

SAPPMA

southern african plastic pipe manufacturers association

WEBINAR IV

QUALITY WORK



May 2022



WEBINAR

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CREATING ABSOLUTE CUSTOMER CONFIDENCE IN THE PLASTICS PIPE INDUSTRY

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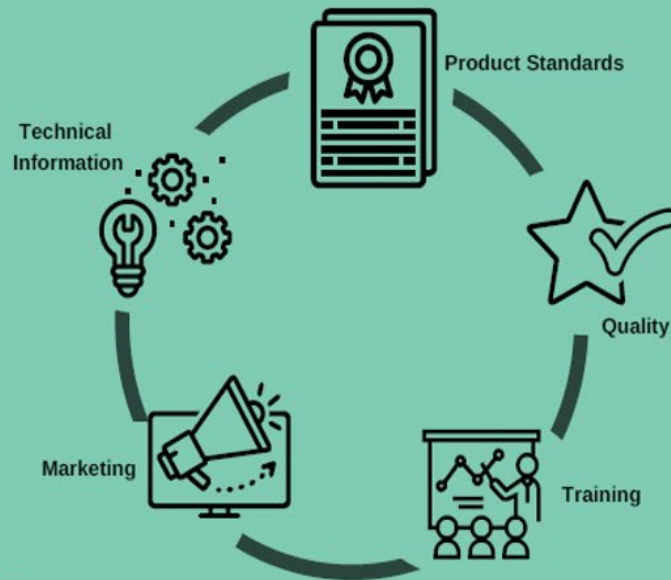


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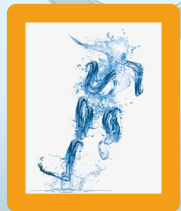
Our focus areas



SAPPMA's 5 Areas of Focus



For the Calendar



24-05-2022



SAPPMA PIPES XIII CONFERENCE

6 & 7 SEPTEMBER 2022

Emperors Palace Convention Centre, Johannesburg

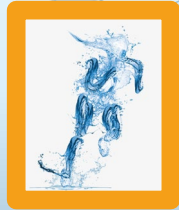
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SAPPMA PIPES XIII CONFERENCE

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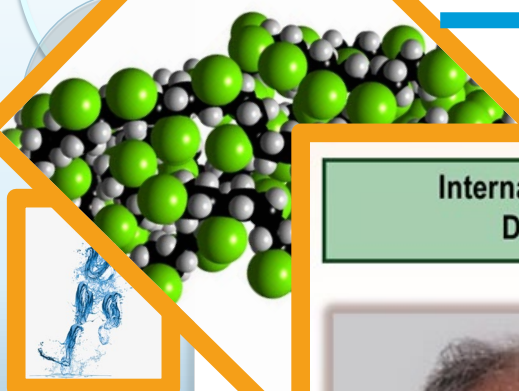
SAPPMA is once again extremely excited and privileged to be hosting PIPES XIII in conjunction with the Plastic Pipe Conference Association (PPCA) on 6 & 7 September 2022! As you may know, PPCA hosts the biggest international pipe conference every second year in either Europe or the USA. Their spin-off conference, which is organised every alternate year, is coming to South Africa this year! The conference programme will include at least 10 of the best papers from PIPES XX which was held in Amsterdam in 2021, in addition to our usual line-up of national and international speakers. The event has been extended to two days to provide for an outstanding offering to our industry.

The main theme for PIPES XIII is *“The Versatility of Plastic Piping Systems”* and covers the two major pipe materials and products, namely PVC and HDPE in pressure and non-pressure configurations. Presentations will deal with a wide spectrum of topics, from Raw Materials right through to Installation, including Product Standards, Quality, Design, Case Studies, Energy & Environment, amongst other topics. Remember this is a **hybrid** conference that will include both physical and virtual attendance. Do not miss out on this great conference.

