altro

the future is safer with altro

Your guide to safety

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Your guide to safety

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Overview of topic

Safety matters

- Safety flooring with a lifetime sustained slip resistance of TRRL ≥36 reduces the risk of anyone slipping or falling to one in a million
- Flooring which does not provide adequate lasting slip resistance can make the odds of a slip or fall as high as one in two

Sustained slip resistance matters because

- Smooth and rubber flooring are not slip-resistant when wet
- Not all safety flooring on the market provides sustained TRRL ≥36 for life
- Safety flooring with sustained slip resistance of TRRL ≥36 keeps users safe even in areas subject to spillages and other contaminants for the lifetime of the flooring

Know what you're specifying

- Not all safety flooring offers sustained slip resistance, check with the manufacturer before specifying
- All Altro safety flooring offers sustained slip resistance for life
- Look for the logo with every Altro safety floor indicating the sustained slip resistance performance

Slips and Trips – the scale of the problem

- Slip and trip accidents cost the UK economy millions each year
- An accident is recorded every three minutes

Flooring – the danger area for slips

- 90% of slipping accidents occur on wet floors, usually on relatively smooth surfaces
- Be aware of what to look for when assessing slipperiness

Your legal obligations

- Employers are legally required to make sure that floors are not slippery, which puts people's safety at risk
- Designers have a legal duty to ensure the safety of those using the buildings they design

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Commonly used tests

The TRRL Pendulum Test

- It lets you measure flooring in situ
- It lets you measure sustained slip resistance
- It is the preferred test of the Health and Safety Executive, The United Kingdom Slip Resistance Group and Altro

The SATRA Pedatron test

- It replicates the real effect on the floor of a million steps
- It can be used to replicate different flooring scenarios
- It is an accurate way of measuring sustained slip resistance

Image courtesy of SATRA

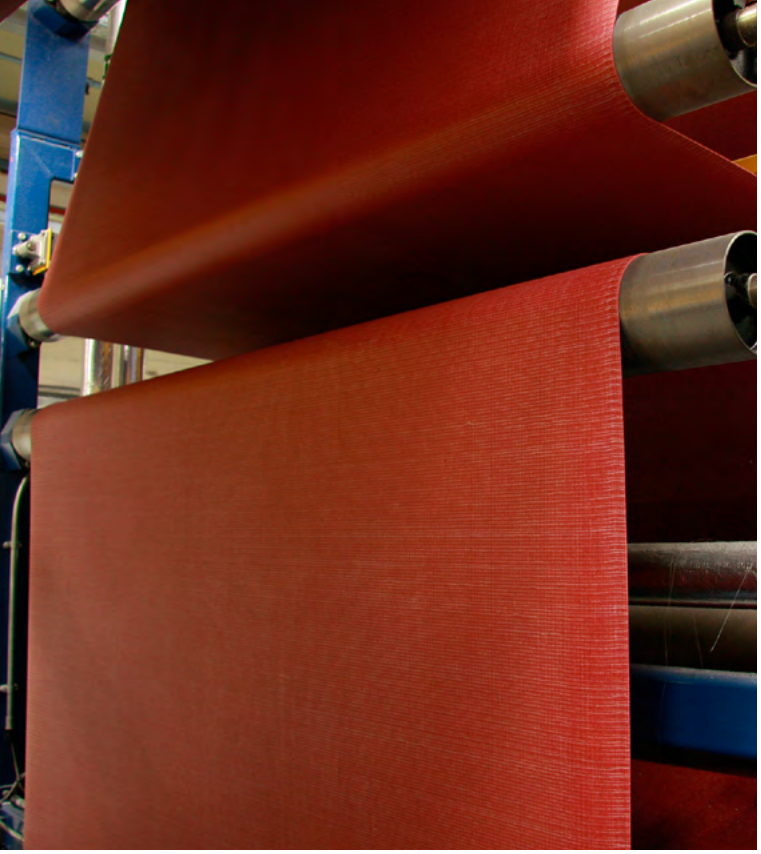
The Surface Microroughness Meter

- Use it in conjunction with the Pendulum Test to measure sustained slip resistance

The Ramp test

- Test uses ex-factory material with safety boots
- The ramp test only measures results in a lab on new flooring, it cannot be replicated on site to measure the slip resistance of flooring which has been installed
- It cannot be used in situ to measure sustained slip resistance
- R values start at R9, with an R9 value indicating the least slip resistance

Image courtesy of SATRA



How the slip resistance shown on datasheets / sample cards is calculated

- Slip resistance is calculated on ex-factory flooring
- Ex-factory flooring results do not measure long-term performance
- Look for the number of cycles on EN 13845 test results

The dangers of ex-factory slip resistance results

- New floor measurements can become obsolete in weeks
- They can be based on a product with an emboss or coating which can wear off

The only reliable way to measure slip resistance

- The TRRL Pendulum test

How vinyl safety flooring works

- It only takes 1-2 μm of wet film to cause a slip or fall. To put that in context, 1-2 μm is about one tenth the thickness of a human hair
- The aggregates in safety flooring penetrate the wet film or dry contaminants to prevent a slip or fall

Why Altro safety flooring?

- Altro safety flooring provides sustained slip resistance for life
- We test our products beyond legal requirements to ensure continued performance
- We continue to invest in new testing methods and new technologies

How Altro safety flooring is made

- Both traditional and new generation Altro safety flooring provide the same high level of slip resistance

Introduction to Altro safety flooring

- There are many different types for general and specific applications

What doesn't give you sustained slip resistance?

- Safety flooring with only an emboss or thin coating of slip-resistant particles
- Smooth and rubber flooring are not designed to have sustained slip resistance

Maintaining sustained slip resistance

- Follow the manufacturer's cleaning recommendations
- Contaminants can be wet or dry or anything that ends up on the floor
- Footwear plays a vital role in preventing slips

Risk assessments

- New Department of Health Performance requirements for England indicate the need for a risk assessment before any new/replacement flooring or walling is installed
- We believe that this example of good practice should be extended across all sectors

Other people who care

- New NHS requirements in England focus on quality and safety and highlight the responsibility of specifiers and project teams to consider performance
- Scotland SHTM 61 provides similar guidance on the specification of floor finishes

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Does safety really matter?

Have you ever used a major public concourse? Of course you have. Picture somewhere big and busy. Let's take Waterloo Station as an example, but really this could be anywhere.

Over 94 million people used Waterloo Station in 2011/12.

Imagine that it's been raining outside, or someone has spilled their cappuccino and the surface is wet in places. The good news is that safety flooring with a lifetime sustained slip resistance of TRRL ≥36 has been installed. The risk of anyone slipping is one in a million. Even in the wet. Not bad odds.

Now imagine the same wet conditions, on the same concourse. The only difference is that a different type of flooring such as a smooth or a rubber, or a safety flooring which does not offer the same sustained slip resistance has been installed. The odds have dramatically altered. The smooth and rubber don't protect you in the wet. The safety flooring has lost its slip resistance with use. The odds of slipping can now be as high as one in two. Or put another way, 47 million people could reasonably be expected to suffer a slip or fall.

That's why safety matters.

You've specified safety flooring because you want to protect people from slips and falls. Surely you want them to have that level of safety for as long as the floor is in use? That level of lasting safety is referred to as sustained slip resistance.

Sustained slip resistance is critical. It's why we want to make you that **one in a million** and not one in two.

Remember

- Safety flooring with a lifetime sustained slip resistance of TRRL ≥36 reduces the risk of anyone slipping or falling to one in a million
- Flooring which does not provide adequate lasting slip resistance in wet and dry can make your odds of a slip or fall as high as one in two

Why is sustained slip resistance so important?

Put simply…it reduces your risk of slipping to one a million and keeps it that way over time!

Different flooring types provide different levels of slip resistance. The key is to select the right type that keeps delivering the right level for the life of the flooring. Failure to do so could put users at risk, leading to injury for them and possible litigation for you.

This chart, indicating TRRL Pendulum test results, shows the Risk Factors associated with different levels of slip resistance.

TRRL Pendulum Test Value (PTV)	Co-efficient of Friction	Risk Factor
36	0.36	1 : 1 000 000
34	0.34	1 : 100 000
29	0.29	1 : 10 000
27	0.27	1 : 200
24	0.24	1 : 20
19	0.18	1 : 2

These results were generated in the 1960s by the Building Research Establishment (BRE) and other academic institutes and apply to a “normal person walking in a straight line on a flat and level surface.” They are still used today and accepted in the flooring industry and by the Health and Safety Executive (HSE) as an accurate measure of slip risk.

The risk factors in the table on the left tell a worrying story. With a TRRL <19, you stand a 50% chance of a slip or trip. That’s why declarations of sustained slip resistance matter.

We consider that safety flooring which continues to provide TRRL ≥36 for its lifetime, the minimum HSE recommended level, may be considered a true safety floor offering sustained slip resistance. In other words, it will continue to keep users safe for its lifetime. Not all safety floorings do this.

