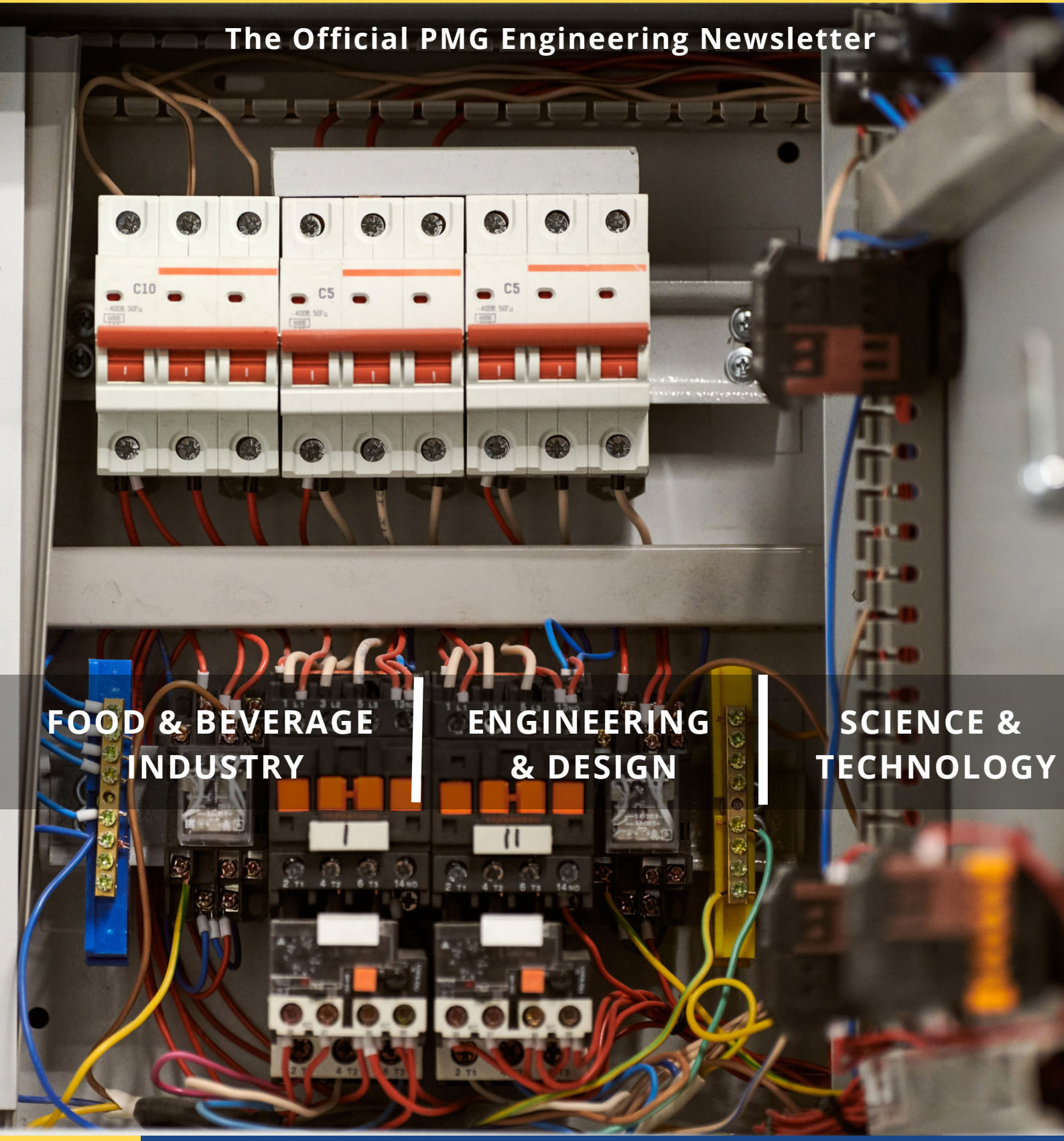
www.pmg.engineering Vol .03-Issue .11-March 2024

