Aging behavior of running track surfaces

ASBA Technical Meeting 2023 – Session 8 – December 4, 2023

GEZOLAN

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Agenda

1. Influencing factors for the aging of running track surfaces
2. Aging behavior of EPDM granules
3. Aging behavior of PU in running tracks
4. Solutions to avoid Chalking
5. Conclusion

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1. Influencing factors for the aging of running track surfaces

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I. Non-influenceable Factors

A. Environmental conditions

B. Weathering

FOCUS

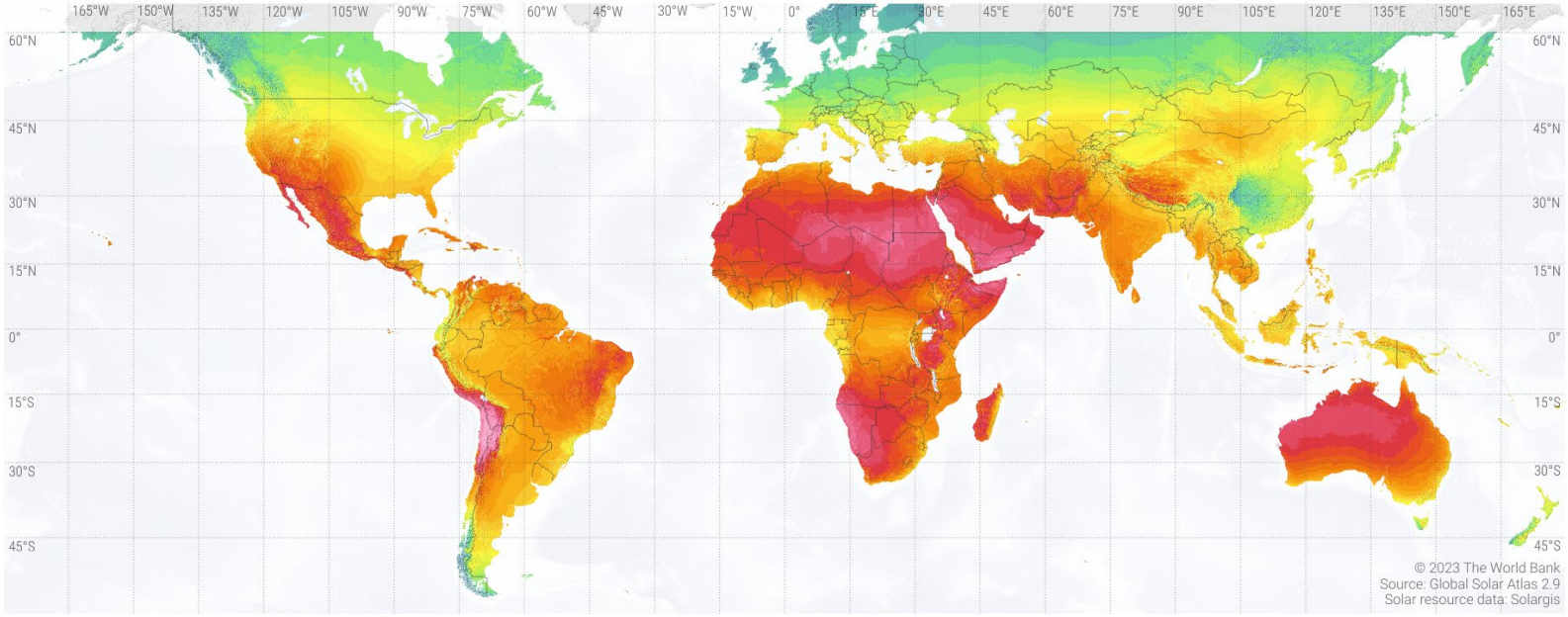
C. Climate conditions

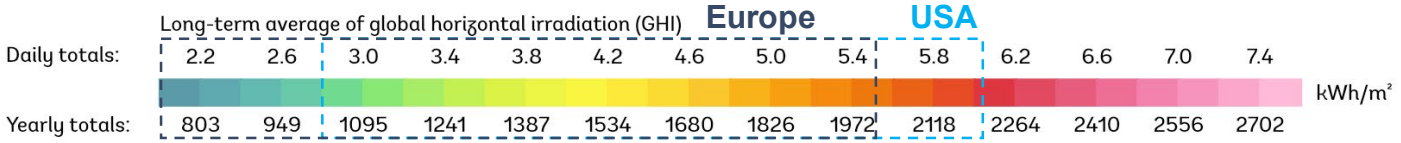
I. Non-influenceable Factors

Climate conditions

SOLAR RESOURCE MAP
GLOBAL HORIZONTAL IRRADIATION

WORLD BANK GROUP ESMAP SOLARGIS





This map is published by the World Bank Group, funded by ESMAP, and prepared by Solargis. For more information and terms of use, please visit http://globalsolaratlas.info.

Global horizontal irradiation (GHI)

USA: 2.34 - 5.97 kWh/m²
Europe: 2.10 – 5.45 kWh/m²

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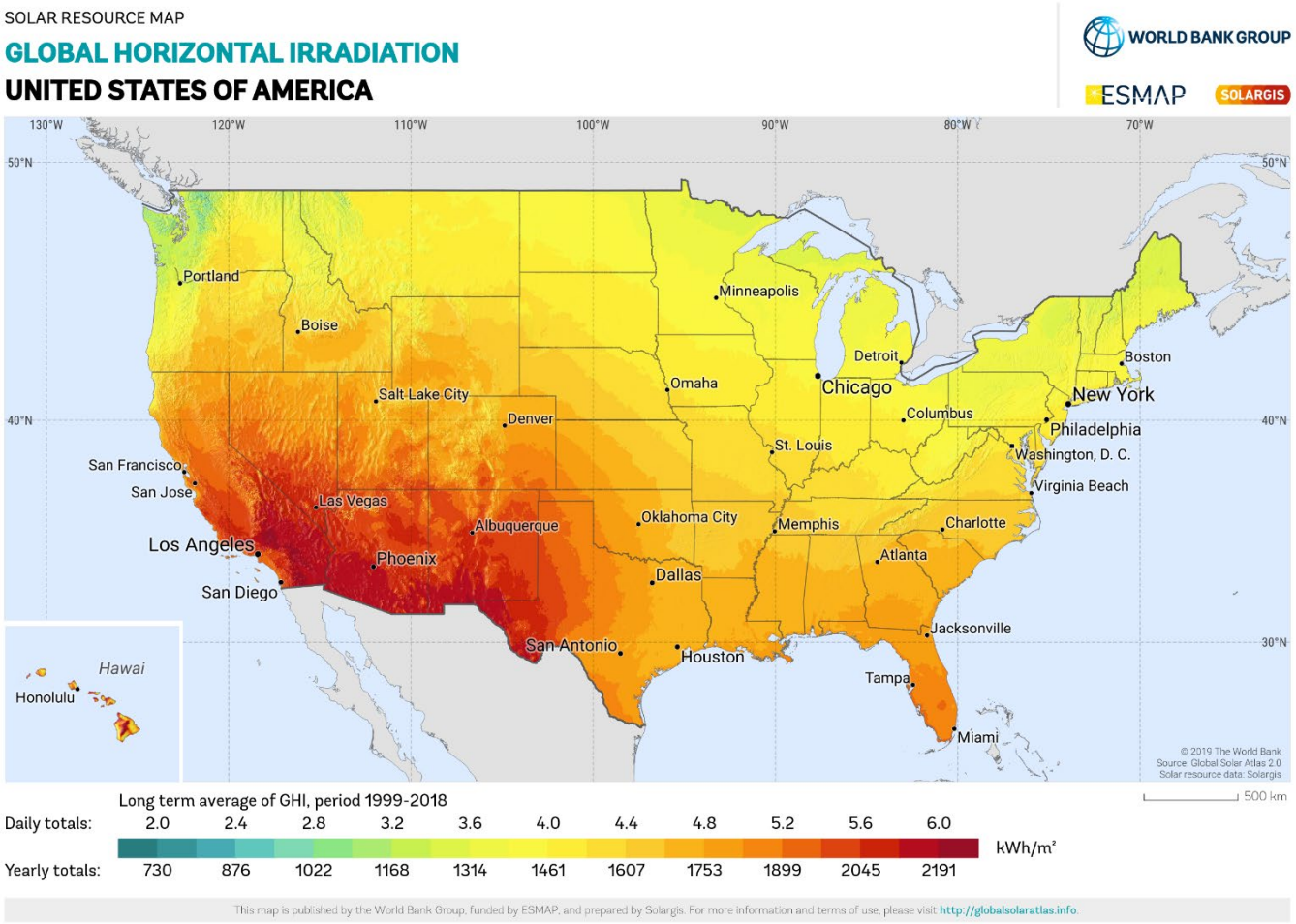
I. Non-influenceable Factors

Climate conditions



Distribution

Global horizontal irradiation

more than 5.40	11.7 %	
5.40 – 5.20	4.4 %	
5.20 – 5.00	6.3 %	
5.00 – 4.80	8.6 %	
4.80 – 4.60	13.7 %	
4.60 – 4.40	11.2 %	
4.40 – 4.20	9.1 %	
4.20 – 4.00	12.3 %	
4.00 – 3.80	10.0 %	
less than 3.80	12.7 %	
	100.0 %	

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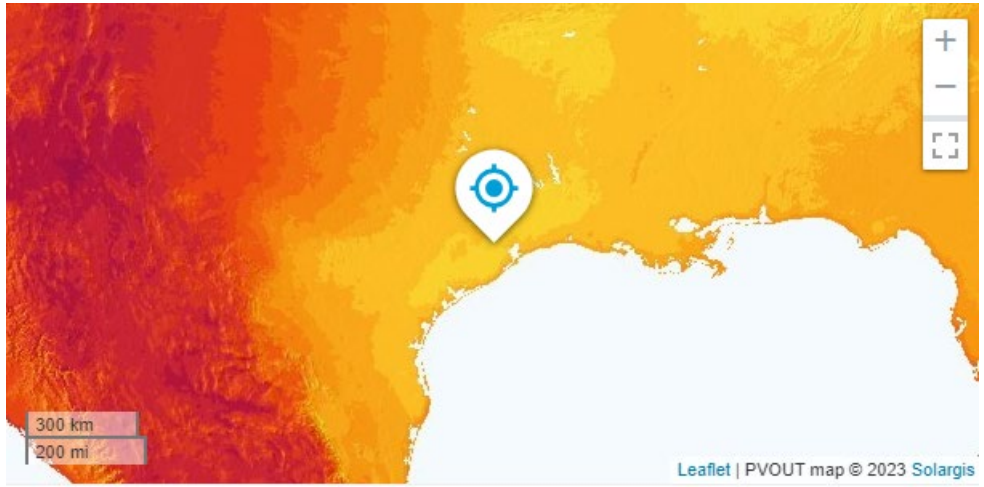
I. Non-influenceable Factors

Climate conditions

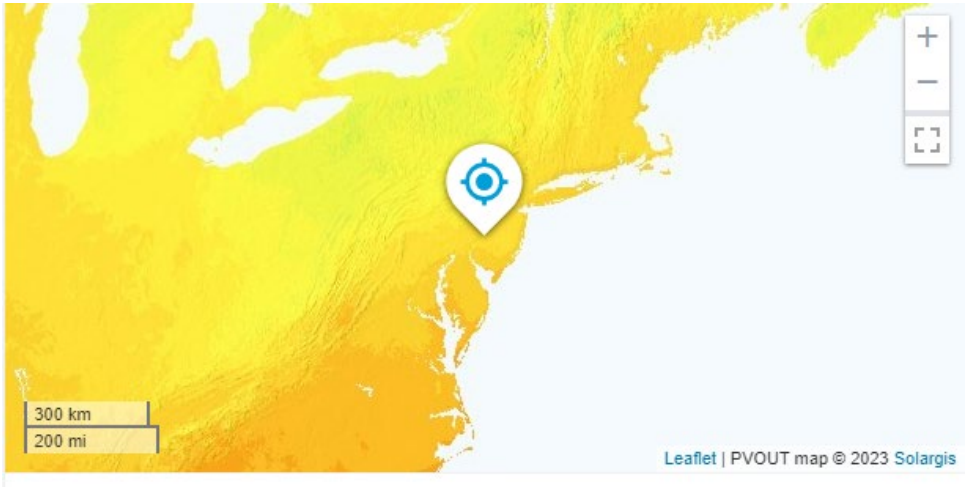
Houston



GHI 4.629 kWh/m^2 per day

vs.