As a responsible manufacturer, we are passionate about your safety. All Altro safety flooring provides TRRL ≥36 for its lifetime. It is our mission to keep your risk level to one in a million!

Remember

- Smooth and rubber flooring are not slip-resistant when wet
- Not all safety flooring on the market provides sustained TRRL ≥36 for life
- Safety flooring with sustained slip resistance of TRRL ≥36 keeps users safe even in areas subject to spillages and other contaminants for the lifetime of the flooring

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How do you know what you're really specifying?

Do you believe that all safety floorings on the market offer sustained slip resistance to the HSE minimum level for their declared lifetime?

Many people do. We don't. We have proved in external, independent laboratory tests that some don't. The findings and potential risks concern us. Please refer to the chart below for a comparative illustration of the sustained slip resistance performance of Altro and competitor safety flooring.

As the inventors of safety flooring, we have an established pedigree in championing the need for safety. Keeping people safe lies at the heart of our business and that's why we're campaigning for responsible sustained slip resistance information – indicators of how long a safety floor will maintain its slip resistance performance.

Pioneering sustained slip resistance

The alarming thing is that there is currently no legal requirement for sustained slip resistance or an agreed industry standard on how to measure it. Manufacturers can launch products with a thin coating or emboss, which qualify them as safety flooring, but which can wear away with use leaving users vulnerable.

We find that unacceptable and consequently develop Altro safety flooring to go beyond current requirements to provide sustained slip resistance for life.

The Altro approach

We monitor the sustained slip resistance of our products in the field.

We work with leading international test houses to ensure that our products consistently deliver to the highest standards.

We invest in additional tests to assess the sustained slip resistance of our products as we believe it's the right thing to do.

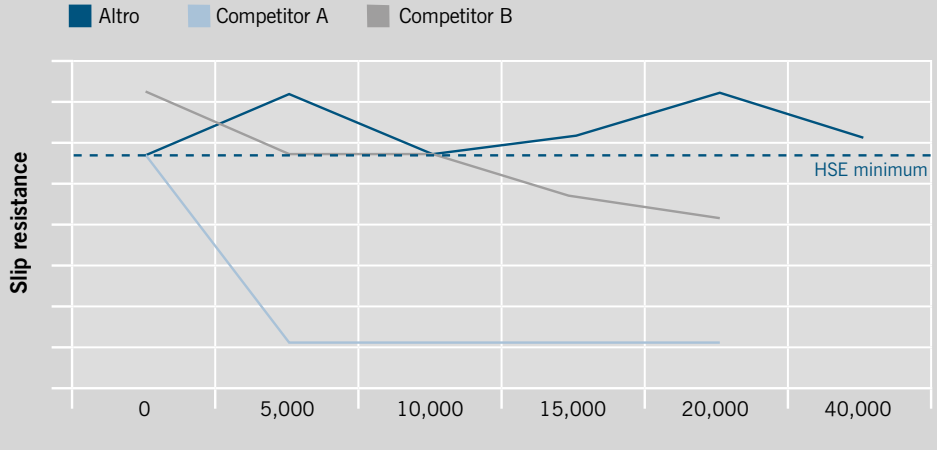
As part of this process we're introducing a logo indicating the number of years you can expect Altro safety flooring to provide sustained slip resistance to the HSE minimum standard of TRRL ≥36. In short, we know our slip resistance will not fail for the life expectancy of the product; it will keep you safe for the period stipulated in the sustained slip resistance logo on each safety flooring product page. We won't add this logo to products we know don't have this lifetime slip resistance, such as smooth and rubber flooring.

We strongly recommend that you check the sustained slip resistance with the manufacturer of any safety flooring before specifying, to ensure you use the most effective product for each area, minimising the risk to users.

Remember

- Not all safety flooring offers sustained slip resistance, check with the manufacturer before specifying
- All Altro safety flooring offers sustained slip resistance for life
- Look for the logo with every Altro safety floor indicating the sustained slip resistance performance

An example of recent Accelerated Wear tests on Altro Suprema II, carried out at an independent test house



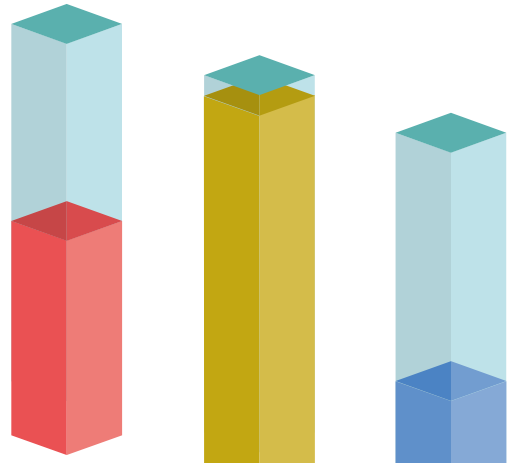
Over a lifetime, a product's slip resistance performance, such as Altro's, may vary slightly. This graph illustrates the significant reduction of slip resistance performance of competitors A and B. For more information, please consult your local Altro Sales Representative.

The test house states that 5,000 cycles is equivalent to approximately two years' normal usage.

Slips, trips and falls – are you aware of the size of the problem in the UK?

They cost employers over **£512** million each year.

They cost the National Health Service **£133** million each year.



They cause **55%** of all accidents in education.

95% of major accidents cause broken bones.

They cause over **36%** of all accidents that lead to injury in the UK.

They are the **most common cause of injury in the workplace** across the UK.

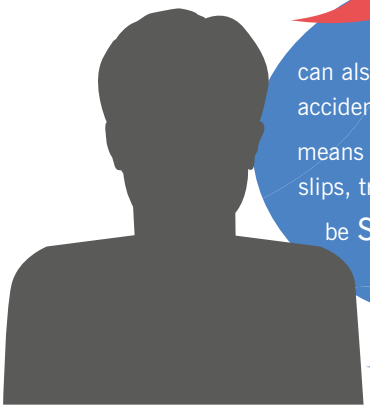
They are a major cause of injury and **absence from work**

They are the **leading source of injury, disability, lifelong impairment and death for the elderly, infirm and young.**

A slips and trips **accident** is recorded **every three minutes**

1600+ healthcare staff suffered a major injury in 2009/10 because of a slip, trip or fall, most often on a wet or contaminated floor.

Slips, trips and falls can also be the first event in other classes of accident, such as a fall from a height, which means that **the actual number** of slips, trips and falls induced accidents could be **significantly higher** than currently estimated.



They cause almost **11,000 major injuries** each year.

Source: the Health & Safety Executive

These statistics are of great concern to us and that's why we are striving to make you one in a million.

Remember

- Slip and trip accidents cost the UK economy millions each year
- An accident is recorded every three minutes

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Identify your danger areas for slips - make the floor a priority

Research in the UK by the HSE has shown that 90% of slipping accidents occur on wet floors, most often on relatively smooth surfaces.

Focusing on the floor surface in any environment is vital to successfully reducing slip incidents. If you can minimise risk in this area you are well on your way to creating an accident-free zone.

What are the risk factors associated with the slipperiness of flooring?

Even a floor with little grip may pose no threat in perfect physical conditions. However, in many environments conditions can change and this can have a marked effect on the slipperiness of a floor.

Things to be aware of when assessing the potential slipperiness of floors are decribed below.

Lighting Conditions

The effects of the factors outlined above can be exacerbated by poor lighting, which can contribute to slips by reducing the ability of users to observe hazards.

Stairs

Stairs are a particularly dangerous area. Approximately 500 people in the UK die each year in stairs-related accidents. According to the HSE, stairs account for around 20% of all major reported injuries resulting from slip, trips and falls from a height.

Remember

- 90% of slipping accidents occur on wet floors, usually on relatively smooth surfaces
- Be aware of what to look for when assessing slipperiness

Leaks, spills and splashes

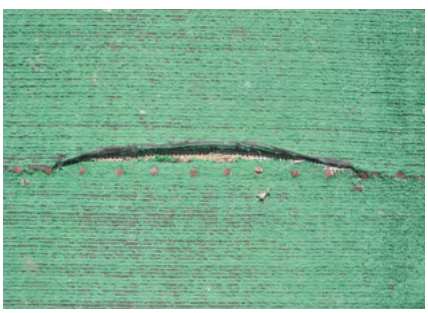
Wet floors following cleaning / processes

Unsuitable footwear for floors

Rain and mud

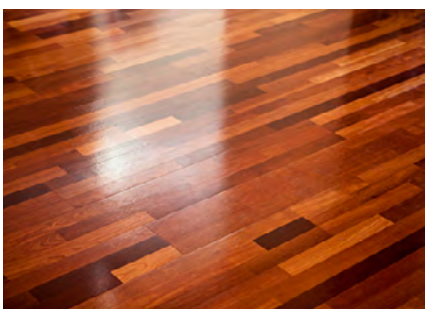
Dust and other dry contaminants

Leaking roofs or condensation from pipework



Unsuitable entrance matting

Sloping surfaces



Unsuitable floors
(e.g. glossy or polished surfaces)

What are you obliged to do by law?