To register kindly click the following link: <https://forms.gle/bApnbTAJbvq1s1LRA>



SAPPMA Webinar IV 2022



24-05-2022

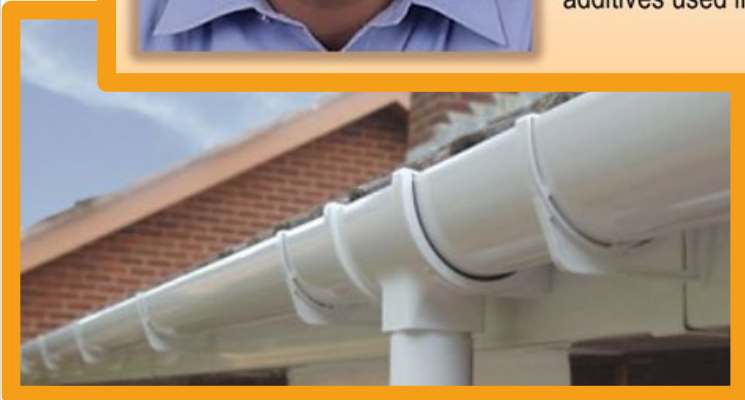
International legislative changes on PVC pipe additives: Does South Africa have reasons for concern?



PVC additives influence or determine a number of product properties, such as: mechanical properties, weather fastness, colour, clarity and flexibility.

Renier Snyman is the Technical Manager at Sun Ace SA and will be bringing a wealth of experience on this topic.

The webinar will include recent and current legislative changes and restrictions on some additives used in PVC pipe manufacturing.