Philadelphia



GHI 4.044 kWh/m^2 per day

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I. Non-influenceable Factors

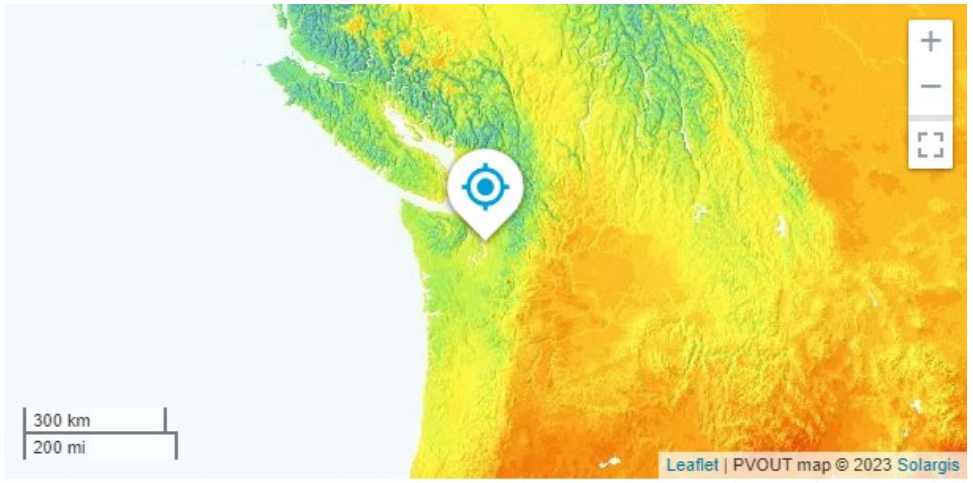
Climate conditions

Miami

GHI 5.267 kWh/m^2 per day

vs.

Seattle



GHI 3.512 kWh/m^2 per day

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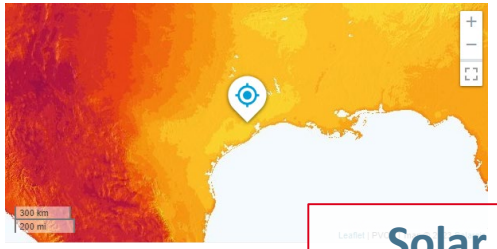
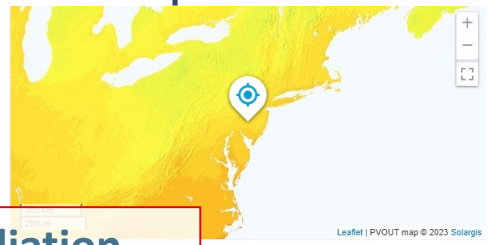
I. Non-influenceable Factors

Climate conditions

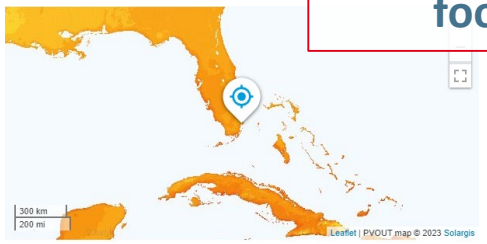
Houston



Philadelphia



Miami



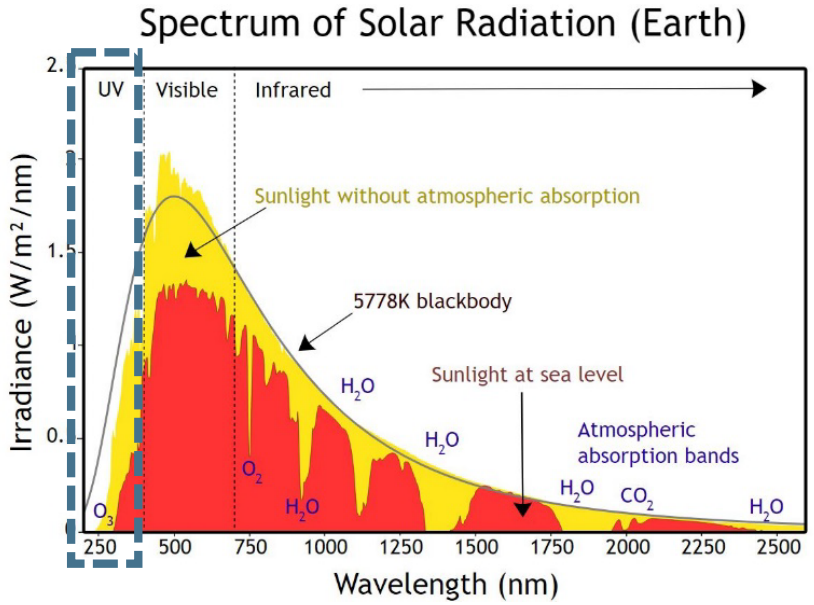
Seattle

Solar radiation footprints

City	Global horizontal irradiation (GHI)
Houston	**4.629** kWh/m² per day
Philadelphia	**4.044** kWh/m² per day
Miami	**5.267** kWh/m² per day
Seattle	**3.512** kWh/m² per day

Solar radiation vs. Isolated UV radiation

There is no accurate correlation between reality and lab testing because the sample in the UV testing device is not exposed to the entire spectrum of solar radiation!



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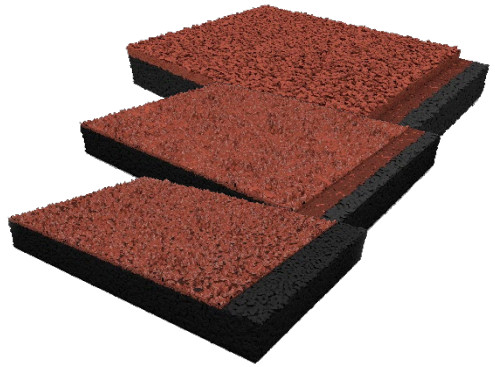
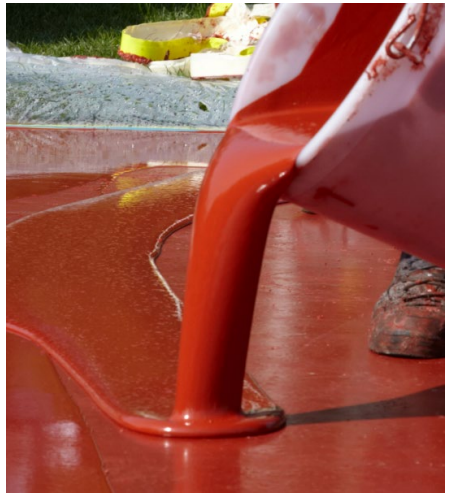
II. Influenceable Factors



A. System type



B. Finishing / Coating

C. Maintenance

FOCUS

D. System components

2. Aging behavior of EPDM granules

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I. Artificial aging of EPDM granules

Why artificial aging / exposure to accelerated UV radiation in the lab

- EPDM granules for sports and leisure applications are applied outdoors and therefore need a high resistance against outdoor conditions that will last over a long period with stable performance and appearance
- Outdoor conditions feature a few severe threats to polymer materials like EPDM
  - → **Photo degradation causes chain scission in the molecules of polymer materials**
  - → **The result is a loss of physical properties as well as a change to the visual appearance**
  - → **This process takes years outside, so it is simulated and accelerated under lab conditions**
  - → **Standardized processes are needed for lab-reality correlation**
- Accelerated weathering and artificial aging simulates damaging effects of long term outdoor exposure of materials and coatings

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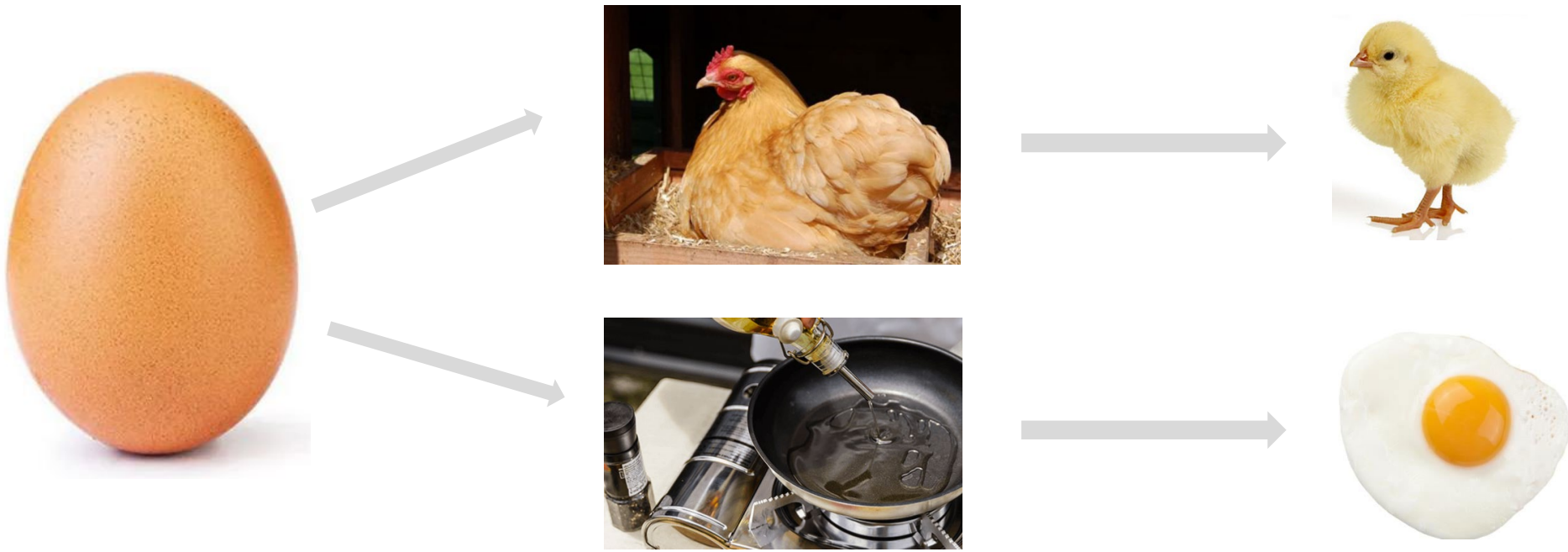
I. Artificial aging of EPDM granules

It`s not only about accelerating the process. The result is a matter of the right parameters!