As an employer

What does the law require an employer to do about reducing the potential of slips and trips?

"The law requires that floors must not be slippery, so they put people's safety at risk."

HSE – "Assessing the slip resistance of flooring"

The HSE has embarked on a Priority Programme to reduce slips by ensuring clients and specifiers assess risks and put preventative measures in place.

(Visit www.hse.gov.uk/slips for more information.)

"Employers have responsibilities for the health and safety of their employees. They are also responsible for any visitors to their premises such as customers, suppliers and the general public." There is a duty to "make floors, walkways, stairs, roadways etc safe to use".

"The floors of workplaces must have no dangerous bumps, holes or slopes and must be fixed, stable and not slippery."

EU Directive 89/391/EEC on Health and Safety at Work and Council Directive 89/654/EEC 1989 concerning the minimum safety and health requirements for the workplace

As a designer

The client, specifier and supplier all have a role to play. The designer has a legal duty to ensure the safety of people using the buildings they design.

According to the Construction (Design and Management) (CDM) Regulations 2007, the designer must

- Make clients aware of their duties
- Give due regard to health and safety in design work
- Provide adequate information about the health and safety risk of the design to those who need it
- Co-operate with the planning supervisor and, where appropriate, other designers involved in the project

Designers now have a legal responsibility to "avoid foreseeable risks to the health and safety of any person using a structure designed as a workplace".

Designing buildings to avoid the risk of slips and trips is therefore an important obligation, covered by UK law.

When it comes to the design of a building, at Altro we have thrown all our resources into offering designers a full range of safety flooring that enables those responsible to comply with Health and Safety requirements.

Remember

- Employers are legally required to make sure that floors are not slippery, putting people's safety at risk
- Designers have a legal duty to ensure the safety of those using the buildings they design

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The most commonly used slip resistance tests

The following represent an overview of the most common and reliable methods of testing slip resistance internationally. These tests give consistent results and, with the exception of the Ramp test, are portable, so they can measure slip potential on site at any time during the life of the flooring, which is vital in establishing on-going performance.

The TRRL Pendulum Test BS7976

How it works

The 'pendulum' coefficient of friction test is based on a swinging, dummy heel (using a slider made of a standardised rubber soling material) which sweeps over a set area of flooring in a controlled manner, to simulate slipping on a wet floor. The slipperiness of the flooring has a direct and measurable effect on the pendulum value. Flooring that achieves a wet result of ≥36 on the Pendulum test has a low slip potential. Results should be interpreted using the information in the table.

Potential for slip classification based on pendulum test values:

Pendulum value / Slip resistance value (TRRL)	Potential for slip
0 - 24	High
25 - 35	Moderate
36 +	Low

All Altro safety flooring for shod areas exceeds the ≥36 rating, indicating the lowest potential for slip, this is indicated on every sample card and datasheet for each product.

DS ES	TRRL EN 13845 EN 13893 DIN 51130	≥36 ESf DS R10

Advantages of the TRRL Pendulum test

- It can be used to measure slip resistance once the flooring is in situ
- It can be used to measure sustained slip resistance on flooring that has been down for many years for the period of its lifetime
- It can be used to measure slip resistance as part of a risk assessment
- It uses water as the contaminant, which is the most common contaminant, rather than motor oil (used in the ramp test) which is only encountered in certain specific applications
- It uses a standard rubber sole to measure the slip resistance, to replicate the most common shoe sole
- While it can test both wet and dry flooring, the results quoted are always the wet results, as slipping occurs in wet conditions. If you are only ever quoted dry results by a manufacturer and they appear high, ask for the wet test results too
- It measures slip resistance on a flat surface, rather than a ramp, to reflect real life situations more accurately
- It is the preferred test of the Health and Safety Executive and the United Kingdom Slip Resistance Group

Remember

- The pendulum test lets you measure flooring in situ
- The pendulum test lets you measure sustained slip resistance
- The pendulum test is the preferred test of the Health and Safety Executive, The United Kingdom Slip Resistance Group and Altro

West Lancashire College - Altro Suprema II

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Surface Microroughness Meter

How it works

An indication of slipperiness may be obtained by measuring the total surface roughness of flooring materials. This test uses a microroughness meter which measures in Rz microroughness values (microns). It works by tracing a needle over different areas of the flooring, taking peak to valley measurements, to calculate surface microroughness as an indicator of on-going slip resistance on site.

This test is frequently used in conjunction with the TRRL Pendulum test and it is not recommended that it is used in isolation as the sole selection criterion for flooring. Results should be interpreted using the information in the table below.

Potential for slip classification based on Rz microroughness values (application for water-wet low activity pedestrian areas):

Rz surface roughness (microns)	Potential for slip
Below 10	High
10 or above	Moderate
20 or above	Low

A surface roughness of 20 microns or above implies low slip risk.

In most circumstances, both TRRL Pendulum Coefficient of Friction (CoF) and Surface Microroughness readings are required to give an accurate indicator of floor surface slipperiness.

Advantages of the Surface Microroughness Meter

- It can be used to measure slip resistance once the flooring is in situ, throughout its lifetime
- It can be used to measure slip resistance as part of a risk assessment

Remember

- The Surface Microroughness Meter, used in conjunction with the Pendulum Test, measures sustained slip resistance

The ramp test

How it works

The ramp test (DIN 51130) is widely used, particularly in Continental Europe, and its 'R' values are quoted by most flooring companies. R9-R13 values are based on angle measurements, where an operator walks on an inclined ramp, which is covered in motor oil. Values are calculated by tilting the ramp and measuring the angle at which the operator slips.

While we quote R values for our products, as our customers in Continental Europe in particular are used to working with them, we believe the values do not always provide clarity of slip potential and that the categories of values are too broad.

Common misconceptions surrounding R values

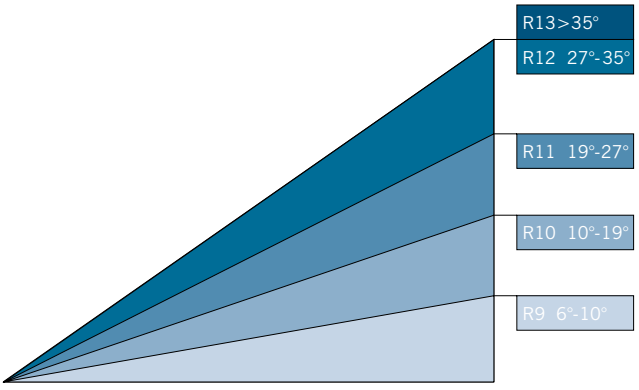
R values are a classification rather than a test result. These classifications are frequently misunderstood. It is often assumed that the scale of R values starts at R1 and ends at R13, with R1 a measure of the greatest slipperiness. With this in mind, an R9 value is often interpreted as indicating a surface which provides good slip resistance and some manufacturers do nothing to dispel this misunderstanding.

How to interpret R values

The truth is that R values start at R9, with an R9 value indicating the least slip resistance.

Each R value encompasses a broad scope of angles. For example R10, as indicated in the chart below, represents angles from 10º to 19º. These angles represent very different co-efficiencies of friction and therefore the slip resistance performance will vary considerably, despite having the same R rating.

Floors that have potentially very different slip characteristics can be classified with the same R value and may have different performance in use.



R9 is the lowest rating on the R scale, with a slip angle of only 6°, a rating found even in smooth vinyl flooring. All Altro safety flooring is rated R10 or above. We offer R11 (Altro Classic) for areas where spillages and occasional wet and dust can increase the risk of slips and falls such as laboratories, kitchen areas and bars. We also have an R12 / TRRL >50 (Altro Stronghold 30), suitable for greasy environments, where an R10 is not enough, such as professional kitchens.

What the data doesn't tell you

Details on manufacturers' sample cards and datasheets only indicate part of the story. Some manufacturers only show an R10 rating in isolation, with no reference to a TRRL result. An R10 rating does not necessarily equate to TRRL Pendulum Test result ≥36. Should a slip or fall should occur, any resulting regulatory investigation is carried out using the TRRL Pendulum test. Therefore, we recommend asking for TRRL Pendulum Test results at the point of specification to ensure compliance with HSE minimum requirements.

Only where you see R10 and a corresponding TRRL ≥36 with an indication of lifetime sustained slip resistances, such as on an Altro sample card, can you be sure that you'll be 1 in a million!

DS	TRRL EN 13845 EN 13893 DIN 51130	≥ 36 ESf DS R10


Image courtesy of SATRA

Disadvantages of the ramp test

- It only measures results in a lab on new flooring, it cannot be replicated on site to measure the slip resistance of flooring which has been installed, as this would mean uplifting the flooring and putting it back on the ramp
- It cannot be used in situ to measure performance or wear over a flooring's lifetime
- A factory finish thin coating or emboss can be applied to a product at the point of manufacture with the sole aim of passing the Ramp test. These thin levels of slip resistance can wear off in use leaving users subject to possible slips and falls and designers/employers open to the risk of litigation
- The contaminant used in the test is motor oil, whereas the most frequent contaminant encountered by the majority of people is water
- The operator wears safety boots with a heavily cleated sole, whereas most people who slip or fall wear ordinary shoes
- The results are very broad and often misunderstood, not adequately differentiating slip resistance levels or long-term performance

A barefoot version of the test (DIN 51097) also exists, where the ramp is covered with water.

