

Drycotec Diaries





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Benefits: Cement Workability Anti slip / Anti-Sag Thickening Open time Adjustment time Cost reduction Bounce back reduction **Application Speed**

Applications : Gypsum Manual Plaster Finishing plaster Spray plaster Joint filler **EIFS** Spot Glue

Benefits: Gypsum Anti-sag Thickening Workability Working time **Smoothness** Surface hardness Reduce chalking **Application Speed**









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Editor's Page : The New Language, New Words & New Abbreviations



As the English tried to rule the world, they certainly did a good job in spreading their language, which is today the officially business language of the world.

We are slowly becoming a one world one communication breed. The new generation has adapted their own words & abbreviations to make their life easy. These have been accepted by all. The Oxford Dictionary has featured several new Indian English words, including 'Aadhaar', 'chawl', 'dabba', 'hartal', and 'shaadi'. 'Jugaad' is also officially used in the world of business. Here are some more words which I found interesting & thought that our readers should know.

BAPUTISM: Always trying to become a father figure, trying to parent or keep bossing.

NOMOPHOBIA: Fear of Mobile failure or loosing the mobile.

SITUATIONSHIP: A relationship which is not official, neither friendship nor anything else.

FITSPIRATION: Inspiration to join the fitness regime or become fit or joining the gym.

HELICOPTERMOM: Mom who continuously gets involved in the child all the time & always.

FINFLUENCER: Influencer in the financial world, related to investments and planning.

CHORIFOCUS: Someone who continuously thinks of stealing / acquiring in the wrong way.

LAKIRKEFAKIR: They strictly follow what is written. Rules, processes or methods.

CHAKKAJAAM: Work/road Block. It creates hinderance to the flow of man/material.

TUBELIGHT: Some one who is slow on thinking or taking action as compare to others.

Why is this happening?

IMO (In My Opinion) it is the change of the thought process which is driving this culture. We are increasingly becoming more faster in our day to day life. We get tired quickly & TGIF TGIF (Thank God It is Friday). Technology is responsible for making things fast. Therefore, we are even adapting to abbreviations in our informal and now even formal communication. Sometimes I am LOL (Laughing Out Loud) at the availability of TMI (Too Much Information). BTW (By The Way) it is now impossible to avoid it. Our mobile has become our magic wand, without which we are completely OOO (Out Of Office). In our next issue, we will be giving more details about the next DDA (Drycotec Drymortar Association) Conference. Keep reading, I shall BRB (Be Right Back)

Dr. Mandar Chitre
Editor & Founder – Drycotec Diaries
Drycotec Drymortar Association



DRY MIX MORTAR PLANT

Mortar | Grout | Tile Adhesive | Black Box | Putty | Green Sand

































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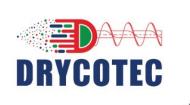


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My Industry Diaries : Trends within the Industry



Dr. Jai Shankar Kumar, Head (Sales & Marketing) Shyam Steel India has more than two decades of experience and has worked for some of the Top Cement brands of India. He has done his MBA from IIM Calcutta and also completed his PhD. He expresses his views on the news clips which was published in the news paper as below,

THE STATESMAN ,ND 10-04-2024

Cement price hikes to pose challenge to affordable housing: Experts

AGENCIES

NEW DELHI, 9 APRIL

Post the hike in cement prices across India, builders have opined that the trend will weaken the already slow demand for affordable houses as well as impact retail consumers, large-scale construction projects and infrastructure projects.

Last week, cement majors in India announced a hike in prices in the range of Rs 10-15 per bag in North India, Rs 30-40 per bag in Central and East India, and Rs 20 per bag in the Western region.

The move comes after a prolonged period of decline in cement prices for five consecutivemonths due to weakened demand. Builders say hike in the prices of cement will further weaken the



demand for affordable hous-

"Affordable Housing has already seen a downturn. The increase in cement prices may make housing in this area unaffordable. Infrastructure contracts in future will also see a cost escalation," says Niranjan Hiranandani, Chairman, National Real Estate Development Council.

Several others in the industry feel higher cement prices will impact consumers entiments and also impact infrastructure projects.

"The price hike will affect retail consumers, large-scale construction projects and infrastructure projects. The factors contributing to the recent price hike include the rising costs of raw materials, power, transportation, and the increased demand for cement" says Jatin Shah, Chief Technical Officer of Project Management and MD, Technical Advisory Services, Colliers India.

