets criteria for ergonomic safety and surface suitability.
- ✓ No obvious sharp projections noted that would breach NZS5828/EN1176 intent.

## Overall Assessment Result: D4 – GOOD

Based on the visual grading of shape, particle uniformity, and the absence of sharp projections or splinter risks, this sample would be graded D4 – GOOD, and is considered acceptable for use as impact-attenuating loose particulate surfacing in children's play environments under the Playsafe qualitative grading system.



## Suitability – Loose Particulate Materials:

Playsafe assesses organic impact-attenuating surfacing (IAS) materials for their ergonomic suitability in children's play environments. Grading ranges from Excellent to Very Poor, with emphasis on consistent particle shape and size to reduce the presence of long, slender, or sharp fragments that may splinter.

This grading system provides a general framework but does not account for all material types. Each IAS material must be evaluated on its own merits, based on the specific context and requirements of the play area.

While materials may meet both suitability and impact attenuation standards, there remains an inherent risk of skin puncture due to irregular particle shapes, sizes, or potential contaminants. However, this risk is consistent with that of comparable IAS products subjected to the same assessment criteria.

## Disclaimer:

Please note that Playsafe has not conducted a Sieve Test and has conducted the following size grading by visual assessment only. Playsafe recommends an independent sieve test be undertaken to confirm compliance, particularly filtering particles by their cross-section dimensions.

# IMPACT PUNCTURE HAZARD TEST

## Assessment Type: Impact Puncture Hazard Test for Loose Particulate Surfacing

**Impact Attenuating Surface Media:** Reharvest Cushionfall Woodchip #1006188 (Expiry 19/05/2028)

**Test Name:** Hand Grip and Release Sharpness Exposure Test

**Standard Referenced:** AS 4685.0:2017 – Clause 4.2.8 & NZS 5828:2015 – Appendix D (General Surface Requirements for Loose Fill Material)

### Test Description:

This visual and physical assessment method is designed to evaluate whether loose particulate surfacing materials (e.g., woodchip, bark) may pose a puncture or laceration hazard upon normal child interaction – particularly through hand contact or skin pressure.

### Test Procedure:

1. A standard adult hand grip was used to compress a representative handful of the loose particulate sample material.
2. The hand was then fully opened, and the palm and fingers inspected for:
  - Adhering particles
  - Penetration by sharp slivers
  - Surface discomfort or puncture risk indicators
3. Any visible penetration, embedded particles, or discomfort (such as pricking or sharp edges) was noted.
4. The test sequence was repeated for consistency, and observations were recorded photographically.



### Test Results:

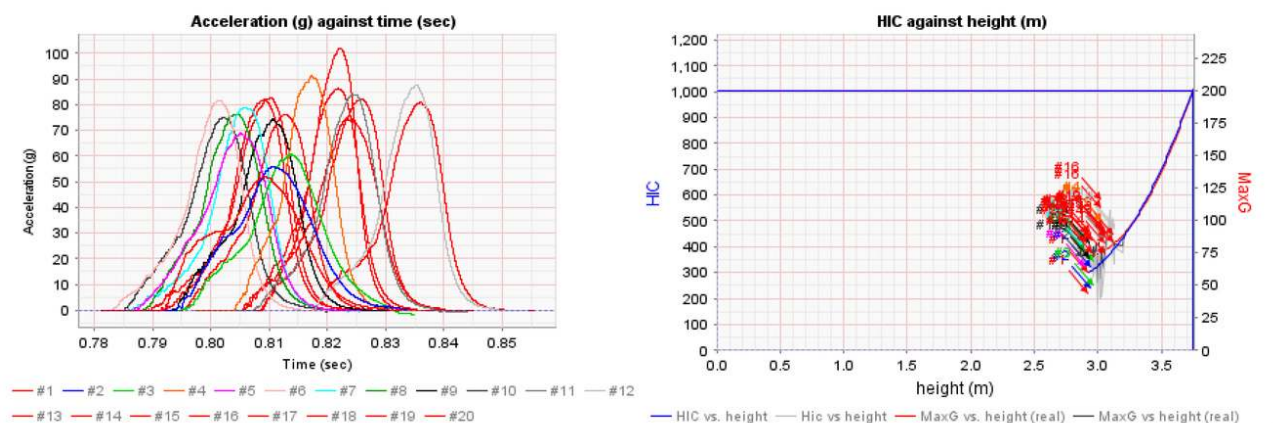
- Grip Phase: Particles compressed easily and conformed under pressure without piercing or pricking the skin.
- Release Phase: Only minor particle adherence was noted, with no embedded slivers or sharp projections penetrating or causing discomfort to the skin.
- Visual Inspection: No excessively angular, pointed, or splintering fragments were detected during or after grip release.
- Surface Feel: Comfortable to the touch, with no obvious risk of skin laceration.

