PLATINUM.

SUSTAINABLE USE OF PVC STABILIZERS AND ADDITIVES

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- **Mr. Milind Magar**

Platinum Industries Limited

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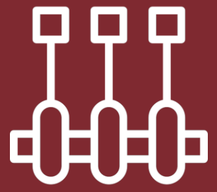
INTRODUCTION



STABILIZERS

APPLICATIONS

CPVC ADDITIVES

TAKEAWAYS

PLATINUM GROUP IS A LEADING MANUFACTURER OF PVC & CPVC ADDITIVES, METAL SOAPS & LUBRICANTS

PLATINUM.

Platinum industries is one of the fastest growing companies in India

- Manufacturers of PVC/ CPVC additives and Performance Lubricants
- Eco-friendly products catering to the developing environment
- Consciousness of customers worldwide
- Expertise, knowledge & understanding of PVC additives & technology
- Assisting customers in safe use of additives & substitution of hazardous additives
- Steady focus on quality management

GLOBAL PVC STABILIZERS CONSUMPTION (THOUSAND TONS)

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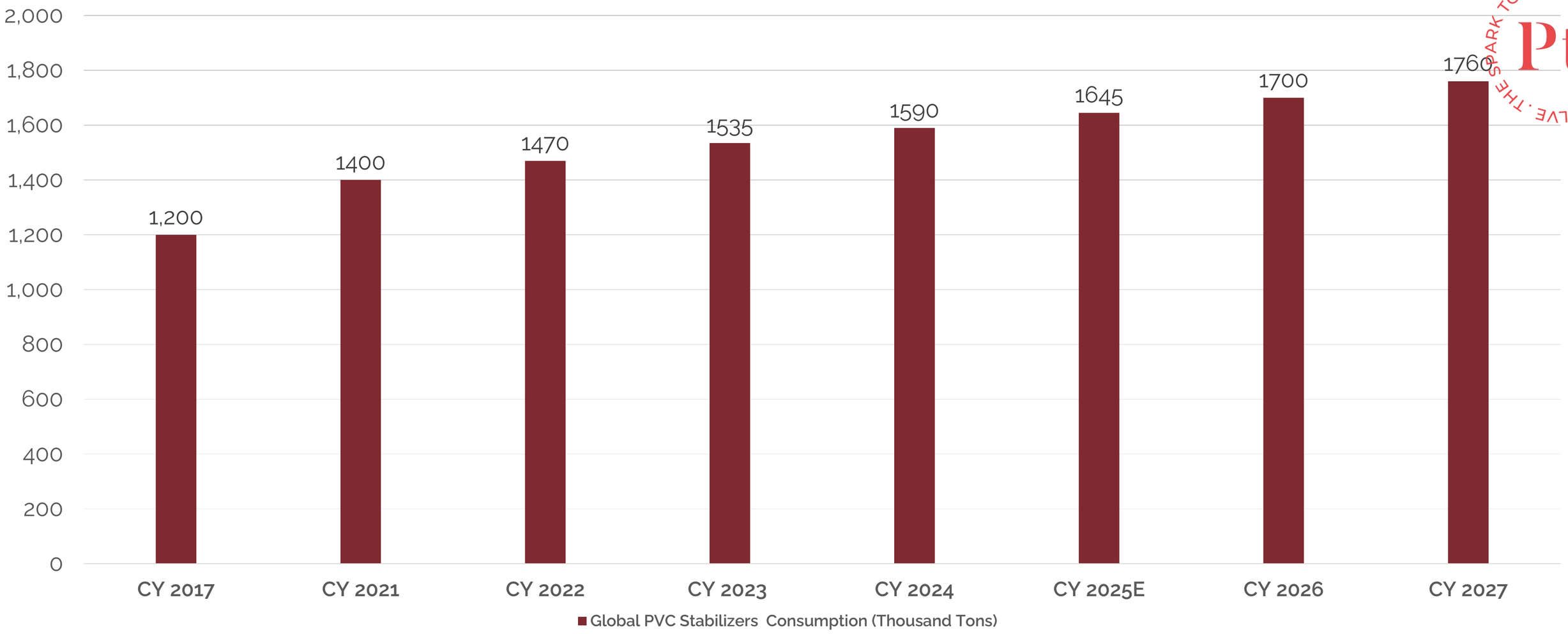

- Global PVC Market is growing @ 3.7% CGR
- Global Market Size by value is $ 5.2 billion

Source:- CRISIL M & A Consulting

PVC PRODUCTS ARE SUSTAINABLE

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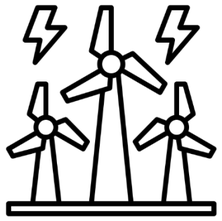
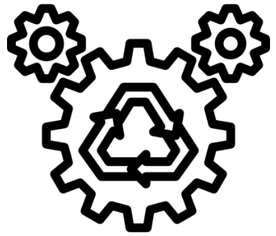


Special combination of additives can save energy and resource while processing

Excellent polymer to substitute metal and wood in multiple Infrastructure applications