I. Artificial aging of EPDM granules

Overview of typical application and contained testing standards

Requirement Standard		Application	Parameters	Testing standard for UV Exposure	Equipment
FIFA 2015	International	Artificial Turf / Infill	**UVA** (340nm) 9600 kJ ± 125 **5000 h**	**EN 14836**	UV-lamp radiation (EN ISO 4892-3)
NF P 90-112	France	Artificial Turf / Infill	**UVB** (313nm) 4896 kJ ± 125 **3000 h**	**EN 14836**	UV-lamp radiation (EN ISO 4892-3)
EN 14877 / NF P 90-100	Europe / International	Track and Play	**UVA** (340nm) 4896 kJ ± 125 / 9600 kJ ± 125 **3000 h / 5000h**	**EN 14836**	UV-lamp radiation (EN ISO 4892-3)
DIN 18035-7	Germany	Artificial Turf / Infill	**Xenon** 0,51 W/(m²·nm) @340 nm **1500 h**	**DIN EN ISO 4892-2,** Procedure A, Cycle 1	Xenon arc radiation / Daylight filtering (EN ISO 4892-2)

Concluding assessment for all:

EN ISO 20105-A02

Grey Scale: Determination of color-change rated from 5 to 1

- with 5 = best result / no change | 1 = worst result strong change
- Requirement mostly ≥ 3

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I. Artificial aging of EPDM granules

Overview of typical application and contained testing standards

Exposure Standards NF P 90-100 and EN 14877 define the artificial aging of samples according to standard EN 14836 (current version).

Method 1 specifies the use of a UVA lamps by applying an exposure of **3000h / 4896 ± 125 kj/m²/nm at 340 nm**. This method makes it possible to evaluate products intended to be implemented in environments where it is unlikely that strong UV exposure will be observed.

Method 2 specifies the use of a UVA lamp by applying an exposure of **5000h / 9600 ± 125 kj/m²/nm at 340 nm**. This method makes it possible to evaluate products intended for use in environments where high UV exposure is observed



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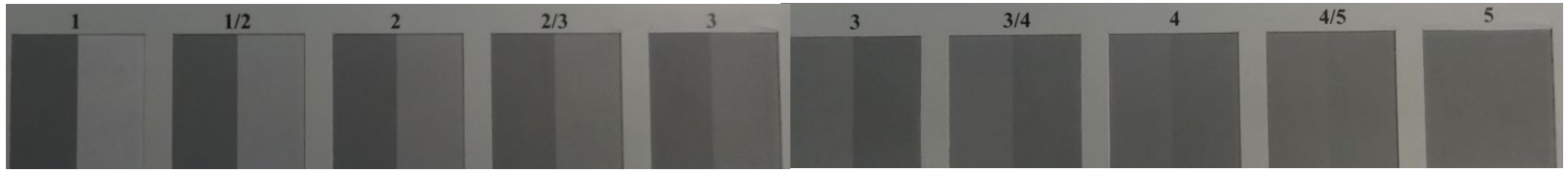
I. Artificial aging of EPDM granules

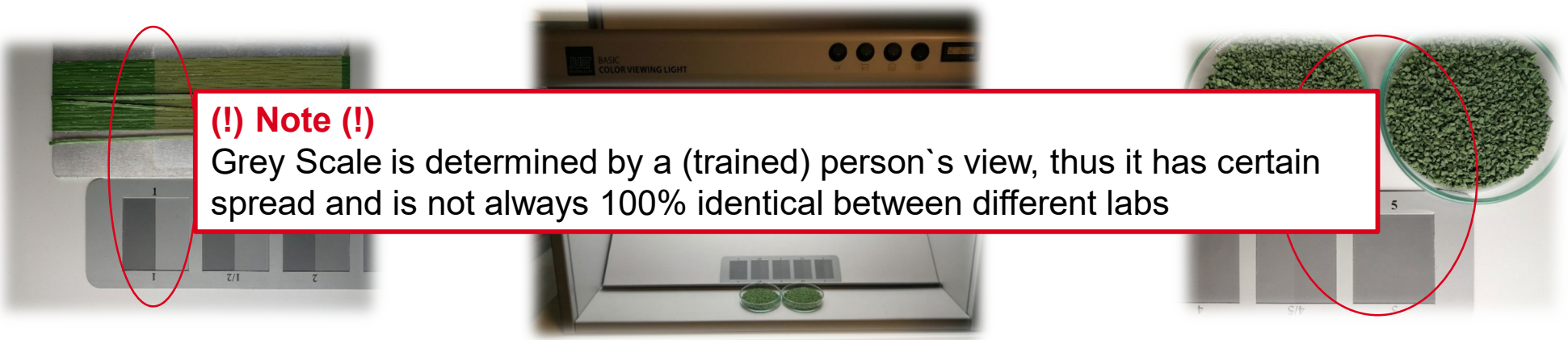
Overview of typical application and contained testing standards

Assessment: **Grey Scale** EN 20105 – A02 standard : 1995 – Textiles – Test for color fastness – Part A02: Grey scale for assessing change in color - Evaluation of color change and or fading with standardized scale and intervals

Grey Scale



Assessment by means of Grey Scale



(!) Note (!)
Grey Scale is determined by a (trained) person`s view, thus it has certain spread and is not always 100% identical between different labs

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I. Artificial aging of EPDM granules

Overview of typical application and contained testing standards

Besides ISO 4892, the following standards are also relevant in the USA:

- ASTM G 154:2023 – Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Materials
- ASTM D 4329:2021 – Standard Practice for Fluorescent Ultraviolet (UV) Lamp Apparatus Exposure of Plastics
- ASTM D 4587:2023 – Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings

→ Even though there are US standards, European standards are followed!

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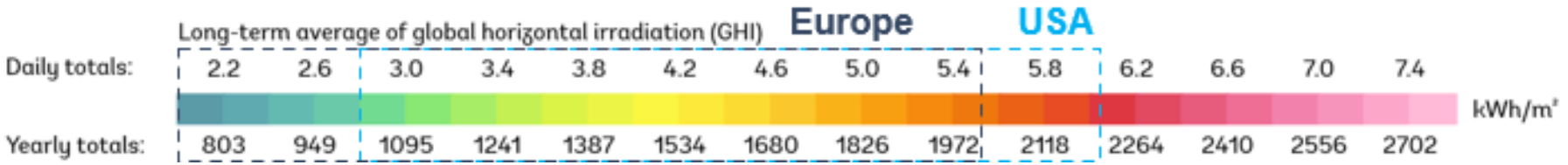
I. Artificial aging of EPDM granules

Overview of typical application and contained testing standards

Conclusion

- As represented in the UV maps, in the USA UV irradiation is different than Europe.
- Available EN Standards for UV exposure towards sports and leisure floorings probably do not match typical UV irradiation scenarios (outdoor) in the US.
- The ISO 4892 standard is also frequently used in the USA, and is then sometimes manually adapted to local conditions and individual parameters.
- Some system houses and installers have switched to increasing the intensity of existing standards (for both UV exposure and condensation cycle).



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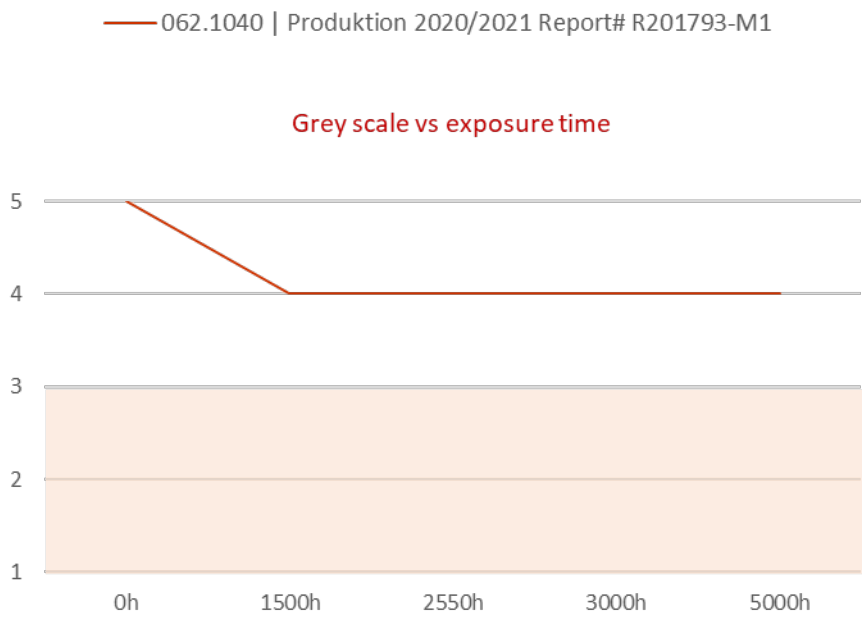
II. Color stability of EPDM granules

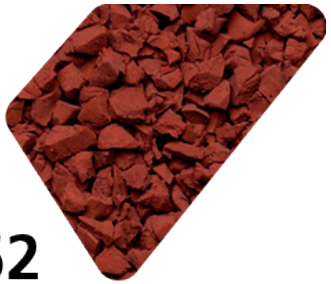
Results of artificial aging – official Test reports



Parameter Elément Elemento	Unit Unité Unidad	Test method Méthode d'essai El método de ensayo	Result Résultat Resultado	NF P90-100
Color Couleur / Color	(-)	visual	Orange / orange / naranja	-
Grey scale Echelle de gris / Escala de gris	(-)	EN 20105-A02	3-4	≥ 3
Visual aspect Aspect visuel / Aspecto visual	(-)	visual	Pas d'agglomération No agglomeration	-
			Pas de fissuration No crack	-

View of the new product
Photographie du produit neuf
Fotographia del producto nuevo

View after ageing
Photographie du produit après vieillissement
Fotographia del producto después del envejecimiento



062

RED

RAL 3016

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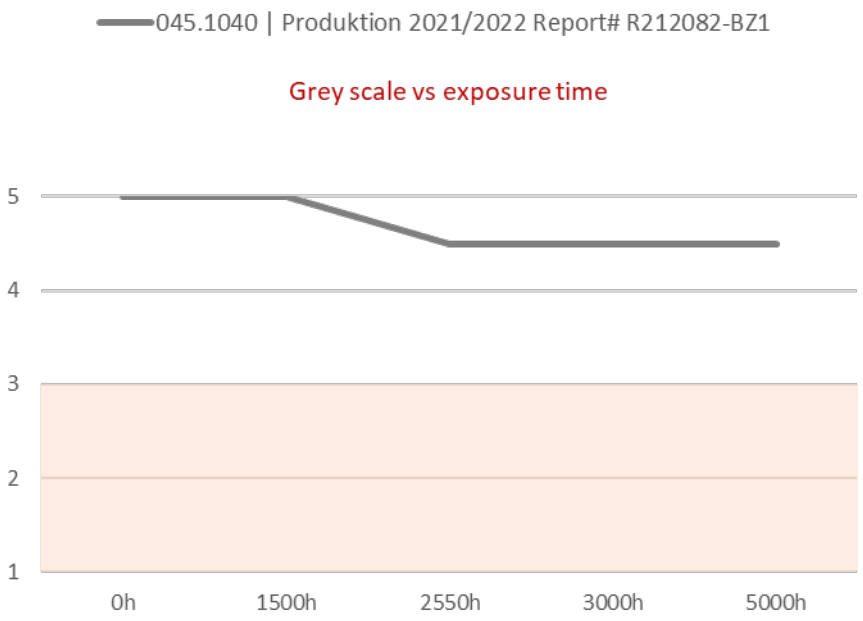
II. Color stability of EPDM granules