### Pass – No Significant Sharp Projections Present

The sample is deemed compliant with AS 4685.0:2017 and NZS 5828:2015 in relation to sharp projection risk. It presents no significant hazard for puncture, splintering, or skin laceration during typical use.

Position		Session	
Position:	Reharvest Timber PRODUCTS	Session date:	2025-05-20 08:55 (Tue)
Position description:		Critical height Hic:	3.74 m
Surface type:		Critical height MaxG:	3.74 m
Surface type descr.:		Critical HIC:	1000.00
		Critical MaxG:	200.00
		Type:	Polynomial Regression
		Description:	Cushionfall 2025

Measurement #	HIC	HIC time	Drop height	Acceleration	Impact velocity	Fall time	Remarks
#1	180	21.060 ms	2.99 m	52 G	7.66 m/s	0.781 sec	-
#2	198	17.460 ms	3.01 m	56 G	7.69 m/s	0.784 sec	-
#3	209	12.840 ms	3.03 m	61 G	7.71 m/s	0.786 sec	-
#4	462	9.360 ms	3.10 m	91 G	7.80 m/s	0.795 sec	-
#5	284	12.900 ms	2.97 m	69 G	7.63 m/s	0.778 sec	-
#6	360	9.960 ms	2.93 m	82 G	7.58 m/s	0.773 sec	-
#7	356	10.470 ms	2.96 m	79 G	7.62 m/s	0.776 sec	-
#8	340	10.890 ms	2.97 m	76 G	7.63 m/s	0.778 sec	-
#9	316	10.980 ms	3.00 m	75 G	7.68 m/s	0.783 sec	-
#10	317	11.190 ms	2.95 m	75 G	7.61 m/s	0.776 sec	-
#11	393	10.080 ms	3.12 m	84 G	7.82 m/s	0.797 sec	-
#12	427	9.990 ms	3.20 m	88 G	7.93 m/s	0.808 sec	-
#13	377	10.320 ms	3.19 m	81 G	7.91 m/s	0.806 sec	-
#14	334	12.060 ms	3.12 m	75 G	7.83 m/s	0.798 sec	-
#15	398	10.500 ms	3.13 m	82 G	7.84 m/s	0.799 sec	-
#16	542	8.640 ms	3.09 m	102 G	7.79 m/s	0.794 sec	-
#17	334	10.890 ms	3.02 m	76 G	7.70 m/s	0.785 sec	-
#18	396	10.320 ms	3.01 m	83 G	7.68 m/s	0.783 sec	-
#19	427	10.020 ms	3.10 m	86 G	7.80 m/s	0.796 sec	-
#20	375	9.930 ms	2.98 m	82 G	7.65 m/s	0.780 sec	-





## OUR STORY

Playsafe was founded out of a passion for playground safety and a dedication to enhancing children's lives. Our founders combined their expertise in playground compliance, project management, manufacturing and construction to create a company that offers unparalleled safety and operational support to the playground industry.

We look forward to continuing this journey and making even more significant contributions to the playground industry in the years to come.

## ABOUT US

The Leading Authority in Certified Playground Safety Solutions – Playsafe is dedicated to ensuring safe and enjoyable play environments for children. With our expertise in NZS5828 and EN1176 safety inspections, impact testing of surfaces, and design evaluation reviews, we have become the top choice for playground services for councils, schools, and early childhood centers across multiple countries.