Presenter

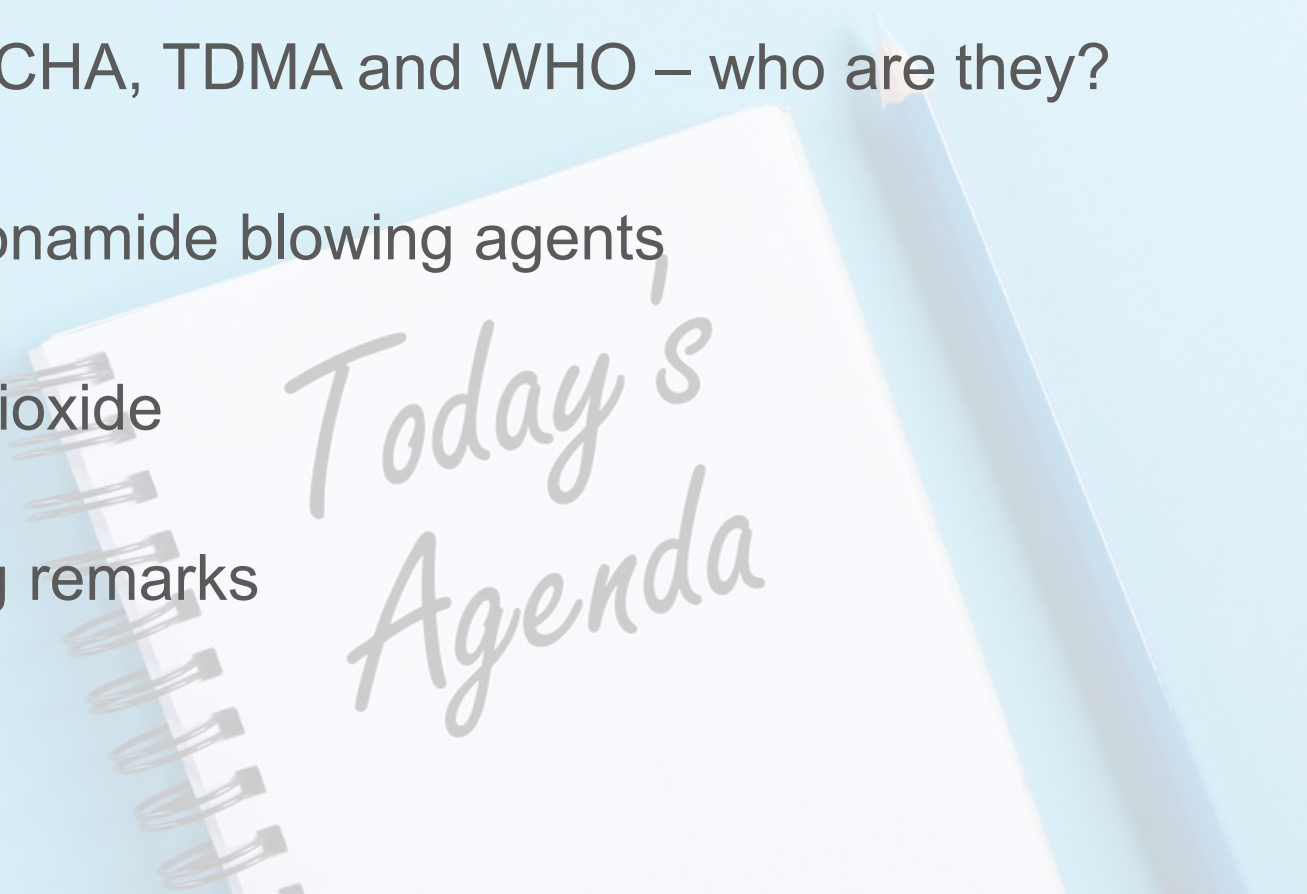
SAPPMA Webinar IV 2022

24 May 2022



Renier
Snyman



1. Sun Ace group
 2. REACH, ECHA, TDMA and WHO – who are they?
 3. Azodicarbonamide blowing agents
 4. Titanium Dioxide
 5. Concluding remarks
- 

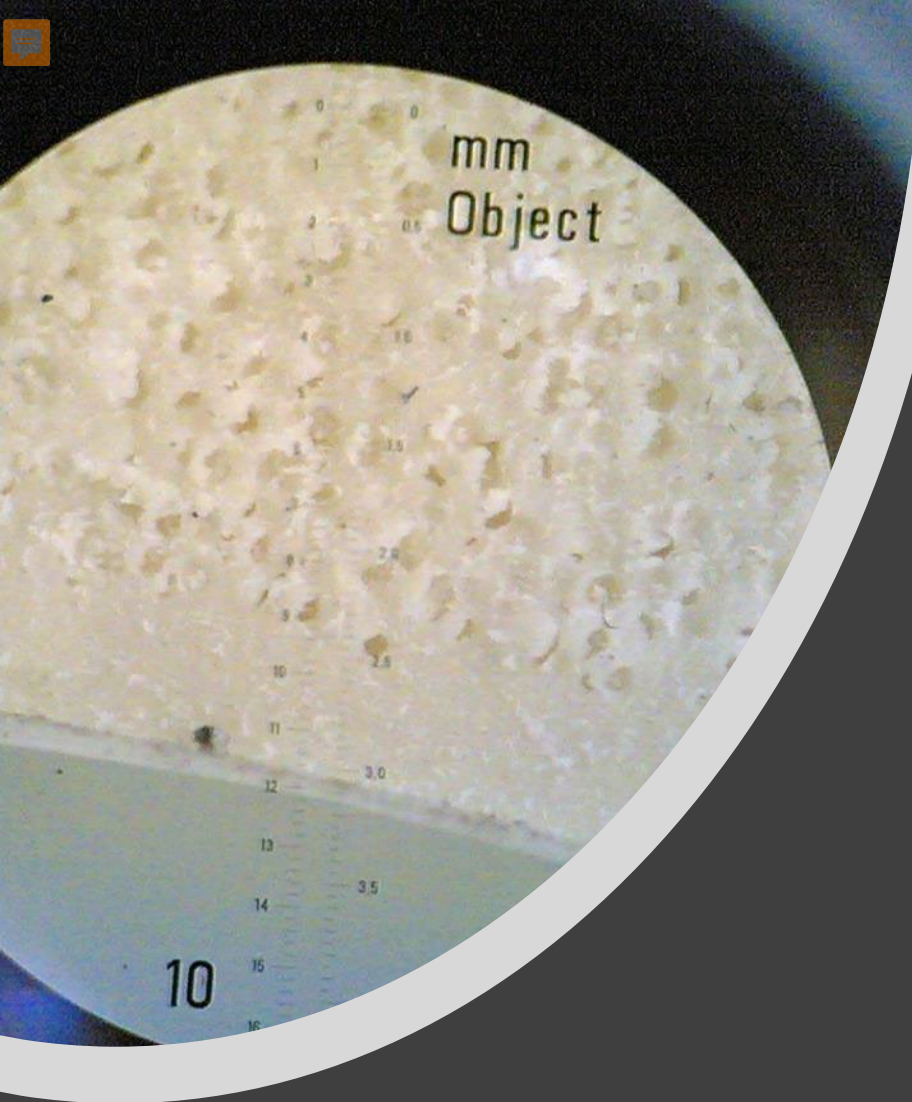
Who is Sun Ace?

