

API 936 Refractory Material Design, Application, Installation and Inspection

Identifying and Understanding the Refractory Material Design from the Expert!

Course Level : Basic to Intermediate

22nd - 26th April 2024 at Bandung, Indonesia | 19th - 23rd August 2024 at Kuala Lumpur, Malaysia
 26th - 30th August 2024 at Bandung, Indonesia | 11th - 15th November 2024 at Kuala Lumpur, Malaysia
 18th - 22nd November 2024 at Bandung, Indonesia



Petrosync Distinguished Instructor
M. El-Sayed Mahmoud Shama

A lot of
Practical Things,
Case Studies
and Exercises!

International Certifications

- ▶ API 936 – Refractory Personnel - Certificate #52150
- ▶ API 510 – Authorized Pressure Vessel Inspector - Certificate #40900
- ▶ API 570 – Authorized Process Piping Inspector - Certificate #77129
- ▶ API 653 – Authorized Aboveground Storage Tank Inspector - Certificate #36169
- ▶ API 580 – Specialist Risk Based Inspection - Certificate #50552
- ▶ API 571 – Specialist Corrosion and Materials – Certificate #50434
- ▶ CSWIP 3.1 – Authorized Welding Inspector (TWI) – Certificate #16928
- ▶ CSWIP 3.2 – Senior Welding Inspector (TWI) – Certificate #29373
- ▶ ASNT Level II (RT, UT, MT and PT) – Certificate #C6000/101/115/120/124
- ▶ Qualified CSWIP BGAS Painting Inspector Grade 2

PROGRAM SCHEDULE

08:00	Registration (Day1)
08:10 – 10:00	Session I
10:00 – 10:15	1 st Tea Break
10:15 – 12:00	Session II
12:00 – 13:00	Lunch Break
13:00 – 14:45	Session III
14:45 – 15:00	2 nd Tea Break
15:00 – 16:00	Session IV
16:00	End of Day

*Schedule may vary for each training

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Course Overview

Refractory technology has changed significantly in recent years as new monolithic materials have replaced brick in many industries. Vibratable and pumpable castables with superior properties, as well as significantly improved brick, ceramic fiber products, and other items, make optimum refractory selection complex.

Advanced construction methods must be utilized if these improved materials are to achieve their maximum service life. This course includes a review of refractory fundamentals while emphasizing selection and construction techniques for a variety of applications in refineries, chemical plants, industrial furnaces, incinerators, and utility boilers.

The course covers practical guidelines for inspecting and repairing existing linings, criteria for field testing and accepting new installations, and vendor certification of materials prior to shipment.

Course Objectives

Upon the successful completion of this course, each participant will be able to:

- ▶ Design, apply, install and inspect refractory material in a professional manner
- ▶ Describe the refractory types and classification, test procedures, effects of additives and explain why chemistry alone is not a critical factor
- ▶ Emphasize the refractory phase relationships and fracture mechanics
- ▶ Inspect and quality control the refractory that includes acceptance/rejection criteria, sampling and testing as well as material and installer certification
- ▶ Discuss monolithic including castable and plastic refractories, compositions and properties, anchorage, design and installation and the effects of firing on strength and thermal properties
- ▶ Employ the refractory installation techniques including modern refractory state of the art, precast modules, storage & handling, failure analyses, etc.
- ▶ Carryout refractory repairs and design various refractory linings
- ▶ Employ and apply the refractory selection guidelines from data sheet interpretation and product choice for designed exposure
- ▶ Determine and practice the refinery application of refractories including FCCU applications, effects of coking, reformers, transfer lines, Sulphur plants as well as the stacks, creep tests and hot spot detection

Who Should Attend?

This course provide an overview of all significant aspect and considerations of refractory for those who are responsible for refractory design, application, installation, and inspection.

WHY YOU SHOULD ATTEND PETROSYNC'S EVENTS

- To ensure that all objectives of the course matches yours, all PetroSync programs are developed after intensive and extensive research within the industry
- PetroSync programs focus on your immediate working issues to ensure that you are able to apply and deliver immediate results in real work situations
- Application and implementation of industry knowledge and experience are the drivers for our course design, not theoretical academic lectures
- PetroSync training focuses on practical interactive learning tools and techniques including case studies, group discussions, scenarios, simulations, practical exercises and knowledge assessments during the course. Invest a small amount of your time to prepare before attending the course to ensure maximum learning
- PetroSync follows a rigorous selection process to ensure that all expert trainers have first-hand, up-to-date and practical knowledge and are leaders of their respective industrial discipline