Our services extend internationally, upholding the highest safety standards wherever we operate. With offices in New Zealand and Johannesburg, our qualified inspectors regularly travel throughout New Zealand, Australia, Asia, and Africa to deliver top-notch safety services.

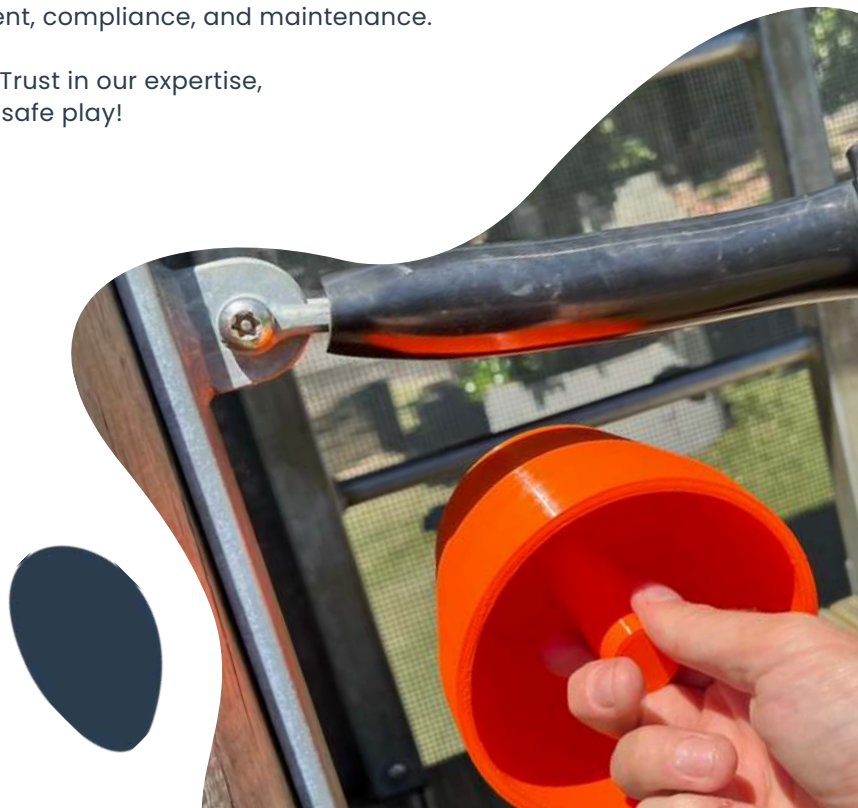
Our reputation reflects our commitment to excellence. Our experienced, certified inspectors undergo rigorous training and vetting, providing you with the utmost peace of mind. With over 30 years of experience in the commercial park and recreation industry, our team possesses a deep understanding of playground design, construction, project management, compliance, and maintenance.

Choose Playsafe as your playground safety partner. Trust in our expertise, rely on our credibility, and ensure a world of fun and safe play!

## SERVICES

Playsafe specialises in a range of playground safety services, including:

- Design Review
- Certified Inspections
- Post-Installation Inspections
- Product and Surface Material Certification
- Timber Testing
- Surface Impact Testing
- Expert Witness and Injury Investigation
- Inspector Training
- Project Management



## Meet the Core Team

With over 30 years of experience in the commercial park and recreation industry, our team has a deep understanding of playground design, construction, project management, compliance, and maintenance.



**Adam Stride**

Founder/Director

Adam Stride is a highly qualified RPII playground specialist, renowned for his extensive experience in the playground industry. As the founder of Playsafe Ltd, he has over two decades of expertise in playground design, compliance, and project management.

Adam has exceptional knowledge in inspecting both outdoor and indoor play areas to ensure they meet the required safety standards for children. He is particularly passionate about outdoor play environments for Early Childhood Education Services and serves as a technical member of the CEGAP (Centre Design, Environmental Factors, and Group Size Advisory Panel). Adam is also a member of the AS/NZ Joint Standards Committee.



