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A Joint Program was arranged by SIEMA, CHAMBER, CODISSIA & IIF on 6th March 2026
Several delegates from DELOITTE India presented the program.

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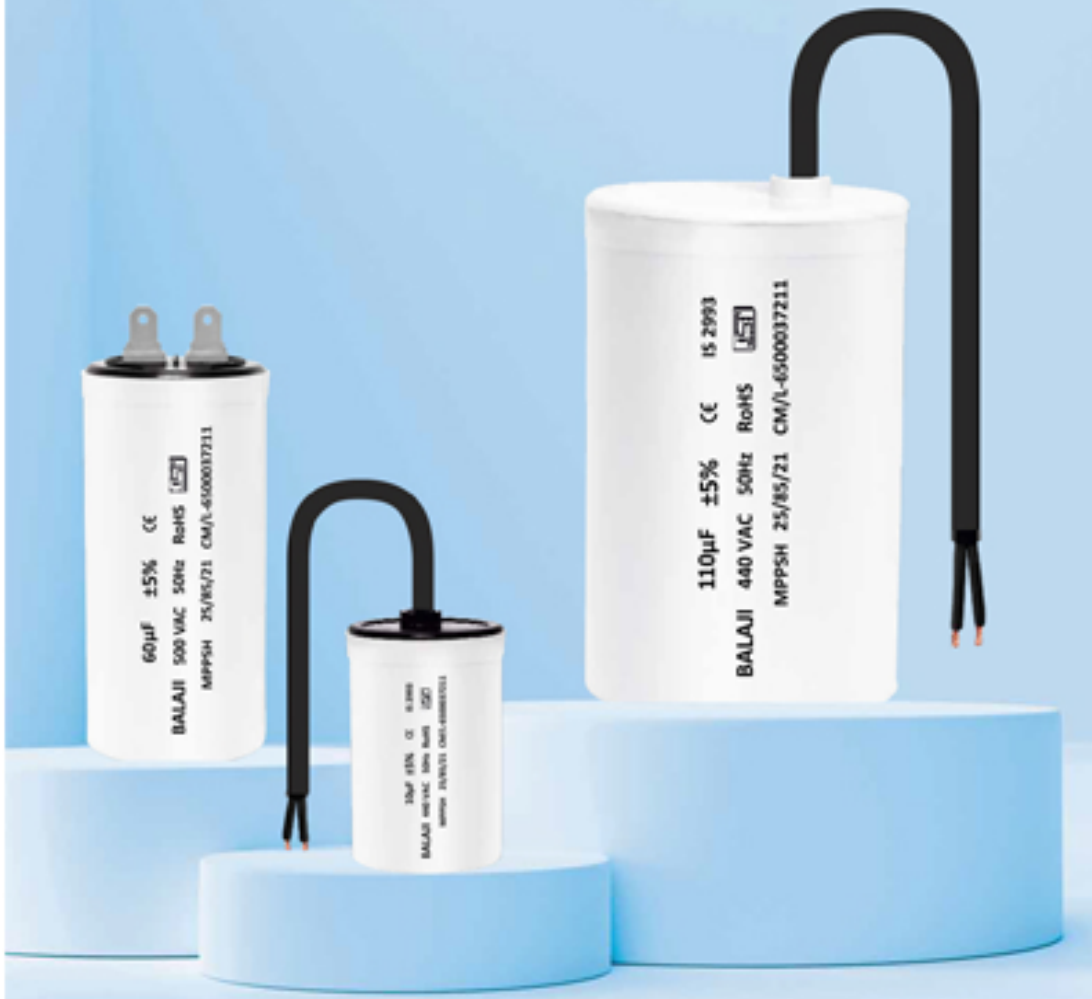
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From the President's Desk

Dear Members,

Greetings from your Managing Committee.

I am pleased to share some of the important activities and initiatives undertaken by SIEMA during the recent period, reflecting our continued commitment towards industry development, infrastructure advocacy, technical advancement, and social responsibility.

Our Technical Committee has been actively engaging with key industry and regulatory matters. During the Technical Committee Meeting of SIEMA, detailed discussions were held on the BEE Grouping Guidelines and the BEE New Label. I appreciate the participation and valuable contributions of Mr. Anil Ankol, Mr. K. V. Karthik, and other Technical Committee members.

SIEMA representatives also participated in the BEE Technical Committee Meeting held in Delhi on 10th February 2026, where important deliberations concerning energy efficiency standards and related industry developments were undertaken.

A Joint IPMA–SIEMA Online Meeting was conducted on 12th February 2026 to discuss IS 7538 efficiency levels. The meeting witnessed active participation from our TC Chairman Dr. C. Murugesan and other Technical Committee members. Further, a Joint IPMA–SIEMA Meeting was held on 18th February 2026 at 10:00 AM to deliberate on the BEE Star Rating for Regenerative Pumps under IS 8472, with participation from Technical Committee members of both associations.

SIEMA also organized a highly informative Seminar on "Growth Capital Strategy through SME IPO", featuring expert sessions by Sri. R. Senthil Murugan from NSE Emerge and Sri. Gagandeep Singh, Business Head – Smart Horizon Capital Advisors Pvt. Ltd., who addressed topics on IPO readiness, valuation, and market overview. The programme provided valuable insights for entrepreneurs and MSMEs aspiring for growth and capital expansion.

On the infrastructure front, SIEMA has continued its efforts through constructive representations to the Government and Railway authorities. On 6th February 2026, a representation seeking provision of a Trumpet Interchange at Neelambur and a wide underpass at Irugur for Coimbatore Bypass and Airport Connectivity was submitted to Shri Nitin Gadkari, Hon'ble Union Minister, and also to the General Manager, Southern Railways, during his visit to Coimbatore.

Further, on 13th February 2026, a representation was submitted to Shri R. N. Singh, General Manager, Southern Railways, requesting the upgradation of Coimbatore North Railway Station as a Terminal Station, along with extension, increase in frequency, restoration, and commencement of train services for Coimbatore.

I also had the opportunity to participate as a panelist in the Industry Leaders Council Meeting at the Global Expo and Knowledge Summit organized by BNI on 31st January 2026, where important discussions on industry growth and economic opportunities were held.

In the area of social responsibility and environmental sustainability, SIEMA joined hands with Siruthuli and the Tamil Nadu Police in their Afforestation Project programme conducted on 25th January 2026. Office Bearers including me and Managing Committee Members actively participated in the tree plantation initiative, reaffirming our commitment towards environmental conservation.

I thank all our members, office bearers, committee members, and stakeholders for their continuous support and active participation in SIEMA's initiatives. Together, let us continue to work towards the growth of our industry and the betterment of society.

With warm regards,

Mithun Ramdas
President, SIEMA

Mission & Vision

To enable our members to compete globally with their products and services

- *To extend support to our member industries to prosper*
- *To offer up-to-date technical support to members*
- *To train and enable members to meet the global challenges in technology and competitiveness*
- *To develop techno-commercial co-operation with international enterprises*
- *To promote programmes for enhancing the quality of life of all stake-holders*
- *To represent members on common issues with the policy makers.*

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The opinions and views expressed in this magazine are those of the respective authors.

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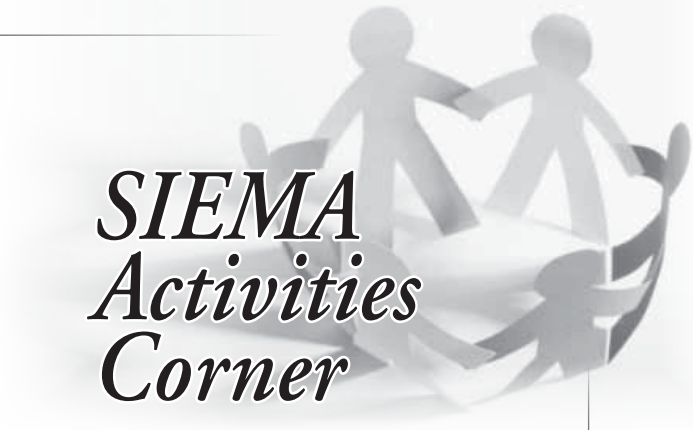
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SUB COMMITTEE REPORTS



Dr. C. Murugesan

Technical Committee Meeting – 2

Date & Time: **02-04-2026, 3:45 p.m.**

A Technical Committee meeting was conducted to review and provide SIEMA's comments on the Draft Amendment No.1 of IS 996: 2025. Members discussed technical challenges and implementation concerns.

The committee submitted comments recommending removal of clauses related to declaration of winding resistance and noise level, as these values are not currently declared. Detailed comments were shared with the ETD 15 department for further consideration.

Participation:

All Technical Committee members and the TC Chairman participated in the meeting.

Member Knowledge Enhancement Committee Report

Sri. R. Karthikeyan

A joint program was arranged by SIEMA, CHAMBER, CODISSIA & IIF

Several delegates from DELOITTE India presented the program.

Topics dealt were as follows:

- Labour Code
- Emerging Cyber Trends
- Tax Technology &
- MSME Focussed Services

The program was well attended by around 160 members

Sri. Ma. Sendilkumar

(I) Subjects relating to Central & State Governments

Representation submitted to Shri Jitan Ram Manjhi, The Hon'ble Union Minister for MSME: On 26th Feb 2026

Representation was submitted to Shri Jitan Ram Manjhi, The Honourable Union Minister for MSME during the meeting held on 26th Feb 2026 at CODISSIA. Our Vice President Shri R. Arun presented the Representation to the Honourable Minister on behalf of SIEMA. We have mentioned on behalf of the Industry, the financial & Structural pressures with the following points:

- Payment Period for MSMEs
- Reduction of GST on Pumps to 5%
- Establishment of an MSME Export Development Cluster in Coimbatore
- Additional Working Capital Support with Interest Subvention
- Constitution of a Raw Material Price Monitoring Committee
- Technology Upgradation Support for industry4.0 and Artifical Intelligence
- Raw Material Price Stabilisation Mechanism.

Sri. R. Arun

(II) Representation to various Bodies

All Associations' discussion meet on Current Geopolitical situation, scarcity of Industrial Gas & other petroleum products and Increase in Prices of Essential goods & shortage of Raw materials: On 12th March, 2026

President Sri. Mithun Ramdas attended the meeting as a panellist, held on 12th March, 2026, highlighted the severe challenges faced by the motor and pump industry due to shortage and steep price increase in raw materials, particularly copper, steel, polymers and petroleum-based inputs given below:

- Copper prices have increased sharply in recent months.
- Several upstream metal manufacturers have curtailed or temporarily halted production.
- Polymer and petrochemical inputs used in pump manufacturing are becoming scarce.

Suggestions made:

- Reduction in electricity tariffs and power-related charges.
- Waiver of network charges to facilitate industries in accessing alternate electricity sources and mitigating the impact of the current crisis.
- Recognition of the pump industry as a priority sector, considering its critical role in agriculture.
- Temporary waiver of safeguard duty on steel imports.
- Relaxation in Section 43B(H) provisions relating to MSME payment timelines.
- Enhancement of working capital limits from 25% to 40–50% of turnover.
- Introduction of an emergency credit scheme similar to ECLGS implemented during the COVID period.
- Commercial gas supply for industrial canteens may be prioritised, as uninterrupted food services are critical for sustaining the workforce and ensuring continuity of industrial activities.