Mechanical recycling is very easy and helping environment

PVC does not catch fire easily, low risk of losses

PVC STABILIZER MARKET TREND

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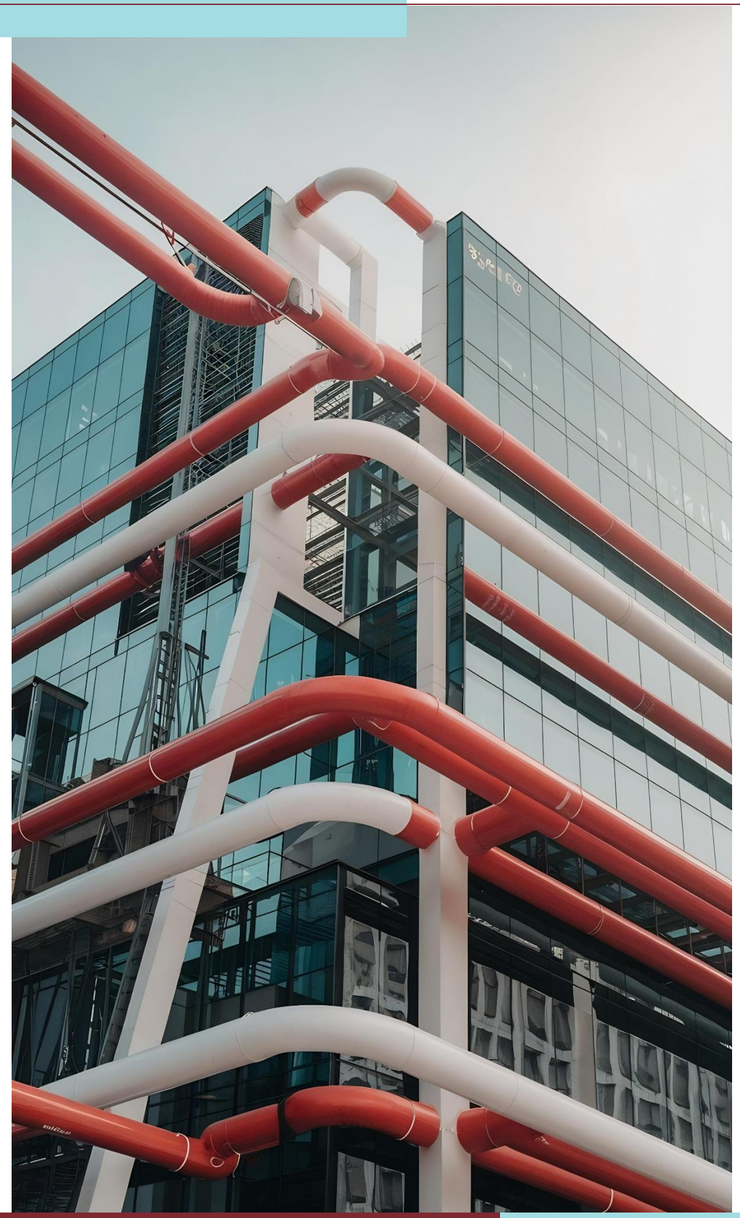
- The stabilizer market is currently moving towards design, manufacture, and use of efficient, effective, safe, and more environmentally benign chemical products

- US and EU shifted from lead stabilizers to alternatives such as calcium zinc and organotin stabilizers

- In Asia, the use of lead stabilizers is declining, and recent legislation in India will hasten the process

- Heavy metal free and Tin free alternatives are gradually increasing



STATUS OF TIN IN OFFICIAL CRITICAL STRATEGIC MINERALS LISTS

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Country / Region	Official list size	Tin listed?	Source
CN China	24	Yes	National Plan for Mineral Resources (2016–2020) / IEA policy summary (IEA)
US USA	60	Yes	Final 2025 List of Critical Minerals, Federal Register (Federal Register)
IN India	30	Yes	Ministry of Mines / PIB, 2023 (Presseamt)
EU EU	34	No	European Commission, 2023 Critical Raw Materials list (Binnenmarkt und Industrie)
JP Japan	35 mineral categories / 56 elements	Yes	JOGMEC review of Japan's 2023 critical minerals framework (JOGMEC Journal)
BR Brazil	13 priority strategic minerals	Yes	Ministry of Mines and Energy, Investor Guide 2026 (Serviços e Informações do Brasil)
RU Russia	61	Yes	Government Order No. 2473-r (2022), as summarized by USGS and other specialist sources (Geologischer Dienst USA)

SUSTAINABILITY IN PVC PRODUCTS

PLATINUM.

- Sustainability : Driven by need for sustainable solutions and environment friendly chemicals
- Sustainability in PVC involves optimizing additive use to minimize environmental impact
- Develop bio-based solutions for PVC additives
- Phthalate free PVC formulations in soft/ flexible PVC
- Platinum's production facilities have taken initiative to optimize energy use throughout its production process
- Developed heavy metal free environmentally friendly advanced stabilizer technology(Tin replacement) for CPVC and PVC applications

PLATINUM'S PVC ADDITIVES A SAFE CHOICE: IT IS PFAS-FREE

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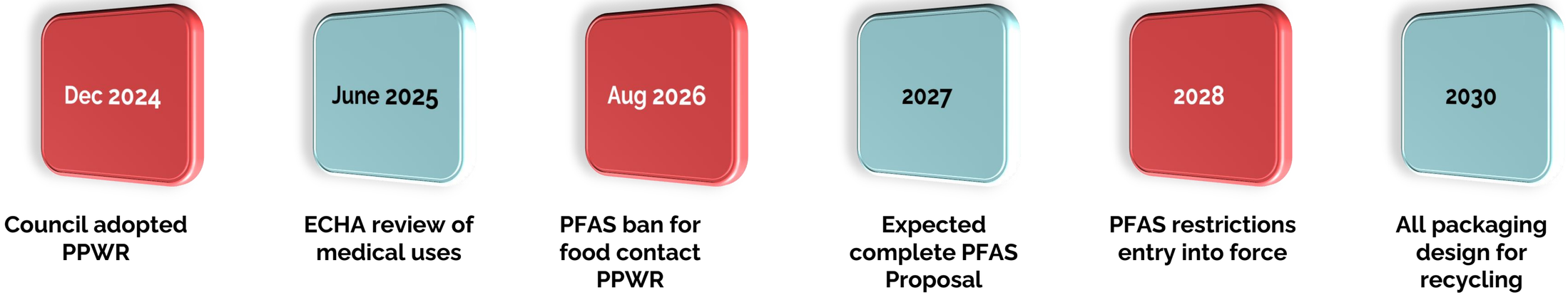
- PFAS are a group of thousands of chemical substances – Organo fluorine
- It is Per-and poly-fluoroalkyl substances
- Platinum products do not contain PFAS and also manufacturing process does not create PFAS
- PFAS exposure and health effects : scientist are working to address PFAS issues