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Course Agenda

Day 1

- Registration and Coffee
- Welcome and Introduction
- Pre – Test
- Introduction of Refractories:
 - ▶ Types and Classifications
 - ▶ Test Procedures
 - ▶ Effects of Additives
 - ▶ Why Chemistry alone is not a Critical Factor
 - ▶ Phase Relationships
 - ▶ Fracture Mechanics
- Refractory Inspection and Quality Control:
 - ▶ Acceptance / Rejection Criteria
 - ▶ Sampling and Testing
 - ▶ Records and Reports
 - ▶ Quality Control
 - ▶ Material and Installer
 - ▶ Certification

Case Study:

Brick Failure

Cracking in Monolithic Lining

Day 2

- Monolithics:
 - ▶ Casable and Plastic Refractories
 - ▶ Compositions and Properties
 - ▶ Achorage
 - ▶ Design and Installation
 - ▶ Effects of Firing on Strength and Thermal Properties

Case Study:

SRU Brick Lining

Acid Gas Incinerator Refractory Damage

Day 3

- Refractory Installation Techniques:
 - ▶ Modern Refractory State-of-the-Art
 - ▶ Self-Flow, Vibe/Pump Cast, Gunite/Shotcrete,
 - ▶ Rammed Plastics
 - ▶ Precast Modules
 - ▶ Storage & Handling
 - ▶ Joints

● Refractory Repairs:

- ▶ Failure Analyses
- ▶ Structural (Anchors, Erosion)
- ▶ Chemical (Proces Reactions, Slag Attack)
- ▶ Thermal (Impingement, Spalling, Fusion)

Case Study:

Study Exposure to Thermal Cycle in FCUU
Fibber Modules Fallen From the Roof

Day 4

- Furnace Linings:
 - ▶ Design of Various Refractory Lining Types
 - ▶ Thermal Curing and Drying
 - ▶ Explosive Spalling
 - ▶ Effects of Aggressive Atmospheres
- Refractory Selection Guidelines:
 - ▶ Data Sheet Interpretation
 - ▶ Product Choices for Design Exposures
 - ▶ Castable, Plastic, Fiber and Brick Selection-
 - ▶ Criteria for FCB and MSW
 - ▶ Boilers, Incinerators, Gasifiers and Heaters

Case Study:

Failing Brick Walls Deformations or Collapse
Castable Cracking

Day 5

- Refinery Application Refractories:
 - ▶ FCCU Applications
 - ▶ Effects of Coking
 - ▶ Reformers
 - ▶ Transfer Lines
 - ▶ Sulfur Plants
 - ▶ Stacks
 - ▶ Creep Tests
 - ▶ Hot Spot Detection

Case Study:

Flare Brick Failure

Regeneration Heater H 1301 Accedent Result
Course Conclusion

POST-TEST

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Instructor Profile



Petrosync Distinguished Instructor M. El-sayed Mahmoud Shama

Mohamed Shama is a senior inspection engineer with over 23 years of extensive experience within the petrochemical, refinery, utilities and oil and gas industries

He conducted training for API Certification Preparatory, Corrosion and Prevention, National Board and ASME PCC-2, ASME VIII Division 1 & 2, ASME V, ASME IV, Lifting Equipment Courses, CSWIP 3.2 and 3.1 Welding Courses, Pressure Relief Valves, NDT Techniques Training Courses

He has experiences and involve in many huge shutdowns in the oil and gas field including supervision of inspectors and technicians and performing internal inspection for all kind of Piping Systems, Pressure Vessels, Tanks, Boilers, Heat Exchangers, Filters, Towers, Coolers, Columns, Drums and Incinerators, Heaters, Driers, Air Vessels, MCHE, Hot Oil Waste Heat Recovery Units, Spheres, ISO-Containers, Bullets and all kind of refractory materials shaped and un-shaped

Sample Major Project List

- ▶ CAM Project (Competency assesement project) for one year including repair and installation of refractory
- ▶ Replacement of incinerator refractory in acid gas removal unit in SEGAS LNG plant
- ▶ Replacement of regeneration heater refractory in Angola LNG plant after heater explosion
- ▶ Replacement / repair of the jetty steel structure refractory in Angla LNG plant
- ▶ Repair boiler refractory in general petroleum company

Partial Client List

- ▶ Badr Eldin oil Company (Western Dessert)
- ▶ SABIC
- ▶ ADNOC
- ▶ KOC
- ▶ AGA
- ▶ Haya Water Oman
- ▶ Dubai Petroleum
- ▶ PetroRabigh
- ▶ Borouge
- ▶ and many more

IN-HOUSE SOLUTIONS

SAVE COST • IMPROVE PERFORMANCE • REDUCE RISK

PetroSync understands that in current economic climate, getting an excellent return on your training investment is critical for all our clients. This excellent training can be conducted exclusively for your organization. The training can be tailored to meet your specific needs at your preferred location and time. We will meet you anywhere around the globe.