MoU Signed with KPR College of Arts Science and Research

An MoU was signed on 18th March 2026, with KPR College of Arts, Science and Research, in mutual co-operations for Placement Opportunities, Industrial Training, Internship and visits, Conducting Skill development Programs, Guest Lectures etc.

What the Media says?



மூலப்பொருட்கள் விலை உயர்வால்

மோட்டார் பம்பு விலை மேலும் 10 சதவீதம் அதிகரிப்பு

சீமா தலைவர் தகவல்

கோவை,மார்ச்.24- தென்னிந்திய என்ஜினியரிங் உற்பத்தியாளர்கள் சங்க(சீமா) தலைவர் மிதுன் ராம்தாஸ் வெளியிட்டுள்ள செய்திக்குறிப்பில் கூறி இருப்பதாவது:-

நாட்டின் ஸ்திரத்தன்மையையும், இயல்பு நிலையையும் பேணுவதற்காக பிரதமர் மோடி எடுத்த நடவடிக்கைகளை தென்னிந்திய என்ஜினியரிங் உற்பத்தியாளர்கள் சங்கம் வரவேற்கிறது. குறு,சிறு மற்றும் நடுத்தர நிறுவனங்கள் கடன் செலுத்தும் விதிமுறைகளில் தற்காலிக தளர்வு,

மிதுன் ராம்தாஸ்

25th March 2026



பம்ப் விலையை மேலும் 10 சதவீதம் உயர்த்த முடிவு

சீமா அறிவிப்பு

கோவை, மார்ச் 24: மூலப் பொருட்கள் விலை உயர்வால் பம்ப் விலையை மேலும் 10 சதவீதம் வரை உயர்த்துவதாக தென்னிந்திய பொறியியல் உற்பத்

கடும் பாதிப்புகளுக்கு உள்ளாகி வருகின்றன. பம்ப் உற்பத்தி செய்ய முக்கிய மூலப்பொருளான செம்பின் விலை 50 சதவீதத்திற்கு மேல் அதிகரித்து, ஒரு டெலோ ரூ.1,200 ஆக உயர்ந்துள்ளது.

இதேபோல அலுமினி

தெருக்குடியை ஏற்படுத்தியுள்ளது. இதன் காரணமாக கடந்த அக்டோபர் மாதம் பம்ப் விலையை 10 சதவீதம் வரை உயர்த்தப்பட்டது. தற்போதைய தெருக்குடியை சமாளிக்கும் வகையில் பம்பின் விலையை இந்த மாதம்

25th March 2026



Pumpset manufacturers to hike prices as MSMEs are hit by high raw material costs

According to Mithun Ramdas, president of the Southern India Engineering Manufacturers' Association, the last six months have seen 'unprecedented' spiralling of raw material prices

The Hindu Bureau
COIMBATORE

Pumpset manufacturers in Coimbatore will hike the prices of pumpsets, including those used in agriculture, by 7.5 % to 10 % next month, apart from a 10 % jump this month.

According to Mithun

relaxation in MSME repayment norms, enhancement of working capital borrowing limits, and waiver of safeguard duties on critical minerals.

If the costs are not controlled, the MSMEs will face an "existential crisis". In an effort to manage the situation, the pumpset manufacturers have decided

lenges faced by industries.

The associations have raised issues such as supply disruptions, raw material prices, and so on with the government.

The Chamber president, Rajesh B. Lund, said in a press release that industries are facing acute shortages and irregular supply of commercial LPG

the safeguard duty on steel imports has contributed to the rise in domestic steel prices. The government should consider temporary removal of the duty to stabilise prices and support MSMEs dependent on steel.

The banks should be advised to enhance working

25th March 2026



Pump set prices to go up due to volatility in metal prices

An Increase of 7.5-10% Is Expected, Says SIEMA

Anushka Juliet
@timesofindia.com

Coimbatore: Price of pump sets is expected to increase by 7.5-10% from April due to the continuing volatility in metal prices and supply uncertainties.

Urging the Union govt to

STARING AT AN UNCERTAIN FUTURE: Industry leaders cautioned that continued absorption of raw material inflation could push many pump manufacturers, particularly MSMEs, into an existential crisis

reiterated that water pumps are primary agricultural machinery, essential for irrigation, groundwater management, and rural livelihoods.

In view of this, the industry has urged the government to reduce GST on water pumps from 18% to 5%, to support farmers, sustain manufacturing, and promote energy efficient technologies.

KV Karthik, president of Indian Pump Manufacturers Association (IPMA) said, "In addition to GST, we are also requesting the Union govt to provide temporary relaxation on safeguard duty on items, particularly like steel and certain types of pol

25th March 2026



An overview on Permanent Magnets for Motors and Other Applications

Compiled by:

Dr. Subramanian, R.

Professor and Dean, Department of EEE, SNS College of Technology, Coimbatore – 641 035

Introduction

Considering the current trends in the global energy transition and high-end manufacturing upgrades, the importance of ***permanent magnet materials*** is increasingly prominent. They are widely used in numerous fields such as electric vehicles, wind power generation, and industrial robots, and are key to achieving efficient energy conversion and high-performance equipment operation.

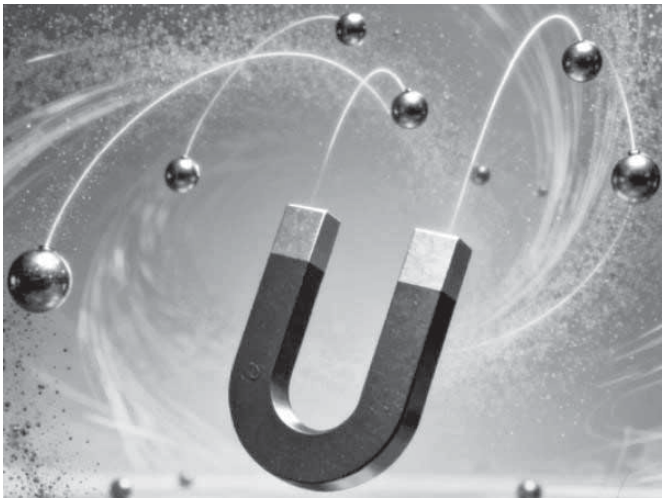


Fig.1 – General Shape of Permanent Magnet

In the world of permanent magnet materials, *rare-earth permanent magnets (such as neodymium iron boron (NdFeB)* dominate the high-end market due to their superior magnetic properties, while non-rare-earth permanent magnets (such as ferrites and AlNiCo) rely on cost advantages to gain a foothold in specific fields. Therefore, this article will provide an insight of comparison of rare-earth and non-rare-earth permanent magnets from the perspectives of magnetic properties, application scenarios, environmental adaptability, and cost supply chain.

History

Permanent magnets are arguably one of the earliest functional materials. Lodestones, comprised mainly of magnetite, were known in ancient times. The magnetic properties of carbon steel were first reported in the 1600s by Sir William Gilbert. With the discovery of electromagnetism in the early 19th century by André-Marie Ampère and the formalism of Maxwell's equations, the stage was set for the linking of mechanical work to electromagnetism so that by the end of the 1800s, simple electric motors and generators were in production. In fact, all-electric and hybrid automobiles were commercially available more than 100 years ago with the first hybrid built in 1900 by Ferdinand Porsche. The drawback to electric cars was their short range due to low battery capacity and low efficiency of the electric motors. There have been significant advances in both these areas with the most efficient motors for vehicle applications being permanent magnet motors made possible by high-performance permanent magnets.

A permanent magnet must have a large magnetic induction *(B)* and the ability to maintain B in a fixed direction relative to the body of the magnet in the presence on an

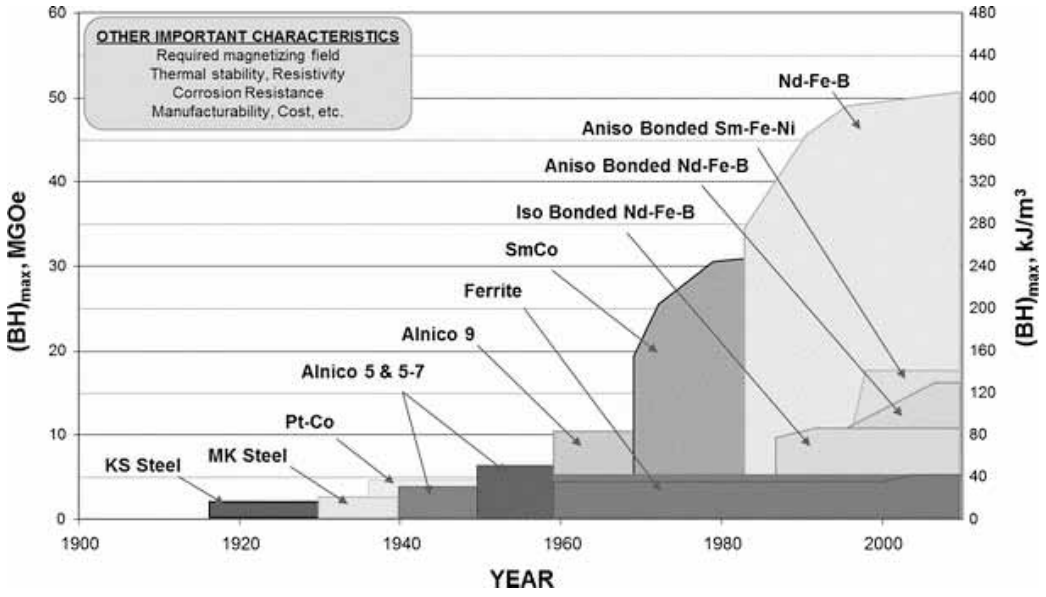


Fig.2 – Historical trend of the improvement in the maximum energy product for commercially produced permanent magnets

opposing magnetic field *(H)*. *B* as a function of *H* is given by $B(H) = M(H) + H$, where $M(H)$ is the magnetization of the material as a function of *H*. The energy product of a magnet is the product of $B(H)$ and *H*. The largest negative value of this product when $B(H)$ and *H* are opposed is $(BH)_{max}$, which is used as a figure of merit. It is a measure of the maximum amount of work that can be performed by a permanent magnet in units of megagauss oersteds (MGOe, or kJ/m^3 in SI units). The ability of a magnet to maintain its magnetization in the presence of an opposing magnetic field is referred to as its intrinsic coercivity. It is characterized by the value of *H* required to reduce $M(H)$ to zero, H_{cJ} is referred to as the intrinsic coercivity.

Through the first half of the 1900s, most permanent magnets were Fe-based alloys. The first significant improvement in the maximum energy product was achieved in columnar grown alnico *(Fig.2)*. The improvement came about from the grain alignment of the cubic phases and the application of a magnetic field during cooling through the spinodal decomposition into the nominally FeCo body-centered cubic (bcc) and the primitive cubic β-AlNi phases. This produces what is essentially an aligned array of nanoscaled compass needles in a nonmagnetic matrix. These Fe-based alloys have sufficient intrinsic magnetization from the Fe and Co atoms, which results in measurable residual induction (B_r), whereas the shape of the needles makes it favorable for the magnetization to point along the axis of the needle, resulting in shape anisotropy. Improving the resistance of an alloy to demagnetizing fields, i.e., H_{cJ}, was paramount to improving energy product in Fe-based alloys. While PtCo and ferrites were significant discoveries in the mid-20th century, alnico continued to be the industry standard for high-end permanent magnets.