- A Japanese origin Polymer Additives & Speciality Chemical manufacturer established in 1940
- Operating in 12 countries with 17 operations
- ISO 9001, 14001 & OHSAS 45001 certified company
- 700 employees with 25 different nationalities
- One of the leading suppliers of PVC stabilizers & metal soaps in the world



REACH, ECHA, TDMA and WHO

- REACH is an acronym for “Registration, Evaluation, Authorisation and Restriction of Chemicals”
- REACH is a European Union regulation and is governed by European Parliament and Council
- ECHA is the European Chemicals Agency, responsible for management and implementation of the REACH regulation
- TDMA is the Titanium Dioxide Manufacturers Association, representing manufacturers of titanium dioxide (TiO₂) in Europe
- WHO is the World Health Organisation, a specialised agency of the United Nations, responsible for international public health



Azodicarbonamide Blowing Agent

- Principle use: Blowing agent in foamed plastics, including multi-layer foamed core pipes
- Azodicarbonamide decomposes at approximately 210°C to release primarily N₂, but also small amounts of NH₃, CO and CO₂
- The activation temperature can be reduced to as low as 130°C by adding initiators like Zinc Stearate
- Azodicarbonamide is exothermic, i.e. releases heat energy during the reaction. This also means its blowing rate increases at hot spots in the melt

Azodicarbonamide Blowing Agent

- Addition of NaHCO_3 (sodium bicarbonate) produces CO_2 during decomposition
- Sodium bicarbonate produces an endothermic reaction, thereby counteracting the exothermic nature of Azodicarbonamide to an extent
- The combination of N_2 and CO_2 gasses allows quick expansion and bubble stability to create a fine, even foam structure
- In addition to the above ingredients, nucleating agents are also added to aid nucleation of foam cells

Azodicarbonamide Blowing Agent

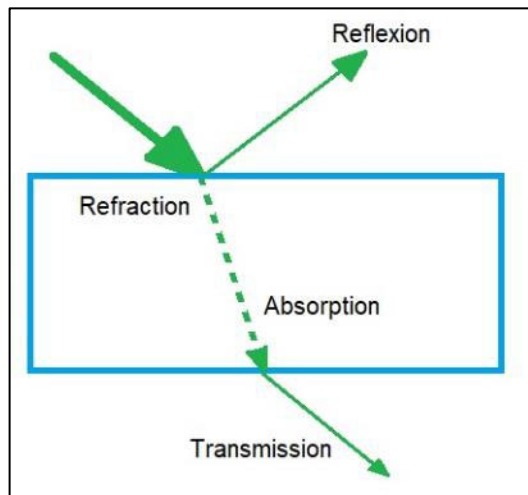
- Current situation w.r.t. legislation
- REACH classified C,C'-azodi(formamide) or azodicarbonamide as a respiratory sensitiser, and is classified as a SVHC (substance of very high concern)
- REACH states that the substance may cause allergy, asthma symptoms or difficult breathing if inhaled *
- The WHO reported that exposure to the chemical in industry should be limited as much as possible, but has not classified it, due to lack of data
- Currently azodicarbonamide is not listed under the SA regulations for hazardous chemical agents, published in March 2021
- Dosages for foamed core multi-layer pipes are very low (typically 0.1 – 0.3phr) and gas is contained within the pipe, posing very low risk to production personnel
- Azodicarbonamide has not been restricted for plastics in any other parts of the world