**Dan Winchester**

Inspector

Daniel is a qualified RPII L3 Outdoor Play Inspector with a strong background in playground engineering and production. With over a decade of experience managing production for one of New Zealand's largest manufacturers, he brings a wealth of knowledge and insight to his role as an inspector at Playsafe.

Daniel's practical and solution-oriented approach to issues enhances the expertise of the Playsafe team.



**Carrie-Ann Jubber**

Inspector

Carrie-Ann brings over 20 years of corporate experience, specializing in Business Administration and Project Coordination. Her meticulous administrative approach enhances the expertise of the Playsafe team, ensuring internal processes run smoothly and effectively.

With over a decade of experience working with various manufacturers and suppliers across different sectors, Carrie-Ann offers valuable insights into client requirements.

She is also an Outdoor Play Inspector and oversees key accounts for the business, combining her administrative skills with her industry knowledge to deliver exceptional service.



**Dale Hartog**

Business Dev/Inspector

Dale Hartog is the founder and Business Development director of IHSS Africa Pty Ltd, a subsidiary of the Veers Group and has over 15 years of expertise in the Health & Safety industry. With a strong background in Health & Safety and understanding the lack of compliance in the Playground environment in the South Africa, this created the opportunity for IHSS Group to joined forces with international experts Playsafe Ltd and with that Playsafe Africa was established, and with its main objective to create safer play environments for the children of South Africa.

He is a Outdoor Play Inspector as well as is a SABS Technical Committee member for Safety of Playgrounds and Playground Equipment - SABS/TC 1090.

## REPORT DISCLAIMER

The information presented in our reporting is believed to be accurate at the time of publication by our assessors. However, we do not assume responsibility for any consequences resulting from the use of this information.

Please note that our reporting is based on the observations and findings of the assessors on the day of the assessment and is not intended to provide an exhaustive record of all potential risks or hazards that may exist, nor all possible areas for improvement.

The inspection conducted was in accordance with the NZS5828/EN1176 Playground Safety Standards, including Appendix A for supervised early childhood and EN1177 for surfacing.

## CONFIDENTIALITY

Confidentiality is a key aspect of our inspection services. To preserve the credibility and integrity of the risk assessment process and to protect all involved parties, our assessors will not disclose any information obtained during the risk assessment to unauthorized individuals, unless legally required to do so.

## PROFESSIONALISM

At Playsafe, we take pride in delivering professional services that are certified, impartial, confidential, and independent. We are committed to maintaining an unbiased and unprejudiced approach to ensure the health and safety of all those who use playground equipment and surfaces. Our team operates under the highest standards of professionalism and strictly adheres to the code of conduct established by the Register of Playground Inspectors International. We take our professional responsibilities seriously and always strive to provide the best possible service.

## SERVICE DISCLAIMER

Playsafe provides its services with the understanding that clients are aware of the following: As a certified provider of RPII Playground Compliance services, we specialize in inspecting, training, and conducting impact tests on playground equipment and surfaces according to relevant standards.

Please note that Playsafe Consulting Ltd is not an AS/ISO agency or a testing laboratory. Our expertise lies in being a recognized testing facility for playground compliance and surface impact testing. We are not structural engineers and do not offer structural calculations. For structural advice, we recommend consulting a chartered professional engineer.



## WHY US

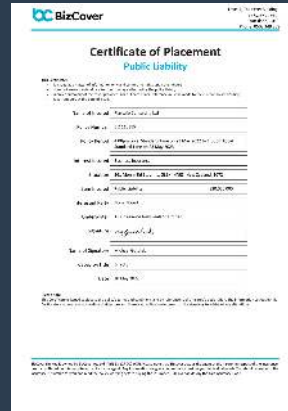
Our team has over 30 years of combined experience in the playground industry, with a broad background in playground design, compliance, construction, engineering, and maintenance. We take pride in our practical approach to providing comprehensive reporting services with effective solutions.