Shah further said that Builders may need to reassess their budgets since every 10 nupee increase in cement price has an impact of 4 to 5 rupees on the construction cost. As such, they need to build in this as a factor into their project estimates or sale price".

India is the second-largest producer of cement in the world and it accounts for more than 8 per cent of the global installed capacity. As per Crisil Ratings, the Indian cement industry has added nearly 80 million tonnes (MT) capacity in FY24, the highest in the last 10 years. Driven by increased spending on housing and infrastructure activities, cement consumption is expected to reach 450,78 million tonnes by the end of FY27.

The ramifications of the price increase will be felt throughout the construction sector, impacting retail consumers, large-scale construction projects, and infrastructure initiatives alike.

Experts say various factors have contributed to the recent escalation in cement prices. These include the rising costs of rawmate rials, power, and transportation, coupled with an increased demand for cement in the market.

Cement Price Hike will lead to a downturn in affordable housing scheme- a major blow to Infra @indianperspective. The increase in cement prices indeed presents a significant challenge for affordable housing in India. Cement is a fundamental building material, and any rise in its cost directly impacts construction expenses, which can then inflate property prices.

- (a) Construction Costs: Cement typically constitutes a substantial portion of construction expenses. When its price rises, it directly increases the overall cost of building houses, making it harder to keep housing affordable, especially for low-income groups.
- (b) Supply Chain Disruptions: Factors such as increased demand, transportation costs, or supply chain disruptions can lead to price hikes in cement. These disruptions often occur due to various reasons like changes in government policies, fluctuations in raw material prices, or disruptions in transportation infrastructure.
- (c) Impact on Developers: Affordable housing developers operate on thin profit margins. Even a small increase in construction costs can significantly impact their ability to deliver affordable housing projects without compromising quality.

- (d) Affordability for Buyers: Higher construction costs are eventually passed on to the buyers, making housing less affordable for those who are already struggling to find decent accommodation within their budget.
- (e) Government Initiatives: The government plays a crucial role in promoting affordable housing through various schemes and subsidies. However, the effectiveness of these initiatives can be undermined by external factors like cement price hikes, which increase the overall cost of the projects.

Addressing these challenges requires a multi-faceted approach involving collaboration between the Government, Developers and Stakeholders in the Construction Industry. This may include measures to stabilize cement prices, incentivize the use of alternative building materials, promote sustainable construction practices, and streamline regulatory processes to reduce construction costs.

BIZZ BUZZ, HYDERABAD 11 APRIL 2024

Rising cement prices make new homes dearer

Surging cost of raw materials, power, transportation adding to the cement prices

Realty Bytes

- Surge of Rs 10 will have impact of Rs5 per sft on construction cost
- · Increased cost directly impacts affordability
- It's posing a challenge to govt's 'Housing for All' initiative
- . This hike comes at an inopportune time . As real estate sector is just beginning to recover

N SHARATH CHOICHART

OWING to the inflationary pressures, the cement mak-ers have been increasing the rates gradually over the last one year. The average prior of a 50-kg bug already reached to around Roseo from Re250-300 from a year-ago period. Agus, the cement in mies have recent cohanced the prices further

costs of one materials, power, transportation, and the in-crossed demand for cement have contributed to the recent price rise. The builders may need to reassess their builgets as every increase of Ro10 in the cornent price has an im-pact of Ref-5 per square fort, on construction cost. They need to build this as a factor into their project estimates or sale price.

As per the real estate ex-

have a major impact on the housing market across India. With every hike in the price of coment huge, the cost of construction tracrones to the property developers who pass on the ultimate financial burden to the new homebovers. committed to their existing

"Input costs are directly pro-portional to the selling peaces. Builders don't do business for losses. They had already faced financial hardships shar to rise in construction costs during the Covid-times, but they couldn't change their sale price fixed in the pre-punden-ic period," Confederation of Real Estate Developers' Asso-ciations of India (Credat) Notional Secretary Gummi Ram Reddy told they Bury

Group. He said, "Telangana has the highest number of cement manufacturers in India. Whenever cement industry players indulge in cartelisa-tion, the prices will go up-across the country. The cost across the country. The cost fixing activities of the criment cartet will have a big impact on the end-user market." G. Hari, Babu, National President of Naredco, said.