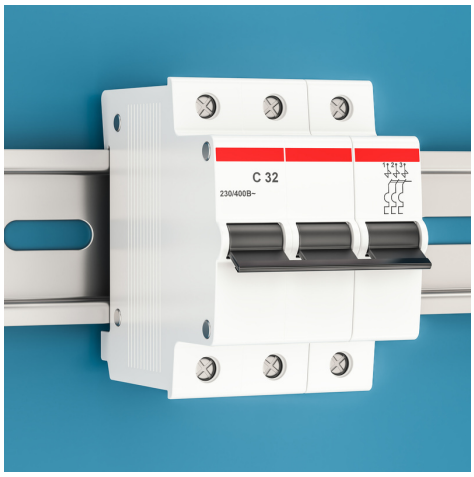
TECH-KNOWLEDGE

The Official PMG Engineering Newsletter

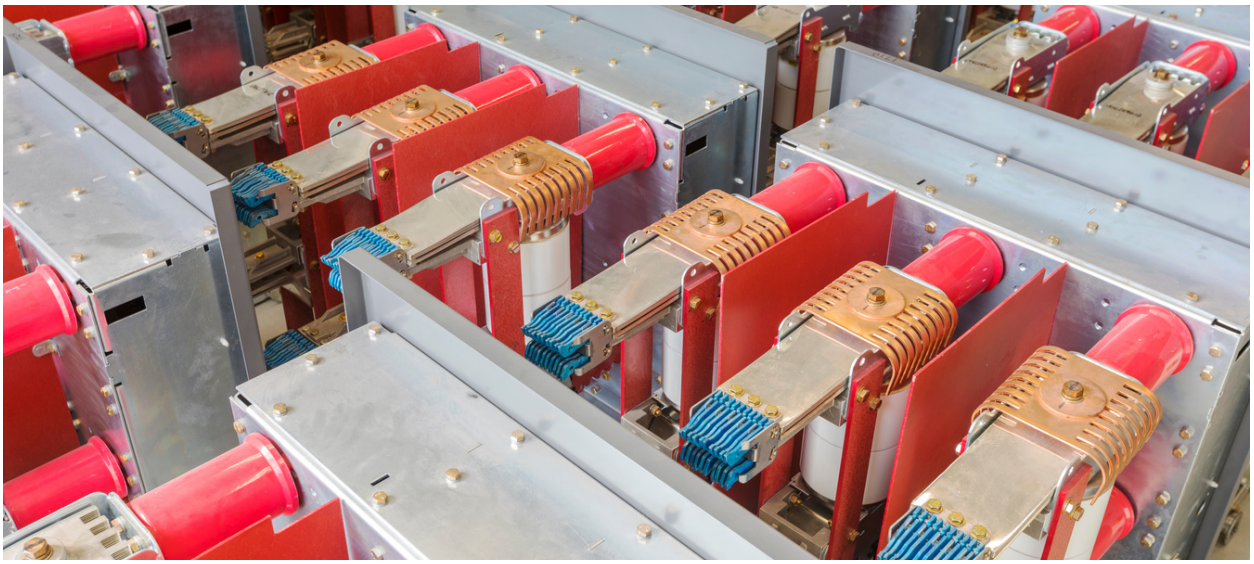


FOOD & BEVERAGE INDUSTRY | ENGINEERING & DESIGN | SCIENCE & TECHNOLOGY

CONTENTS



VACUUM CIRCUIT BREAKER



Introduction

The vacuum interrupter technology was first introduced in the year of 1960 but still is a developing technology. A circuit breaker is a device that interrupts an electric circuit to prevent unwarranted current caused by short circuit, typically resulting from overload. It's basically functionality is to interrupt current flow after a fault is deducted. This is kind of circuit breaker where arc quenching takes place in a vacuum medium. The operation of switching on and closing of current carrying contacts and interrelated arc interruption takes place in vacuum chamber in a breaker is called vacuum interrupter. Vacuum offers high insulating strength.

Construction

The vacuum circuit breaker consists of fixed contact, moving contact and an arc shield mounted in a vacuum interrupter. The outer insulating body is made with glass and has high vacuum capacity. The movable part is connected to control mechanism by stainless steel bellows. Arc shield prevents deterioration of internal dielectric strength by preventing metallic vapours from falling on inside surface of outer insulating body. To reduce possibility of leak, permanent or tight sealing is done.