Playsafe is a highly experienced specialist in the industry, particularly in the area of compliance, inspection and impact absorbing surfaces, with extensive knowledge of their various types and properties.

# INSURANCE

Playsafe Consulting Ltd is an incorporated New Zealand owned and operated Limited liability company NZBN: 9429046546753

We are fully insured with comprehensive Professional Services Indemnity Insurance (\$1,000,000 coverage) and Public Liability Insurance (\$20,000,000 coverage).



# ACCREDITATION

At Playsafe, our inspectors are certified by the Register of Playground Inspectors International (RPII) at the international level. Many hold accreditation's in Level 3 and 4 Outdoor and Indoor Play Inspection, Operational Inspection, and HIC Impact Testing. They are experts in providing compliance services to the NZS5828 Playground Safety Standards. Additionally, Playsafe is the leading registered and accredited training and examination center for the RPII.





## HEALTH & SAFETY

At Playsafe Consulting Ltd, our top priority is health and safety management.

We aim to continuously improve our performance in this area by making safety a key part of all our operations. Our commitment to the health and safety of our staff, clients, and colleagues is unwavering.

## SITE SAFE | SITEWISE

Playsafe Consulting is committed to the Health & Safety of our staff, clients and colleagues.

We are proud to carry a **Site Wise status** that demonstrates a high quality health and safety system in place.



## GLOBAL REACH

Playsafe's head office is located in Auckland, New Zealand, with our South African office based in Cape Town. We extend our services internationally.

Our qualified inspectors regularly travel throughout New Zealand, Australia, Asia and Africa.



## SURFACING – LOOSEFILL

**Loosefill surfaces, such as bark, woodchip, sand, or pea gravel, are assessed during the audit using our exclusive Playsafe Depth Probe.**

To comply with NZS5828, a minimum depth of 300mm for loosefill surface material is essential.

Our depth probe applies the appropriate force to accurately assess both the depth and quality of your loosefill. Equipped with 50mm increment markers, it enables us to measure the average depth across multiple points on the surface. Any depth inconsistencies are clearly documented in the final report.

*Playsafe recommends the source of loosefill materials are from pre-certified suppliers.*

300mm 250mm 200mm 150mm 100mm 50mm

## SURFACING – SYNTHETIC

**Synthetic surfaces should be impact tested every two years to verify head injury compliance. Playsafe recommends this test is completed as part of the Annual audit.**

Falls are the leading cause of injuries on playgrounds, often resulting in serious head, neck, and back injuries.

Roughly 70 percent of injuries related to playground equipment occur due to falls onto either insufficient surfacing or hard objects. The most common type of injury is a fracture in the long bones, affecting the arms and legs.

Through our Certified Surface Impact Test, we assess your playground's surface performance against the critical fall height criteria for the specific play equipment. This testing process provides a detailed electronic report that identifies any issues and ensures compliance with the head injury performance standards outlined in NZS5828:2015 + EN1177.

# Playground Surfacing – Specifications, requirements and test method.

The aim of impact testing a playground surface is to assess its impact attenuating performance and verify compliance with thresholds that, if exceeded, increase the risk of fatal brain injury resulting from falls or impacts. These thresholds specifically address acute brain injuries.

Those involved in the design, installation, and upkeep of playgrounds must diligently identify and mitigate foreseeable hazards. The primary cause of serious playground injuries is falls from heights onto the playground surface. Hence, employing impact-absorbing playground surfaces is crucial for safety and injury prevention. The Standard delineates testing methods to evaluate the impact-absorption capabilities of playground surfaces. Such testing is necessary during the development of surfacing products, installation of new surfaces, and periodic field-tests to ensure ongoing acceptable performance levels.

The performance criteria outlined in the NZS5828 and EN1177 Standards represent minimum thresholds that installers, and operators are strongly advised to surpass. Enhanced impact-absorption properties in surfaces correlate with reduced frequency and severity of injuries, especially brain injuries. While playground surfaces target head impact criterion, they can in many instances effectively mitigate long-bone fractures involving the growth plate, significantly reducing the risk of head, neck and back injuries.