The sudden surge in cement prices not only puts pressure on existing projects but also impacts specining developments. As construction costs continue to rise, developers are grappling with increasing

Passure: "Rising cost dynamics directly hamper housing afford-ability, posing a major hundle for the Housing for Alf, the ambilious vision of the Central government. This unpreedented surge has come when the real estate dos

Whenever cement industry players indulge in cartelisation, the prices will go up across the country. The cost fixing activities of the cement cartel will have a big impact on the end-user market

-Gummi Ram Reddy, National Secretary, Credai, tells Bizz Buzz

from the post-pundemic tur-mod. Insteadate intervention is necessary to stabilise content prices, promote an environ-ment conducive to the continand growth and prosperity of the industry, he added. According to the latest re-port by Crisil Market Intelli-

gener and Analytics (MI&A). Indian connent sector will add 150-160 million tenne over 150-160 million tenne per an-mon (MTPA) capacity in the five years starting this fiscal, through both organic and in-organic routes, with an eye on anticipated demand growth

in infrastructure and beauting and to a bid to capture market share in a highly fragmented and competitive industry:

"In the last five fiscal years, the industry added a capacity of 119 MTPA to much as 70-75 MT of the capacity addition is expected to be commis-sioned next fiscal, with 30-53 per cent concentrated in the eastern and central regism. Large players will account for 50-55 per cent of the planned capacity addition," the report said.

the demand is projected to grow 10-12 per cent this facal, demen by government push to affordable housing and pre-election spending or infrastructure. That said, in-cremental supple and height ened competition will limit price growth to 0-1 per cent, maintain prices at Ro300-395 per 50 kg bag, and keep utili-sation at 70-75 per cent. Next. fiscal, Crisil M&A

Next from Cross of grow expects the demand to grow a moderate 4-6 per cent on a high base of the previous there fiscal years. Also, rising raw material cost and a flat base will lead to an uptick of 1-3 per cent in prices to Ba400-405 per 50 kg bag. Jutin Shah, CTO, Project

Management & MD, Techni-cal Advisory Services, Collien cat Advancy Services, Cottons India, said that the cornent price bike will not only affect utail consumers, but also the large-scale construction pro-jects and infrastructure pro-

Actual Example

A rise in cement prices of Rs.10/ per bag may increase by Rs. 5 per square foot - can indeed have a notable impact on construction costs. For a typical home, where cement is a primary material used in various components like foundations, walls, and floors, this increase would translate into a significant overall cost hike.

For example, let's say you're building a 1500 square foot home. A Rs. 5 increase per square foot would result in an additional cost of Rs. 7,500 for cement alone. When considering the total cost of construction, which includes other materials, labor, and overheads, this increase could substantially affect the final price of the home.

Builders and developers may need to reassess their budgets, negotiate with suppliers, or consider alternative construction materials to mitigate the impact of rising cement prices and keep homes affordable for buyers. Additionally, consumers might need to adjust their expectations or budgets when planning to buy or build homes in such market conditions.

ECONOMIC TIMES, MUMBAI, 17 APRIL 2024

FALLING INPUT COSTS to provide relief at a time when low demand makes price rise unsustainable

Cement Cos' Q4 Profits to Grow in Double Digits Aided by Volumes

Rajesh.Naidu@timesgroup.com

ET Intelligence Group: Revenues of top cement firms including UltraTech Cement, ACC, Ambuja Cements, Shree Cement and Dalmia Bharat are likely to grow in the range of 5% to 13% year-on-year for the March quarter, show the estimates of eight domestic brokerages. The growth will be largely driven by volumes since cement firms have been unable to sustain any increase in cement prices over the past few quarters.

Intense competition due to incremental capacity addition and lower-than-expected demand have been a few key challenges that have restricted the ability of cement

firms to raise prices meaningfully. In FY24, the average cement price fell by around 1% to ₹359 per 50 kg bag. Cement demand from the real

estate sector, which provides more than 55% of the total demand, has been weak. **Upside Priced In**

Company	Consensus EPS (१)			CRoCI (%)	
	FY24E	FY25E	Growth (%)	FY24E	FY25E
ACC	101	120	19	16	17
Ambuja Cements	16	18	11	13	14
Dalmia Bharat	46	64	40	NA	NA
JK Cement	109	139	28	18	19
Nuvoco Vistas	5	10	115	10	10
Orient Cement	9	12	33 🔣	NA	NA
Shree Cement	642	741	15	21	20
The Ramco Cements	20	31	52	NA	NA
UltraTech Cement	248	313	26	18	19

CRoCI: Cash Return on Gross Capital Invested Source: Bloomberg, FactSet, Kotak Institutional Equities

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tate projects has not improved in a

noteworthy manner.