*REACH EC/LIST No.: 204-650-8

*REACH CAS No.: 123-77-3

*Last updated 12/12/2021

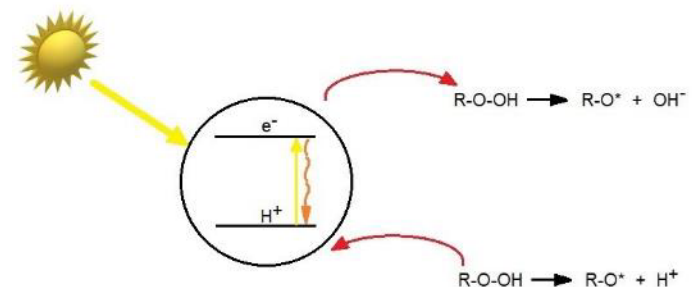
Titanium Dioxide



- **Principle use(s):** Whitening (colouring) agent and UV protector for plastics products, toothpaste, paints, cosmetics and foods
- **Significance:** TiO_2 offers unparalleled cost to performance in many applications and will be difficult, if not impossible, to replace
- TiO_2 is a crystallite in either Rutile or Anatase form. Rutile form absorbs more UV light than Anatase form. It occurs naturally in beach sand or is made from mineral ilmenite
- Titanium dioxide has a high refractive index and can reflect and scatter, as well as absorb ultraviolet rays (primarily below the visible light range $< 340\text{nm}$) to provide UV protection
- Most of the light rays are reflected and scattered, due to titanium dioxide's high refractive index

Titanium Dioxide

- The photocatalytic reaction of TiO_2 involves photochemical activation and electron hole formation, dissociating surface water and oxygen to degrade the surrounding PVC
- This degradation of the surrounding PVC can be seen as fading / loss of brightness and chalking
- Surface layer of PVC degrades in UV, exposing TiO_2 and CaCO_3 to air, producing a white, powdery deposit
- As the chalk is washed away by rain, etc. a new layer of PVC is exposed, producing new chalk layer
- Chalking maintains whiteness of product longer, but has a negative effect on gloss



Lead

	8	9	10	11	12	13	14
	0,06%	2,01%	4,94%	9,81%	19,57%	33,22%	48,82%
1							
2							
3							
4							
5							
6							

Calcium-Zinc

	50	51	52	53	54	55	56
	0,06%	2,01%	4,94%	9,81%	19,57%	33,22%	48,82%
1							
2							
3							
4							
5							
6							

Organic

	29	30	31	32	33	34	35
	0,06%	2,01%	4,94%	9,81%	19,57%	33,22%	48,82%
1							
2							
3							
4							
5							
6							

Titanium Dioxide

- Rutile TiO₂ has a refractive index of 1.8 in PVC matrix and 2.7 in air, therefore TiO₂ exposed to the atmosphere by chalking is brighter than TiO₂ in the PVC matrix
- Rutile TiO₂ (especially surface treated) is less susceptible to chalking than Anatase
- Metal oxide coating of TiO₂ can greatly reduce chalking and result in “non-chalking” grades, and also improves powder flow and dispersibility in PVC
- Poor quality TiO₂ can lead to a variety of photo discolorations in the presence of certain types of stabilisers, i.e. uncoated TiO₂ and Pb stabiliser, in presence of sunlight and moisture, can result in a grey colour

Titanium Dioxide

- Current legislation situation
- The restriction is intended to limit exposure to TiO_2 to 1% max in powders or mixtures. Any such products are restricted inside the EU and has to be labelled identifying it as a suspected carcinogen by inhalation
- Most of the debate surrounding TiO_2 centres around a grade E171 for food applications, but its exposure hazards in industry is also under the spotlight
- In South Africa it is currently listed under Regulations for chemical agents, with an OEL (occupational exposure limit) of $10\text{mg}/\text{m}^3$ for a weighted 8 hour period. It is listed as a carcinogen.
- Exposure limits only applies to powder TiO_2 , so not applicable to pipe or fittings
- The correct use of PPE during mixing and manual weighing will effectively control exposure to titanium dioxide in the workplace

How do these changes affect us?

- South Africa does not need to be worried at the moment
- These changes are only for Europe at this stage
- However, when selling to organisations adhering to European regulations, these restrictions will come into play
- Now is a good time to discuss these regulations in SA and formulate a stance
- SAVVA (SA Vinyl Association) is the right vehicle to host these discussions, as SAVVA is already involved in similar activities for other PVC products

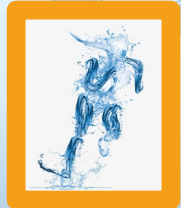
Questions and Answers



Renier
Snyman



Allow us to be part of the process

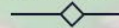


*IT ALL
ALIGNS FROM
START TO
FINISH*

New Rules

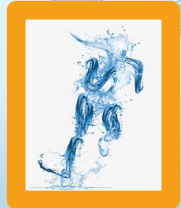
VS

Old Rules



Take up the cue and play
by the rules

SAPPMA Webinar IX



Questions and Answers



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