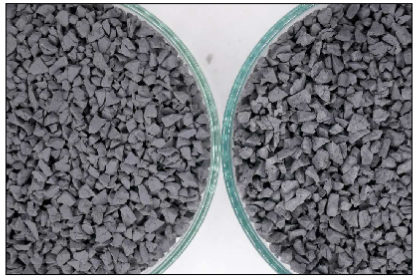
Results of artificial aging – official Test reports



Parameter Elément Elemento	Unit Unité Unidad	Test method Méthode d'essai El método de ensayo	Result Résultat Resultado	NF P90-100
Color Couleur / Color	(-)	visual	Grey / gris / gris	-
Grey scale Echelle de gris / Escala de gris	(-)	EN 20105-A02	4-5	≥ 3
Visual aspect Aspect visuel / Aspecto visual	(-)	visual	Pas d'agglomération No agglomeration	-
			Pas de fissuration No crack	-

View of the new product
Photographie du produit neuf
Fotographia del producto nuevo

View after ageing
Photographie du produit après vieillissement
Fotographia del producto después del envejecimiento



045
DARK GREY
RAL 7011

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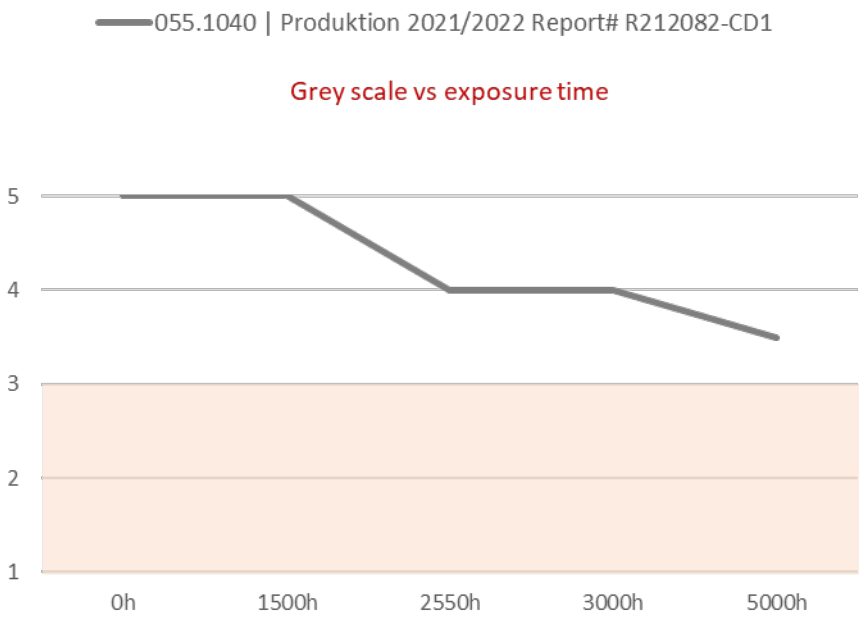
II. Color stability of EPDM granules

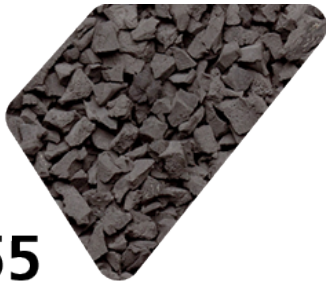
Results of artificial aging – official Test reports



Parameter Elément Elemento	Unit Unité Unidad	Test method Méthode d'essai El método de ensayo	Result Résultat Resultado	NF P90-100
Color Couleur / Color	(-)	visual	Grey / gris / gris	-
Grey scale Echelle de gris / Escala de gris	(-)	EN 20105-A02	3-4	≥ 3
Visual aspect Aspect visuel / Aspecto visual	(-)	visual	Pas d'agglomération No agglomeration	-
			Pas de fissuration No crack	-

View of the new product
Photographie du produit neuf
Fotographia del producto nuevo

View after ageing
Photographie du produit après vieillissement
Fotographia del producto después del envejecimiento



055

MIDDLE GREY

RAL 7037

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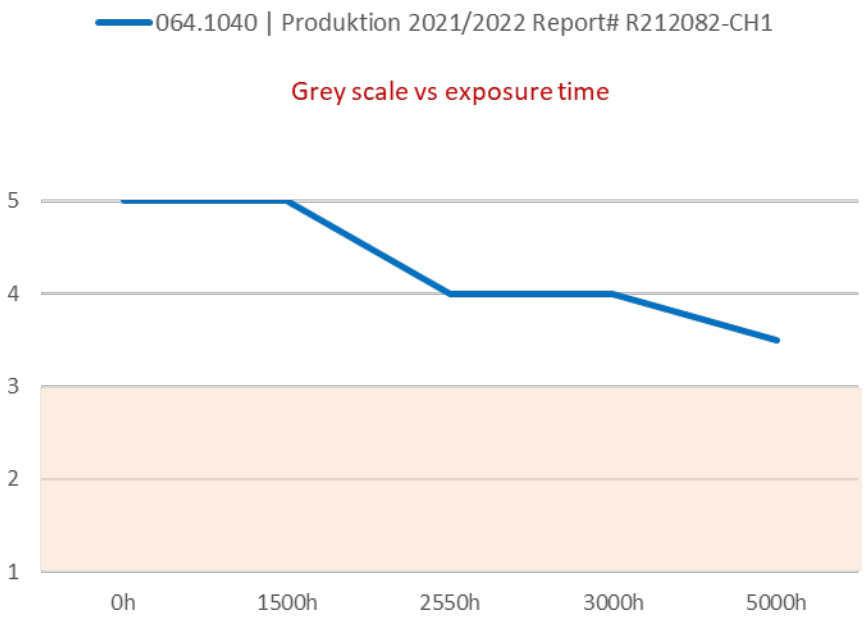
II. Color stability of EPDM granules

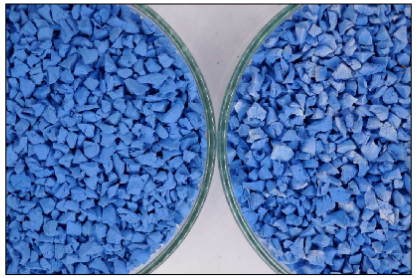
Results of artificial aging – official Test reports

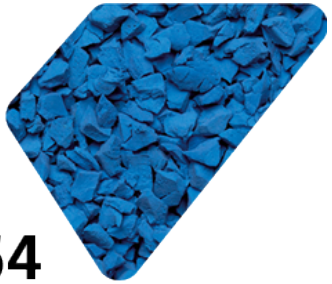


Parameter Elément Elemento	Unit Unité Unidad	Test method Méthode d'essai El método de ensayo	Result Résultat Resultado	NF P90-100
Color Couleur / Color	(-)	visual	Blue / bleu / azul	-
Grey scale Echelle de gris / Escala de gris	(-)	EN 20105-A02	3-4	≥ 3
Visual aspect Aspect visuel / Aspecto visual	(-)	visual	Pas d'agglomération No agglomeration	-
			Pas de fissuration No crack	-

View of the new product
Photographie du produit neuf
Fotographia del producto nuevo

View after ageing
Photographie du produit après vieillissement
Fotographia del producto después del envejecimiento





064

BLUE

RAL 5015

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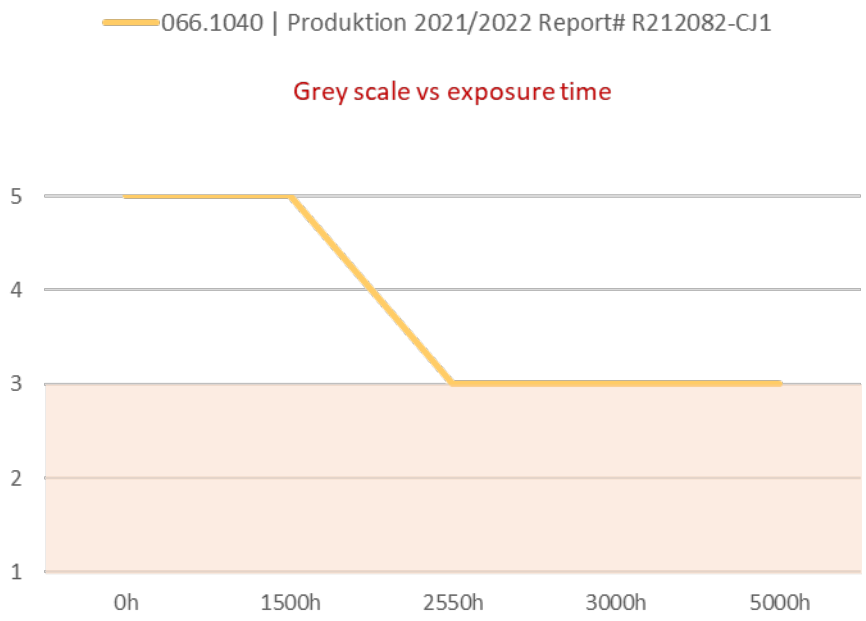
II. Color stability of EPDM granules

Results of artificial aging – official Test reports



Parameter Elément Elemento	Unit Unité Unidad	Test method Méthode d'essai El método de ensayo	Result Résultat Resultado	NF P90-100
Color Couleur / Color	(-)	visual	Beige / beige / beige	-
Grey scale Echelle de gris / Escala de gris	(-)	EN 20105-A02	3	≥ 3
Visual aspect Aspect visuel / Aspecto visual	(-)	visual	Pas d'agglomération No agglomeration	-
			Pas de fissuration No crack	-

View of the new product
Photographie du produit neuf
Fotographia del producto nuevo

View after ageing
Photographie du produit après vieillissement
Fotographia del producto después del envejecimiento

066

BEIGE

RAL 1014

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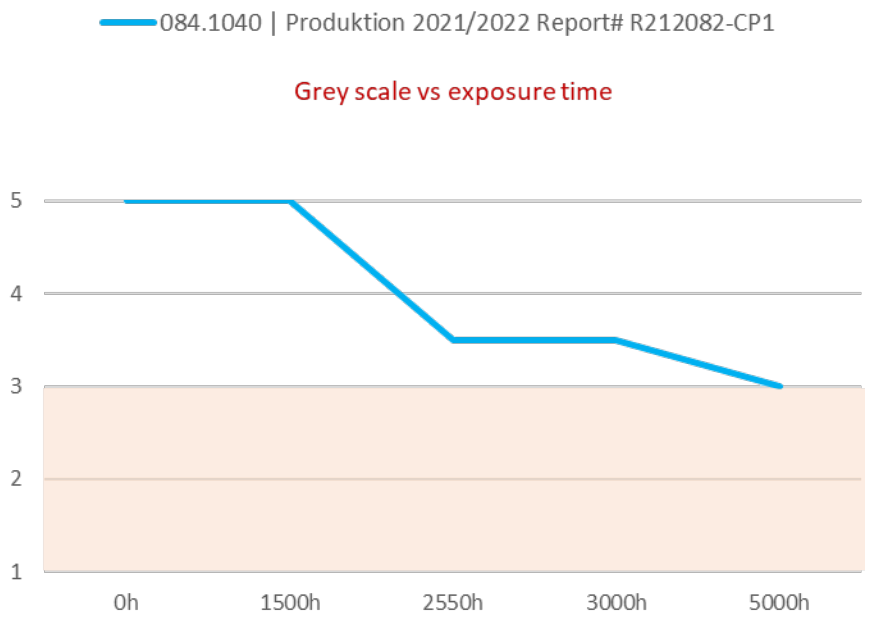
II. Color stability of EPDM granules