PPWR AND PFAS TIMELINE PROPOSAL



STRATEGY OVERVIEW – FROM COST TO SUSTAINABILITY

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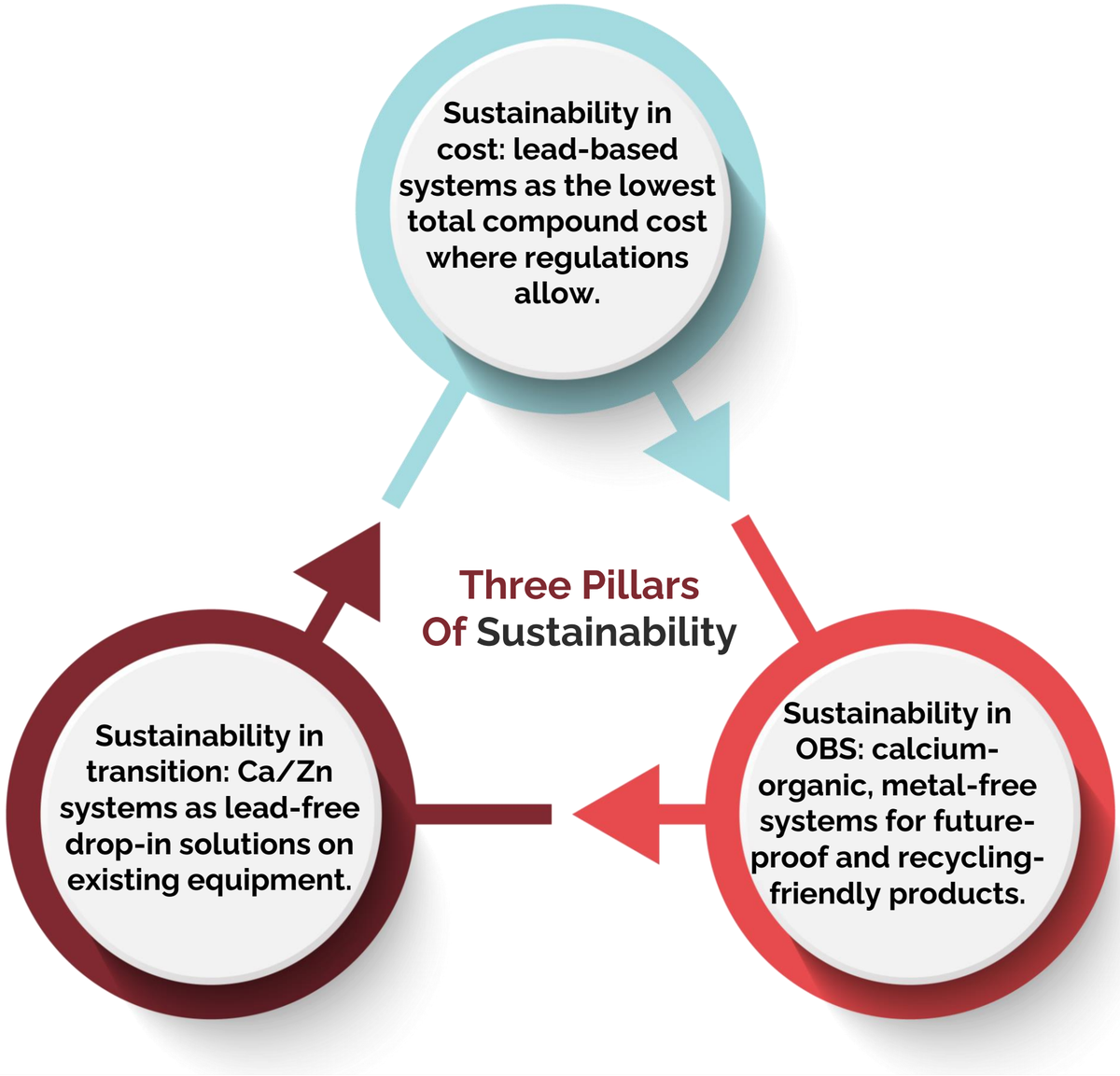

KEY PRINCIPLES FOR ALL OPTIONS:

- Keep existing buildings and most of the equipment wherever possible.
- Avoid tin systems to prevent cross-contamination issues and high raw-material cost.
- Start today with lead-based stabilizers for cost-efficient local production, then convert selected lines stepwise to Ca/Zn or Ca-organic stabilizers for export and high-sustainability products.
- Platinum provides a stabilizer roadmap that allows converters to move stepwise from lead → low lead → Ca/Zn → Ca organic systems.