Altro Aquarius is rated B to DIN 51097 and uniquely also achieves TRRL ≥36 with shoes, offering protection for shoe and barefoot use.

Remember

- The ramp test only measures results in a lab on new flooring, it cannot be replicated on site to measure the slip resistance of flooring which has been installed
- It cannot be used in situ to measure sustained slip resistance
- R values start at R9, with an R9 value indicating the least slip resistance

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SATRA Pedatron Test Machine STM 528

How it works

The SATRA Pedatron Test measures the effect of one million steps over a confined area of flooring, using a shoe with standard sole. It is used to measure flooring surface wear, in a way which represents a real life situation, to ensure that the flooring will live up to the heavy demands placed upon it. Accurate wear patterns are produced, by studying and replicating different walking gaits, incorporating straight and turning steps.

At Altro, we invest in this test as yet another accurate way to measure sustained slip resistance.

The test can be carried out using a variety of footwear, typical of that used in the applications in which Altro safety flooring is installed, including nurses clogs, business shoes, leather soled shoes, rubber soles, hard plastic soles, football boots and barefoot.

Advantages of SATRA Pedatron Test Machine STM 528

- It is an effective measure of sustained slip resistance
- A wide variety of flooring types can be tested
- The test replicates an extended period of time, during which a million steps are taken over a confined area
- It reproduces a whole shoe sole for the purposes of testing
- A standardised textured surface is used for the shoe sole to produce consistent results
- It was developed using biomechanical walking data
- It replicates a realistic walking style of straight and turning steps
- Wear patterns accurately reflect real life wear

Remember

- The SATRA Pedatron test replicates a million steps over real flooring scenarios
- It is an accurate way of measuring sustained slip resistance

Health and Safety Executive Slip Assessment Tool (SAT)

You can download free software at www.hse.gov.uk/slips which enables you to carry out a risk assessment with a surface microroughness meter, resulting in obtaining a slip risk classification for a floor.

Tests in Europe

There are two European standards (ENs) that have been developed by the European Committee for Standardisation (CEN), that have to be satisfied and are part of EN 14041, which is the CE label standard for resilient, textile and laminate floor coverings.

These two tests are

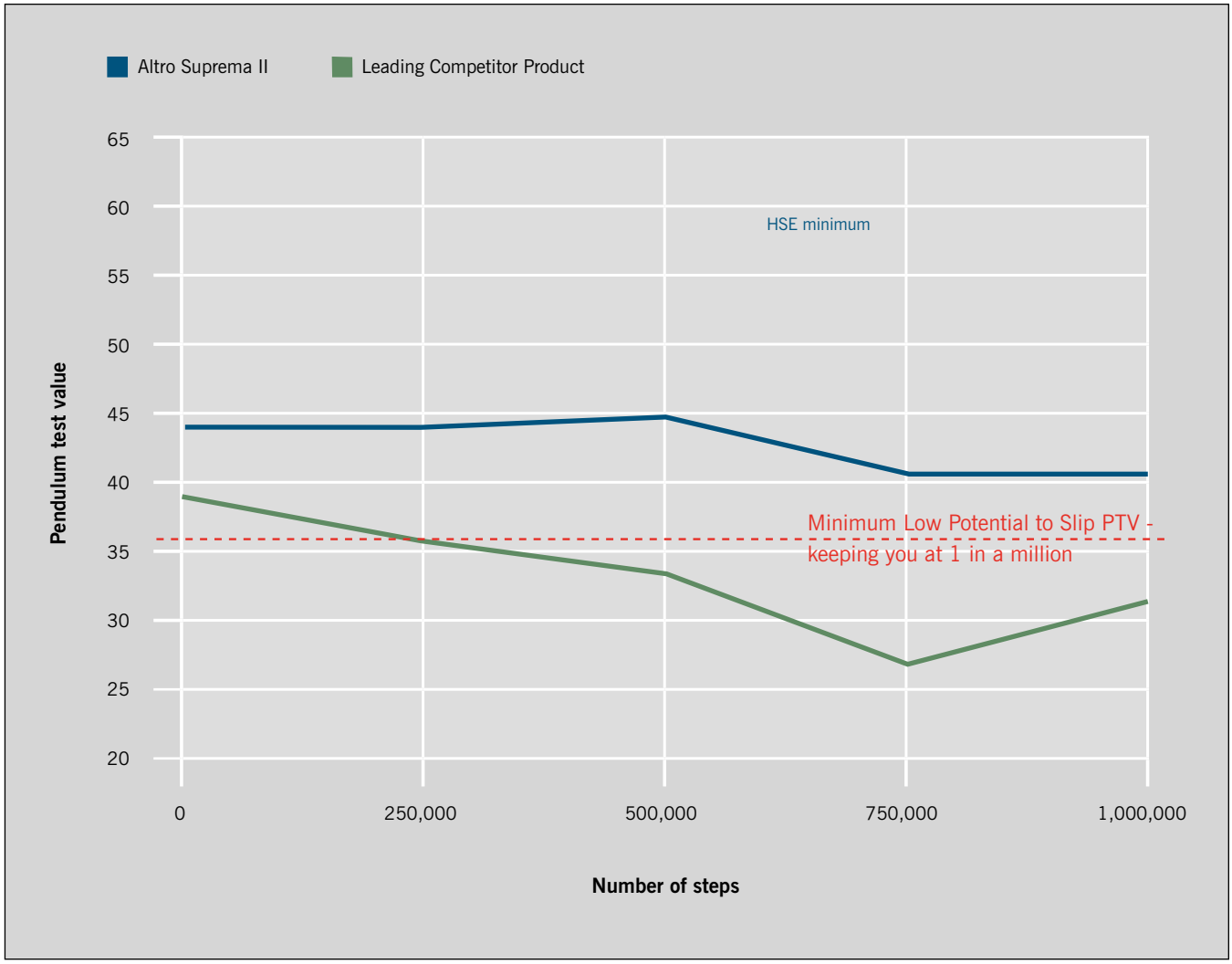
- EN 13893 – a pull sled test where the requirements are a coefficient of friction of >0.30
- EN 13845 Annex C – a ramp test similar to DIN 51130 and DIN 51097 using water and soap as the contaminant

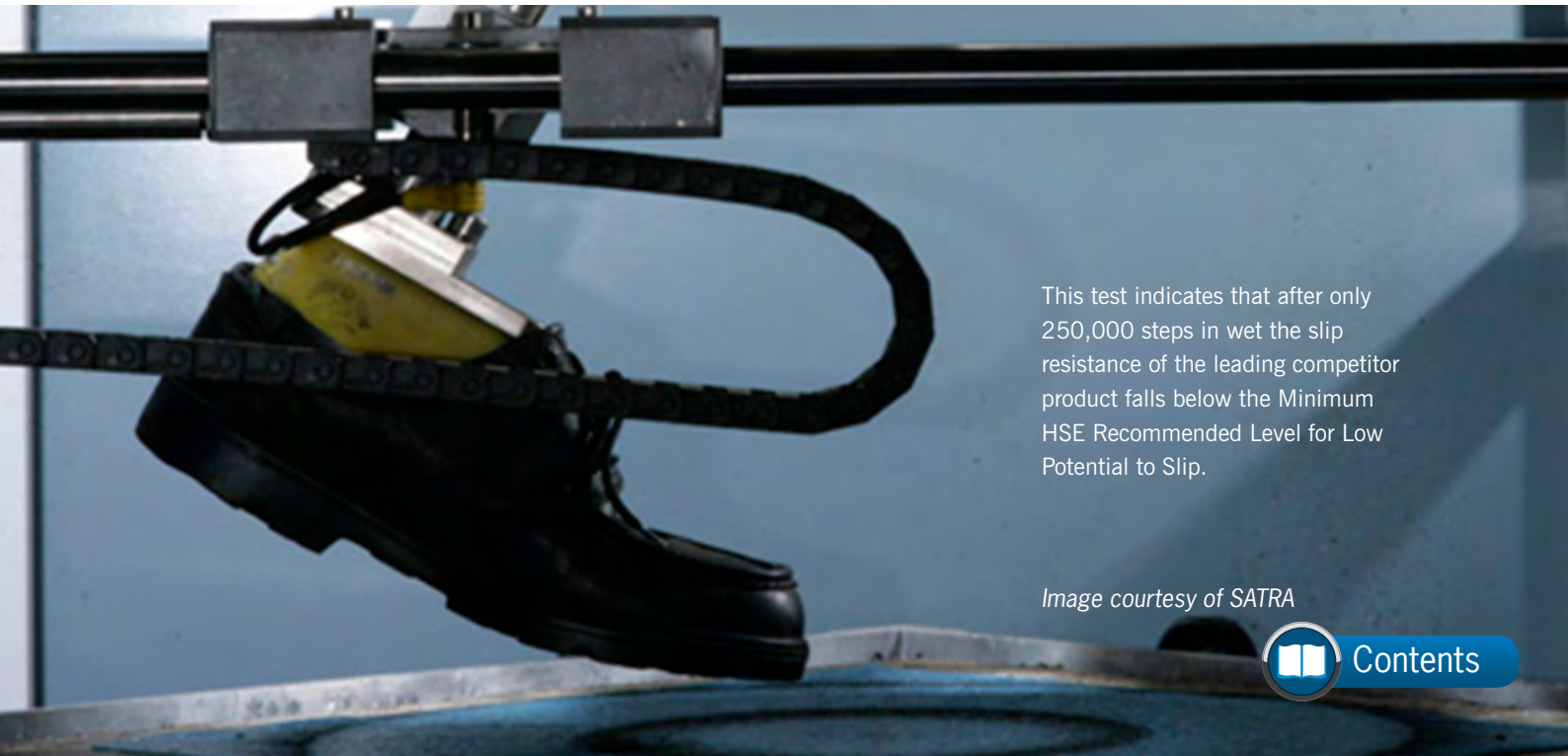
For barefoot areas the requirement is >15° and for shod* areas >20°.