On the operating front, cement manufacturers are likely to benefit from cheaper raw materials such as coal and pet coke. Their prices fell by 30-58% year-on-year in the March quarter. As a result, the cost incurred in manufacturing a tonne of cement for large firms is expected to fall by 5-13% from a year ago. According to the estimates of eight domestic brokerages, the net profit of the top five companies is estimated to grow by 18-34% in the March quarter.

In the past few weeks, cement firms have raised prices. However, it will be difficult to sustain these price levels as demand is expected to remain weak during the election period and subsequent monsoon season.

A key concern is the valuation of large firms. "In our view, the multiples of cement stocks should be about half of their current multiples," said Kotak Institutional Equities in a recent report. The brokerage added that the sector has a very low asset turnover ratio (around one for expansion projects, lower for greenfield projects), which should automatically cap valuations. It cited that most cement stocks trade at 2.5-5 times FY25 estimated book value (BV), which is high in the context of the low-to-mid-teens return on equity (RoE).



Analysts point out that in rural areas, a large portion of the demand from the government's low-cost housing sche-

me, Pradhan Mantri Awas Yojana (PMAY), has already been met. In the urban areas, demand for real es-



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My Industry Diaries : Trends within the Industry



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This fact based article is contributed by Khanjan Shah, Manager - Specifications (Industry, Infra and Building Segments) at Fosroc. Khanjan a civil engineer who also studied IIM Indore, is a seasoned professional with a demonstrated history of working in diversified sectors i.e Govt, Industrial & Infra sector, Building Materials & Construction Chemicals industry handling different portfolios.

Trends in building materials industry:

From past 4-5 years, there is sudden rise in building materials industry opening new parallel verticals for their customers.

For example:

Cement companies started selling construction chemicals.	Paint companies started selling construction chemicals.	Cement Companies started selling paints.
Pipe manufacturers started selling construction chemicals.	Pipe manufacturers started selling paints.	Steel companies started selling cement.
Pipe companies started selling sanitary fitting products.	Paint companies started selling sanitary fitting products.	Quarry Owners stated selling Mortars

The core idea is to sell the entire basket of building materials to a same customer under one Roof and try to get a maximum share of wallet. But here the major concern is giving a consistent "QUALITY". The biggest fear is due to lack of quality & services in other parallel verticals, it affects the primary business of these companies which can be observed.

We can see a tremendous price-war in such companies at a retail / distribution level to acquire a customer. Customer acquisition cost is also very high for brand promotions & marketing. They all want to become a "Wal-Mart" or a "D-Mart" for their customers.

Brand play has dominated the quality of a product!

What are your views on the same???

You can connect directly to the author on shahkhanjan.99@gmail.com



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ULTRASONIC SEALING FOR VALVE BAGS



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SEALING BUILT IN WITH YOUR PACKER



IMMEDIATE SEAL AFTER FILLING



Housing Market Continues its Record-breaking Sales March

Top 7 cities see 14% jump in sales in March gtr; MMR, Pune account for over 51% of deals

Faizan.Haidar@timesgroup.com

New Delhi: India's housing market continued its post-pandemic growth trajectory, achieving recordbreaking sales in the March quarter.

The top seven cities achieved sales of 139,170 units during the quarter, a 14% growth from a year earlier, according to data from real estate consultancy Anarock. March quarter performance boosted total housing sales to 492,900 units in FY24, marking a 30% increase.

"MMR (Mumbai Metropolitan Region) and Pune contributed to over 51% of the total sales in the top 7 cities, with MMR experiencing a 24% yearly increase and Pune witnessing over a 15% yearly rise. Despite new launches exceeding the 100,000 mark, they only saw a marginal 1% yearly increase from Q1 2023 to Q1 2024," said Anuj Puri, chairman, Anarock Group.