LEAD SYSTEMS – SUSTAINABLE IN COST

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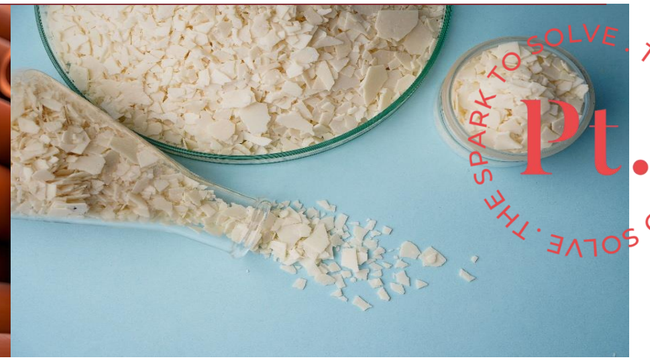
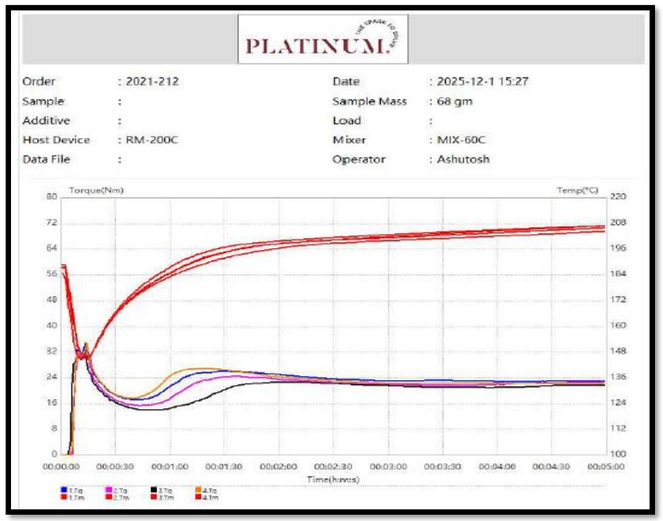
- Lead is the cost benchmark and starting point for our roadmap.

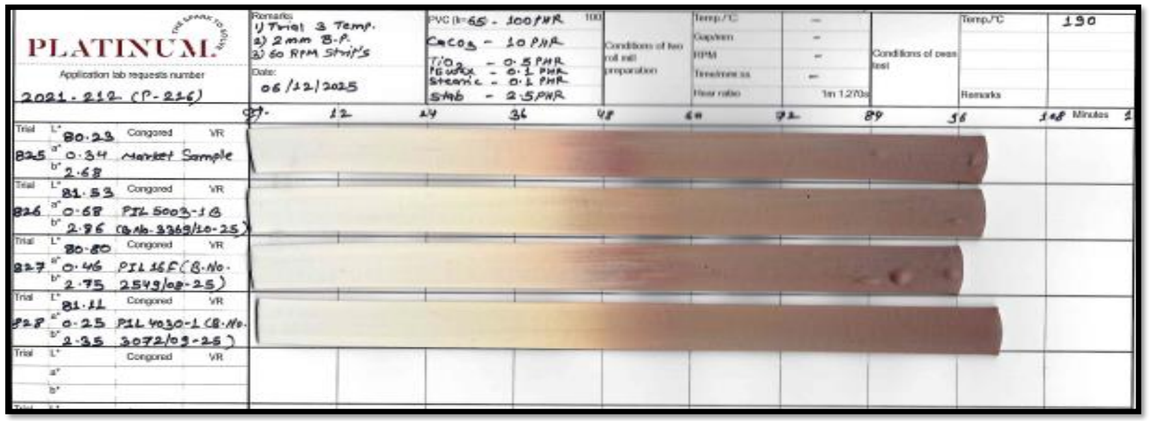
- **Representative Platinum packs (one pack per application):**
  - **Pipes :** PVC Addpack Lead Based – Pipe grade.
  - **Fittings :** PVC Addpack Lead Based – Fitting grade.
  - **Cables :** PVC Addpack Lead Based – Cable grade.

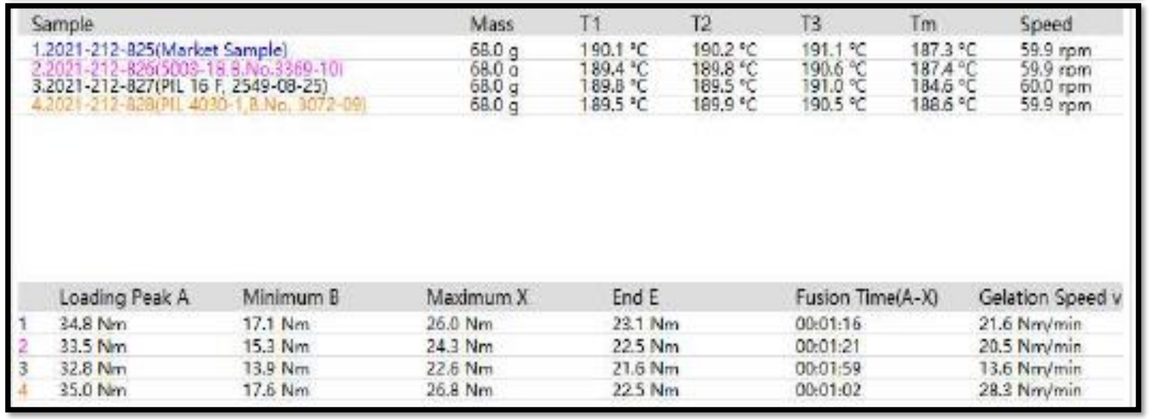


Lead-Based Stabilizer – Guideline Formulation & Lab Testing

Formulation	Lead-Based Stabilizer (Pipes)
S-PVC (k = 65)	100
Calcium Carbonate	10
Titanium dioxide	0.5
PE wax	0.1
Stearic Acid	0.1
Lead Stabilizer (Pipes)	2.5
Total	**113.4**