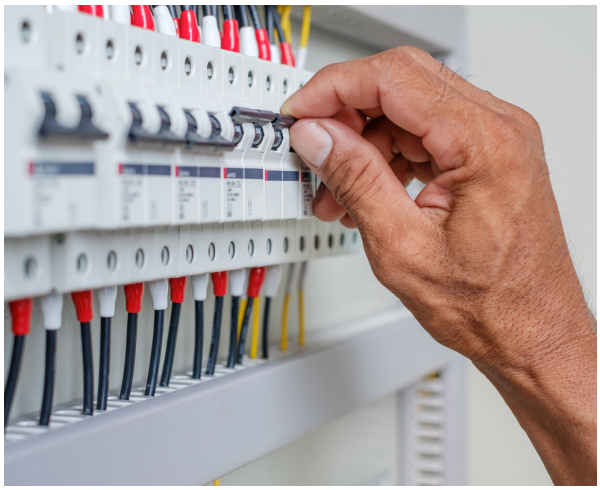
Working principle

When breaker operates, the moving contact separates from fixed contact and an arc is struck between the contacts. The production of arc is due to ionization of metals ions and depend very much upon materials of contact. The arc is quickly extinguished because metallic vapours, electrons, and ions produced during arc are diffused in a short time and seized by surface of moving and fixed member and shields. Since vacuum has very fast rate of recovery of dielectric strength because dielectric strength of vacuum is eight times greater than air and four times greater than sf6.
Contact materials must have following properties:

- High density.
- Contact resistance must be less.
- High arc resist capability.
- A boiling point must be high to diminish arc erosion.
- Thermal conductivity is high to dissipate quickly the large heat produced throughout arcing

Ratings and specification of vacuum circuit breaker

READ MORE....



The rating of circuits breakers is generally given in MVA. VCB comes a wide variety ranging from 250 to 1500MVA. According to European standard, the commonly available preferred values for rated current are 25A, 32A, 40A, 50A, 63A, 80A, 100A, 125A

Advantages

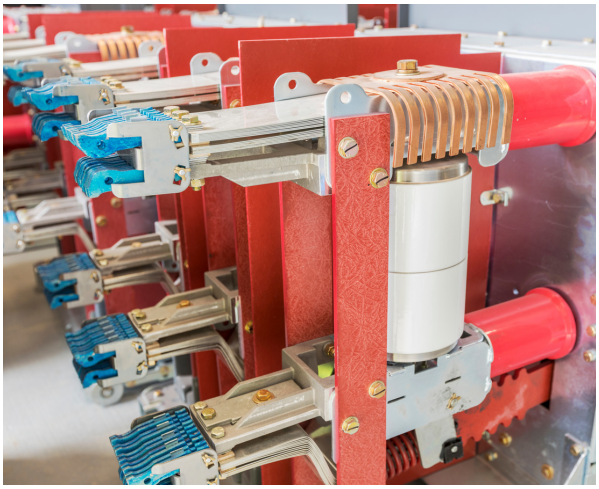
- It does not require any additional filling of oil or gas.
- The VCB is fast in operation so ideal for fault clearing and suitable for repeated operation comfortably
- Vacuum circuit breaker is almost maintenance free and minimum maintenance required as compared to other circuit breakers.
- No exhaust of gas to atmosphere and noiseless operation.
- No fire hazards
- The dielectric strength of vacuum is greater than air and sf6 circuit breaker. High dielectric strength makes possible to quench a vacuum arc within very small gap.