If you like to know more about this excellent program, please contact us on +65 3159 0800 or email general@petrosync.com

INVESTMENT PACKAGES

Please checklist the package that you are attending!

	API 936 - Refractory Material Design, Application, Installation & Inspection Schedules	LOCATION	PRICE
<input type="checkbox"/>	22 nd - 26 th April 2024	Bandung, Indonesia	USD 3,250
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* All prices are subject to change without notice and are not guaranteed, except that prices for an order that have been accepted by PetroSync is not subject to change after acceptance

* Price is nett excluding Withholding Tax if any and will be quoted separately. Please send us the withholding tax payment receipt.

* We can help to register API exam certification which incur **USD 100** administration fee per application.

* For API Exam late application, there will be additional **USD 150** borne by the participant

DELEGATE DETAILS

1st Delegate Name _____ Mr Mrs Ms Dr Others

Direct Line Number: _____ Email: _____

Mobile Number: _____ Job Title: _____

Department: _____ Head of Department: _____

2nd Delegate Name _____ Mr Mrs Ms Dr Others

Direct Line Number: _____ Email: _____

Mobile Number: _____ Job Title: _____

Department: _____ Head of Department: _____

3rd Delegate Name _____ Mr Mrs Ms Dr Others

Direct Line Number: _____ Email: _____

Mobile Number: _____ Job Title: _____

Department: _____ Head of Department: _____

*Please fill all the details including mobile number. This help us to contact participant if they are late in class or if there is any urgent update (through whatsapp/call)

INVOICE DETAILS

Attention Invoice to: _____

Direct Line Number: _____ Fax: _____

Company: _____ Industry: _____

Address: _____ Postcode: _____

Country: _____ Email: _____

Please note:

- Indicate if you have already registered by Phone Fax Email Web

- If you have not received an acknowledgement before the training, please call us to confirm your booking.

PAYMENT METHODS

By Credit Card

By Direct Transfer : Please quote invoice number(s) on remittance advice

PetroSync Global Pte Ltd Bank details:

Account Name : PetroSync Global Pte Ltd

Bank Name : DBS Bank Ltd

Bank Code : 7171 • Bank Swift Code : DBSSSGSXXX • Branch code : 288

Account No : 0288-002682-01-6-022 (USD)

Bank Address : 12 Marina Boulevard, Level 3, Marina Bay Financial Centre Tower 3, Singapore 018982

All bank charges to be borne by payer. Please ensure that PetroSync Global Pte Ltd receives the full invoiced amount.

Confirmation

I agree to PetroSync's payment terms and cancellation policy.

Signature : _____

Date : _____

PAYMENT TERMS : Payment is due in full at the time of registration. Full payment is mandatory for event attendance.

PROGRAMME CONSULTANT

Contact : Cay Aagen

Email : registration@petrosync.com

Phone : +65 3159 0800

TERMS AND CONDITIONS

DISCLAIMER

Please note that trainers and topics were confirmed at the time of publishing; however, PetroSync may necessitate substitutions, alterations or cancellations of the trainers or topics or location (classroom / Virtual). As such, PetroSync reserves the right to change or cancel any part of its published programme due to unforeseen circumstances. Any substitutions or alterations will be updated on our web page as soon as possible.

DATA PROTECTION

The information you provide will be safeguarded by PetroSync that may be used to keep you informed of relevant products and services. As an international group we may transfer your data on a global basis for the purpose indicated above. If you do not want us to share your information with other reputable companies, please tick this box

CANCELLATION POLICY

Delegates who cancel after the training is officially confirmed run by email, are liable to pay the full course fee and no refunds will be granted. You may substitute delegates at any time as long as reasonable advance notice is given to PetroSync.

In the event that PetroSync cancels or postpones or change the trainer or change the training location (classroom / virtual) of an event for any reason and that the delegate is unable or unwilling to attend in on the rescheduled date, you will receive a credit voucher for 100% of the contract fee paid. You may use this credit voucher for another PetroSync to be mutually agreed with PetroSync, which must occur within a year from the date of postponement.

PetroSync is not responsible for any loss or damage as a result of the cancellation policy. PetroSync will assume no liability whatsoever in the event this event is cancelled, rescheduled or postponed due to any Act of God, fire, act of government or state, war, civil commotion, insurrection, embargo, industrial action, or any other reason beyond management control.

CERTIFICATE OF ATTENDANCE

80% attendance is required for PetroSync's Certificate of Attendance.

DETAILS

Please accept our apologies for mail or email that is incorrectly addressed.

Please email us at registration@petrosync.com and inform us of any incorrect details. We will amend them accordingly.

Find us on Social Media:

 PetroSync Global Pte Ltd

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CHARGES & FEE(S)

- For Payment by Direct Telegraphic Transfer, client has to bear both local and oversea bank charges.

- For credit card payment, there is additional 4% credit card processing fee.