CALCIUM ZINC SYSTEMS - SUSTAINABLE IN REPLACEMENT

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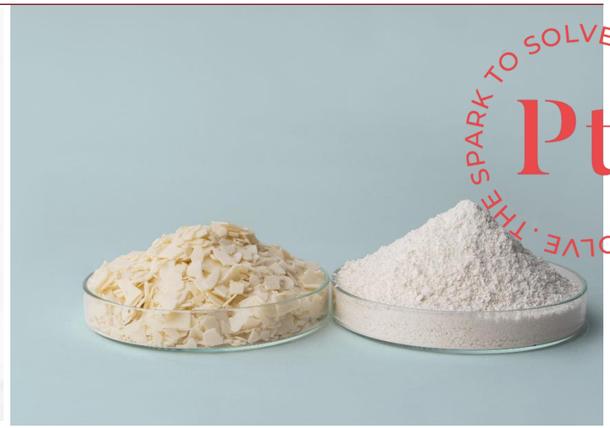
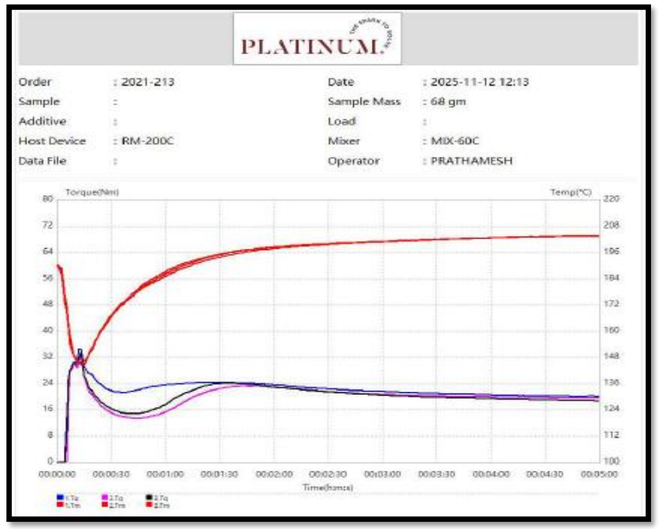
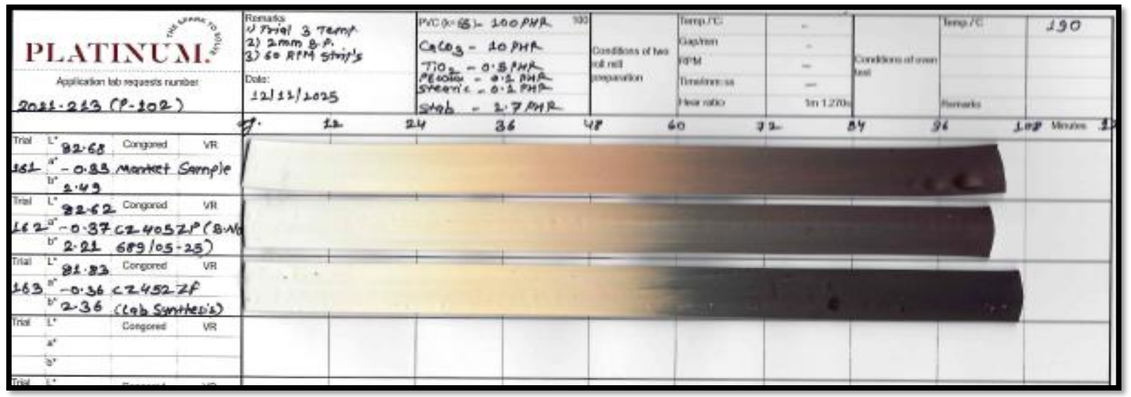
- Ca/Zn is the main lead-free workhorse, using existing equipment.
- Representative Platinum packs (one pack per application):
  - **Pipes :** Highstab® Ca/Zn – Pipe grade.
  - **Fittings :** Highstab® Ca/Zn – Fitting/profile grade.
  - **Cables :** Highstab ® Ca/Zn – Cable grade.
- **Eco-Friendly :** full lead-free replacement, no tin, good long-term stability.

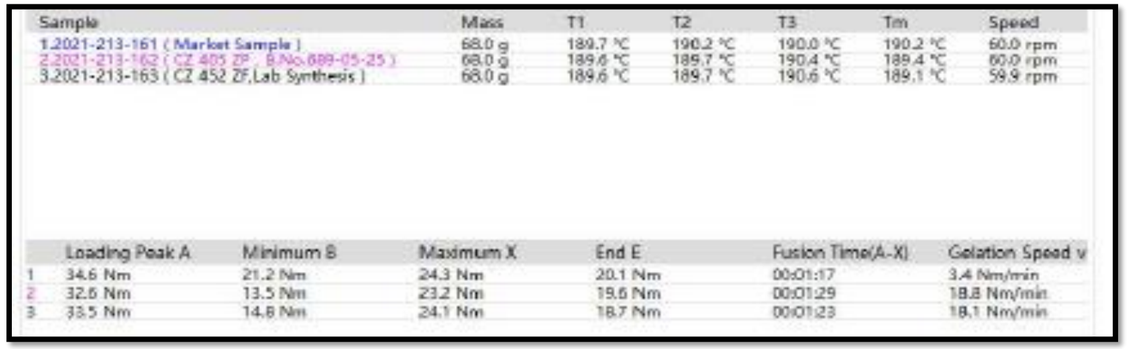


Ca-Zn Stabilizer (Pipes) - Guideline Formulation & Testing

Formulation	Ca-Zn Stabilizer (Pipes)
S-PVC (k = 65)	100
Calcium Carbonate	10
Titanium dioxide	0.5
PE wax	0.1
Stearic Acid	0.1
CaZn Stabilizer (Pipes)	2.7
Total	**113.4**







Sample	Mass	T1	T2	T3	Tm	Speed
1.2021-213-161 (Market Sample)	68.0 g	189.7 °C	190.2 °C	190.0 °C	190.2 °C	60.0 rpm
2.2021-213-162 (CZ 405 ZP B.No.689-05-25)	68.0 g	189.6 °C	189.7 °C	190.4 °C	189.4 °C	60.0 rpm
3.2021-213-163 (CZ 452 ZF,Lab Synthesis)	68.0 g	189.6 °C	189.7 °C	190.6 °C	189.1 °C	59.9 rpm

	Loading Peak A	Minimum B	Maximum X	End E	Fusion Time(A-X)	Gelation Speed v
1	34.6 Nm	21.2 Nm	24.3 Nm	20.1 Nm	00:01:17	3.4 Nm/min
2	32.6 Nm	13.5 Nm	23.2 Nm	19.6 Nm	00:01:29	18.8 Nm/min
3	33.5 Nm	14.8 Nm	24.1 Nm	18.7 Nm	00:01:23	18.1 Nm/min