It is compulsory for manufacturers like Altro to test to and pass these standards, if they are going to claim that flooring is slip-resistant and can be sold in European countries.

*shod areas are areas where people normally wear shoes.

1,000,000 Step Pedatron Testing - Based on testing completed for Altro by SATRA





This test indicates that after only 250,000 steps in wet the slip resistance of the leading competitor product falls below the Minimum HSE Recommended Level for Low Potential to Slip.

Image courtesy of SATRA

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How is the slip resistance shown on datasheets and sample cards calculated?

These claims are based on tests performed on ex-factory material.

Manufacturers send their material to independent test houses to certify that their products achieve either a TRRL pendulum test value ≥36 in the wet, or an R10 classification, depending upon where the floorcovering is going to be used.

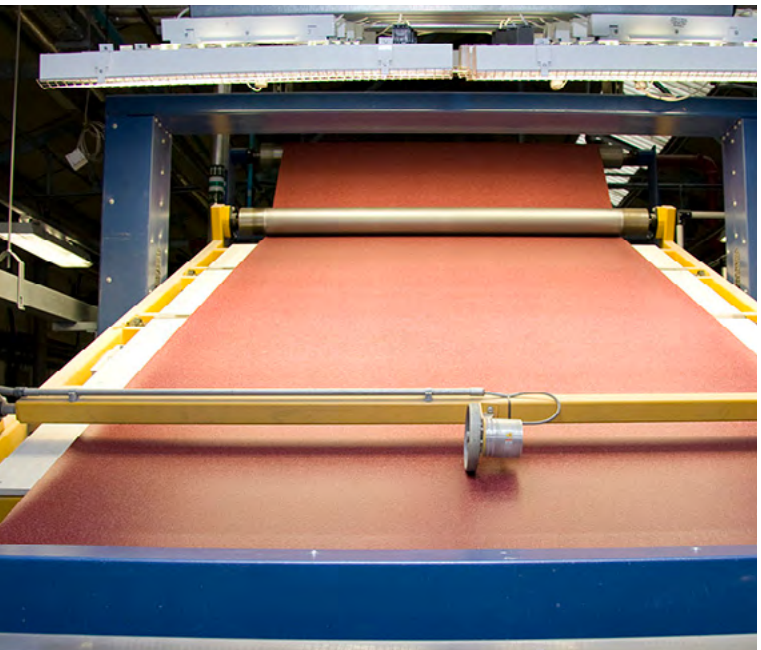
However, we believe that not all floors that achieve these ratings can be truly called safety floors.

At Altro, we do not believe that ex-factory results alone are a good enough measure of a floor covering's slip resistance performance.

Ex- factory results capture the floor's performance at a specific moment in time: a moment when no-one has walked on it, a moment when it is fresh from production. These results don't tell you how that floor will maintain its level of slip resistance over time and in use.

We believe that the only true way for a floor covering's performance to be measured is in the installed state and more than that, its performance must be maintained throughout its lifetime.

EN 13845, resilient floor coverings - Polyvinyl chloride floor coverings with particle based enhanced slip resistance - Specification, is the European standard that covers safety flooring. To be classified as a PVC safety floor, we believe the product must conform to this standard.



EN 13845 – what the results tell us

This test measures slip resistance by counting particles over a given area on an ex-factory flooring sample. The surface is abraded for a given number of revolutions and then the particles are re-counted. If the reduction in the number of particles is <10% after 20,000 cycles, the flooring passes the first classification. The process is repeated in increments of 10,000 cycles up to 50,000 and again, if the loss of particles is <10% of the original number, the flooring passes that classification and is classed as either ESf or ESb, meaning Enhanced Slip Resistance Footwear or Enhanced Slip Resistance Barefoot.

The number of cycles reached indicates what building use classification is achieved. After 50,000 cycles the flooring is suitable for the top classification of 34/43 which is very heavy commercial and very heavy industrial respectively.

	EN13845	"10% particles lost over 50000 Cycles "10% de las partículas perdidas en 50.000 ciclos "10% Parkitel werden uber 50000 Ümdrehungen verloren

All Altro safety flooring passes the 50,000 cycle test classification.

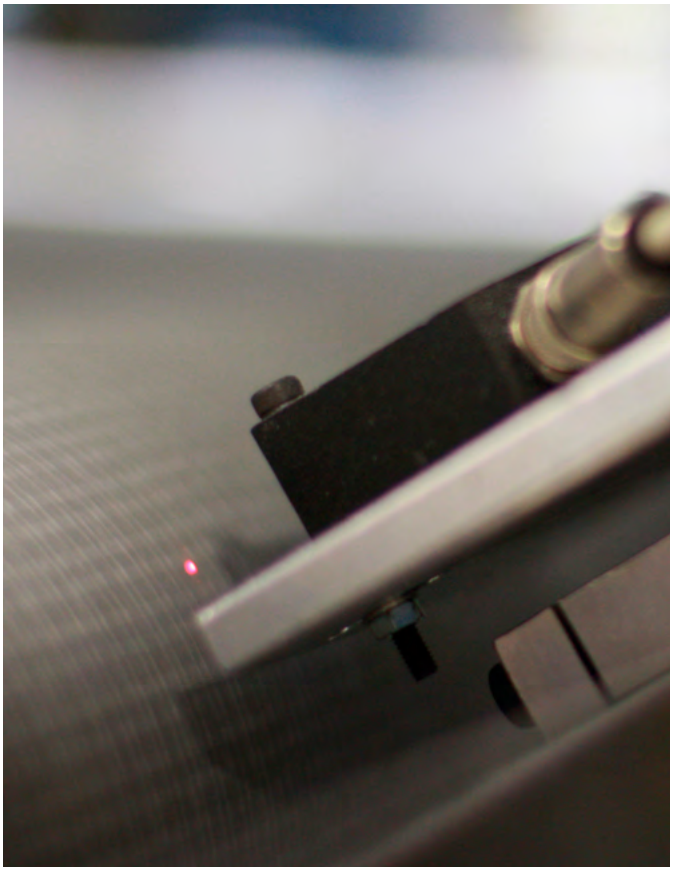
Test results combine the ESf or ESb with the number of cycles indicating the level of sustained slip resistance.

DS	TRRL EN 13845 EN 13893 DIN 51130	≥ 36 ESf DS R10

This extract from an Altro datasheet clearly specifies the number of cycles that the flooring has successfully passed. Not all manufacturers display this data and simply indicate the test result as "Pass". This Pass could reflect that the product has only been tested to the lowest level of 20,000 cycles. We recommend that, whenever the information is not provided, you ask a manufacturer for the specific number of cycles that the flooring has passed as an indicator of that product's level of sustained slip resistance.

Remember

- Slip resistance on datasheets is calculated on ex-factory flooring
- Ex-factory flooring results do not measure long-term performance
- Look for the 50,000 cycles on EN 13845 test results



The dangers of relying on ex-factory results

Not all floors that achieve TRRL ≥36 or an R10 classification exhibit sustained slip resistance. 'As new' floor measurements can become obsolete in weeks.

Ex-factory results can be based on flooring which features a thin coating or emboss, applied to increase the level of slip resistance at the point of manufacture for the purposes of achieving a certain slip resistance rating, such as TRRL ≥36 or an R10 classification.

We and other leading British safety flooring manufacturers believe, based on decades of industry experience, that these thin levels of slip resistance can wear off in months from usage and regular maintenance to leave a considerably less slip-resistant surface, which could fall significantly below the HSE minimum recommended level of TRRL ≥36, leaving the floor potentially unsafe .