Disadvantages

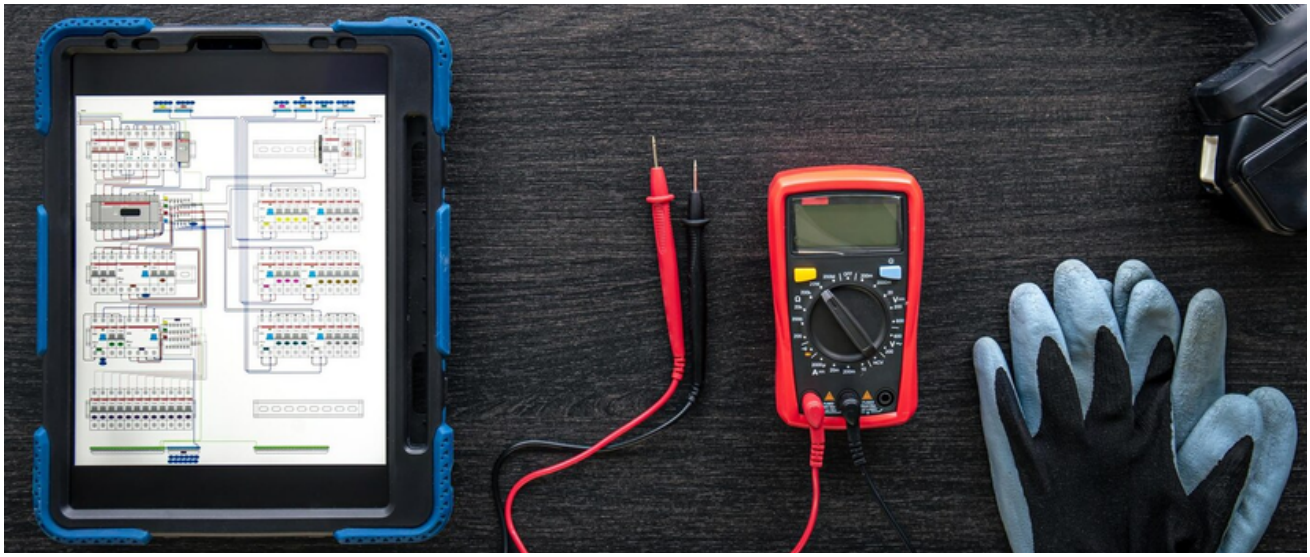
- The main disadvantages of this circuit breaker is that it become uneconomical at voltage exceeding 38kv because at more than 38kv, two number of vacuum circuit breaker are required to be connected in series.
- VCB production is uneconomical if produced in small quantities.

Conclusion

Now a days, vacuum circuit breakers applications to not only medium voltage power systems but also for in high voltage transmission systems. It is because it has so many advantages characteristics such as high interruption capability, long operation life, safety and high-cost performance. After Kyoto protocol in 1997, sf6 circuit breaker is one of major problem of global warming gases, since then vacuum circuit breaker uses become widespread.



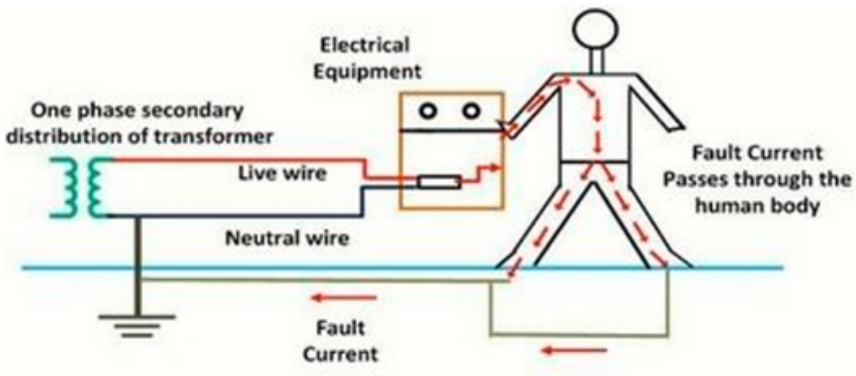
EARTHING



Introduction

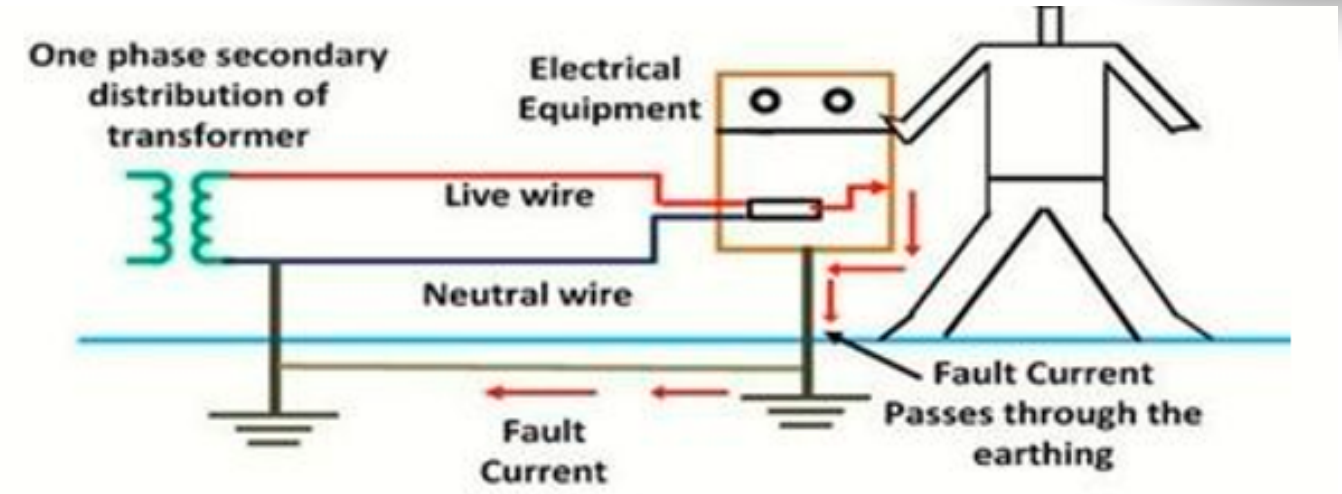
Earthing is arrangement by which an electrical installation is connected to means of earthing. This is usually for safety purposes although sometimes also for functional purposes, for example in case telegraph lines which use earth as conductor to save cost of retrurn wire over a long circuit. If there is fault in electrical installation, a person could get an electric shock by touching a live metal part because electericity uses the body as path to earth.