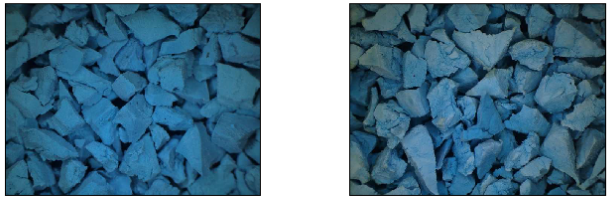
Results of artificial aging – official Test reports

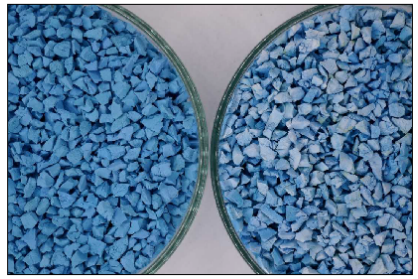


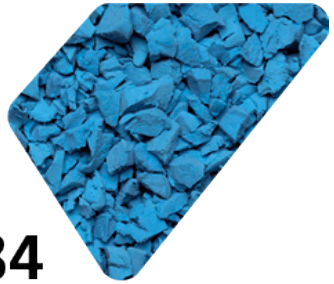
Parameter Elément Elemento	Unit Unité Unidad	Test method Méthode d'essai El método de ensayo	Result Résultat Resultado	NF P90-100
Color Couleur / Color	(-)	visual	Blue / bleu / azul	-
Grey scale Echelle de gris / Escala de gris	(-)	EN 20105-A02	3	≥ 3
Visual aspect Aspect visuel / Aspecto visual	(-)	visual	Pas d'agglomération No agglomeration	-
			Pas de fissuration No crack	-

View of the new product
Photographie du produit neuf
Fotographia del producto nuevo

View after ageing
Photographie du produit après vieillissement
Fotographia del producto después del envejecimiento







084

BRIGHT BLUE

RAL 5012

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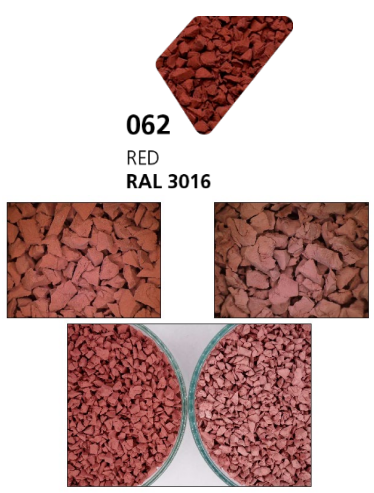
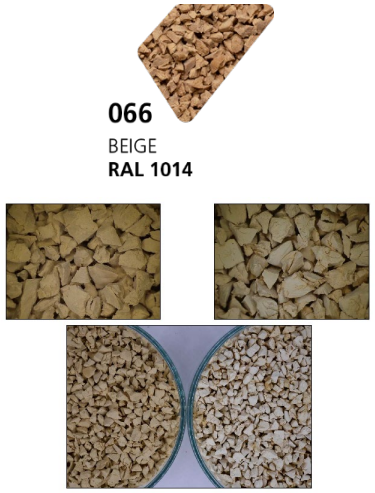
II. Color stability of EPDM granules

Results of artificial aging – official Test reports





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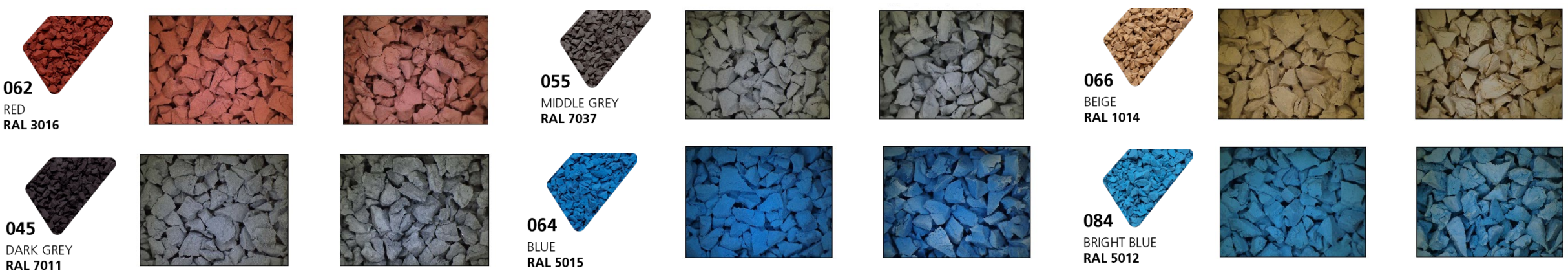
II. Color stability of EPDM granules

Results of artificial aging – official Test reports



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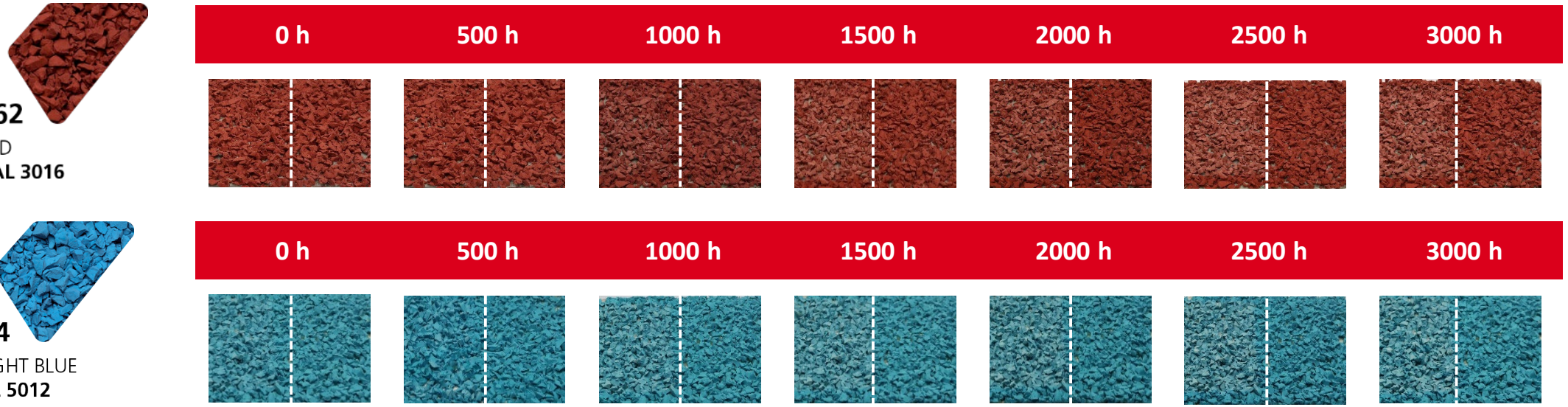
II. Color stability of EPDM granules

Results of artificial aging – internal results in course of time



What do we see?

Left side of the samples were exposed to artificial aging – right side of the samples were covered

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II. Color stability of EPDM granules

- Artificial aging using accelerated UV exposure is a difficult test for polymer materials
- The goal is to bring severe damage to the material and compare the results
- Results have to be seen in context in order to be understood properly

Reminder

- As represented in the UV maps, in the USA UV irradiation is different than Europe.
- Available EN Standards for UV exposure towards sports and leisure floorings probably do not match typical UV irradiation scenarios (outdoor) in the US.
- The ISO 4892 standard is also frequently used in the USA, and is then sometimes manually adapted to local conditions and individual parameters.
- Some system houses and installers switched to increasing the intensity of existing standards (for both UV exposure and condensation cycle).

→ **Again, a clear correlation of lab results to reality is not possible (!)**

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III. Chalking of EPDM Granules

What is “Chalking”?

- One of the visual effects, that is a result of aging, is the whitening on top of the initial color of an EPDM rubber surface after a period of time

  → **This effect of aging on the surface of EPDM granules is called “Chalking”**

- Chalking is only happening on the surface of the granules and can be cleaned off

→ **To understand Chalking we need to review the typical composition of EPDM granules!**

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III. Chalking of EPDM Granules

Did you know that EPDM granules are not actually 100% EPDM?

- The term “EPDM granules” suggests that these are rubber granules that consist of 100% EPDM.
- EPDM granules are a mixture of different raw materials (a compound)
- EPDM is one component of EPDM rubber granules, the primary raw material
- The term "EPDM compound granules" is more accurate
- If an EPDM granule would consist of 100% EPDM, the end product would lack important properties that are crucial for its performance within the running track system
- All raw materials play a role in the performance of rubber granules
- Knowledge of raw material composition is crucial for a high-quality EPDM granule.

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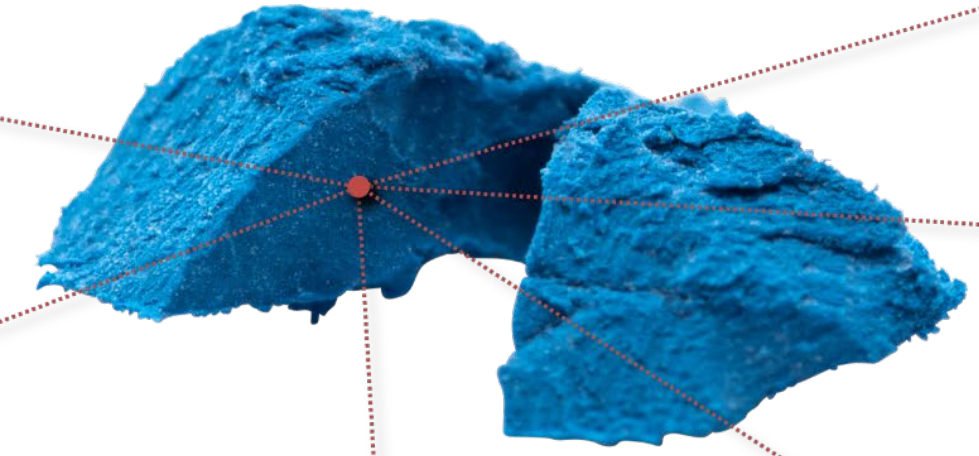
III. Chalking of EPDM Granules

Synthetic rubber (EPDM)

FOCUS

Filler

Cross link agent



Plasticizer oil
(paraffinic white oil)

Pigments and masterbatches

Selected additives

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III. Chalking of EPDM Granules

Function of fillers in an EPDM compound

- EPDM granules for sports and leisure flooring generally contain an inorganic natural filler in the form of calcium carbonate (commonly known as chalk).
- The filler affects the haptic experience and properties of the finished EPDM granule
- The filler ensures optimal adhesion of the polyurethane binder during processing
- The Filler enhances the weight properties of the granules
- Fillers are a cost-optimized means of ensuring the volume of an EPDM granule
- Fillers make up the majority of the content of EPDM granules / Fillers make up the largest proportion of EPDM granules in terms of quantity.