Remember

- New floor measurements can become obsolete in weeks
- They can be based on a product with an emboss or coating which can wear off

Contents

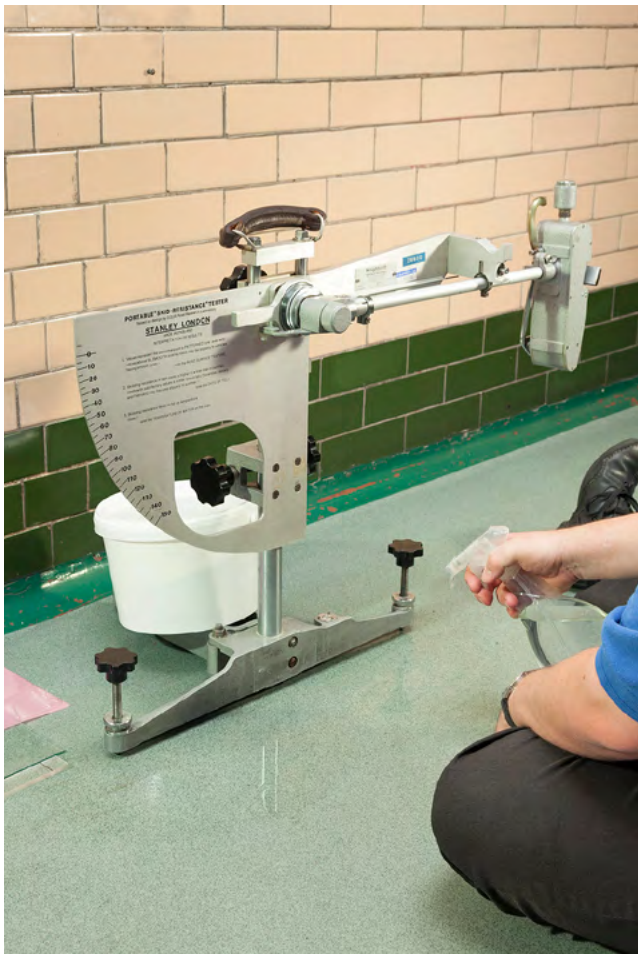
The only reliable way to test slip resistance

The United Kingdom Slip Resistance Group, of which Altro are a member, believe that the best way to measure slip resistance is to use the TRRL Pendulum test and we share this view. It is also the preferred method of the Health and Safety Executive. This method has several advantages over the Ramp test, the biggest of which is that it can be used to measure in situ floor coverings and therefore sustained slip resistance, thereby identifying a product which we consider to be a true safety floor.

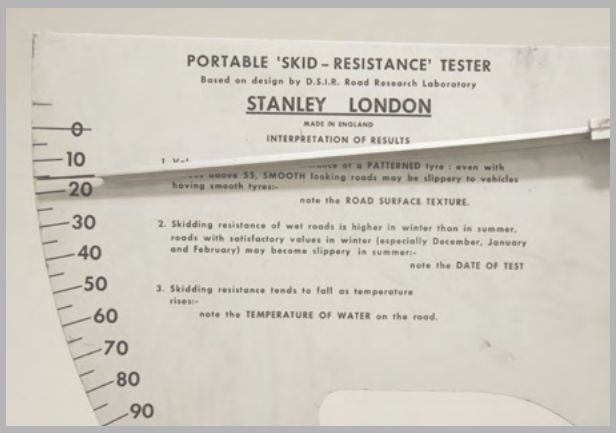
Pendulum value / Slip resistance value (TRRL)	Potential for slip
0 - 24	High
25 - 35	Moderate
36 +	Low

Remember

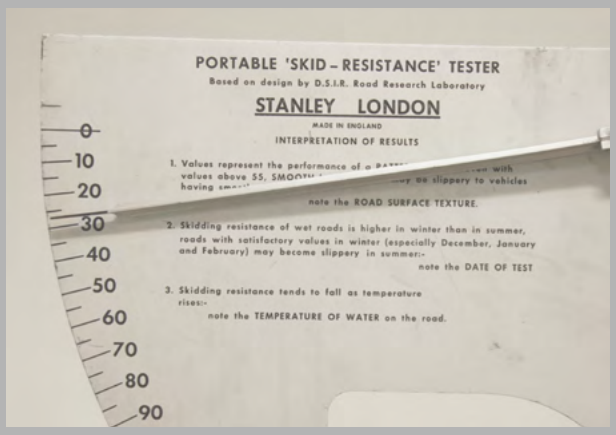
- We consider the TRRL Pendulum test the only reliable way to measure sustained slip resistance



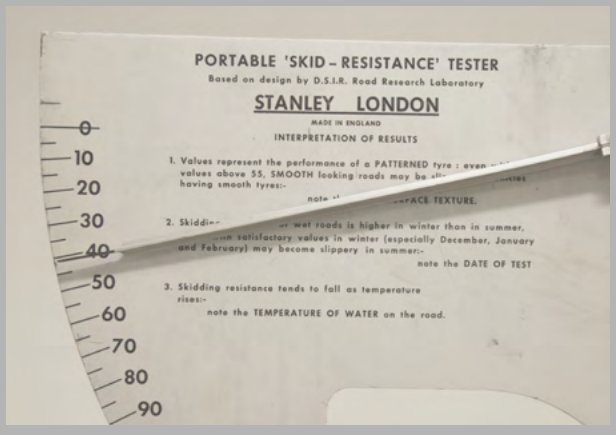
How to read Pendulum test results



When you carry out a pendulum test, if the needle falls between 0 and 24, it indicates that the flooring being tested has a high potential for slip.



A result between 25 and 35 indicates that the flooring being tested has a moderate potential for slip.

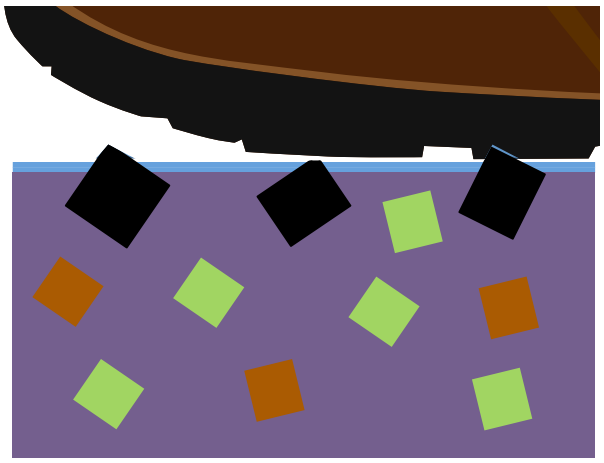


A result of 36 or over indicates that the flooring being tested has a low potential for slip. All Altro safety flooring is tested to this level.

How vinyl safety flooring works

Wet contaminants on flooring create a film between the shoe and the floor. The most common wet contaminant is water, but it could be virtually anything. The film created by the wet contaminant prevents complete contact between a shoe and the floor and can result in a slip or fall. Safety flooring works by incorporating aggregates into a wear layer, which, providing they are sufficient in number and quality, penetrate the film to provide contact with the shoe.

A wet film needs only to be 1-2 μm thick to prevent complete contact between a shoe and the flooring. That's about one tenth the thickness of a human hair.



Film of water

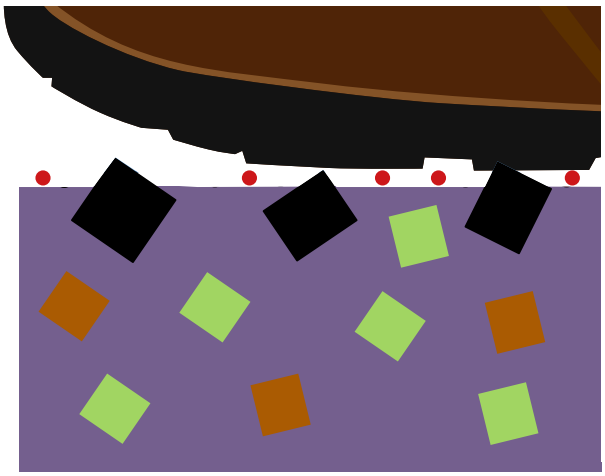
Silicon Carbide

Recycled Glass

Aluminium Oxide

Flooring

Dry contaminants can act as millions of tiny ball bearings which can also result in a slip or fall. The aggregates in the safety flooring sit proud to provide sufficient contact with the shoe to prevent a slip or fall.



Solid contaminent

Silicon Carbide

Recycled Glass

Aluminium Oxide

Flooring

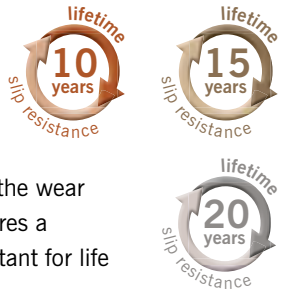
Remember

- It only takes 1-2 μm of wet film to cause a slip or fall
- The aggregates in safety flooring penetrate the wet film or the dry contaminants to prevent a slip or fall

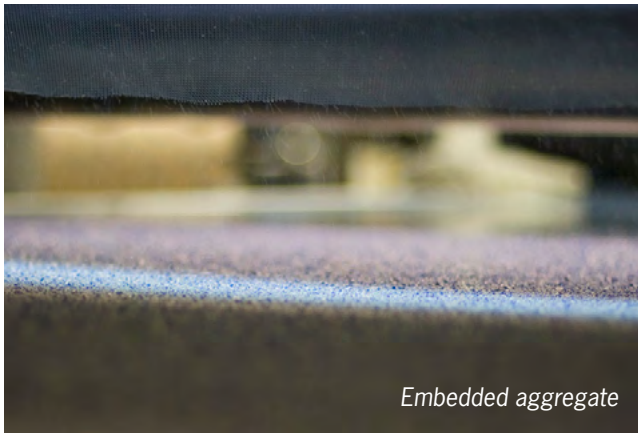
Contents

Why Altro safety flooring?