Earthing provides an alternate path for fault current to flow of earth. It can be seen in power system networks, industries, domestic homes, commercial buildings.
In this below diagram, we can easily see that euipment body leakage current leakage from equipment body, pass to a human body as there is no grounding of euipment or device. This increases the risk of electrical shock. Hence earthing play an immense important role in industries, commercial building, home etc.



Electrical system without earthing

READ MORE....



Electrical system with earthing

Method of earthing

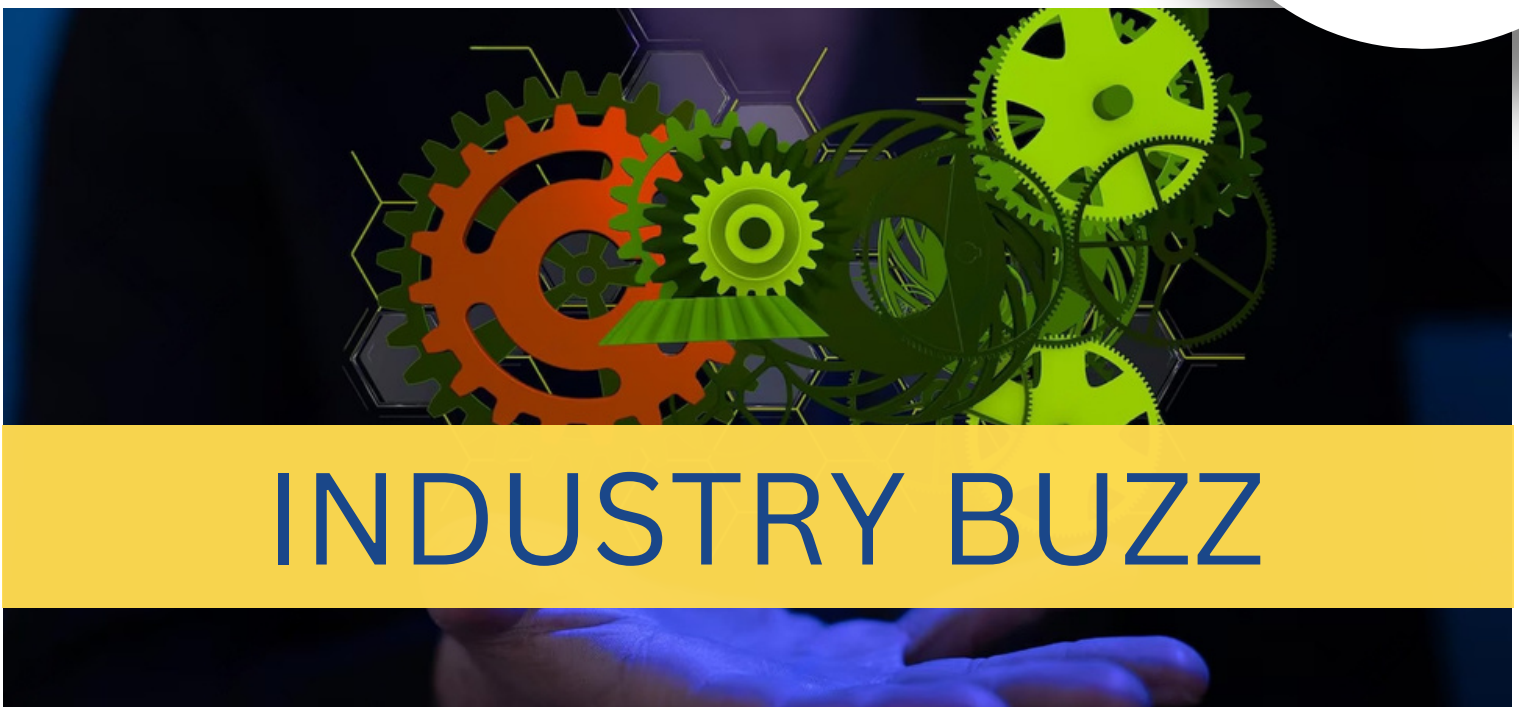
1.Earthing mat
It is done by number of joinining of rod through copper conductor and it reduces overall grounding resistance of system. Such type of earthing helps to limiting the potential. This type of earthing used in where there is a high fault current is to be experinced. While designing this system following points must consider.