Filler

III. Chalking of EPDM Granules

Reasons of Chalking

- EPDM Polymer degrades → Filler remains as a deposit, whitening the surface
- In general this is a normal process for EPDM granules but with an effect on color change in grey scale
- Chalking happens faster and in a larger extent on low quality EPDM granules

  → **This is one of the reasons why ASBA specifies that the EPDM polymer content of the compound should not be less than 20 %!**

- Chalking is only a visual matter and not a matter of performance of EPDM granules
- A proven and reliable formulation with select high quality raw materials, combined with a well-controlled mixing and vulcanization process, will reduce chalking on your surface

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III. Chalking of EPDM Granules

Challenging Colors

- The chemical composition and properties of the pigments differs slightly among colors
- There are some colors that seem to be more conducive to chalking
- The UV stabilizers used in the formulation are consumed during exposure to UV radiation and this happens more quickly with bright colors
- Surface protection → prevent UV from penetrating!
  - Some colors are reflective, which means less UV is absorbed (less UV absorption = less damage)
  - Pigment loading also plays a role (pigmentation = surface protection)
- Crosslinking → when UV has already penetrated!
  - The stronger the crosslinked network, the longer it holds together

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III. Chalking of EPDM Granules

Challenging Colors – Examples after 5000 h (!)

3. Aging behavior of PU in running tracks

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I. Polyurethane discoloration

Types of polyurethane

Based on the isocyanates used, polyurethane binders and coatings can be categorized as:

1. Aromatic binders and coatings

- Standard PU for installing a surface made of colored rubber granules
- Binders are usually amber-colored
- Not lightfast (!)

2. Aliphatic binders and coatings

- Alternative to aromatic binders
- Binders are usually colorless and free from aromatics
- Aliphatic binders and coatings are light-fast and UV-stable
- Significantly much more expensive compared to aromatic PU

→ **There is no difference between aromatic and aliphatic binders in terms of application!**

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I. Polyurethane discoloration

«Yellowing effect» with aromatic binders and coatings

- Aromatic polyurethanes are not lightfast (!)
  - When exposed to UV radiation, they tend to form a yellowish film
  - Occurs within hours after the surface has been installed
  - Can temporarily affect the appearance of the installed surface and can lead to undesirable color changes on the surface

    → **This phenomenon is called the “yellowing effect”**
- The extent to which yellowing becomes visible is dependent upon:
  1. The color of the rubber granules
  2. The intensity of the UV radiation
  3. Other locally given parameters

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I. Polyurethane discoloration

«Yellowing effect» with aromatic binders and coatings – QUV EXPOSED FOR 500 HRS

Aliphatic binder Aromatic binder

I. Polyurethane discoloration

(!) Important to know (!)

The yellowing effect is only aesthetic

- Absolutely no influence on the properties of the surface (!)
- The technical and mechanical properties of the surface are completely retained
- The durability of the surface is not affected
- The color change does not indicate inferior material or an incorrect installation in any way

The yellowing effect is not a change in the color of the rubber granules

- It is only a very thin and discolored film → The original color of the rubber granules is retained underneath
- It is only a change in the visual perception of the original color

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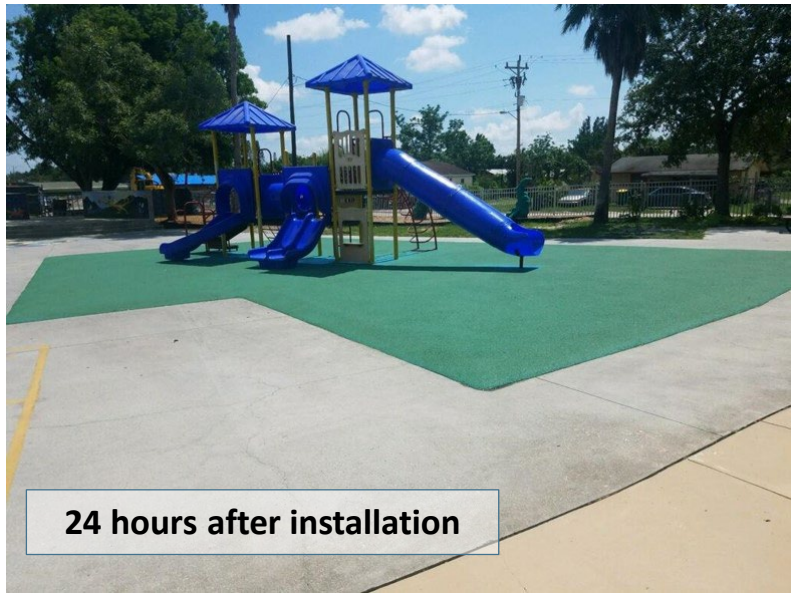
I. Polyurethane discoloration - Binder

Examples to illustrate the «Yellowing effect»

1. **Surface made of light blue rubber granules**



The binder film will wear away with regular use and weathering The change in color recedes due to abrasion and weathering after a period of time (usually within 2 to 6 months) The change in visual perception is not permanent, but lessens almost completely over time. Sooner or later the surface regains its original color

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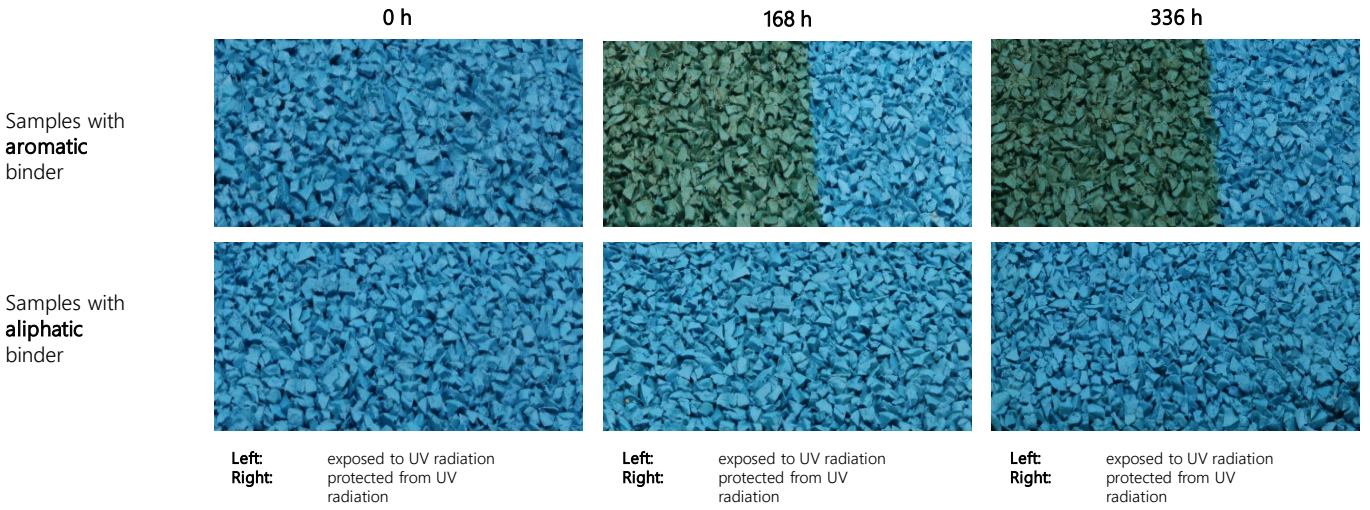
I. Poyurethane discoloration - Binder

Examples to illustrate the «Yellowing effect»

2. Bound samples in Eggshell

Both colors are eggshell; However, the smaller area was made with aromatic (= non-lightfast) binder.

3. Tests with simulated UV radiation (UVA aging according to EN 14836)



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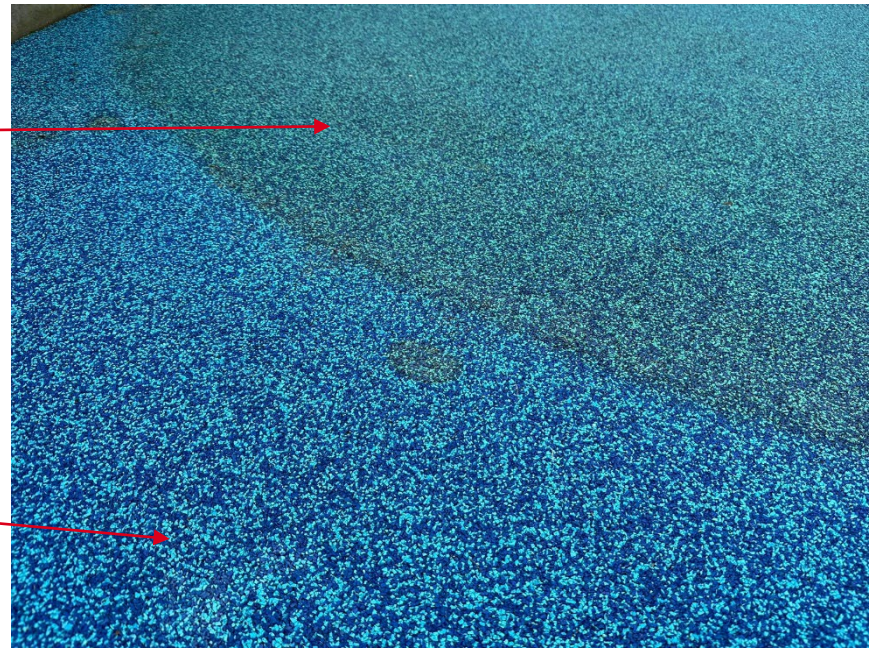
I. Polyurethane discoloration - Binder

(!) Important to know (!)

Area was covered by a pool = no exposure to UV, weathering and abrasion
→ Yellowing still visible!

Area was exposed to UV, weathering and abrasion
→ Yellowing is gone!