- It provides sustained slip resistance for the lifetime of the product - Altro's unique, patented construction of flexible, high grade vinyl with slip-resistant grains throughout the wear layer of the safety flooring, ensures a durable surface that is slip-resistant for life



- We have ≥36 TRRL test results for every Altro safety flooring which we are happy to share with you
- During manufacture it is quality tested every 400 linear metres to ensure its ≥36 slip resistance
- During its installed lifetime, we test various flooring installations on site to ensure slip resistance performance
- We have invested in international tests to ensure the rigorous performance of our safety flooring over and above the minimum required test standards
- Varieties of aggregate (including silicon carbide, quartz and aluminium oxide) are embedded in sheet vinyl to prevent slips and falls


Embedded aggregate

- We invented safety flooring over 60 years ago. We pioneered the original technology and are still pioneering new technologies today
- We keep samples of each production roll for the life of the warranty
- It meets the highest standards of safety, hygiene and sustainability
- A product spends many years in development both in the lab and in the field to ensure performance – for example Altro Aquarius was in development for seven years before launch


Customer visit

- We were the first to market with invisible slip giving you a modern, high design, non-sparkle look without compromising on sustained slip resistance
- We invented Altro Easyclean Maxis PUR for sustained slip resistance and ease of cleaning
- We formulate to meet strict fire and smoke regulations
- High quality reinforced glass fibre scrim provides strength and dimensional stability
- We have recently invested over £5 million in new technologies to keep bringing you ground-breaking new product solutions
- We hold continuous in-house training for our manufacturing operatives to promote quality of manufacture

- We run Training Schools to promote the highest standards of craftsmanship among industry installers

Training Schools

- We have invested to be able to carry out our own VOC testing to monitor our product development to ensure our products keep contributing to improved indoor air quality

- We are championing the cause for enhanced visibility of sustained slip resistance claims by manufacturers to empower you to know what you are specifying

- Safety flooring is available in homogenous and heterogeneous options, with specialist ranges available for greasy commercial kitchens and combined shoe and barefoot use


Altro Aquarius

- We are active members of the UK Slip Resistance Group and are closely involved in developing slip resistance test methods designed to keep you safe

- We are the only manufacturer to offer a 100% recyclable and reusable post-use safety floor putting sustainability at the heart of our product development


Altro Recycling Plant

Remember

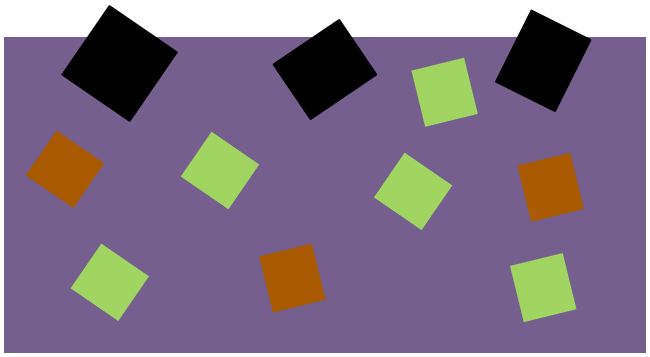
- Altro safety flooring provides sustained slip resistance for life
- We test our products beyond legal requirements to ensure continued performance
- We continue to invest in new testing methods and new technologies

Contents

How is Altro safety flooring made?

The traditional method

Traditional Altro safety flooring includes silicon carbide and often a coloured quartz too. This method of production is still in use among many manufacturers and remains popular. It is characterised by its sparkly appearance.



Silicon Carbide

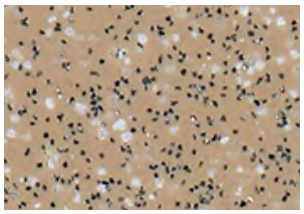
Aluminium Oxide

Recycled Glass

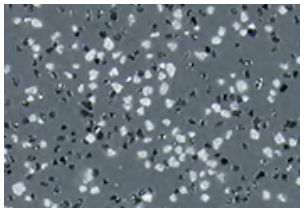
Flooring

Traditional flooring

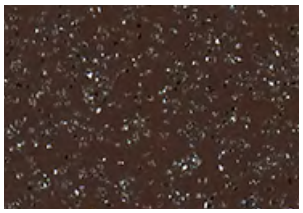
Blue X2541R11
WR71 A1M71
LRV 20



Biscuit D25904
WR146 A1M20
LRV 30



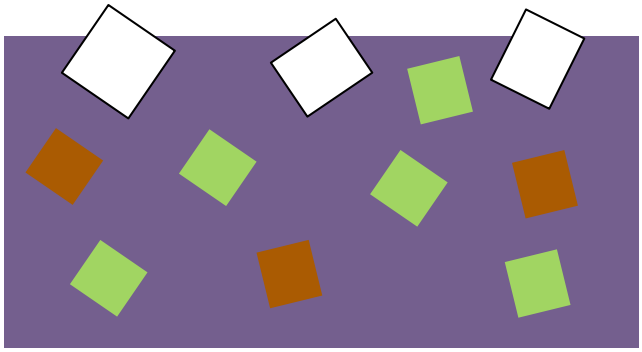
Dolphin K3010
WR86 A1M86
LRV 21



Walnut X4086
WR62 A1M62
LRV 10

The new generation method

New generation Altro safety flooring is also known as “invisible slip”. It includes aluminium oxide instead of silicon carbide, because it is hard-wearing and transparent. It provides the same degree of performance but has non-sparkly, aesthetic benefits. The surface of the product is structured in a way to minimise dirt retention. The particular grade of aluminium oxide features a patented specialised treatment to improve performance.



Transparent Aluminium Oxide

Recycled Glass

Aluminium Oxide

Flooring

Two technologies – one slip-resistant outcome

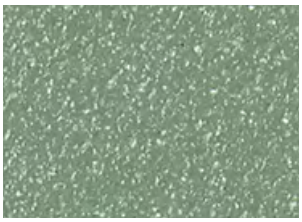
Whichever method is used in the manufacture of the product, they have one thing in common: the slip-resistant particles are found throughout the entire wear layer and this means they provide sustained slip resistance for the lifetime of the product.

Remember

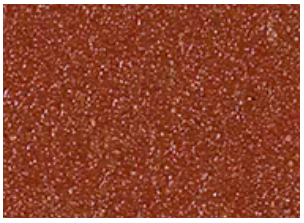
- Both traditional and new generation Altro safety flooring provide the same level of slip resistance

New generation flooring

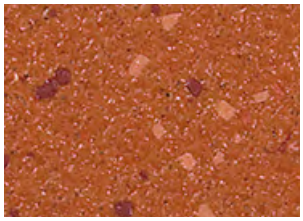
Vintage Cherry
WSA2002
WR301 A1M82
LRV 11



Roof Garden
VM2000P / XL2200P
WR262 A1M154
LRV 23



Paprika SU2043
WR278 A1M42
LRV 13



Signal UBI2516
WR300 A1M42
LRV 13

Contents

Types of Altro Safety flooring

Heavy duty solutions

Altro Unity 25, Altro Classic 25, Altro Designer 25

These 2.5mm safety floors are the ideal choice for extreme heavy duty areas where additional protection is required and provide outstanding durability and sustained slip resistance. Their excellent resistance to mechanical or physical damage and long-term replacement costs make them firm favourites in the demanding environments of education, industry and healthcare.

These three heavy duty ranges offer you contemporary, industrial or decorative design options to suit the requirements of varied applications. Affording low maintenance and ease of cleaning, these products provide lasting appearance retention and are backed by lengthy 15 year product warranties and 20 year life expectancies.

Where ease of maintenance and aesthetics are key, select new Altro Unity, with its fresh palette and PUR technology.

Versatile solutions

The Altro Walkway Collection , The Altro XpressLay Collection, Altro Impressionist II

Providing sustained slip resistance, excellent durability and ease of installation, these low maintenance safety floors are easy to clean and perfect for busy, public areas in healthcare, education, retail, leisure and commercial. They offer you a great choice of colour and chipped and non-chipped varieties for greater design flexibility.

Apart from traditionally adhered ranges, there is also a truly sustainable, recyclable and reusable, adhesive-free option Altro XpressLay. Suitable for a host of applications including large public areas, permanent, temporary and listed buildings, it is ideal for use where original substrates may need protecting or where sustainable criteria must be met. Altro XpressLay is also the only safety floor that is 100% recyclable or reusable post-use.