BENEFITS OF TIN-FREE STABILIZERS PACKAGES + CO-STABILIZERS (e.g. UV STABILIZERS, ANTIOXIDANTS)

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REGULATORY & SAFETY ADVANTAGE (FOOD & PHARMA)

- **Tin-free systems** eliminate critical metals (Tin), thus from price fluctuations, regulatory concerns.
- Tin is limited percentage wise in food and pharma applications
- In-house formulation flexibility vs. fixed tin chemistry
- Adjustable compliance with specific **food-contact and pharmaceutical regulations** all over the globe

Ideally for:

- Pharma blister packs
- Medical tubing
- Food-grade films

This are the biggest driver for

- Future replacement of tin stabilizers

Benefits:

- No Odor!
  Softness + transparency maintained
- Safer plasticizer + stabilizer combination

Benefits:

- Long-term clarity
- No tin as legacy element contamination
- Better UV resistance → longer shelf life

Flexible Applications (Plasticized PVC)

- Medical tubing
- Blood bags
- Flexible films

Rigid Applications (RPVC)

- Food containers
- Pharma bottles
- Transparent sheets

CPVC: FORMULATIONS FOR BRABENDER DYNAMIC HEAT STABILITY

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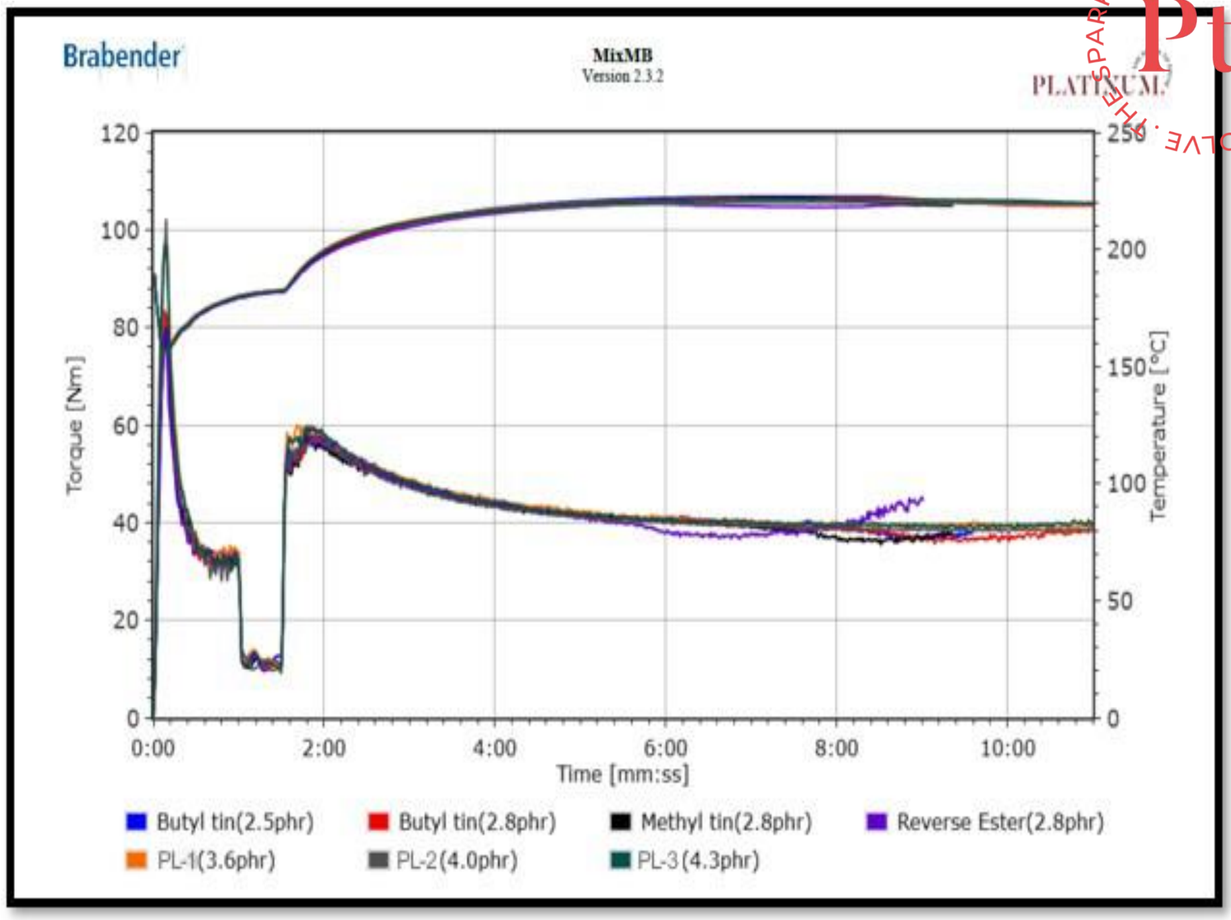
Formulation [phr]	1	2	3	4	5	6
CPVC pipe grade	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
UNIPACK™ formulation without heat stabilizer	**22.0**	**22.0**	**22.0**	**22.0**	**22.0**	**22.0**
Butyl Tin industry standard	**2.8**					
Methyl Tin reference standard		**2.8**				
Reverse Ester Tin industry standard			**2.8**			
New Stabilizer Innovation By Platinum [Complex Highstab]				**3.6**	**4.0**	**4.3**