Installed on May 18, 2023 with an aromatic, non UV-stable binder – yellowish within days – pictures taken on September 30, 2023 (= 135 days after installation)

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I. Polyurethane discoloration

Choosing the right PU

- The temporary yellowing effect can be prevented by choosing the right poyurethane type
- Aliphatic PU are UV-stable and the alternative to aromatic PU → Aliphatic polyurethanes are therefore called lightfast or UV-stable.
- Under certain circumstances the use of aliphatic polyurethanes can be useful
- Several factors determine the right PU for a specific project
- Therefore, a general recommendation for the right PU is not possible
- Recommendation can be made based on a few factors

1. The selected color of the rubber granules
    - Every color is affected to a certain degree by the yellowing when using aromatic binders
    - But with light blue tones, light green tones, light gray and white tones, as well as bright colors (e.g. purple and pink) yellowing is often more noticeable
2. The expected UV exposure at the planned installation location should also be considered

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II. Aging of PU coating

Aromatic vs. Aliphatic coating

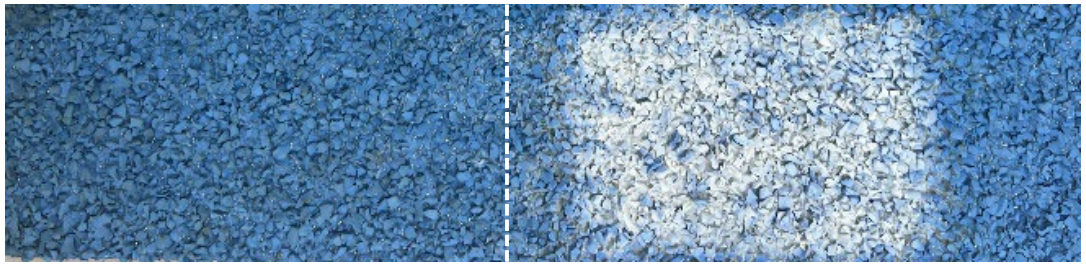
- Aromatic PU coatings also experiences chalking due to UV degradation and release of filler
- Aliphatic is minimal, almost none so that using an aliphatic top coat would help to delay chalking
- Typically, red and black are the only colors that aromatic coatings are used. For all other colors, an aliphatic coating is recommended.

Comparing unexposed vs. QUV exposed 2-C PU (Hertha Blue) –
This 2-C PU is typically used with the 1-4 EPDM granules broadcast in to create the “embedded” surface.

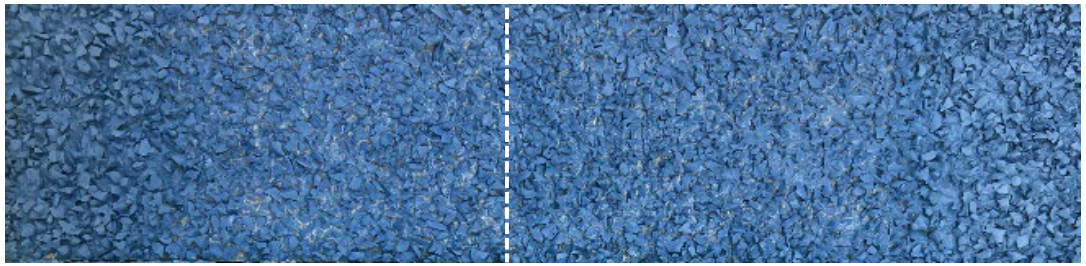
II. Aging of PU coating

Aromatic vs. Aliphatic coating

- Formulation components including the specific types and amounts of fillers, pigments, UV stabilizers, other additives have an effect on long term behavior.



064 Blue – Embeded (No Coating) – 5000 QUV hrs



064 Blue – Embeded (With Coating) – 5000 QUV hrs

Right side of the samples were exposed to artificial aging – left side of the samples were covered

4. Solutions to avoid Chalking

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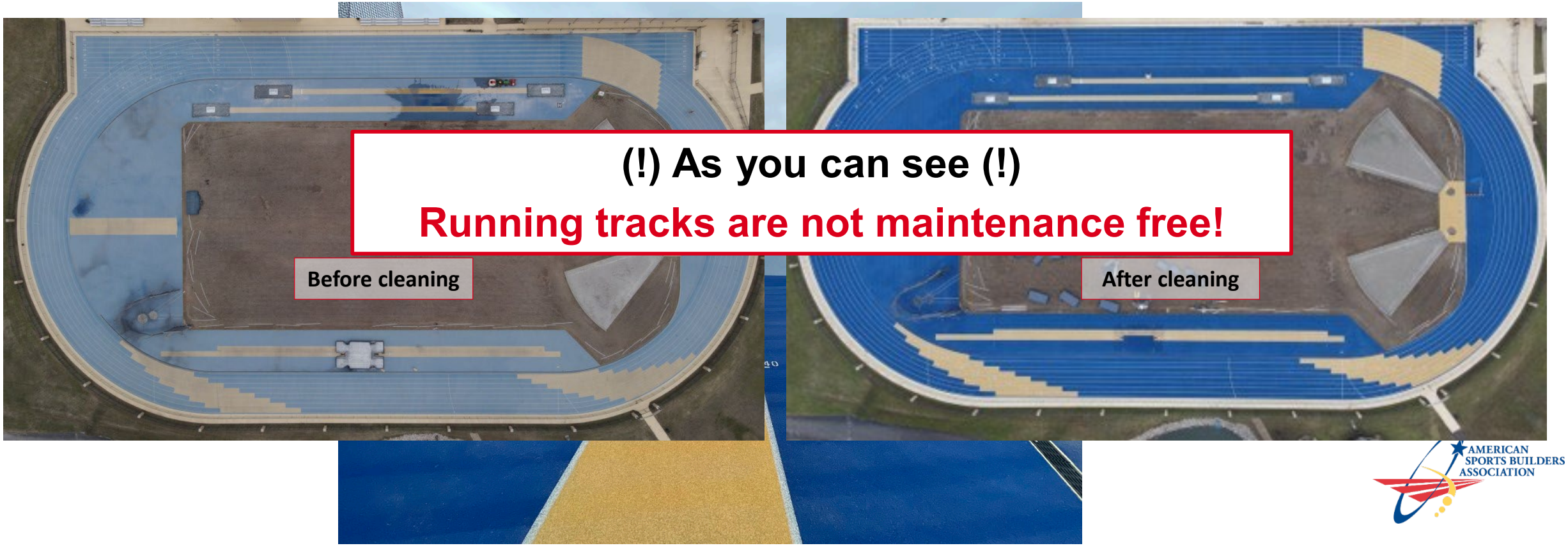
I. Regular maintenance

Effects of maintenance



(!) As you can see (!)

Running tracks are not maintenance free!

II. Finishing / Coating

Embedded and encapsulated

- On embedded surfaces (rubber exposed) most of the chalking can be removed with cleaning but it returns
- Options for systems using aliphatic coatings to preserve color
  - Embedded + aliphatic varnish – varnish does not significantly change the texture
  - Structural Spray systems
- Benefits of adding a coating
  - UV stability (aliphatic)
  - Cleanability
  - Prevents rubber migration
  - Added durability

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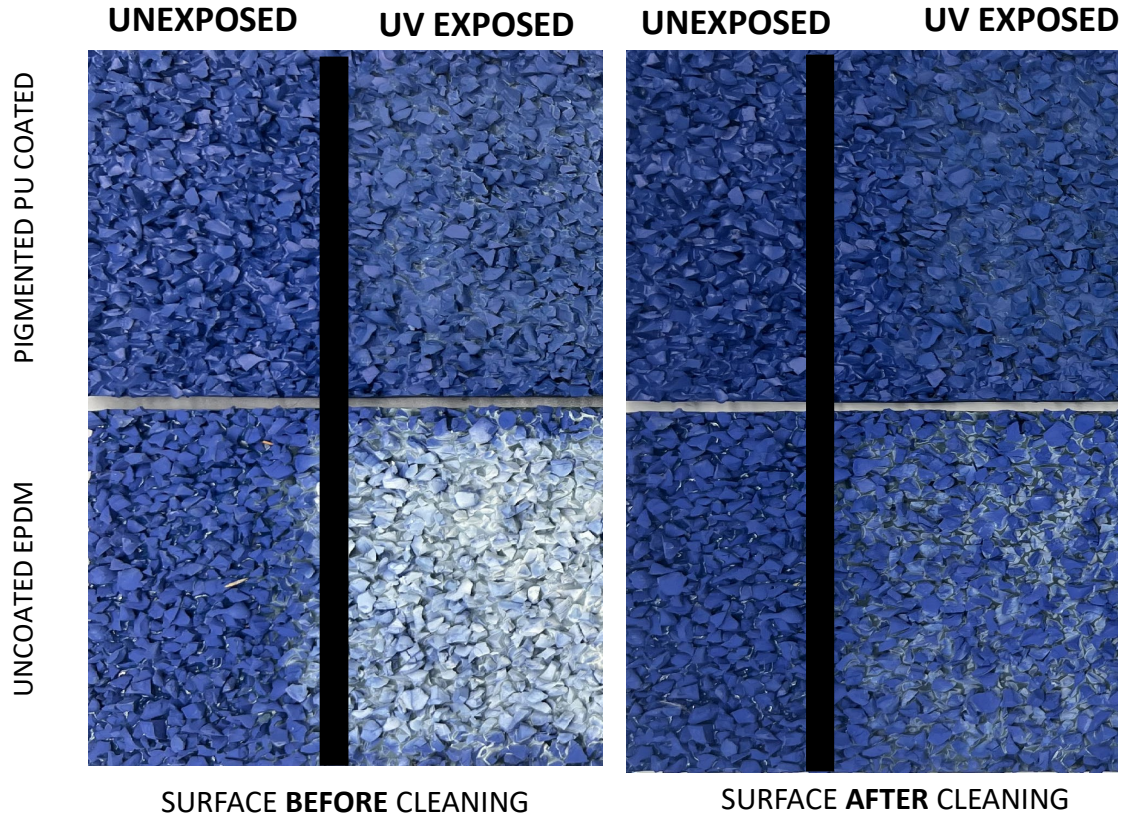
II. Finishing / Coating

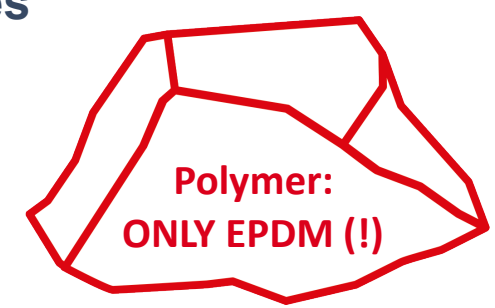
Embedded and encapsulated – Samples of QUV EXPOSURE (5000 HRS)



III. Choosing high-quality EPDM granules

The EPDM rubber content can be an indicator for the quality of rubber granules

- Polymer content ≠ EPDM content
  - Important not to confuse the polymer content with an EPDM content
  - EPDM is a polymer, but not every polymer is an EPDM
  - EPDM is expensive but a high-quality polymer with good crosslinking properties
  - Other polymers are less expensive but do not have such good crosslinking properties

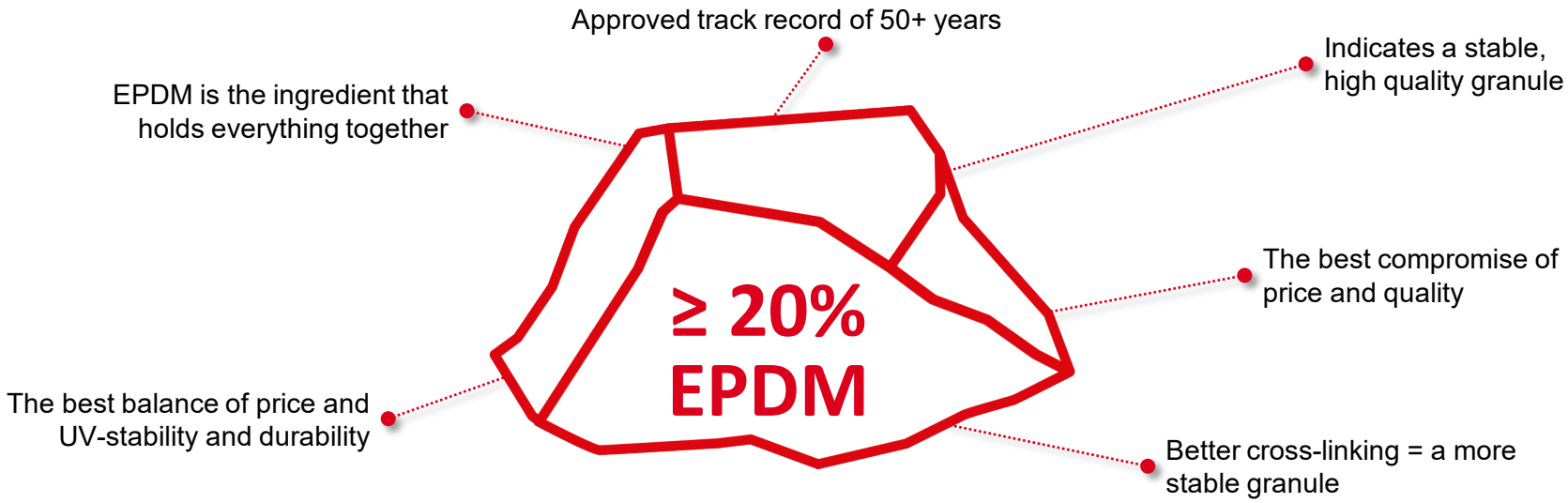


→ Only EPDM should be used as polymers!