2.Earthing electrode
In this earthing, we may use wire, rod, pipe and inserted verically or horizontally into ground and In distribution system there is rod of nearly 1m is used and inserted vertically into ground but in generating substations there is earthing mat is used rathan than this.

3.Pipe earthing
This type of earthing is mostly used and this is considered best method as comared to other type of earthing for same soil condition. In this earthing, the galvanized steel or perforated pipe of approved length and diameter depend upon types of soil and current carried by that rod is placed upright in wet soil as shown in figurenormally size of pipe is of 40mm diameter and 2.5m in length for ordinary soil but for dry soil length may increase. When there is summer then moisture of soil decrease which cause increase in ground resistance some arrangement of water is done for water accesible or 3 or 4 buckets of water is put into a pipe which is connected to soil pit. In soil pit, there is mixed of charcoal and salt around the pipe to reduce the effective resistance of soil.

4.Plate earthing
In this earthing, either copper plate of 60cm×60cm×3m or galvanized iron rod of 60 cm× 60 cm×6mm is buried in ground with it face vertically to ground and depth is not less than 3m from ground level. The ground wire connected to copper plate through nut or bolt. Copper wire is not used mostly because of high costing. The layer of soil and coke is placed in soil pit.

5.Earthing through water mains
In this type of grounding, the copper or GI wire is connected to water mains through water pipe and water pipe is directly connected to earth as shown in fig. when the fault condition occurs the whole leakage current passes through water steel pipe and earthed.



INDUSTRY BUZZ

The new KHS aseptic block with bottle sterilization offers increased hygiene, safety, and capacity.

KHS is introducing a new aseptic block for bottle sterilization that raises the bar for safety and cleanliness. However, beverage bottlers don't have to sacrifice performance in this case because the block's rotational filler provides three times the output of a linear filler.

Its linear aseptic fillers have a long history of success when filling delicate liquids into PET bottles with the utmost safety in mind. Thus, the Dortmund systems provider is now pleased to offer a rotating aseptic filler with sanitary qualities that raise the bar for larger capacity. Here, the maker of the equipment and systems is purposefully emphasizing bottle sterilization, which, in contrast to preform sterilization, may also be used in conjunction with the FreshSafe PET coating system, which offers extra product protection for delicate drinks.

Experience a new cuisine when The Patio, Ganga Lahari, Haridwar, presents it.

Haridwar, well-known for its spiritual significance and beautiful scenery, is welcoming a new culinary landmark: The Patio at Ganga Lahari Hotel, which has just released an intriguing new menu. Encircled by the vibrancy of Devbhoomi, The Patio's alfresco dining area overlooks the glorious Ganges, providing guests with an unmatched dining experience.

It is ideally situated close to the well-known "Har ki Pauri," where taking a plunge in the river is thought to relieve one's soul of material troubles. It offers travellers and spiritual searchers a charming and easily accessible haven.

This open-air cafe epitomises Haridwar's serene serenity. The Ganges may be seen flowing past the ghat below, and you can listen to the sounds of the market below and the chiming of temple bells to calm your senses.

Blume and Omnivore provide $10 million in seed funding for Optimo Loan.

Optimo Loan, an innovative MSME lending-tech company operating in rural India, has declared its successful completion of a $10 million seed investment round. Blume and Omnivore led the round, and Prashant Pitti, the company's founder, contributed.