With 10 year warranties and long life expectancies, they all offer excellent value for money.

Inspirational solutions

Altro Suprema II, Altro Wood Safety

These safety floors are for areas where aesthetics, sustainable slip resistance and durability cannot be compromised. They offer vast colour choice (Altro Suprema II with up to 40 plain and chipped options) and reproduce the natural warmth of nature (Altro Wood Safety), enabling you to create inspirational interiors. The non-sparkle finish makes them perfectly suited to installation in dementia/care homes. They are also ideal for public areas such as receptions, corridors, shops, cafes, wards and day rooms, where they never cease to impress.

Easy to clean and maintain, with the added reassurance of PUR, these ranges will provide years of appearance and colour retention. With a 10 year warranty and 15 year life expectancy, they represent an excellent long-term investment.

Special application solutions

We have developed flooring solutions for demanding environments with particular requirements.

For kitchens/catering - Altro Stronghold 30

The wet and greasy conditions of commercial kitchens, prone to frequent spillage, are catered for by a 3mm safety floor which boasts Altro's highest rating for slip resistance.

For industrial applications - Altro Atlas 40

A 4mm option affords enhanced resistance to chemicals, indentation and mechanical damage, making it ideal for use in locations such as light engineering and chemical processing.

For barefoot or barefoot/shod - Altro Marine 20, Altro Aquarius

For wet areas such as pool surrounds, studded safety flooring (Altro Marine 20) keeps barefoot and soft soled shoe wearers safe. For other potentially wet areas where users may be barefoot or wearing any type of shoe, Altro's revolutionary option (Altro Aquarius) is the ideal solution. It has been designed for use by the wearers of any type of shoe, including hard and soft soled, rubber and trainers, plus barefoot, meaning this flooring can be specified for use in wet and dry locations, including bathrooms, shower and changing areas, healthcare, leisure and social housing.

Remember

- There are many different types of Altro safety flooring for general and specific applications

Contents

What doesn't give you sustained slip resistance?

Safety flooring with a thin coating or emboss

Some manufacturers can add a thin coating or emboss of slip-resistant particles, which can wear away with usage or regular maintenance.

The structure of this type of product means that the slip resistance can be transient, putting users at risk.

Thin coating with slip resistant particles

Smooth and rubber flooring

Smooth and rubber flooring are not designed to have sustained slip resistance but can be safe under dry, contaminant-free conditions.

Thin coating

Remember

- Safety flooring with an emboss or thin coating of slip-resistant particles does not provide sustained slip resistance
- Smooth and rubber flooring are not designed to have sustained slip resistance

How to maintain sustained slip resistance

The evaluation of slip resistance is not simply a case of taking a reading from an instrument, but also an assessment of other factors such as any contaminants involved, the cleaning regime in use, type of footwear etc.

All safety flooring, irrespective of manufacturer, requires maintenance to ensure that it performs to expected standards.

Cleaning

Ensure that you follow the manufacturer's cleaning recommendations

- Correct cleaner at the correct dilution

- Allow sufficient time for cleaning solution to work after application

- Rinse as directed – the key to effective cleaning is not just to loosen and move the dirt around but to remove it entirely from the floor

If an incorrect cleaning regime is followed, this can lead to a build-up of dirt and/or cleaning chemicals on the surface of the flooring which can act as a barrier to effective slip resistance, resulting in potential slips and injuries.

Footwear

While it is not always possible to influence the choice of footwear in any area, it is important to remember that it plays a vital role in the prevention of slips. The HSE recognises the crucial role that footwear plays in occupational slips and trips. Footwear recommendations can be made to staff in certain locations, such as hospitals and supermarkets, to help significantly reduce the incidence of slips and trips.

Contaminants

Contaminants are not always obvious and can be interpreted as any substance which ends up on the floor. This can include everyday materials that form a part of your regular activities such as water, oil or other liquids, spillages, leaks, as well as dry contaminants such as dust, cardboards, talc, flour and fat particles. The danger they can pose is to reduce available friction on the flooring resulting in a potential slip or injury.

We strongly recommend carrying out a risk assessment on any area in which you are considering installing any type of flooring to identify all potential slip hazards.

Typically, these areas may include

- Receptions, foyers – damp, debris fom wet shoes, umbrellas, clothing
- Corridors – drinks, food, paper
- Kitchens – oils, fat, grease, soapy water, baking powder, flour, fruit, dropped peelings

- Changing rooms, toilet areas – water, talc, shampoos, shower gels, body fats
- Wards – bodily fluids, medicines, ointments, creams, food, drinks
- Treatment rooms, operating theatres – blood and other bodily fluids, water, medicines
- Art rooms – water, powder paints, clay, paper, oils
- Technology suites –wood and metal shavings, sawdust, oils, greases
- Flower stalls – water drips

Remember

- Follow the manufacturer's cleaning recommendations
- Contaminants can be wet or dry and anything that ends up on the floor
- Footwear plays a vital role in preventing slips

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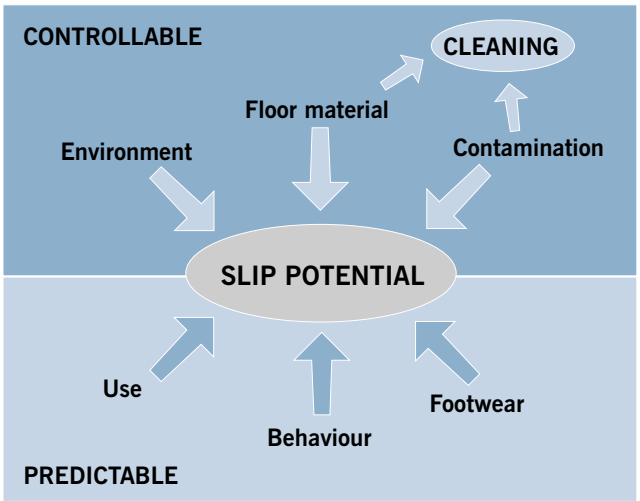
Risk assessments

In some sectors, the need for risk assessments is clearly outlined. The Department of Health's Performance requirements for building elements used in healthcare facilities (HBN-00-10) Version: 0.6: England, which supersedes HTM61, sets out essential quality and safety standards to which building elements must adhere. For Scotland SHTM 61 provides similar guidance on the specification of floor finishes.

These performance requirements indicate that a risk assessment be carried out before any new or replacement flooring and/or walling is installed and should consider and record the following

- Environment
- Contamination
- Slip and trip potential of foot traffic etc under different conditions
- Appearance
- Acoustics
- Use
- Footwear

We strongly recommend that this Department of Health requirement be extended beyond healthcare and become an example of best practice in all sectors, to protect not only all those who use flooring in any environment where safety is a concern, but also those who have responsibility for the health and safety of employees/visitors.



The HSE chart above illustrates the factors that influence slip potential.

For assistance with carrying out risk assessments, visit www. flooring.hse.gov.uk to use the Health and Safety Executive's (HSE's) Find the right flooring tool.

Remember

- New Department of Health Performance requirements for England indicate the need for a risk assessment before any new/replacement flooring or walling is installed
- We believe that this example of good practice should be extended across all sectors

Other people who care

The National Health Service (NHS) is concerned about the dangers of slips and falls, both to patients and staff.

To tackle the problem, the NHS has introduced new requirements to help raise standards and reduce accidents

New Department of Health performance requirements

The Department of Health's Performance requirements for building elements used in healthcare facilities (HBN-00-10) Version: 0.6: England identifies the need for quality and fit for purpose NHS estates to ensure the delivery of efficient healthcare.

The document highlights the responsibility of specifiers, project teams and anyone who commissions building and maintenance works to consider the performance requirements outlined in the document with regard to quality and safety.

Key requirements with regard to flooring

- Carpets should be avoided in clinical areas. If they are to be considered in non-clinical areas, it is essential that a documented local risk assessment is carried out and a clearly defined preventative maintenance and cleaning programme implemented
- Floors in hospital streets and corridors must be capable of withstanding the loads imposed by heavy wheeled and intense pedestrian traffic
- Floors in operating theatres should be able to withstand the movement of mobile heavy equipment and frequent spillages, regular cleaning and disinfection
- Central kitchens should be planned with environmental health officers with reference to the HSE's Stop slips in kitchens website, www.hse.gov.uk/slips/kitchens
- Entrance floors should be slip-resistant in all weather conditions
- All flooring, including slip-resistant, should be capable of being cleaned to agreed hygiene standards and surfaces must be able to prevent pedestrians from slipping both in areas deemed as dry and those that can become wet or contaminated
- Design should focus on enhancing patient safety, thereby contributing both to a reduction in accidents involving patients and to costs incurred by such accidents and ensuing hospital stays

Visit www.altro.com for more information on Slips and Trips in Healthcare and Social Care.

Remember

- New NHS requirements in England focus on quality and safety and highlight the responsibility of specifiers and project teams to consider performance
- Scotland SHTM 61 provides similar guidance on the specification of floor finishes

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