Non-Rare Earth Magnets

These kind of permanent magnets are created from abundant materials, such as iron, nickel, cobalt, and manganese, offering a stable, cost-effective, and environmentally friendly alternative to high-performance rare-earth magnets (e.g., Neodymium). Common types include ferrite, Alnico, iron nitride, and Manganese Bismuth (MnBi) magnets.

Ferrite (Ceramic) Magnets: The most common non-rare earth magnet, offering low cost and high corrosion resistance, though with weaker magnetic strength.

Alnico Magnets: Composed of Aluminium, Nickel, and Cobalt, these are known for high temperature stability.

Iron Nitride ($Fe_{16}N_2$): An emerging, high-performance, non-rare earth alternative with high magneto crystalline anisotropy.

Manganese-Bismuth (MnBi): Developed for high-temperature performance, where their strength often improves rather than decreases with temperature.

Tetrataenite (FeNi): A metallic phase found in meteorites, now being researched for high-performance applications.

Advantages

Supply Chain Security: Materials are abundant and not limited to specific regions.

Cost Efficiency: Cheaper raw materials compared to Neodymium (NdFeB) magnets.

Environmental Impact: Lower environmental impact, avoiding the harsh chemical processing involved in mining and refining rare earths.

Performance Stability: Some, such as MnBi, have superior strength at high temperatures (e.g., up to 212°F).

Applications

EV Motors: Researching MnBi and Iron Nitride for electric vehicle traction motors.

Consumer Electronics: Used in electronics where high performance isn't necessary, but high stability is needed.

Industrial Motors: Used in applications that need high stability over high strength.

Rare Earth Magnets

Rare earth magnets are the strongest type of permanent magnets, crafted from alloys of rare earth elements (primarily neodymium or samarium) and transition metals. They are crucial for modern technology due to their immense magnetic strength, high coercivity (resistance to demagnetization), and stability, enabling miniaturization in electronics, electric vehicles, wind turbines, and industrial motors.

Key Types and Properties

Neodymium Magnets ($Nd_2Fe_{14}B$): The most common and powerful type, known for high magnetic energy product (strength) but limited by lower temperature resistance and susceptibility to corrosion.

Samarium-Cobalt Magnets ($SmCo_5$ or Sm_2Co_{17}): Less powerful than neodymium but highly resistant to high heat and oxidation, making them ideal for high-temperature applications like aerospace components.

Characteristics: These magnets are extremely strong, often 2–7 times stronger than traditional ferrite magnets, yet they are quite brittle and can shatter upon impact.

Temperature: NdFeB works well at standard temperatures, but specialized SmCo is superior for very high temperatures.

Common Applications

Technology & Electronics: Computer hard drives, speaker systems, mobile phone vibration units, and medical imaging (MRI) machines.

Green Energy & Automotive: Electric vehicle (EV) traction motors, wind turbine generators, and power steering components.

Industrial: High-speed motors, sensors, and magnetic couplings.

Production and Geopolitics

Processing: Production involves breaking down ore, separating elements, and combining them, followed by processes like sintering. High-temperature grades often use elements like dysprosium.

Global Market: Production is concentrated, with China holding a dominant position in both raw material mining and manufacturing of these magnets.

Hazards: Due to their strength, these magnets can cause injuries, such as pinching fingers, and are hazardous if swallowed.

Handling

Rare earth magnets (especially neodymium) must be coated (often with Nickel-Copper-Nickel) to prevent rust and corrosion. They are also sensitive to heat and will lose their magnetic properties permanently if heated above their Curie temperature.

Rare earth magnets (neodymium, samarium-cobalt) are 2–15 times stronger,

Table 1 – ***Comparison between Non Rare Earth and Rare Earth Magnets***

Description	Non-Rare Earth Magnets	Rare Earth Magnets
Key Types	Ferrite / Ceramic, Alnico	Neodymium (NdFeB), Samarium Cobalt (SmCo)
Strength	Moderate, sufficient for everyday applications.	Extremely strong (up to 10x stronger than ceramic).
Composition	Primarily made from iron oxide, nickel, or cobalt (often called Ceramic).	Composed of rare-earth elements like Neodymium, Dysprosium, or Samarium.
Key Properties	Low cost, high durability, and high corrosion resistance.	High resistance to demagnetization (high coercive force).
Temperature	Good, but weaker in performance.	SmCo is excellent at high temperatures, but Neodymium is vulnerable at high heat, though better than standard ferrites.
Applications	Household items, magnets, refrigerator magnets, DC motors, and low-cost sensors.	High-performance devices: Computer hard drives, electric vehicle motors, wind generators, headphones, and sensors.
Cost	Lower, ideal for large-scale production.	Higher cost due to limited, specialized mining.
Size	Typically larger to achieve similar, though lesser, strength.	Small but powerful.
Power	Lower relatively.	Stronger about 2-7 times.
Environment	Resist to rust and harsh environments even without protective coating.	Resistance to rust and harsh environments be achieved by providing adequate protective coating.
Demagnetization	Lower relatively.	Much more resistant to demagnetization.

more compact, and more expensive than non-rare earth (ferrite/ceramic) magnets. They offer higher magnetic field strength (1.4+ Tesla) and superior resistance to demagnetization (high coercivity), making them ideal for high-performance motors and small devices, whereas ferrite magnets are best for low-cost, large-scale applications. Following table provides an easy understanding of difference.

An in depth insights is narrated further.

Magnetic Properties

Rare-earth permanent magnets possess extremely high remanence, coercivity,

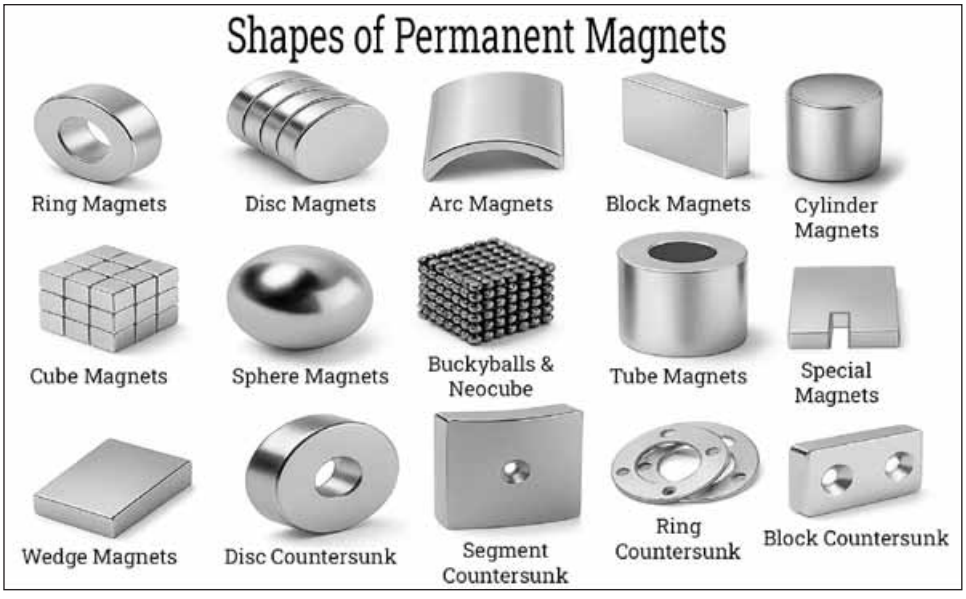


Fig.3 – Shapes of Permanent Magnet

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- Battery energy storage system
- PM Scheme

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and maximum energy product. Taking neodymium iron boron as an example, it is currently the most powerful permanent magnet material, capable of generating a strong magnetic field. This makes it widely used in fields with extremely high magnetic field strength requirements, such as high-performance motors, wind turbines, and magnetic resonance imaging (MRI) equipment.

In contrast, ***non-rare-earth permanent magnets,*** such as ferrite permanent magnets, have relatively weaker magnetic properties, lower remanence, and lower maximum energy product. However, their coercivity can still meet the requirements of certain applications in some situations, and they are often used in applications where the magnetic field strength requirement is not high, such as loudspeakers and small motors.

Temperature Stability

Rare-earth permanent magnets have poor temperature stability. At high temperatures, their magnetic properties will significantly decrease, and irreversible demagnetization may even occur. For example, although samarium cobalt permanent magnets have better temperature stability than neodymium iron boron magnets, certain protective measures are still required at high temperatures.

Non-rare-earth permanent magnets, especially ferrite permanent magnets, have good temperature stability and can maintain relatively stable magnetic properties over a wide temperature range. Therefore, they have advantages in some high-temperature applications, such as electronic devices around automotive engines. In addition, the ability of ferrites to resist thermal demagnetization makes them suitable for outdoor environments and equipment that operates continuously under fluctuating temperature conditions.

While a large maximum energy product does provide electric machine designers the greatest flexibility, there are considerations beyond $(BH)_{max}$. These include the T_c (Curie temperature) and the temperature dependence of the magnetic properties (Fig.4).

While the Nd-based magnets have superior maximum energy product at ~100°C or below, the Sm-based alloys do better above 200°C. Currently, Dy is added to Nd-based alloys to boost its performance in generators and traction motors. Many alternatives to Nd-based alloys will need to boost their maximum energy product by a factor or two to be comparable with current rare earth element-based magnets.

Mechanical Properties

Rare-earth permanent magnets are generally brittle, with high hardness but insufficient toughness. They are prone to cracking and damage during processing and use, which increases processing difficulty and cost.

Non-rare-earth permanent magnets generally have better mechanical properties, possess a certain degree of toughness, and are easier to process into various shapes and sizes, making them suitable for large-scale production and application. Moreover, this machinability gives non-rare-earth magnets greater design flexibility in consumer electronics, sensors, and industrial products, where shape and structure optimization are critical.

Corrosion Resistance

Rare-earth permanent magnets are easily corroded, especially ***neodymium iron boron (NdFeB) magnets,*** which oxidize and rust rapidly in humid environments. Therefore, surface treatments such as electroplating and spraying are required to improve their corrosion resistance.

Non-rare-earth permanent magnets have relatively better corrosion resistance. Ferrite permanent magnets themselves possess a certain degree of corrosion resistance and do not require complex protective measures. This characteristic allows them to maintain stable performance in humid, saline, or chemically reactive environments, which is essential for outdoor and marine applications.