CPVC: BRABENDER DYNAMIC HEAT STABILITY CHIP TEST

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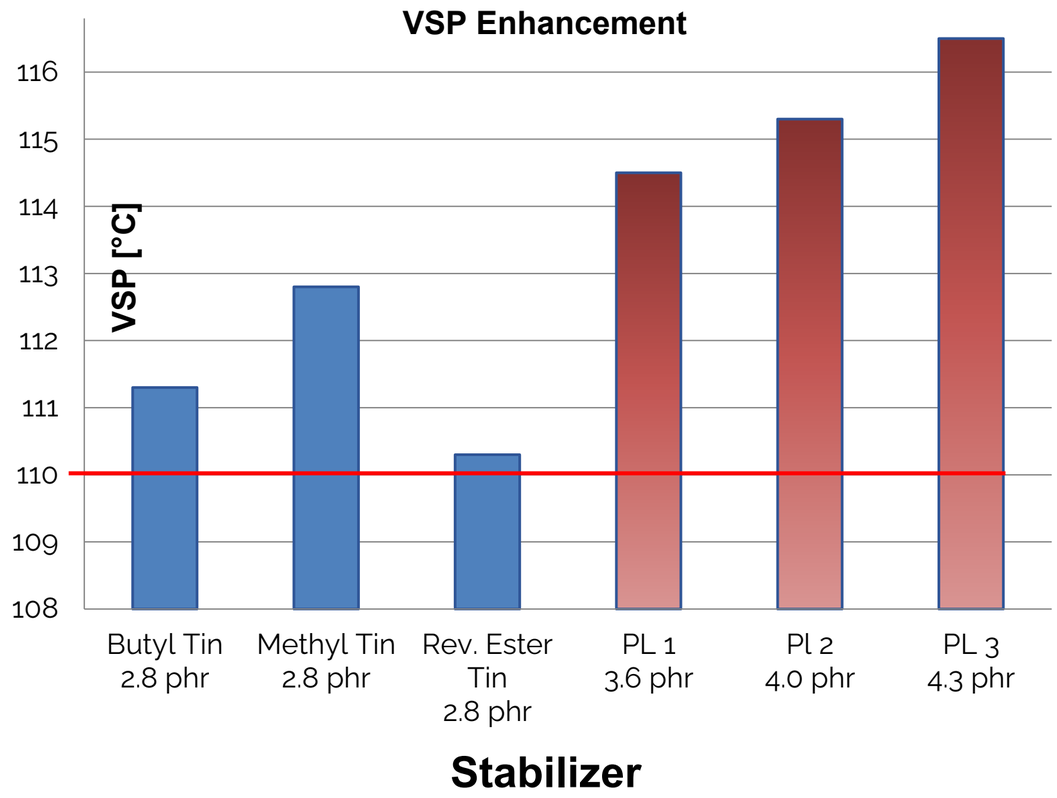
CPVC: THERMO-MECHANICAL PROPERTIES

PLATINUM.

Formulation [phr]	1	2	3	4	5	6
Butyl Tin industry standard	**2.8**					
Methyl Tin reference standard		**2.8**				
Reverse Ester Tin industry standard			**2.8**			
New Stabilizer Innovation By Platinum [Complex Highstab]				**3.6**	**4.0**	**4.3**
VSP (Specification >110°C) IS13360-6-1 **[°C]**	**111.3**	**112.8**	**110.3**	**114.5**	**115.3**	**116.5**
Notch Izod Impact Strength **[KJ/m2]**	**7.29**	**5.62**	**8.45**	**6.86**	**7.50**	**6.81**
Tensile Strength > 45 MPa	**64.83**	**69.85**	**59.94**	**58.65**	**63.60**	**63.26**
Tensile Modulus > 2000 MPa	**2100**	**2260**	**2390**	**2090**	**2600**	**2230**



PLATINUM CaZn STABILIZER TECHNOLOGY PROVIDING EXCELLENT PERFORMANCE

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- Specialization in formulation design, complete R&D set up
- Excellent color holding and long-term stability
- Broad processing window during production
- Using efficient lubricant package, solving plate out issues
- Achieving required physical properties
- Easy recycling
- A complete eco system

CPVC - INTRODUCTION

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CPVC -THERMOPLASTIC

- **Chlorine Content** - has higher chlorine content between range of 66-67% compared with 56-57% for PVC. CPVC is inherently resistant to even the most concentrated chlorin levels due to its molecular structure.
- **Flame Retardancy** - has **LOI of 60** - Will not burn on its own, but rather will char & self-extinguish when the flame is removed
- **Ease of Installation** - light weight, solvent cement joining method , use of inexpensive tools.
- **Service Temperature** up to 93˚C.
- CPVC has high resistance to **corrosion.**
- Better **chemical resistance**.
- The ability to bend, shape, and weld CPVC enables its use in a wide variety of processes and applications like water tank, chemical tanks.

NSF

Certified to NSF Guideline 533

PRODUCT PORTFOLIO

PLATINUM.

PVC LEAD STABILIZER RANGE

- Hybrid® Low Lead Stabilizer
- Lead Stabilizer
- PVC Add pack

PVC LEAD FREE STABILIZER RANGE

- HIGHSTAB® Calcium Zinc
- HIGHSTAB® Calcium Organic Stabilizer

CPVC UNIPACK RANGE

- UNIPACK™ CPVC Compound
- UNIPACK™ Additives

METALLIC STEARATES RANGE

- Calcium Stearates
- Zinc Stearates
- Magnesium Stearates

PRODUCT PORTFOLIO : APPLICATION

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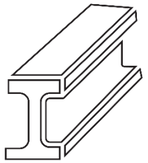
CALCIUM ZINC

Plumbing pipes | Flooring tiles | Fittings | Technical Profiles
Mica Sheets | Foam Boards | Conduit Pipes | Gaskets
Cables | Shoe Soles

