

TECHNICAL DATA SHEET



FEATURES & BENEFITS

• Quality

Ensures superior uniformity and consistency, meeting the highest quality standards. Delivers both early and final high strength, speeding up construction timelines by enabling faster demoulding, handling, and utilization of all types of precast concrete products. Optimized for reliable concrete production in extreme hot or cold weather conditions.

• Chemistry

Designed with a reduced alkali content, effectively preventing damage from Alkali-Silica Reaction (ASR). Contains low levels of chloride, free lime, and magnesia, enhancing the longevity of concrete structures. In addition to that, it offers noticeable cost savings through improved slump retention with lower admixture dosages, while delivering high early and final strength.

Ordinary Portland Cement (OPC) CEM I 42.5 R

INTRODUCTION

National Cement CO. P.S.C with over 4 decades of experience produces highest quality cements in the UAE. With some of the most prestigious projects like Dubai International Airport, Jabel Ali Port, Palm Jumeirah, Dubai Marina, Dubai Metro, Khalifa Port, Dubai Canal, Expo 2020 etc to name a few is testament to markets desire for highest quality cements.



PRODUCT

- Ordinary Portland Cement (OPC) CEM I 42.5R is produced to comply with the chemical and physical requirements of **BS EN 197-1:2011-CEM I 42.5 R & ASTM C 150 TYPE I-2020 standards.**
- It is produced by inter-grinding high-grade clinker with premium-quality gypsum in carefully controlled proportions, this cement is ideal for general-purpose applications. It is highly recommended for use in concrete, mortars, renders, and grouts, ensuring consistent strength and durability across a wide range of construction projects."

ADMIXTURES AND ADDITIONS

Admixtures like air-entraining agents and workability aids, as well as extenders such as Ground Granulated Blast Furnace Slag (GGBS), Silica Fume, and Fly Ash, are fully compatible with National Cement Company's Ordinary Portland Cement (OPC) CEM I 42.5 R. It is recommended to perform trial mixes to determine the optimal proportions for best results.

APPLICATIONS

OPC CEM I 42.5R is a versatile cement suitable for a wide range of applications, including cast-in-place plain and reinforced concrete, ready-mix concrete, precast and prestressed concrete, pavement concrete, architectural concrete, concrete masonry units, masonry mortars, grouts, renders, and screeds.

MANAGEMENT SYSTEMS

NCC is approved to the following management systems:

- ISO 9001 – 2015 Quality management.
- ISO 14001 – 2015 Environmental management.

Availability

- Bulk



- 50 kg Bag



- 1.50 ton Jumbo Bags



National Cement Company

P.C.S., Dubai

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HEALTH AND SAFETY

- Avoid direct contact with skin and eyes by using protective gloves, clothing, and eyewear.
- Inhalation of cement dust may cause respiratory irritation; use appropriate respiratory protection in dusty environments.
- In case of skin or eye contact, rinse immediately with plenty of water and seek medical advice if irritation persists.
- Always follow local health and safety regulations when handling and storing OPC.
- For more information, refer to the Material Safety Data Sheet (MSDS).

TEST CERTIFICATES

NCC delivers comprehensive data and routine certification for critical properties, covering compressive strength of mortar prisms, fineness, setting times, soundness, and the chemical composition on a weekly basis.

National Cement Company P.S.C.,
Dubai, AL QUOZ, NO.3
P.O. BOX 4041, DUBAI, U.A.E.
TEL: 04-3047361
FAX: 04- 3388886
www.nationalcement.ae
Sales@nationalcement.ae

STORAGE

- Cement should be stored in covered dry conditions to prevent quality deterioration caused by premature hydration and carbonation. Even moisture from the air can be as harmful as direct moisture exposure.
- Bulk cement should be stored in well-maintained silos, ensuring no damp air or moisture ingress.
- Bagged cement must remain unopened, elevated off the ground, and stored in dry covered conditions. Bags should be stacked safely and securely to maintain stability.



Cement Product Range

Product	Description	EN Standard	ASTM Standard
Ordinary Portland Cement (OPC)	Produced by inter-grinding high-grade clinker with premium-quality gypsum. Suitable for general-purpose applications including concrete, mortars, and grouts.	EN 197-1: 2011 CEM I 42.5R	ASTM C150 Type I
Sulfate-Resistant Cement (SRC)	Formulated to withstand high sulfate environments, particularly in foundations, marine structures, and sewage systems.	EN 197-1: 2011 CEM I 42.5N SR (Sulfate Resistant)	ASTM C150 Type V
Moderate Sulfate-Resistant Portland Cement (MSRPC)	Offers resistance to moderate sulfate exposure and is recommended for projects where durability against sulfate is required but in lower concentrations.	EN 197-1: 2011 CEM I 42.5R	ASTM C150 Type II
Ground Granulated Blast Furnace Slag (GGBS)	GGBS is used in concrete for enhanced durability, reduced heat of hydration, and improved resistance to chemicals.	EN 15167-1:2006	ASTM C989

TYPICAL PARAMETERS AS PER

BS EN 197-1:2011-CEM I 42.5 R & ASTM C 150 TYPE I-2020

Characteristics	Unit	Specification		Typical Results as Per
		BS EN197-1:2011 CEM I 42.5 R	ASTM C 150 Type I-2020	BS EN197-1:2011 CEM I 42.5 R
Loss On Ignition (LOI)	%	5 (Maximum)	3 (Maximum)	1.50 – 2.95
Insoluble Residue	%	5 (Maximum)	1.5 (Maximum)	0.20 – 0.60
Silicon Dioxide (SiO ₂)	%	---	---	19.50 – 20.50
Aluminum Oxide (Al ₂ O ₃)	%	---	---	4.20 – 5.10
Ferric Oxide (Fe ₂ O ₃)	%	---	---	3.00 – 3.60
Calcium Oxide (CaO)	%	---	---	63.00 – 64.00
Magnesium Oxide (MgO)	%	---	6 (Maximum)	1.00 – 2.00
Sulphur Trioxide (SO ₃)	%	4 (Maximum)	3 (Maximum)	2.40 – 2.80
Chloride Content	%	0.10 (Maximum)	---	0.01 – 0.06
Equivalent Alkali	%	---	0.6 (Maximum)	0.45 – 0.59
Tricalcium Aluminate (C3A)	%	---	---	6.00 – 7.60
Fineness - Specific Surface	m ² /Kg	---	260 (Minimum)	300 – 350
Initial Setting Time	Mint.	60 (Minimum)	45 (Minimum)	110 – 180
Final Setting Time	Mint.	---	375 (Maximum)	200 – 250
Soundness	Mm	10 (Maximum)	0.80 (Maximum)	0.00 – 2.00
Compressive Strength – 2 Days	N/mm ²	20 (Minimum)	12 (Minimum)	20 – 27
Compressive Strength – 7 Days	N/mm ²	---	19 (Minimum)	39 – 43
Compressive Strength – 28 Days	N/mm ²	42.5 (Minimum)	28 (Minimum)	50 – 55



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