While new launches remained robust, available inventory in the top seven cities decreased by 7% to 580,890 units in Q1 2024 from 626,750

Home, Sweet Home

492,900 Total housing sales in FY24 in top 7 cities

MMR sees. 24% yearly rise, Pune witnesses over a 15% jump

Available inventory in top 7 cities down 7% annually

27% NCR experienced highest decline in its unsold . stock during Q1

BHAVIN G units in Q1 2023.

NCR saw the highest decline of 27% in unsold stock in the March quarter, with the current inventory lower than other prominent cities like MMR, Pune, and Hyderabad.

"The real estate market is experiencing a surge across all segments due to a strong demand from first-time home buyers and affluent home buyers who are looking for a second home, Even investors are very keen on properties located in prime loca-

Overall economic outlook in India remains

residential property price rise across top positive 7 cities

10-32% Avg

tions with the potential for high returns. Gurugram remains the top residential market in the NCR, and the completion of the Dwarka Expressway has changed the entire dynamics of the city," said Pradeep Aggarwal, founder & chairman, Signature Global (India).

In Gurugram, promising areas such as Sector 37 D, Sector 71, Dwar-

ka Expressway, Sector 84, and Southern Peripheral Road are witnessing significant interest.

The overall economic outlook in India remains positive, with the country boasting one of the highest GDP growth rate globally and inflation seemingly under control. This favourable environment is sustaining robust homebuyer sentiment.

"Delhi-NCR's real landscape is witnessing an unprecedented surge in demand for luxury homes due to excellent connectivity and infrastructural development. As new residential projects emerge and existing ones gain momentum, they

will inevitably create a ripple effect, generating employment opportunities. Consequently, this expansion will not only fuel economic growth but also contribute to the overall development of the region," said Amar Sarin, MD & CEO, TARC.

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My New Tech Diaries: 3D Printing & More



ABHIJEET GAWDE, **Head Business Development & Marketing**, **Godrej Constructions**, is a top class civil engineer with comprehensive experience in consulting, technology, construction & business development, writes this article on 3D Printing & More. The construction sector contributes approximately 20 percent of India's annual carbon emissions. Recognising this environmental challenge, a concerted effort exists to explore sustainable and alternative construction materials to significantly reduce the sector's carbon footprint.

The Indian construction sector is actively embracing a technological transformation to improve operational efficiency and bolster sustainability. The drive towards innovative materials and cutting-edge technologies signifies a forward-thinking approach that addresses the immediate challenges and long-term environmental concerns associated with construction activities. 3D construction printing technology & collaborative tools: 3D construction printing technology holds the promise to revolutionise the construction sector. This innovative technology, also known as additive manufacturing, transforms how we design and construct our built environment, promising a future where architectural designs are only limited by the bounds of our imagination.

3D construction printing technology, combined with collaborative tools like BIM and Lean principles, has the potential to optimise the construction process. One key advantage of 3D construction printing is its ability to optimise resource use and reduce environmental impact. For instance, in Khalapur project, we utilised a concrete mix design incorporating up to 20 percent Recycled Concrete Aggregates (RCA). This not only reduced waste but also addressed concerns about embodied carbon in construction. 3D construction printing eliminates traditional building formwork, allowing for the rapid and cost-effective realisation of concrete structures. Automation and robotics play a crucial role in this process, enabling the precision and efficiency of constructing complex geometries. The resulting structures boast intricate designs and textures that would be impractical to achieve using traditional methods.

We have installed an innovative Solar Tree structure that resembles a tree, generating solar energy during the day using photovoltaic (PV) panels. These solar trees require less space due to their design, allowing for greater power generation per unit area and being ideal for supporting off-grid structures. Additionally, the surrounding area of Cocoon features reed beds, a wastewater treatment system that utilises wetland plants to effectively clean effluent before discharging it back into the environment.

These projects showcase how the combination of Construction 3D printing technology, effective planning tools, and sustainable practices can revolutionise construction methods and contribute to circularity in construction. They offer rapid, costeffective solutions for areas with significant housing needs and promote eco-friendly commercial establishments. 3D Construction Printing Technology represents a significant step towards creating environmentally conscious structures by reducing waste and incorporating recycled materials.

Industry stakeholders, including developers, are strategically navigating the future by embracing progressive concepts. They are also leveraging the efficiencies of industrialised construction through pre-fab and modular techniques. These measures aim to strengthen projects against future challenges, focusing on sustainability and long-term viability.