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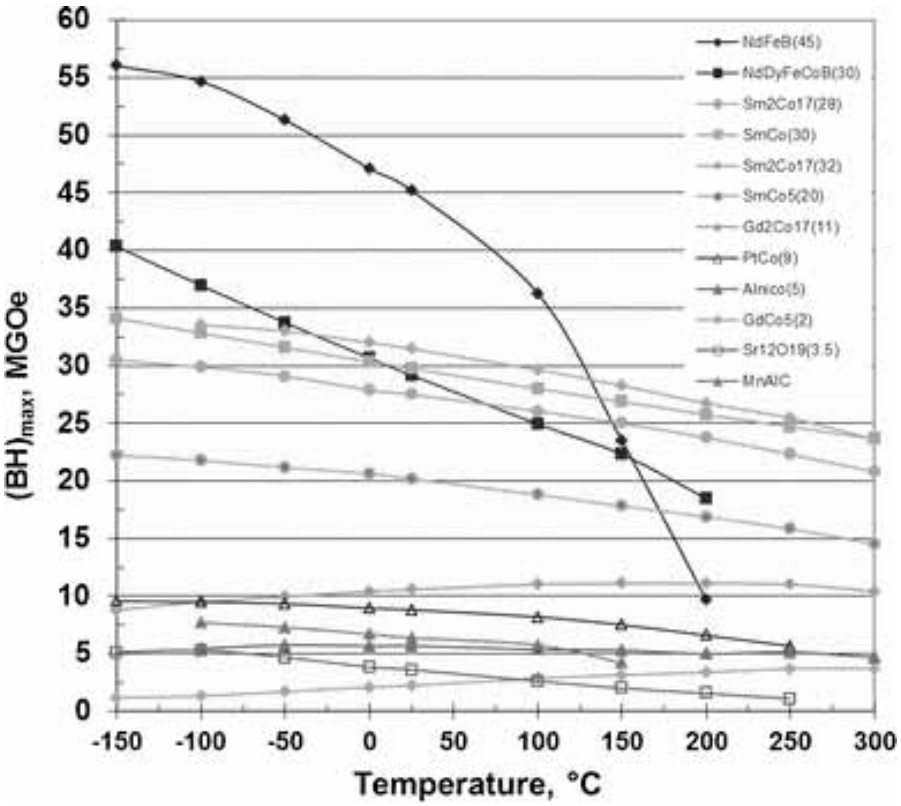


Fig.4 – The temperature performance of the maximum energy product as a function of temperature for many common commercial magnets and some promising alternatives

Cost and Resources

The production of ***rare-earth permanent magnets*** depends on rare earth elements. However, the uneven distribution of rare earth resources and the high costs of mining and refining result in relatively high prices for rare earth permanent magnets. In recent years, the prices of rare earth raw materials such as praseodymium and neodymium have fluctuated significantly, putting cost pressure on both manufacturers and end-user companies.

Non-rare-earth permanent magnets have widely available raw materials and relatively lower costs. For example, ferrite permanent magnets use iron oxide as a main raw material, resulting in more stable prices and making them suitable for large-scale, low-cost applications. In addition, as industries move toward sustainability, the recyclability and environmental friendliness of ferrite magnets have become increasingly attractive, especially for manufacturers aiming to reduce their dependence on critical raw materials.

Conclusion

To conclude, ***rare-earth permanent magnets*** and ***non-rare-earth permanent magnets*** exhibit significant differences in performance, application, and cost, each with its unique advantages and obvious disadvantages. In complex real-world applications, it is not possible to simply determine which permanent magnet is superior. Instead, it is necessary to comprehensively weigh specific usage requirements, harsh working environments, and sensitive cost factors to accurately select the most suitable permanent magnet material.

Looking ahead, as material science continues to evolve; hybrid magnet systems and new composite materials may emerge, combining the high magnetic strength of ***rare-earth magnets*** *with the thermal and corrosion stability of non-rare-earth types, paving the way for more balanced and sustainable magnet solutions in the future.*

QMS (Quality Management System): Definition, Types, Documentation, Processes, and Software

Author: Desiree Tarranco, Quality Assurance Professional

A Quality Management System (QMS) is a structured framework that documents processes, procedures, and responsibilities to ensure products or services meet regulatory and customer requirements.

A QMS is tailored to industry-specific needs and requirements, with various QMS types and standards ensuring compliance and continuous improvement through structured approaches.

QMS documentation establishes the framework for consistent quality and compliance by defining policies, procedures, and responsibilities. Building on this foundation, core QMS processes are essential for maintaining product consistency and meeting applicable requirements. Key QMS processes include document control, change control, training, nonconformance management, customer complaints, corrective and preventive actions (CAPA), audits, supplier management, and more.

To establish a QMS, an organization must define its quality objectives, develop documented processes and procedures aligned with applicable requirements, assign roles and responsibilities, and implement systems for monitoring, continuous improvement, and compliance.

QMS software is a digital solution that helps organizations manage and automate quality management processes to ensure consistent quality, streamline workflows, and meet regulatory and customer requirements.

What is a Quality Management System (QMS)?

QMS stands for Quality Management System. A Quality Management System (QMS) is a formalized system that documents processes, procedures, and responsibilities for ensuring that products or services consistently meet customer and regulatory requirements. Consistent products and services are achieved by maintaining records of activities that indicate that quality-related tasks are being systematically performed.

A QMS in the life science industry ensures products and processes meet regulatory requirements and quality standards. By controlling every aspect of product development and manufacturing, a QMS reduces risks that could impact product safety and quality which can in turn impact consumer safety.

QMS functions include process control, documentation management, risk assessment, and corrective and preventive actions (CAPA). Internal and external audits verify compliance, while training programs enhance staff competency. Continuous improvement strategies optimize system efficiency and reliability. Senior management reviews or management reviews align quality objectives with corporate and regulatory goals, ensuring product integrity and regulatory compliance.

Implementing QMS is important as it supports customer and regulatory compliance, minimizes risks, and streamlines operations. QMS ensures a company consistently delivers uniform and high-quality products or services.

Additionally, QMS enhances customer satisfaction by delivering reliable products or services and reduces costs by preventing errors and inefficiencies. A well-structured QMS drives continuous improvement, strengthens market reputation, and fosters long-term business growth by analyzing data such as complaints.

QMS can be implemented and structured in various formats – electronic, paper-based, and hybrid, each catering to different organizational needs and preferences.

An example of electronic quality management software is Simpler QMS. Simpler QMS offers comprehensive eQMS tailored to the unique needs of life science companies.

What Are the Different QMS Formats?

The different QMS formats are listed below.

- **Paper-Based QMS:** A traditional QMS format that relies on physical documents and records to implement QMS.
- **Spreadsheet-Based QMS:** A QMS format that uses spreadsheet applications like Microsoft Excel or Google Sheets to record, track, and manage quality data.
- **On-Premise Electronic QMS (eQMS):** A digitally managed QMS format installed on an organization's internal servers, offering customized data control and security.
- **Cloud-Based Electronic QMS (eQMS):** A Software-as-a-Service (SaaS) QMS format, hosted on external servers and accessed via the internet.
- **Hybrid QMS:** A mixed QMS format combining electronic and traditional paper-based processes, facilitating gradual digitalization while ensuring compliance.

Paper-Based QMS

Paper-based QMS is the conventional, manual system that relies on physical documents, binders, and records.

Paper-based QMS is easily implemented due to low initial cost and familiarity. Small companies benefit from paper-based QMS without technical expertise or software investment. Growing organizations, however, face inefficiencies, higher error risk, version control issues, and compliance challenges.

Spreadsheet-Based QMS

A spreadsheet-based QMS leverages Microsoft Excel, Google Sheets, or similar tools to track quality metrics, manage documents, and maintain records.

A spreadsheet-based QMS is a low-cost, customizable approach with more structure than paper-based systems. The downside of this format of QMS is that it remains prone to human errors, lacks automation, and complicates version control, making audits and regulatory compliance more challenging. As businesses grow, scaling becomes inefficient, limiting its long-term viability.

Spreadsheet-based systems can serve as part of a hybrid QMS alongside electronic or paper-based methods, enabling a gradual shift toward digitalization while maintaining compliance and flexibility.

On-Premise Electronic QMS (eQMS)

An on-remise electronic QMS is a software installed on a company's local servers. An on-premise eQMS enables the management of electronic document control, audit tracking, and other QMS processes.

For organizations with strict and regulatory requirements, on-premise eQMS is ideal because it provides high security, extensive customization, and full data control on their own servers. Despite its advantages, on-premise eQMS requires significant upfront investment and dedicated IT maintenance and has limited remote accessibility compared to cloud-based eQMS solutions.

Cloud-Based Electronic QMS (eQMS)

A cloud-based electronic QMS is a platform hosted in the cloud facilitating centralized quality management and real-time collaboration.

The advantages of cloud-based eQMS are that it offers scalability, remote accessibility, automated updates, and reduced IT maintenance. A cloud-based eQMS supports workflow automation, flexibility, and seamless integration with remote teams. It involves ongoing subscription costs and relies on stable internet connectivity.

Hybrid QMS

Hybrid QMS is a quality management system that combines electronic or digital solutions with traditional paper-based or on-premises methods, allowing organizations to gradually transition toward full digitalization while maintaining compliance with regulatory requirements.

Despite providing cloud-based accessibility and scalability potential, hybrid QMS introduces complexities. This includes system integration, potential data silos, and requires careful management for seamless integration.

Why is Quality Management System (QMS) Important?

QMS is important for standardizing QMS processes. QMS outlines formal procedures, such as SOPs and work instructions, that govern each stage of product development, manufacturing, and service provision. Organizations can ensure consistent outcomes and reduce variability by following these defined procedures.

QMS is required to maintain product quality. Regular checks, process controls, and inspections help verify that products conform to predefined specifications and quality standards. QMS extends to external sources by establishing criteria for material acceptance and evaluating suppliers, thereby helping to ensure raw material quality and services.

QMS is vital to mitigating risks. For instance, a robust CAPA system, as one of the core processes of QMS facilitates rapid issue identification, investigation of root causes, and resolution of recorded issues (e.g. deviations, nonconformities, complaints, and audit findings).

Furthermore, a QMS is important for ensuring compliance with applicable requirements and maintaining consistent product or service quality. A QMS helps organizations meet customer and regulatory requirements while improving efficiency, reducing waste, and minimizing costs.

What are the Benefits of Quality Management Systems?

Listed below are the 10 main benefits of quality management systems.

- **Improved Regulatory Compliance:** QMS ensures companies comply with industry regulations, ISO standards, and guidelines, reducing noncompliance risks and potential penalties.
- **Increased Customer Retention and Satisfaction:** QMS guarantees consistent product and service quality, fostering loyalty and increasing the likelihood of repeat business.
- **Encouraged Continuous Improvement:** QMS encourages a culture of continuous improvement, empowering companies to identify areas for improvement, implement changes, and optimize processes over time.
- **Standardized Operational Processes:** QMS establishes standardized processes, leading to consistent and reliable outcomes, reducing variability, and ensuring a uniform approach across operations.
- **Strengthened Internal Communications:** QMS enhances cross-functional collaboration, ensuring clear communication across teams, departments, and management.
- **Streamlined Employee Training:** QMS provides a structured framework for employee training, ensuring that staff members are adequately trained and qualified to perform their roles efficiently.
- **Increased Efficiency and Waste Reduction:** QMS identifies and eliminates inefficiencies, resulting in streamlined processes, reduced waste, and optimized resource utilization, which contribute to cost savings.
- **Improved Decision-Making:** QMS enables businesses to leverage quality data analytics, improving strategic decision-making.
- **Improved Company Culture:** QMS fosters a culture of quality, accountability, and continuous improvement, creating a positive work environment and aligning employees with organizational goals.
- **Increased Profits:** QMS contributes to revenue growth through improved efficiency, customer satisfaction, and reduced costs.