→ You must insist on knowing the total EPDM content

III. Choosing high-quality EPDM granules

The EPDM rubber content can be an indicator for the quality of rubber granules



→ **ASBA specifies that the rubber granules must be 20% <u>EPDM (!)</u> content**

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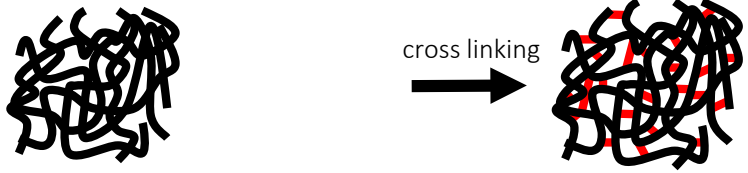
III. Choosing high-quality EPDM granules

The EPDM rubber content can be an indicator for the quality of rubber granules

Cross link density **Effects**

High quality EPDM



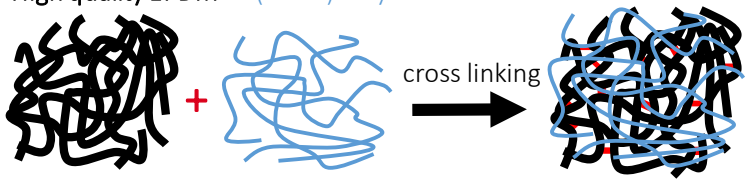
HIGH / LOW

→ good network / stable matrix

→ (Enduring) elasticity, stability and properties

less release of filler / holds the pigments and the filler

High quality EPDM + (other) Polymer[1]



HIGH / LOW

→ Poor cross linking and/or network

→ Structural weakness, stability and properties at risk

more release of filler and the pigments / more chalking

Low quality EPDM[2]

HIGH / LOW

→ Poor cross linking and/or network

→ Structural weakness, stability and properties at risk

highest release of filler and pigments / highest chalking

[1] non cross linkable | [2] Low molecule size or low cross link ability

IV. Choosing the right and appropriate color

Rule of thumb

"The brighter and more shiny a color is, the more challenging it is towards fading over time!"

→ **Try to convince your customer not to choose a challenging color if the project is in an area with a high UV irradiation**

→ **If a customer cannot be dissuaded from choosing a challenging color for a project in an area with high UV irradiation, make them aware of chalking**

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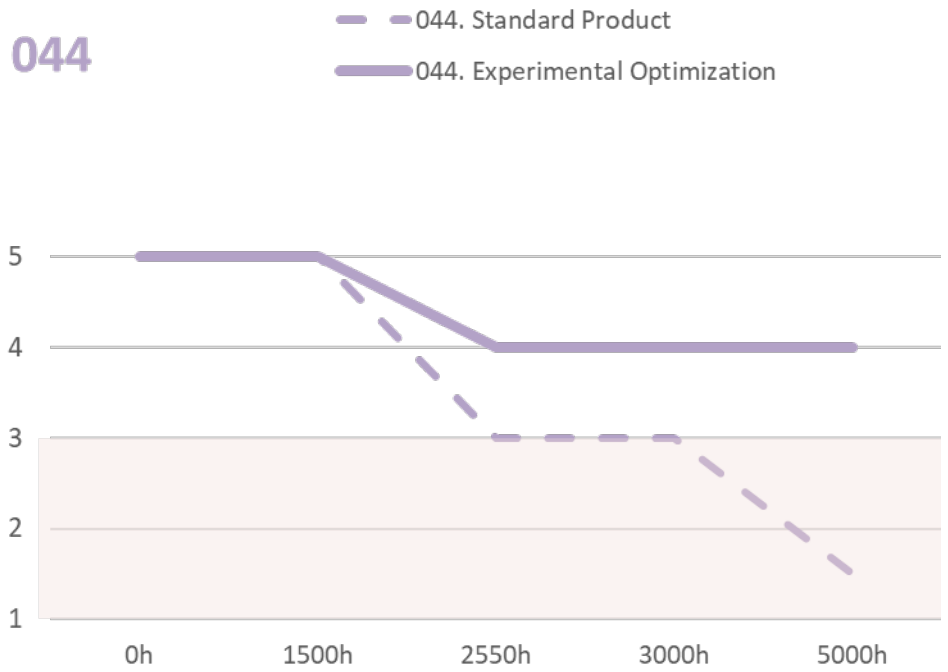
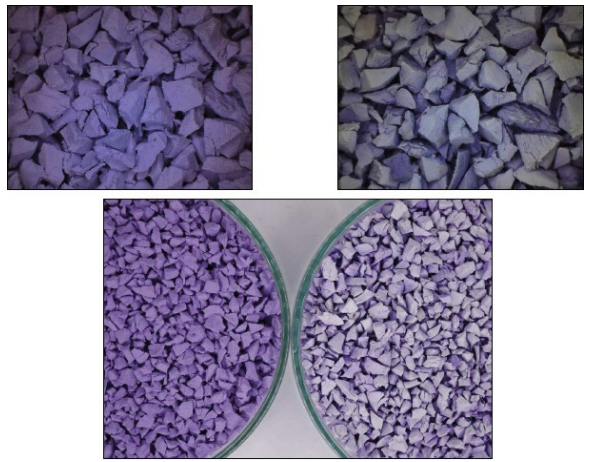
V. Using improved EPDM granules in case of UV stability / color stability

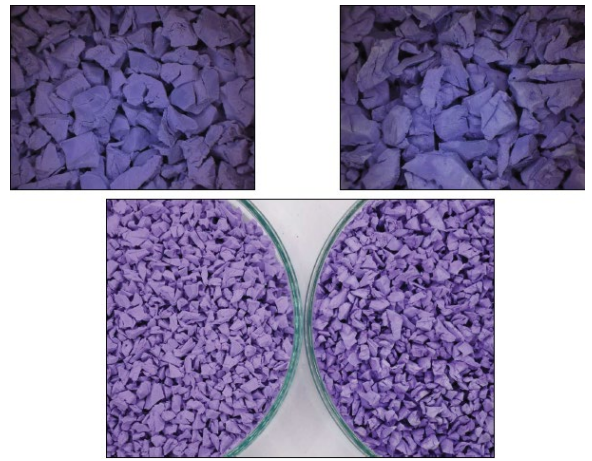
044
LILAC
RAL 4005



Standard Product



Experimental Optimization



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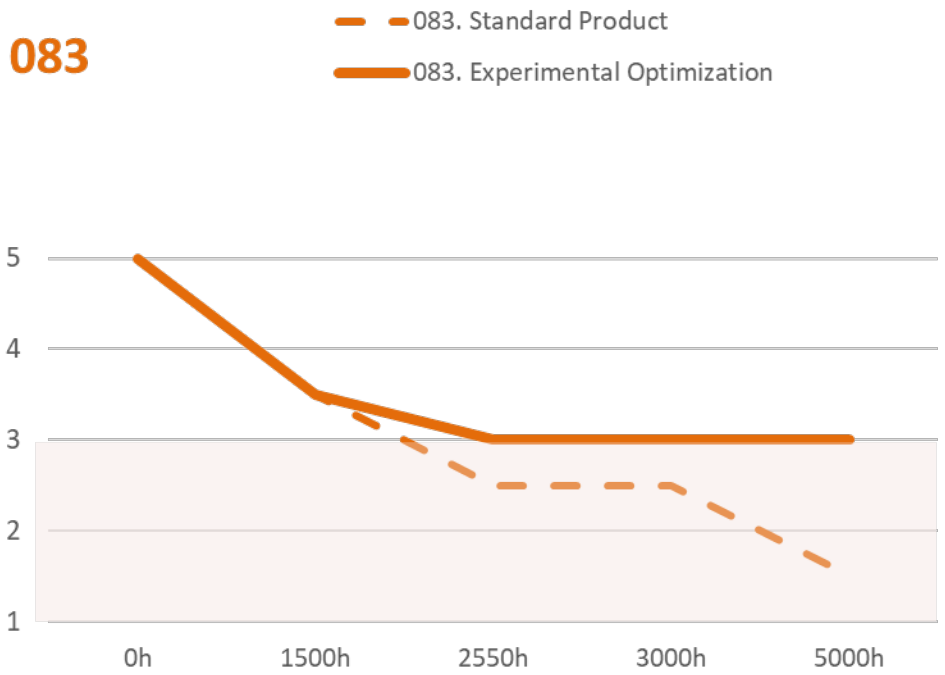
V. Using improved EPDM granules in case of UV stability / color stability

083
BRIGHT ORANGE
RAL 2008



Standard Product

Experimental Optimization

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Summary of solutions

Chalking can be counteracted…

- ✓ … by regular and appropriate maintenance.
- ✓ … by using an aliphatic top coat that would help to delay the progress.
- ✓ … by choosing high-quality EPDM granules.
- ✓ ... by choosing the right and appropriate colors.
- ✓ … by using improved EPDM granules with higher UV stability / color stability.

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5. Conclusion

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Conclusion

- Aging of running track surfaces is a normal process and will always be present!
- Aging is caused by various influenceable and non-influenceable factors
- Materials and coatings are subjected to accelerated weathering and artificial aging to simulate damaging effects of long term outdoor exposure
- Available EN Standards for UV exposure towards sports and leisure floorings are frequently used in the US but sometimes manually adapted to local conditions and individual parameters
- A clear correlation of lab testing results to reality is not possible
- All components in a running track system are affected by aging
- The major effect of aging to EPDM granules is so called “Chalking”
- Chalking is only a visual matter but not a matter of performance of EPDM granules
- Aromatic PU is not lightfast / not UV-stable and also experiences Chalking
- Chalking can be counteracted by various measures
- Running tracks are not maintenance free as Maintenance can help to extent the lifetime / better appearance
- If you invest the extra money in maintenance, high quality EPDM granules, and/or a coating the visual appearance will be better
- As usual the cheapest product may end being the most expensive in the end

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// Please feel free to contact us with any questions:

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Many thanks for your attention!