Optimo seeks to close the $530 billion credit gap in MSME lending by giving MSMEs easier access to flexible, rapid, and hassle-free funding choices. With this investment, it hopes to use a phygital distribution model and state-of-the-art technology to transform MSME lending in rural India. The startup is developing a co-lending platform with a distinct underwriting process for MSMEs. It can obtain deeper insights into the financial health of MSMEs thanks to this innovative technique, which facilitates financing decisions and encourages entrepreneurship and economic growth in rural areas.

The FSSAI requests that States create an antimicrobial resistance surveillance plan.

The FSSAI presented its anti-microbial resistance action plan during the 43rd Central Advisory Committee (CAC) meeting in Coimbatore, Tamil Nadu

According to FSSAI, discussions were held to educate farmers on the prudent use of antibiotics in livestock, aquaculture, and poultry.

According to a statement from the FSSAI, plans were discussed for monitoring antimicrobial susceptibility in the food matrix, and States were advised to create plans and hold frequent meetings with State labs.
In addition, at the CAC meeting, FSSAI representatives talked about the significance of hygienic marketplaces and the creation of health clubs in schools.

Tata Starbucks introduces popular refreshers around the world.

Tata Starbucks has announced the launch of its highly anticipated handcrafted Starbucks Refreshers Strawberry Açaí Lemonade and Mango Dragon Fruit Lemonade, which are globally beloved. This innovative range of vibrant, iced, fruity beverages will set the tone for an unparalleled summer experience for Indian customers. Arriving in India after making its global debut and capturing the attention of the Instagram community with its vivid hues, these drinks are modeled after the tantalizing bursts of flavor from passionfruit, strawberry, acai, and mango.

The novelty behind it is the use of green coffee extracts derived from unroasted arabica coffee beans and promise a blast of freshness with fruits. This gives a distinctive twist to the regular coffee ritual.
Thanks to the category launch, the brand can now penetrate deeper into younger, newer consumer groups and demand areas, which is helping it maintain its current growth trajectory.

WEEKS HIGHLIGHT

15 MARCH

WORLD SLEEP DAY

World sleep day is celebrated on 15 March to spread awareness about the importance of regular sleep for achieving an ideal quality of life and improve health globally.

8 MARCH

INTERNATIONAL DAY OF HAPPINESS

The International Day of Happiness is celebrated throughout the world on 20 March to make people around the world realize the importance of happiness within their lives.

DID YOU KNOW?

Fact 1

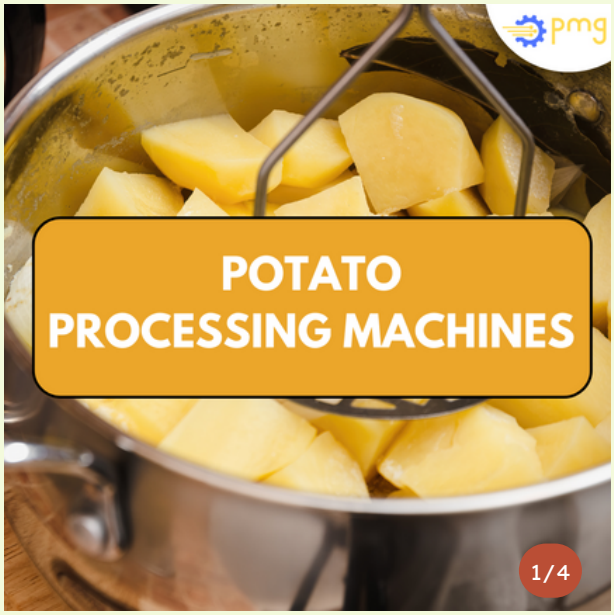
Nuts are nature's tiny powerhouses, packed with essential nutrients like healthy fats, protein, vitamins, and minerals. From almonds to walnuts, they offer a flavorful crunch and versatile culinary use. Whether enjoyed as a convenient snack or incorporated into meals, nuts contribute to heart health, weight management, and overall well-being. Embrace the wholesome goodness of nuts for a delicious and nutritious dietary boost.

Fact 2

Indulge in the exquisite delight of pralines—a harmonious blend of creamy sweetness and crunchy nuts, crafted to perfection. With every bite, experience the rich heritage and culinary artistry that defines this timeless treat. Elevate your senses with the luxurious flavor and irresistible texture of pralines, a true embodiment of gourmet indulgence.