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Reference Standard	IEC 62391-1
Safety Class	S2

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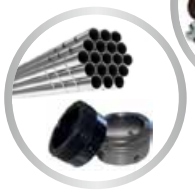
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What are the Different Types of Quality Management Systems?

The different types of Quality Management Systems include life science QMS, pharmaceutical QMS, medical device QMS, laboratory QMS, biotechnology QMS, clinical QMS, and others. These types of quality systems are tailored to the specific needs and requirements of the implementing company. The nature of a QMS depends significantly on the industry in which the company operates and the applicable customer and regulatory requirements.

For instance, pharmaceutical QMS systems must follow regulations and requirements, such as FDA 21 CFR Parts 210/211 or EU GMP. FDA 21 CFR Part 820, EU MDR, and ISO 13485 are for the medical devices industry. Laboratory QMS systems reference ISO 17025 and Good Laboratory Practices (GLP) for specific testing environments.

Life Science Quality Management Systems

A life science quality management system is a structured framework for documenting processes, procedures, and responsibilities in companies within the life science industries, including pharmaceuticals, biotechnology, and medical devices. The key objective of life science QMS is to ensure regulatory compliance with FDA, EMA, and GxP requirements and customer requirements.

Some of the different types of life science QMS are listed below.

- **Pharmaceutical Quality Management System:** A pharmaceutical QMS manages organizational processes, documentation, and responsibilities to maintain quality, safety, and compliance in pharmaceutical manufacturing. A pharmaceutical QMS aims to ensure product quality and safety throughout the pharmaceutical manufacturing process. Applicable requirements for pharmaceutical QMS include Good Manufacturing Practices (GMP), FDA 21 CFR Parts 210/211, ICH Q10, and ISO 9001.
- **Medical Device Quality Management System:** A medical device QMS is a regulatory-driven quality system that documents policies, procedures, and processes to ensure medical devices are safe, effective, and compliant throughout their lifecycle. The medical device QMS goal is to ensure the safety and effectiveness of medical devices throughout their lifecycle, from design and development to manufacturing, distribution, and end-use. Applicable requirements include FDA 21 CFR Part 820, EU MDR, EU IVDR, and ISO 13485.
- **Laboratory Quality Management System:** A Laboratory QMS is a structured framework that standardizes processes, documentation, and responsibilities to maintain accurate and reliable laboratory testing and research. A laboratory QMS aims to help ensure accurate and reliable test results, maintain data integrity, and achieve compliance with customer and regulatory requirements. Applicable requirements for a Laboratory QMS include GLP, ISO/IEC 17025, and ISO 15189, among others.
- **Biotechnology Quality Management System:** A Biotechnology QMS ensures compliance with regulatory requirements and industry standards in biotechnology. This biotechnology QMS maintains product safety, efficacy, and quality across research, development, production, and distribution in the biotechnology industry. Relevant requirements often include FDA 21 CFR Parts 210/211, GMP, GLP, ISO 9001, and ISO 13485 depending on the nature of the biotechnology product.

- **Clinical Quality Management System:** A Clinical QMS is a formalized system designed to manage processes, procedures, and responsibilities within clinical research, clinical trials, and healthcare settings, ensuring clinical trials' quality, integrity, andsafety. Pharmaceutical and medical device QMS frameworks often integrate clinical QMS, as clinical trials are essential for drug and device development and approval. Clinical QMS ensures patient safety, data integrity, and compliance with customer and regulatory requirements throughout clinical trials and healthcare delivery. Applicable requirements such as FDA 21 CFR Parts 50/56, ICH GCP (E6), EU Clinical Trial Regulation, and any relevant local requirements.
- **Healthcare Quality Management System:** A Healthcare QMS is designed to optimize patient care, hospital management, and regulatory compliance within healthcare facilities and medical institutions. This healthcare QMS enhances patient safety, clinical outcomes, and operational efficiency while ensuring adherence to healthcare standards such as the Health Insurance Portability and Accountability Act (HIPAA) and Joint Commission International (JCI).

Other industry-specific quality management systems are designed to ensure product quality, regulatory compliance, and operational efficiency within their respective sectors. Examples include QMSs used in general manufacturing, food and beverage, automotive, and aerospace and defense – each aligned with relevant requirements such as ISO 9001, ISO 22000, FSSC 22000, IATF 16949, and AS9100.

Common QMS Requirements

The common QMS requirements across different industries are listed below.

- **ISO 9001:2015:** The ISO 9001:2015 standard establishes the general requirements for quality management systems. ISO 9001:2015 applies across various industries and defines Quality Management System (QMS) requirements. For instance, some pharmaceutical companies and general manufacturing industries use ISO 9001 to structure their QMS.
- **ISO 13485:2016:** ISO 13485:2016 outlines QMS requirements for medical device manufacturing. A QMS compliant with ISO 13485:2016 provides a structured framework for designing, developing, producing, installing, and servicing medical devices, ensuring consistent delivery of safe and effective products.
- **FDA 21 CFR Part 820:** The FDA 21 CFR Part 820, also known as the Medical Device Quality System Regulation (QSR), is a regulation established by the US FDA. FDA 21 CFR Part 820 specifies the Current Good Manufacturing Practices (cGMP) requirements for medical devices. This regulation applies to medical device manufacturers seeking to distribute their products commercially in the United States.
- **ISO 15189:2022:** The ISO 15189:2022 standard defines the requirements for quality and competence in medical laboratories, including guidelines for a robust QMS. This ISO 15189:2022 standard ensures laboratory services' accuracy, reliability, and quality, ultimately enhancing patient safety and well-being.
- **ISO 17025:2017:** The ISO 17025:2017 standard outlines the general requirements for the competence, impartiality, and consistent operations of laboratories. This standard outlines the necessary management system and documentation requirements to ensure reliability. This standard applies to testing and calibration laboratories performing various analyses or measurements across multiple fields, including those within the life sciences industries.
- **ICH Q10:** The ICH Q10 guideline defines the requirements for the Pharmaceutical Quality System (PQS). ICH Q10 presents a comprehensive model for an effective quality management framework. It applies to pharmaceutical and biopharmaceutical companies involved in the development and manufacture of drug substances and drug products.

- **AS9100:** AS9100 is an aerospace, space, and defense industry-specific QMS standard that extends ISO 9001 with additional risk management, product reliability, and regulatory compliance requirements for high-risk sectors. Companies adopting AS9100-certified QMS gain a competitive edge by ensuring product reliability, supply chain integrity, and adherence to international safety standards.
- **IATF 16949:** IATF 16949 defines the criteria for an automotive-based QMS developed by the International Automotive Task Force (IATF). By implementing IATF 16949 QMS, manufacturers and suppliers achieve higher efficiency, defect reduction, and supply chain excellence, ensuring compliance with global automotive standards.
- **Hazard Analysis and Critical Control Points (HACCP):** HACCP is a preventive food safety management system (FSMS) designed to identify, assess, and control potential hazards in food production, processing, and distribution. HACCP ensures consumer safety, regulatory compliance, and food quality by systematically analyzing risks and implementing critical control measures.
- **ISO 22000:** ISO 22000 is an international standard for Food Safety Management Systems (FSMS) that establishes requirements for identifying, controlling, and preventing food safety hazards across the entire food supply chain. ISO 22000 integrates HACCP principles, risk management, traceability, and regulatory compliance, ensuring that organizations consistently produce safe food products.

What are the Different Approaches and Methodologies of QMS?

The different approaches and methodologies of QMS include continuous quality improvement (CQI), total quality management (TQM), lean manufacturing, Six Sigma, and agile QMS.

QMS approaches and methodologies refer to structured frameworks, principles, and techniques used to implement and improve QMS within an organization.These methodologies enhance efficiency, consistency, and customer satisfaction while minimizing risks and operational inefficiencies.

Some of the different approaches and methodologies of QMS are listed below.

- **Continuous Quality Improvement (CQI):** CQI focuses on identifying, analyzing, and refining processes to enhance efficiency, effectiveness, and customer satisfaction. CQI is recognized as a best practice across industries to meet evolving customer and regulatory demands, although not mandatory.
- **Total Quality Management (TQM):** TQM is a quality management approach to achieve continuous improvement in the quality of products, services, and processes. TQM fosters teamwork and a culture of excellence across the organization but is not required by regulations.
- **Lean Manufacturing:** Lean Manufacturing is a QMS methodology designed to minimize waste and maximize efficiency by eliminating non-value-added activities. Often adopted voluntarily in manufacturing, it aims to improve competitiveness and customer satisfaction.
- **Six Sigma:** Six Sigma is a statistical QMS methodology that aims to identify and eliminate defects, reduce process variations, and improve overall quality. Six Sigma follows a DMAIC cycle (Define, Measure, Analyze, Improve, Control) for continuous improvement. It is optional and can be implemented in any organization aiming to enhance quality and reduce errors.
- **Agile Quality Management:** Agile Quality Management is a QMS approach that emphasizes flexibility, collaboration, and adaptability in quality control processes. Many companies adopt Agile Quality Management to rapidly meet shifting requirements and better serve customer needs, while not a mandated approach.

What is QMS Documentation Structure?

Quality management system documentation is the Quality Manual that defines a company's quality

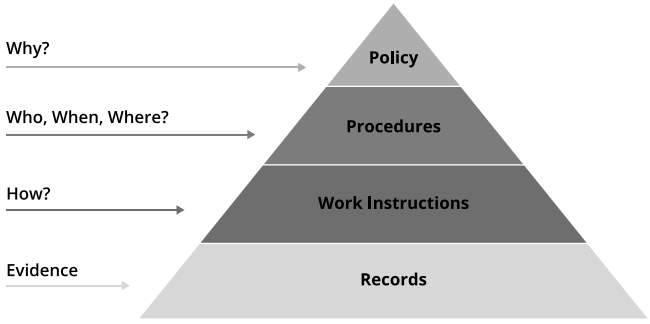
system. QMS documentation includes policies, procedures, work instructions, records, and other relevant documents.

QMS documentation structure is a hierarchical organization of documents. The document hierarchy facilitates comprehension, communication, and visualization of the documentation structure.

The four levels of documents in a QMS pyramid are described below.

- **Policies:** QMS policies, such as quality policies and company policies, are high-level statements that serve as the foundation for all supporting QMS documents. These policies set the overall direction for quality efforts and serve as a guiding principle for employees.
- **Procedures:** Procedures outline the step-by-step methods or processes for performing specific tasks or activities. Procedures serve to standardize operations, ensure consistency, and facilitate compliance with regulatory requirements.
- **Work Instructions:** Work instructions provide detailed guidelines for completing specific tasks or operations, often at a more granular level than procedures. Work instructions are used to ensure that tasks are performed correctly, safely, and efficiently.
- **Records:** Records document the results, activities, or events related to quality management processes, such as audits and training. Records serve as evidence of performance and compliance, enabling traceability and accountability.

The four levels of documents in a QMS pyramid are shown in the image below.



Quality Management System Document Pyramid

What are the Core Quality Management System Processes?

The core QMS processes are the fundamental activities that ensure consistent quality, compliance, and continuous improvement in an organization.