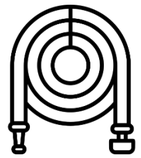
CALCIUM ORGANIC

PVC Pipes | O-PVC Pipes | CPVC pipes | CPVC Fittings
UPVC Pipes | UPVC Fittings



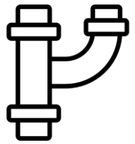
LEAD ONEPACK

Pipe | Sheet | Panel | Foam Boards | Profiles | Cables |
Shoes



PVC ADDPACK

Wires/Cable | Shoes | Hose Tubes | Suction pipes | Films |
Medical tubes | Blood bags | Disposable Oxygen Mask |
Floorings | Plastics | Gasket | Soft Injection molded Articles



CPVC ADDPACK

CPVC pipes | CPVC Fittings

HYBRID™ LOW LEAD

Conduit Pipe | Profile | Foam Boards | Roofing | Panels
Pressure Pipe | Sewage Pipe | UPVC Fittings | Injection
molded articles

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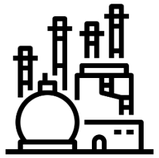
Applications of Metallic Stearates (Metal Soaps) in Diverse Industries

PLASTICS INDUSTRY

As a releasing agent and lubricant in PVC compounding, masterbatches, automotive compounding, etc.

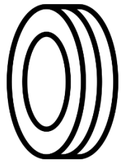


PETROCHEMICALS / POLYOLEFIN

As an acid scavenger

PAINTS AND COATING INDUSTRIES

As a matting agent and abrasive



RUBBER ADDITIVES

As a releasing agent, dispersing agent

MANUFACTURING FACILITIES

PLATINUM.

 # Unit 2 Palghar, Maharashtra, India

Our staff undergoes regular trainings, Keeping us updated on latest technology

All the facilities are extremely safe and Successfully running 24x7

We have 3 Automated Plants in India delivering excellent quality year over year

TÜVNORD
TÜV NORD CERT GmbH
ISO 9001
tuev-nord.de

NSF
Certified to NSF Guideline 533

STAR EXPORT HOUSE
RECOGNIZED BY GOVT. OF INDIA

PLATINUM EGYPT – ENVISIONING REGIONAL STABILIZER HUB

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- Plant ready to start production is **coming soon**
- Complete PVC stabilizer product mix is planned

GROWTH PLAN OUTSIDE INDIA IN EGYPT AT THE HEART OF THE SUEZ CANAL CORRIDOR

Platinum Egypt will be a local producer of PVC stabilizer systems in Egypt.

KEY POINTS

- **Location:** Sokhna (SCZONE) as a hub for Egypt, North Africa, Middle East & Russia.
- Planned capacity including lead- stabilizer, Ca/Zn and OBS systems.
- Shorter lead times and local technical support for pipe, fitting and cable producers.

Focus Area

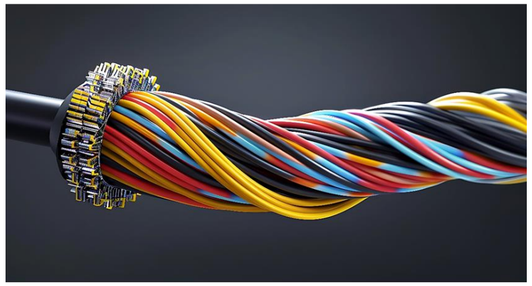
a. CaZn system for PVC cable industry

b. Stabilizer technology for transparent compound

c. Organic base system

d. CPVC compound in granule form

e. CaZn stabilizer in pellets



Customer Connect: We are creating chemistry with customers

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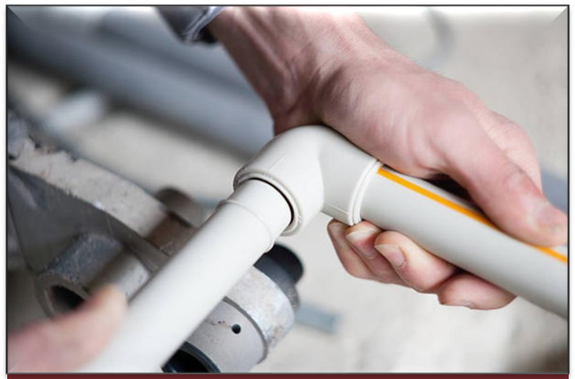
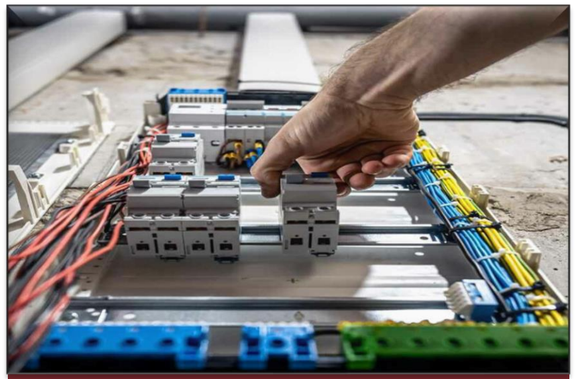
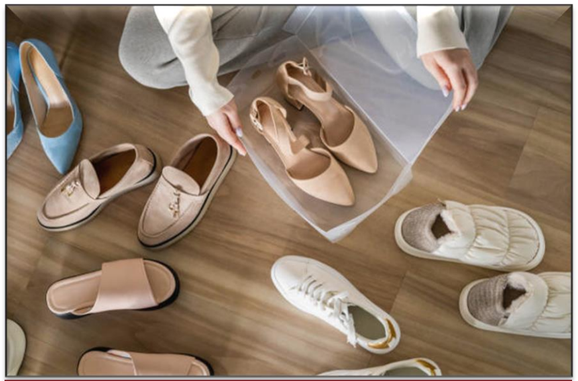
PVC Window



PVC Pipe



PVC cable



Footwear

PVC Films

PVC Blister, Films

1. High quality PVC stabilizers enhance PVC properties and wide range of applications

2. Our R&D team builds on experience to create recipe to meet customer need

3. We co-create solutions along with customers, product development, plant trials and online assistance

PLATINUM.

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THANK YOU

www.platinumindustriesltd.com