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My Sand Diaries: Sand Washing - Pros & Cons: Baton Consultants Review

PREMIUM PLASTERING SAND: WASHED SAND "GOOD OR BAD"







Washed Sand is the purest form of sand. It is a very good product for making wall plasters. The sand will contain almost 0% slit, free of -50 & -75 Microns product. This sand can be packed in bags and sold over the counter as premium plaster sand. The entire city of Bangalore uses this sand for their plastering need. There is negligible sale of ready plaster and the masons prefer only this sand.

DISADVANTAGES OF WASHED SAND

Probably one of the reasons for drying up the water of Bangalore is the excessive usage of this washed sand. Water consumption in this sand is very high. The washing process needs 1:3 Sand Water Ratio. 10-13% water consumption is in the final product. Recovery tanks and thickeners do their job only to a certain extend. The by-product is sludge.



Cost of Drying this sand is very high. Some manufacturers use the age-old sun drying method indulging workers to ned the sand. This process removes 5-8% of moisture and the rest is taken care by the dryer.

THE SLUDGE



Most dangerous and notorious product generated from the process of washing is sludge. It is not processable. The material contains up to 40% moisture. It cannot be dried because it forms pebble like particles which would need grinding after drying. It cannot be used as road filler because the density keeps varying a lot and is completely unpredictable in compaction. Also dangerous because it can turn into quick sand during heavy rains.

READY PLASTER SAND

Conclusion: Not advisable to make ready plaster with washed sand. It will be too expensive and would be wasting too much water.

Conclusion: If you have washed sand easily available which is well graded, it will be difficult to sell a dry ready mix plaster in that area.

Conclusion: Do not go for a washing system if you are short of space to deposit sludge. It will a lot of empty space to dump it.

Conclusion : The market for washed concrete sand will be limited because it is used only when they require high strength concrete.

Conclusion: In case you want to go for washed sand but free of sludge, we have a solution. You should contact us on **mandar.chitre@batonconsultants.com**

Conclusion: The IS codes allow usage of 20% passing 150 Microns in crushed sand, however for plaster sand, removal of 50 Microns is a must.





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"

My Tech Diaries : Javed Mansuri Plant Head & Technical Manager, Bimbe Trading (Zambia)



Javed Mansuri, Plant Head & Technical Manager is an expert with 13yrs experience in Building material products, Readymix plaster, tile adhesive, dry mix mortar, block joining mortar, wall putty, AAC blocks, Bentonite grinding. He has given us this simple but effective article.

POINTS TO STRICTLY FOLLOW THE AUTOCLAVE SOP

Strictly attend and solve leakages and abnormalities found. And Schedule regular maintenance & inspections. Address any potential issues proactively.

Autoclave bottom roller to be free from dust for the expansion of autoclave (on pressure load).

(it's expanded approx. 25mm)

After closing door make sure teeth are aligned properly with each other and the handle valve (attached with silencer handle valve) with a moon shape is in position.

Regularly check the springs and roller condition of the autoclave.

Autoclave door gear box mechanism & handle should always be smooth.

The mechanical lock should be placed properly on the door teeth.

Before opening the autoclave door ensure that the inside pressure is zero. Provide an interlocking system) Inserting molds inside the autoclave check bridge aligns with the autoclave and rail to avoid material collapse.

Regular check of main boiler PRV (pressure return valve) to avoid excess pressure going to autoclave.

For better Autoclaving results check and monitor the working condition of the drain & trap valve.

Main steam line PRV should be set below the autoclave design pressure.

Before starting the autoclave manually from the main valve, the transfer valve should be closed.

Check for any leakage from door packing and stop autoclave if any leakages are found in running condition.

Make sure the half-line valve is open when you start to build pressure in autoclave, so the door can be air-tight locked. Provide PPE like heat resistance gloves, safety goggles & heat resistance clothing.

Reg check on the dead weight of the door to ensure no displacement of it for smooth operation.

Continuously monitor temp & pressure throughout the cycle. Steam pressure less than 12kg.

Operators should be aware & trained on what to do 1st in case high pressure is reached & safety valve pops up.

Provide timely training to operators and laborers to avoid any incidents.

Regular check on all Safety valves, Pressure valves, Door packing seals, and valve seals.

Perform regular ultrasonic testing (UT) on Autoclave walls.

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