The core QMS processes are listed below.

- **Document Control:** Document control ensures that all QMS-related documents and records remain current, accurate, and accessible, supporting regulatory compliance, consistency, and traceability.
- **Change Management:** Change management provides a structured QMS process for evaluating and implementing changes within the organization.
- **Training Management:** Training management ensures that employees are equipped with the necessary knowledge and skills to perform their jobs effectively.
- **Deviation and Nonconformance Management:** Deviation and nonconformance management systematically identifies, documents, investigates, and resolves process deviations.
- **Complaint Management:** Complaint management formalizes a structured QMS process for receiving, evaluating, and resolving customer complaints.
- **Corrective Action and Preventive Action (CAPA) Management:** CAPA management is a QMS-driven process focused on identifying, resolving, and preventing recorded issues such as deviations, nonconformances, complaints, and audit findings.
- **Equipment Management:** Equipment management ensures proper registration, qualification, calibration, maintenance, and disposal of equipment used in manufacturing and quality control processes.
- **Supplier Management:** Supplier management maintains a structured QMS framework for evaluating, selecting, and monitoring suppliers to minimize risks and ensure high-quality product sourcing.

- **Risk Management:** Risk management systematically identifies, assesses, mitigates, and monitors risks that could impact product quality, safety, or regulatory compliance.
- **Audit and Inspection Management:** Audit and inspection management ensure systematic planning, execution, and review of audits and inspections to assess QMS compliance.

The fundamental core QMS processes are summarized in the image below.

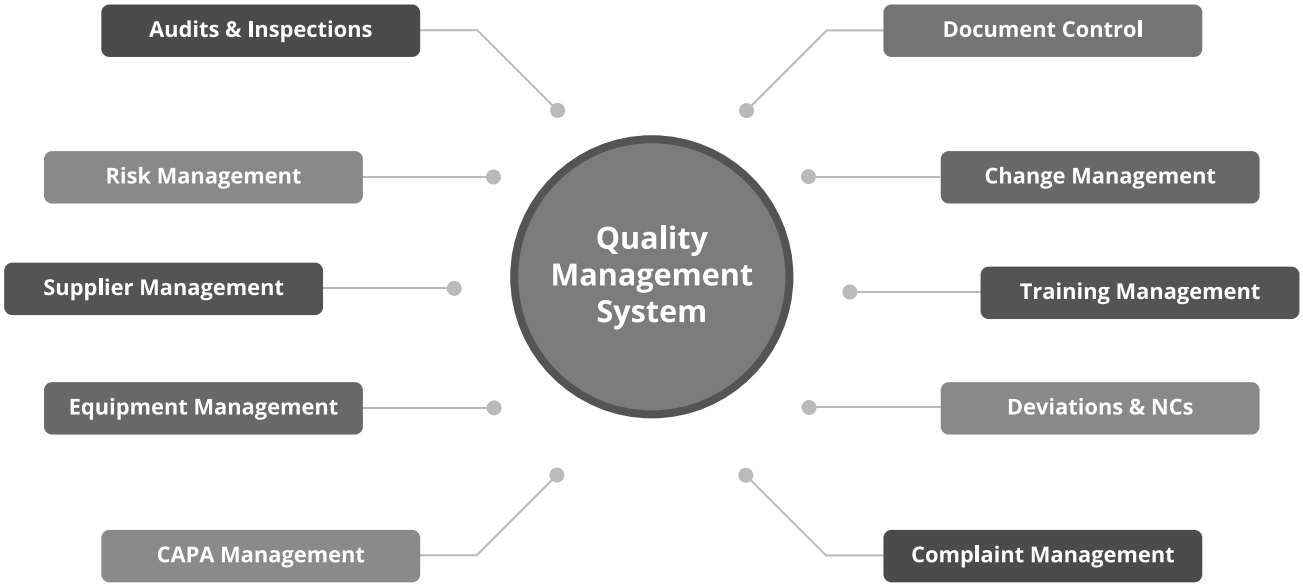
Change Management

Change management is a systematic QMS approach to implementing process modifications, product updates, and workflow improvements.

Change management ensures that any alterations made to the quality processes are carefully evaluated to minimize risks and maximize benefits.

Change management is essential to a QMS as it enables companies to adapt to evolving regulatory and customer requirements whilesafeguarding quality and compliance.

Quality Management System Elements



Document Control

Document control is the management of QMS-related documents and records. Document control ensures that relevant documentation, such as policies, procedures, work instructions, and specifications, are created, reviewed, approved, updated, and retired as necessary.

By establishing robust document control procedures, companies can mitigate the risk of errors, inconsistencies, and outdated information.

Additionally, effective document management facilitates transparency, accountability, and traceability.

Training Management

Training management is the process that equips personnel to possess the necessary skills, knowledge, and expertise to perform their job effectively.

By providing comprehensive training programs, companies ensure employees understand their roles, responsibilities, and requirements of a QMS.

Effective training management helps minimize errors and improve productivity.

Deviation and Nonconformance Management

Deviation and nonconformance management are the systematic process of identifying, documenting, investigating, resolving, and preventing deviations

or nonconformances related to procedures, products, suppliers, and more.

Deviation and nonconformance management ensure product quality, safety, and regulatory compliance. When deviations or nonconformities occur, addressing them promptly and effectively is essential to prevent recurrence, minimize the impact on product quality and safety, and ensure continuous improvements.

Complaint Management

Complaint management is a formal QMS process for receiving, documenting, investigating, and resolving customer complaints to improve product quality and compliance.

Complaint management enables companies to respond effectively to customer feedback, address quality issues, and drive continuous improvement. By prioritizing customer satisfaction and actively engaging with customer complaints, companies can build trust, loyalty, and long-term relationships with their customers while maintaining compliance with regulatory requirements.

Corrective Action and Preventive Action (CAPA) Management

CAPA management is a QMS process designed to identify, resolve, and prevent recorded issues from recurrence or avoid issue occurrence. CAPA involves investigating root causes through structured methodologies such as 5 Whys and Fishbone Diagrams. CAPA implements corrective and preventive measures based on those findings and verifies the effectiveness of these actions in eliminating or mitigating the associated risks.

Companies can minimize risks, improve processes, and ensure continuous improvement by implementing effective CAPA processes.

Equipment Management

Equipment management is a systematic approach to ensuring the ongoing functionality, accuracy, and reliability of all equipment used within the companies' processes.

Equipment management involves registration, qualification, calibration, maintenance, and disposal of equipment used in the manufacture of products.

Properly managed equipment ensures that manufacturing processes are conducted accurately and consistently, minimizing the risk of defects or deviations from quality specifications.

Supplier Management

Supplier management is a QMS process that ensures suppliers meet quality and compliance requirements.

Supplier management involves evaluating, selecting, and monitoring suppliers to ensure that they consistently deliver uniform and high-quality products or services.

Effective supplier management helps companies identify reliable and capable suppliers, optimize supply chain performance, and mitigate risks associated with poor supplier performance.

Risk Management

Risk management within a QMS framework focuses on identifying, assessing, mitigating, and monitoring risks that could impact product quality, safety, and regulatory compliance.

By proactively identifying and assessing risks, companies can implement strategies to mitigate or eliminate risks, thereby reducing the likelihood of quality incidents like nonconformance and deviations.

Audit and Inspection Management

Audit and inspection management is a QMS process that ensures internal and external audits are effectively planned, executed, and reviewed.

Audit and inspection management ensures that quality management processes are effectively implemented and followed across the company. Audit and inspection management assesses compliance with internal policies, procedures, quality standards, industry guidelines, and regulatory requirements.

How to Establish and Implement a Quality Management System?

The typical steps in establishing and implementing a quality management system are listed below.

- **Define Quality Objectives and Scope:** Establish business goals and customer

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Phone: +91 422 710 9966, 266 9966 | Fax: +91 422 266 6695 | Email: sales@krishcarbon.com | Web: www.krishcarbon.com

Raw Material Meeting was held on 28th Jan 2026

A meeting with the SIEMA Members was arranged for an exclusive discussion on various topics including Pricing Policy, the best practices and overall impact on industry.



Seminar on Growth Capital Strategy through SME IPO

by **Sri. R. Senthil Murugan**, *NSE Emerge &*

IPO Readiness, Valuation & Market Overview

by **Sri. Gagandeep Singh**
Business Head – Smart Horizon Capital Advisors Pvt Ltd





and regulatory requirements to align with organizational needs. To ensure the inclusion of all applicable processes and departments, establish the scope of the QMS.

- **Develop a Quality Policy and Leadership Commitment:** Formulate a quality policy that aligns with the strategic objectives of the organization. Additionally, establish leadership commitment by ensuring top management actively supports quality and continuous improvement within the QMS.
- **Identify and Document Key Processes:** Create a clear mapping of core business processes and define their interactions within the QMS. Establish Standard Operating Procedures (SOPs), work instructions, and process guidelines for relevant processes to maintain consistency and compliance.
- **Implement Document Control and Record Management:** Establish a centralized document control system for version management and accessibility. Set up compliance measures with relevant industry standards within the QMS, depending on the industry. For example, use ISO 13485 for medical devices and ISO 9001 for the pharmaceutical industry.
- **Train Employees and Build Quality Awareness:** Create training programs to educate employees on QMS procedures and regulatory compliance. Launch a culture of quality, accountability, and continuous improvement within the organization.
- **Establish Risk Management and CAPA Processes:** Initiate risk assessment methodologies, such as Failure Mode and Effects Analysis (FMEA), to identify potential issues. Establish Corrective and Preventive Actions (CAPA) within the QMS to systematically address recorded issues.
- **Set Up Internal Audit and Compliance Monitoring:** Establish regular internal audit schedules to assess the effectiveness of the QMS. Create monitoring mechanisms to ensure ongoing regulatory compliance and process improvements.
- **Measure Performance and Continuous Improvement:** Formulate key performance indicators (KPIs) such as customer complaints, defect rates, and process efficiency metrics. Establish continuous improvement initiatives using methodologies like 5S, Six Sigma, and Total Quality Management (TQM).
- **Prepare for Certification and Regulatory Audits:** Begin gap assessments and corrective action plans to prepare for external audits. Prepare necessary documentation and procedural alignment with ISO, FDA, and GMP standards within the QMS.
- **Review and Optimize the QMS Regularly:** Determine the schedule for periodic management reviews to assess QMS performance and effectiveness. Establish necessary updates based on audit findings, feedback, and regulatory changes.

What is Quality Management Software?

Quality management software is a digital platform designed to streamline and automate quality management processes while ensuring compliance with standards, guidelines, and regulations. This quality management software enables systematic control of quality policies, procedures, and documentation, facilitating adherence to applicable requirements.

QMS software streamlines and automates key QMS processes such as document control, change management, training management, audit management, nonconformance management, deviation management, CAPA management, and supplier management.

What are the Benefits of Implementing QMS Software?

The main benefits of using QMS software are listed below.

- **Improved Compliance:** QMS software helps companies comply with regulatory and customer requirements. The software's workflows ensure processes are being correctly followed. All actions in the workflow are

automatically documented in a time-stamped audit trail.