Surfaces meeting the minimum thresholds but possessing a rebound property may inadvertently increase the likelihood of long-bone fractures. Surfaces that quickly bring a child to rest or allow penetration are also linked to higher fall-related injury risks.

An impact test utilises an instrumented hemispherical missile. The performance of an impact-absorbing surfacing system is quantified by its critical fall height (CFH), which denotes the maximum fall height where impact test results meet specified limits. Presently, these limits include peak acceleration during impact ( $G_{max}$ ) below 200g, a head injury criterion (HIC) value under 1000, and a HIC duration exceeding 3 milliseconds.

A HIC value of 1000 represents one point on a risk severity curve. For instance, a HIC of 1000 corresponds to a 3% likelihood of critical brain injury (equivalent to an Abbreviated Injury Score (AIS) of 5), an 18% chance of severe brain injury (AIS 4), a 55% probability of serious brain injury (AIS 3), an 89% likelihood of moderate brain injury (AIS 2), and a 99.5% chance of minor brain injury (AIS 1) in an average adult male. The committee responsible for setting impact limits did not consider recent research on the long-term effects of traumatic brain injury (TBI) from non-concussive impacts. However, they intend to incorporate such research in future revisions.

It is important to acknowledge that some impact-absorbing playground surfaces may introduce unintended risks to children, depending on the product type. Some surfaces may become excessively hot in unshaded areas during extreme temperatures, while others, particularly recycled materials, may contain hazardous sharp objects. Therefore, caution is advised when selecting playground surfaces to avoid materials that are excessively dusty, sharp, ingestible, contaminated, or otherwise hazardous.

Play is essential for children's healthy development as they explore and understand the world around them. Successfully navigating risky situations during play builds confidence and fosters competent risk assessment skills, vital for managing their safety. The minimum impact-absorption performance thresholds for playground surfaces do not undermine this perception. Playground surfacing should prevent permanent injuries and fatalities while facilitating children's development of autonomous risk assessment skills.

## Poorly maintained playground equipment and surface areas can contribute to serious injury.

Inspections, maintenance and replacement of damaged parts is essential to users safety. The following highlights some of the main focus points within an inspection:

Wear and tear on ropes and chains, including exposed steel core fibers, chain link degradation, and moving or dynamic components such as bearings and hangers.



Evaluation based on NZS:5828 Standards, including assessments for compliance, falling spaces, impact zones, body entrapment, free fall height, and potential misuse.



The impact-attenuating surface serves as the safety net. Statistics reveal that approximately 70% of severe playground accidents result from falls onto these surfaces.

Structural foundation elements like concrete footings, pole foundations, and other structural components require consistent inspection to maintain their structural integrity and prevent potential failures.



Fixtures and fittings such as shackles, eyebolts, trolleys, bearings, and other movable components are designed with wear in mind and are prone to failure if not routinely inspected, maintained, or replaced.



Platform and post inspection, including assessment of raised nail heads, foundation stability, structural integrity, and timber condition, among other factors.



Evaluation of the safety surface, encompassing its condition, depth, impact attenuation, compliance with HIC impact standards, and whether it's synthetic or loose-fill in nature.



# SURFACE IMPACT TESTING

## TEST METHOD

In the impact-attenuating playground surface test, a 4.6kg accelerometer headform with a 160mm diameter (tolerance of +/- 5mm) is dropped from a specified height. This test measures the deceleration of the headform upon impact with the surface sample. Testing can be conducted on-site, depending on climatic conditions, or within a controlled laboratory environment. Under laboratory conditions, the test results have an uncertainty of +/- 7%, which may be higher for on-site tests.

It's important to recognize that results from on-site testing may not be as precisely reproducible as those obtained in a lab. Various materials, such as rubber tiles, mats, slabs, continuous synthetic surfaces (pre-fabricated or formed in-situ), and loose particulate materials like gravel, sand, wood chips, or bark, can provide impact attenuation. This testing method is suitable for evaluating the impact attenuation of any of these surface types.