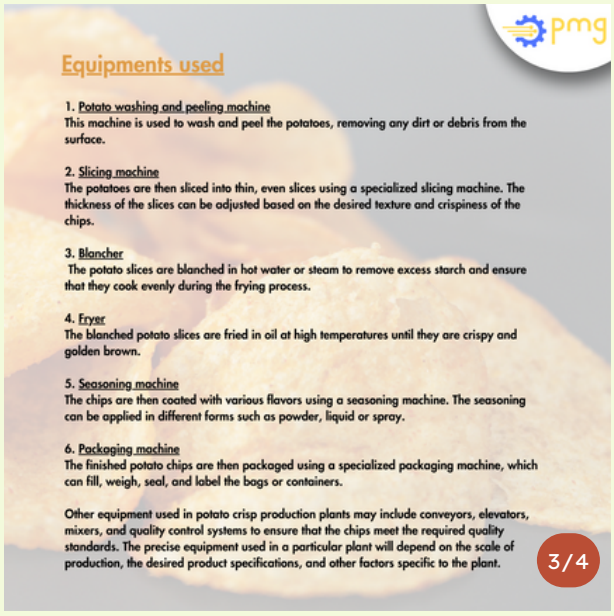
Fact 3

Machines known as grinding, sifting, and sieving plants play a crucial role in the milling process of grains and various food items. They find application predominantly in commercial or industrial environments where there's a requirement to mill and process substantial volumes of grains efficiently.



Fact 4

Revolutionizing potato processing, our advanced machines streamline production, enhancing efficiency and quality. From peeling to slicing, our state-of-the-art technology ensures precision at every stage, maximizing yield while minimizing waste. Designed for versatility and reliability, our machines cater to diverse processing needs, empowering businesses to meet demands with ease.



Fact 5

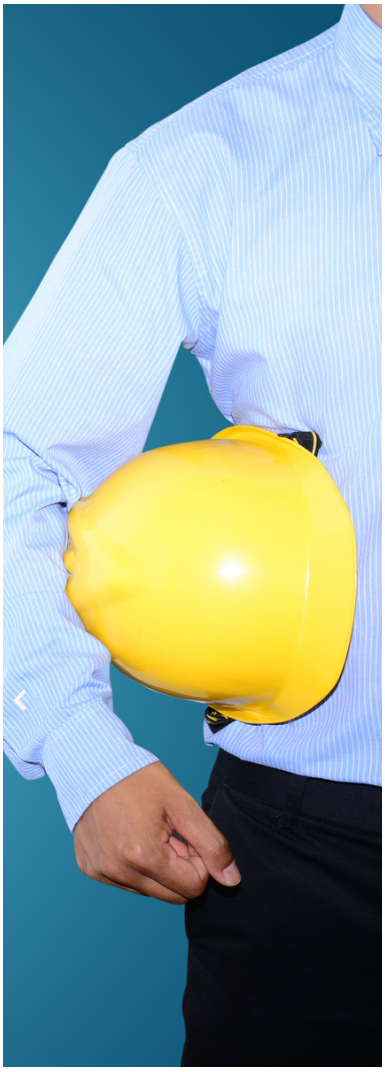
Potato crisp production plants utilize cutting-edge technology to transform fresh potatoes into crispy snacks. From washing and peeling to slicing and frying, each step is meticulously controlled to ensure quality and consistency. These facilities prioritize food safety and hygiene standards, employing stringent measures to deliver delicious and satisfying potato crisps to consumers worldwide, meeting the demands of a growing snack industry.

Vol .03-Issue .11-March 2024

PMG ENGINEERING

About PMG

Delivering End-to-End Engineering Design & Construction Management in Food & Beverage Industry



Meeting Global Benchmarks

In ENGINEERING DESIGN and PROJECT MANAGEMENT
for FOOD and BEVERAGE Industry with SINGLE POINT ACCOUNTABILITY

Process Engineering I Project Management I Mechanical I Electrical I Automation I Food Safety

PEOPLE DELIVERING RESULTS

Safe-by-choice. First Time Quality. Maximize Value. Objectivity. Ownership. Reliable and Trustworthy Business.

- MAKING CUSTOMERS THE INDUSTRY LEADERS
- ENGINEERING MUST CREATE BUSINESS VALUE
- MEET THE EXPECTATIONS OF ALL STAKEHOLDERS
- OPTIMAL ENGINEERING

Website Link

Click Here

Follow Us on