- **Enhanced Efficiency:** Quality management software automates and streamlines quality management processes, reducing manual effort and minimizing errors. The implementation of QMS software leads to increased productivity and operational efficiency within the company.
- **Increased Transparency:** QMS software provides real-time visibility into quality management activities, allowing employees to access relevant data. Transparency fosters accountability, facilitates collaboration, and promotes informed decision-making.
- **Cost Savings:** QMS software reduces the need for manual paperwork, streamlines processes, and helps prevent non-value-adding tasks. As a result, companies can achieve cost savings through improved efficiency, reduced waste, and decreased risk of noncompliance.

At SimplerQMS we designed a QMS software business case template to assist you in assessing the value of implementing modern QMS software and presenting it to your management.

The business case template is tailored to help you visualize the specific benefits that cloud-based QMS software can bring to your business, including potential efficiency enhancements, cost reductions, and improvements in compliance.



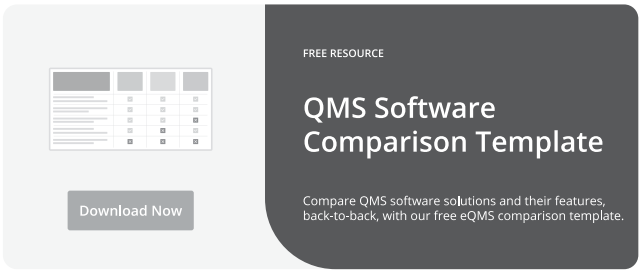
Assess the benefits of investing in an eQMS solution for your company by downloading our QMS Software Business Case template.

How to Choose Quality Management Software?

The main steps to choosing quality management software are mentioned below.

- **Assess Your Requirements:** Evaluate the company's quality management needs and objectives, considering factors such as regulatory compliance requirements and process requirements.
- **Research and Compare QMS Software Vendors:** Research multiple QMS software vendors, comparing features, pricing, customer reviews, and industry reputation to identify potential candidates.
- **Select Relevant QMS Software Vendors:** Pick out QMS software vendors whose offerings align closely with the company's requirements and objectives, ensuring vendors have a proven track record in the industry.
- **Get Demos and Have Meetings:** Request demonstrations and schedule meetings with selected vendors to gain a deeper understanding of their software's capabilities and how it can address specific needs.
- **Consider Getting a Trial:** Explore the possibility of obtaining a trial period from the vendors under consideration, allowing employees to test the software in a real-world setting.
- **Shortlist QMS Software Vendors:** Create a shortlist of the most promising QMS software vendors based on their presentations, feedback from demos, and alignment with the company's needs.
- **Get Demonstration of Specific Use Cases:** Ask shortlisted vendors to provide demonstrations focused on specific use cases relevant to the company, ensuring their software can effectively address particular challenges.
- **Negotiate With Shortlisted QMS Providers:** Engage in negotiations with the shortlisted QMS providers to discuss pricing, licensing terms, support services, any other add-ons, and any customization options required.
- **Make Final Decision:** Make a final decision based on a comprehensive evaluation of each vendor's offerings, taking into account factors such as functionality, cost-effectiveness, vendor support, and potential for long-term value.

Simplify the decision-making process of choosing QMS software with our QMS Software Comparison Template.



Use the eQMS comparison template to conduct a thorough comparison of various eQMS solutions, evaluating vendor features, functionalities, pricing structures, and more. The comprehensive side-by-side comparison helps you understand exactly what each QMS software and vendor has to offer.

What Key Features to Consider When Choosing a QMS Software?

Key features to consider when choosing a QMS software include the listed below.

- **Quality Management Module:** Define the company's specific quality processes, compliance needs, and essential eQMS modules such as document control, training management, supplier management, and more.
- **Validation and Compliance:** Choose QMS software that includes alignment with applicable QMS requirements such as ISO 13485, FDA 21 CFR Part 820, GxPs, and more. For example, Life Science QMS software should follow validation frameworks like ISPE GAMP 5 and comply with applicable software requirements such as FDA 21 CFR Part 11 and EU Annex 11.
- **Training and Support:** Assess vendor-provided training and support to ensure users can effectively utilize the system and receive assistance when needed.
- **Cloud-Based Solutions:** Consider cloud deployment for greater accessibility, flexibility, and automatic updates without requiring extensive IT infrastructure.
- **Additional Capabilities:** Evaluate features such as dashboards, mobile access, document editing, integration options, and reporting tools.

Selecting the right QMS software requires a thorough evaluation to ensure it aligns with business needs and regulatory requirements.

What are the Most Popular QMS Solutions for Life Sciences?

The 9 most popular QMS solutions for Life Science companies are as follows.

1. **SimplerQMS:** SimplerQMS is a QMS software designed for companies in the Life Science industry, including medical devices, pharmaceuticals, laboratories, and biotechnology. Renowned for its comprehensive support of all Life Science QMS processes, extensive module offering, and ease of use, it stands as an effective QMS software solution for these industries. SimplerQMS is integrated with Microsoft Office and requires no additional validation from customers since it is fully validated according to GAMP5.
2. **Qualio:** Qualio is a QMS software for Life Science companies that is tailored specifically for growing companies and startups. Qualio is known for its native web-based document editor, which facilitates transparent document management processes.
3. **MasterControl:** MasterControl is a QMS software designed for various Life Sciences, especially large enterprises. MasterControl is renowned for its comprehensive document control and quality management solutions that are compliant with FDA 21 CFR Part 11 regulation.
4. **TrackWise:** TrackWise is a QMS software designed for industries such as pharmaceuticals, biotechnology, medical devices, diagnostics, and food and beverage. TrackWise is known for its AI-augmented decision-making capabilities, enabling a shift from reactive to proactive quality management.
5. **Ideagen Quality Management:** Ideagen Quality Management, formerly Q-Pulse, is a QMS software designed for various industries, including Life Sciences. Ideagen Quality Management stands out for its extensive array of QMS modules and its utilization of Microsoft

1. Office applications for document editing, along with offering e-learning capabilities.
2. **Greenlight Guru:** Greenlight Guru is a cloud-based QMS software designed for the MedTech industry. Greenlight Guru is renowned for its requirements management and traceability matrix capabilities, and native document editing features, which simplify workflows with in-app editing.
3. **Dot Compliance:** Dot Compliance is a QMS software designed for Life Sciences companies. Dot Compliance is renowned for its AI assistant, Dottie AI, which automatically scans vast amounts of text and diverse data, identifies correlations, and provides ongoing, up-to-date AI insights.
4. **QT9:** QT9 is a web-based eQMS that provides a quality management solution for various industries, including medical devices, pharmaceuticals, chemicals, manufacturing, food and beverage, cosmetics, and more. QT9 QMS is renowned for its extensive range of over 23 built-in QMS modules.
5. **Scilife:** Scilife is a QMS software designed for the Life Sciences industry. Scilife is known for its comprehensive QMS modules. The software is validated according to GAMP 5 on the Amazon Web Services (AWS) platform.

Which Industries Can Benefit from SimplerQMS's eQMS Software?

Industries that can benefit from SimplerQMS's eQMS software are listed below.

- **Pharmaceuticals:** The pharmaceutical industry produces medications and vaccines under stringent quality and safety requirements. Pharmaceutical QMS software helps companies ensure compliance with FDA 21 CFR Part 210/211, EU GMP, and ICH Q10 and streamline tasks such as batch record management, CAPA procedures, and other related activities.
- **Medical Devices:** The medical devices industry is responsible for designing, manufacturing, and distributing devices used in medical diagnostics and treatment. QMS software for medical devices helps ensure compliance with FDA 21 CFR Part 820, ISO 13485, and EU MDR/IVDR by enhancing design control, document management, supplier management, risk assessment, complaint handling, and other essential processes.
- **Biotechnology:** Biotechnology is focused on harnessing biological processes to create products that advance health and well-being. Biotech companies use specialized biotechnology eQMS to meet requirements like ISO 9001:2015, ISO 13485:2016, GMP, GLP, FDA 21 CFR Parts 210, 211, and 820, MDR/IVDR, and ICH Q10. QMS software streamlines change management, training, deviation resolution, batch record oversight, and other critical quality processes.
- **Clinical Research:** Clinical research is centered on evaluating the safety and effectiveness of drugs, medical devices, and treatments. The clinical research companies use clinical research eQMS software to ensure adherence to FDA 21 CFR Parts 50/56, ICH GCP (E6), and GDPR. By improving trial master file (TMF) management, audit readiness, adverse event tracking, investigator training, and related processes, eQMS solutions, such as SimplerQMS, help ensure compliance and improve operations.
- **Contract Manufacturing:** Contract manufacturing provides outsourced production services for pharmaceuticals, medical devices, and biotech products.Contract manufacturing organizations use an eQMS to comply with FDA 21 CFR Parts 210/211, ISO 13485, and GxP guidelines. Contract manufacturing companies can ensure high manufacturing quality and consistency by using QMS software to streamline supplier quality management, batch record control, CAPA processes, nonconformance handling, and other related QMS processes.

Simpler QMS helps life science companies ensure compliance with applicable requirements such as FDA 21 CFR 820, EU MDR (Regulation (EU) 2017/745), ISO 9001, and ISO 13485:2016, to mention a few, by assisting companies in streamlining their QMS processes.



Efficient Management of Industry

Efficient management of industry is a cornerstone of economic growth, organizational sustainability, and global competitiveness. In an increasingly interconnected and technology-driven world, industries must evolve beyond traditional management approaches to embrace efficiency, adaptability, and innovation. This article explores the core principles, strategies, and modern practices that define efficient industrial management.

1. Understanding Industrial Management

Industrial management refers to the coordination and control of industrial processes, resources, and personnel to achieve organizational goals. It combines elements of operations management, human resource management, financial planning, and strategic decision-making. Efficiency in this context means maximizing output while minimizing waste, cost, and time.

2. Key Pillars of Efficient Industrial Management

a. Strategic Planning

Efficient industries begin with clear, long-term planning. Strategic planning involves setting measurable goals, forecasting demand, analyzing market trends, and allocating resources accordingly. A well-defined strategy ensures that all departments work toward common objectives.

b. Resource Optimization

Industries rely on three primary resources: manpower, machinery, and materials. Efficient management ensures optimal utilization of each:

- **Manpower:** Proper training, skill development, and role allocation
- **Machinery:** Preventive maintenance and technology upgrades
- **Materials:** Inventory control and waste reduction

c. Process Efficiency

Streamlining production processes is critical. Techniques like workflow analysis, standardization, and automation help eliminate bottlenecks and redundancies. Efficient processes lead to consistent quality and faster output.

d. Financial Management

Cost control and budgeting are vital. Efficient industries track expenses, optimize investments, and ensure profitability through careful financial planning and analysis.

3. Role of Technology in Industrial Efficiency

Modern industries are increasingly driven by technology. The integration of digital tools has transformed how industries operate.

- **Automation:** Reduces human error and increases production speed
- **Data Analytics:** Helps in forecasting demand and improving decision-making
- **Enterprise Resource Planning (ERP):** Integrates various business processes into a unified system
- **Artificial Intelligence:** Enhances predictive maintenance and quality control

Adopting technology not only improves efficiency but also provides a competitive edge.