### Surface materials eligible for testing include:

- Loose-fill options: bark, wood chips, mulch, pea gravel, metal, gravel, and sand.
- Synthetic turf: artificial grass.
- Rubber variations: EPDM, granules, wetpour, tiles, shockpads, PVC, and grass mats.
- Deck and platform surfaces.
- Natural choices: grass, turf, and soil

## TERMS & DEFINITIONS

- **Critical Fall Height (CFH):** Maximum free height of fall, for which a surface provides an acceptable level of impact attenuation.
- **Impact Attenuation:** Property of a surface, which dissipates the kinetic energy of an impact by localized deformation or displacement such that the acceleration is reduced.
- **Head Injury Criterion (HIC) value:** Criterion for head injuries caused from falls as calculated.
- **Drop Height:** Distance between the test position on the surfacing and the lowest point of the free falling headform prior to release.
- **Free Height Of Fall (FHF):** Greatest vertical distance from the clearly intended body support to the impact area below.

## TESTING EQUIPMENT

Playsafe possesses a range of accelerometers for conducting impact tests and utilizes cutting-edge surface testing technology, setting a benchmark in New Zealand's industry. Our equipment incorporates state-of-the-art IAS measuring technology, and it undergoes independent international calibration and verification.

But how does impact testing actually work? The measuring device mimics the characteristics of a human head during a potential fall. It is equipped with sensors and accelerometers that meticulously record the headform's speed, Gmax, and drop height.

During the testing procedure, we determine the maximum height from which a potential fall might occur for each play activity onto the surface below. Subsequently, we conduct a series of drops to confirm whether the surface meets the critical fall height (CFH) requirements corresponding to each play activity height.



## DEFINITIONS

**The official definitions may be found in the Standard. The explanations which follow attempt to explain them in everyday terms.**

**Climbing equipment:** items on which Children cannot stand unaided but must hold on, requiring three points of contact unless moving.

**Playing surface:** the ground or the surface from which play commences.

**Forced movement:** a movement to which a child is committed by the design of the equipment (i.e. swinging, sliding, or rotating).

**Free space:** the space in which children are undergoing a movement forced by the equipment (i.e. slide chute or fireman's pole).

**Falling space:** a 3D space through which a child may fall from an elevated point on the equipment.

**Free height of fall:** distance from the clearly intended body support, or from a position which can easily be reached, to the impact area.

**Collective use:** use by more than one user at a time.

**Ladders, stairs, and ramps:** means of access or egress.

**Impact Area:** the area where the child will strike the surface after undergoing a fall.

**Grip and grasp:** a specific part of the equipment which the child needs in order to support their weight will require grip, whilst a specific part the child requires for balance would require grasp.

**Obstacle:** a piece of the equipment extending into the path of movement.

**Easily accessible:** requiring only basic skills to access the equipment and not slowing the child sufficiently to allow time for a parent or carer to intervene.

**Cluster:** separate items designed to be grouped together (i.e. adventure trails).

**Steep play element:** a play feature steeper than 45° used to enter or leave equipment.

**Adequate level of impact attenuation:** properties of a surface having the necessary impact attenuation for a given free height of fall.



## ENTRAPMENTS

A fundamental safety principle outlined in NZS5828 is the prevention of unintended entrapment within play equipment.

Entrapment refers to any situation where a body or body part becomes trapped in an opening and cannot be removed. Young children are particularly at risk of head entrapment, as they may enter small openings with their bodies but then find that their heads cannot pass through. With limited reasoning abilities, they may struggle to support themselves, increasing the risk of strangulation.

Playsafe inspectors use probe templates representing a child's torso, head, and neck to thoroughly examine all openings and gaps in play equipment.

Our inspections cover various forms of entrapment, including foot and leg entrapment, fully enclosed rigid openings (such as those between guardrails and barriers), fully enclosed flexible openings (such as those in climbing nets), and checks for potential finger pinching, crushing, and shearing in openings, gaps, moving parts, and connections.





**Look for the Playsafe SAFETY CHECK Label on your next playground visit!**