4. Human Resource Management

People are at the heart of any industry. Efficient management focuses on:

- Recruitment of skilled workers
- Continuous training and development
- Performance evaluation systems
- Employee motivation and engagement

A satisfied and skilled workforce leads to higher productivity and innovation.

5. Quality Control and Continuous Improvement

Maintaining product quality is essential for customer satisfaction and brand reputation. Efficient industries implement:

- Quality assurance systems
- Regular inspections and testing
- Feedback loops for improvement

The philosophy of continuous improvement encourages organizations to constantly refine their processes and products.

6. Supply Chain Management

An efficient supply chain ensures that raw materials are available when needed and products reach customers on time. Key aspects include:

- Supplier relationship management
- Logistics optimization
- Inventory management systems
- A well-managed supply chain reduces delays and minimizes costs.

7. Sustainability and Environmental Responsibility

Modern industrial management must consider environmental impact. Efficient industries adopt:

- Energy-efficient technologies
- Waste recycling and reduction practices
- Sustainable sourcing of materials

Sustainability not only benefits the environment but also enhances corporate reputation and compliance with regulations.

8. Risk Management and Adaptability

Industries face various risks such as market fluctuations, supply disruptions, and technological changes. Efficient management involves:

- Identifying potential risks
- Developing contingency plans
- Maintaining flexibility to adapt to change

Adaptability is crucial in today's fast-changing industrial landscape.

9. Leadership and Organizational Culture

Strong leadership drives efficiency. Effective leaders:

- Communicate clear goals
- Encourage innovation
- Foster teamwork and accountability

A positive organizational culture promotes collaboration and continuous improvement.

10. Globalization and Competitive Advantage

In a global market, industries must compete internationally. Efficient management helps:

- Reduce production costs
- Improve product quality
- Enhance customer satisfaction

This leads to stronger positioning in both domestic and international markets.

Conclusion

Efficient management of industry is a multifaceted discipline that requires a balance of strategy, technology, human resources, and continuous improvement. As industries evolve, the ability to manage resources effectively, adapt to change, and embrace innovation becomes increasingly important. Organizations that prioritize efficiency not only achieve higher productivity and profitability but also ensure long-term sustainability and growth.



Renewable Energy Industry in India

The renewable energy industry in India has emerged as one of the most dynamic and strategically important sectors in the country's development journey. Driven by rising energy demand, environmental concerns, and global climate commitments, India is rapidly transitioning from conventional fossil fuels toward cleaner, sustainable energy sources. This shift is not only about environmental responsibility but also about energy security, economic growth, and technological leadership.

1. Introduction to Renewable Energy in India

Renewable energy refers to energy generated from natural resources such as sunlight, wind, water, and biomass, which are replenished continuously. In India, the push toward renewables has gained momentum over the past two decades, especially as the country seeks to reduce dependence on coal and imported fuels.

India is now among the world's leading producers of renewable energy, particularly in solar and wind power. The sector has attracted both domestic and international investments, making it a key pillar of industrial growth.

2. Major Sources of Renewable Energy

a. Solar Energy

Solar power is the fastest-growing renewable energy source in India. With abundant sunlight across most regions, India has immense potential for solar energy generation.

A major initiative driving this growth is the National Solar Mission, which aims to promote large-scale solar installations. Massive solar parks and rooftop solar systems are becoming increasingly common.

b. Wind Energy

India is one of the largest producers of wind energy globally. Coastal states like Tamil Nadu and Gujarat have strong wind corridors that support large wind farms.

Wind energy contributes significantly to the renewable energy mix and plays a crucial role in reducing carbon emissions.

c. Hydropower

Hydropower has traditionally been a major renewable source in India. Large dams and small hydro projects generate electricity by harnessing flowing water.

Though mature, the sector still offers opportunities for expansion, especially in the Himalayan region.

d. Biomass Energy

Biomass energy uses agricultural waste, animal waste, and other organic materials to generate power. This is particularly useful in rural areas, where it supports decentralized energy production.

3. Government Policies and Initiatives

The Indian government has implemented several policies to promote renewable energy:

- **National Action Plan on Climate Change:** Encourages sustainable development and clean energy adoption.
- Make in India: Promotes domestic manufacturing of renewable energy equipment.
- **Production-Linked Incentives (PLI):** Supports solar panel manufacturing.

India has also committed to ambitious renewable energy targets, aiming for a large share of its electricity capacity to come from non-fossil sources in the coming years.

4. Role of Industry and Private Sector

Private companies play a major role in expanding renewable energy capacity. Leading firms like Adani Green Energy and Tata Power Renewable Energy are investing heavily in solar and wind projects.

These companies are building large-scale energy parks, developing innovative technologies, and contributing to job creation and industrial growth.

5. Economic and Social Impact

The renewable energy sector contributes to the economy in several ways:

- **Job Creation:** From manufacturing to installation and maintenance
- **Energy Access:** Provides electricity to remote and rural areas
- **Cost Reduction:** Falling costs of solar and wind power make energy more affordable
- **Industrial Growth:** Encourages new industries like battery storage and electric vehicles

6. Challenges Facing the Sector

Despite rapid growth, the industry faces several challenges:

- **Intermittency:** Solar and wind energy depend on weather conditions
- **Infrastructure Issues:** Need for better transmission and storage systems
- **Land Acquisition:** Large projects require significant land
- **Financial Constraints:** High initial investment costs

Addressing these challenges is essential for sustained growth.

7. Future Prospects

The future of renewable energy in India looks highly promising. Advancements in battery storage, smart grids, and green hydrogen are expected to transform the sector.

India is also positioning itself as a global leader in clean energy, collaborating with other nations and organizations to promote sustainability.

Conclusion

The renewable energy industry in India represents a powerful shift toward a cleaner, more sustainable future. With strong government support, increasing private investment, and technological advancements, the sector is set to play a vital role in the country's economic and environmental goals.

As India continues to expand its renewable capacity, it not only addresses its own energy needs but also contributes to the global fight against climate change.

SIEMA jointly with CHAMBER, CODISSIA & IIF had arranged a program for our members on 6th March 2026

A Team from DELOITTE India presented the program on

- Labour Code
- Emerging Cyber Trends
- Tax Technology &
- MSME Focussed Services

















MoU Signed with KPR College of Arts Science and Research

An MoU was signed on 18th March 2026, with KPR College of Arts, Science and Research, in mutual co-operations for Placement Opportunities, Industrial Training, Internship and visits, Conducting Skill development Programs, Guest Lectures etc.





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- Non-Inductive Winding.
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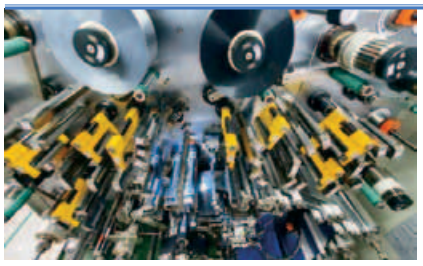

BI-POLAR SLEEVE INSULATED


BIPOLAR

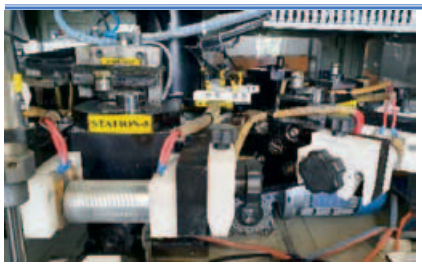

UNIPOLAR

DESCRIPTION	DEFAULT PARAMETERS
DIELECTRIC	Metallized Polypropylene Film
DUTY FREQUENCY	50 / 60 / 120 Hz
CLIMATIC CATEGORY	40/85/56
CAPACITANCE TOLERANCE	±5 %, ±10 %, ±15 %
VOLTAGE TEST BETWEEN TERMINALS	2.0 Times Rated Voltage (10 seconds)
VOLTAGE TEST BETWEEN TERMINAL AND CASE	2.0 kV (2 seconds)
ANGLE OF LOSS Dv/dt – Tan Delta	≤20 X 10-4 / 20 (V/µs)
CLASS OF SAFETY PROTECTION	P0, P1, P2 / S0, S1, S2, S3
CLASS OF OPERATION	CLASS A / B / C / D
ENCAPSULATION	Dry Type – Bio-Degradable Polyurethane Resin
TESTED ACCORDING TO	IEC / BIS / UL STANDARDS
CERTIFIED	BIS, CE, RoHS
COMPLIANCE	REACH, UL 810

INFRASTRUCTURE


AUTOMATED WINDING


ROBOTIC-SPRAY METALLISATION


AUTOMATED ROUTINE AND TYPE TESTERS


ROBOTIC ASSEMBLY OPERATIONS

PRODUCT CERTIFICATIONS

IS : 2993
CM/L – 6500052005

Central Power Research Institute

CE

RoHS 3 COMPLIANT EU 2015/863

REACH COMPLIANCE

MANAGEMENT CERTIFICATIONS

TÜV

- ISO 9001
- ISO 14001*
- ISO 45001*

Products have been Routine, Type and Endurance Tested at CPRI- Central Power Research Institute – Bangalore for Conformity to Applicable standards and Design requirements.

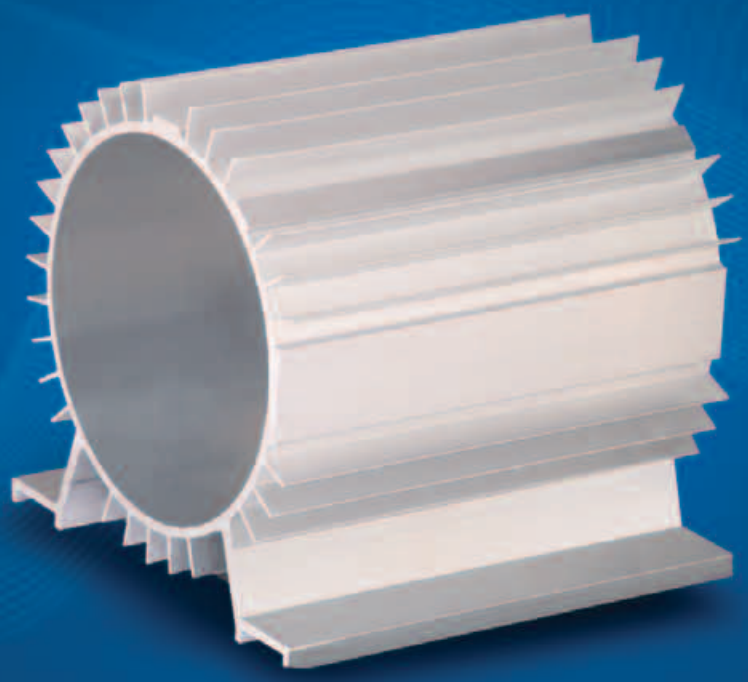
B J ELECTRONICS PRIVATE LIMITED

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The leading supplier of high quality aluminium motor bodies to a majority of Pump manufacturers nationwide, for the past 30 years.

Our vast experience has enabled us to develop long term relationship with our customers to provide total customer satisfaction and on time delivery.

- Advanced design & development capability
- Precise high speed reliable cutting and machining of aluminium motor bodies
- Competitive pricing
- A variety of value added services to our clientele
- Ready stock of wide range of motor bodies

ALUMINIUM MOTOR BODY

Ganga Engineering Corporation

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