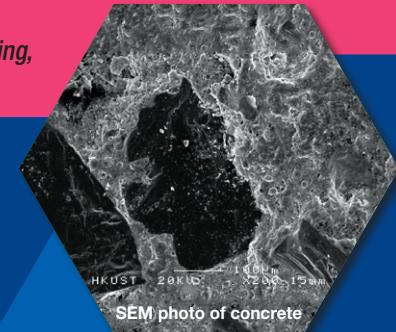


Innovative Materials Science and Technology in the Greater Bay Area Construction

5-6 March 2020

*Multi-Purpose Hall & Exhibition Area A, Zero Carbon Building,
8 Sheung Yuet Road, Kowloon Bay, Kowloon, Hong Kong*



Cover photos: Courtesy by TS Cheng and TY Fan

Organizer

HKIE THE HONG KONG
INSTITUTION OF ENGINEERS
香港工程師學會

Materials Division

材料分部

Supporting Organization



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Background

Following the Framework Agreement on Deepening Guangdong-Hong Kong-Macao Cooperation in the Development of the Greater Bay Area on 1 July 2017, an outline development plan signifying the development of the Area was promulgated on 18 February 2019. The plan supports the development of the five Hong Kong R&D Centers in selected focus areas including Nano and Advanced Materials.

With the total area of 56,000 km², a population of around 70 million and a GDP of HKD12.7 trillion as at end 2017, a number of mega construction projects like Hong Kong-Zhuhai-Macao Bridge have just been successfully completed, and some are under construction such as the Third Runway System project at a construction cost of HKD141.5 billion in Hong Kong, the Shenzhen-Zhongshan Bridge valued at HKD59 billion and the Zhujiang Delta Water Resources Allocation project costing nearly HKD40 billion. More are under planning. The estimated construction expenses on public works alone in the Greater Bay Area are more than HKD750 billion in 2019, and expected to keep increasing in the coming years. Material costs normally account for more than 50% of the overall construction cost in typical building project, but less in infrastructure projects, i.e. 30%. Hence, the market demand for various construction materials in the Greater Bay Area will be at least HKD250 billion per annum in the coming years.

At the same time, innovation and technology are designated by the Government of Hong Kong as major contributing factors to boost sustainable development, enhance competitiveness and provide new momentum for economic development. Mega construction projects provide not only challenges to materials scientists, engineers, technologists and other professionals working or planning to work in the Area, but also unprecedented opportunities for the application of leading edge innovative materials and technologies towards more sustainable built environments.

MaSTEC is a classic event hosted by the HKIE Materials Division, but as distinct from previous conferences, MaSTEC 2019 aims to provide a platform for engineers, researchers, business leaders, industry experts and government officials working or planning to work in the Greater Bay Area, to promulgate their latest innovations or pioneering applications of construction related materials, share information and experiences, and explore collaboration opportunities.

Theme

Innovative Materials Science and Technology in the Greater Bay Area Construction

Discussion Topics

MaSTEC 2019 will include plenary keynote lectures and topics that cover all kinds of construction related materials such as:

- Materials science such as materials genome and alkali-aggregate reaction
- Steel and other metallic materials such as coupler
- Cement-based materials such as 3D printing materials and their additives like fiber and admixtures
- Glass, ceramic and other nonmetallic materials
- Coating materials such as paints
- Functional materials having construction related applications but not listed above
- Materials testing, quality control and big data in manufacturing or construction applications



Guest of Honour

Ms Connie Yeung, JP

Deputy Director (Development and Construction), Hong Kong Housing Authority

Keynote Speaker

Professor Jin-Guang TENG

President, The Hong Kong Polytechnic University

Conference Organizing Committee

Chairman **Ir Dr ZHENG, Herbert**

Members **Ir Raymond WAN Wai Man**

FHKIE (Chairman, The HKIE Materials Division)

Ir Prof Joseph MAK Yiu Wing

FHKIE (Immediate Past Chairman, The HKIE Materials Division)

Ir Dr FUNG Wing Kun

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Ir CHOY, Sam

Ir HO, Corey

Ir KWOK, Andy

Ir LAM, Chi Sing

Dr LAM, Christina

Ir Pak, Kenneth

TAM, Chi Lam, Anlam

Ir YIP, Sam

Who Should Attend

Engineers and professionals from Government, public authorities, consultants, contractors and materials suppliers as well as academics, scientists and students from tertiary and research institutions.

Privacy Statement

We are committed to protecting the privacy, confidentiality and security of the personal information we may hold by complying with the requirements of Personal Data (Privacy) Ordinance and the Institution's relevant policy with respect to the management of personal information.

We are equally committed to ensuring that all our committee members and agents uphold these obligations.

Conference Programme

Day 1 – Frontiers of Research and Engineering in the Greater Bay Area

(09:00-17:30, 5 March 2020, Thursday)

Welcome Speech

Ir Prof Joseph YW MAK

MaSTEC 2019 Organizing Committee; Immediate Past Chairman, Materials Division, The Hong Kong Institution of Engineers, Hong Kong, China

Chaired by Ir Professor Joseph YM MAK

Opening Speech

Ms Connie Yeung, JP

Deputy Director (Development and Construction), Hong Kong Housing Authority

Keynote Speech

Research on Seawater Sea-sand Concrete (To be finalized)

Prof Jin-Guang TENG

President, The Hong Kong Polytechnic University, Hong Kong, China

Study on Use of Secondary Cementitious Materials to Mitigate Alkali-Silica Reaction in Concrete Made with Volcanic Aggregates

Ir Hiu Dan WONG and Ir Wallace SM TAM

Civil Engineering and Development Department, The Government of the HKSAR, Hong Kong, China

Measures for Prevention of Alkali-aggregate Reactions in Concrete

Prof Min DENG, Prof Liwu MO and Academician Mingshu TANG

College of Materials Science and Engineering, Nanjing Tech University, Nanjing, China

RILEM Technical Committee 258-AAA: Development of a Performance-based Testing Concept

Prof Børge Johannes WIGUM

HeidelbergCement Northern Europe, Oslo; University of Science and Technology, Trondheim, Norway

Enhancement of Properties of Recycled Aggregate Concrete by Accelerated CO₂ Curing

Ir Prof Chi Sun POON

Department of Civil and Environmental Engineering, Hong Kong Polytechnic University, Hong Kong, China

Chaired by Ir Dr Herbert ZHENG

Materials Data Science and Shenzhen Materials Genome Initiative Scientific Infrastructure

Prof Xiaodong XIANG

Department of Materials Science and Engineering; Material Genome Institute, Southern University of Science and Technology, Shenzhen, China

Multi-principal Element Alloys – Why Do We Bother?

Prof Chan Hung SHEK

Department of Materials Science and Engineering, City University of Hong Kong, Hong Kong, China

Development of Nano-driven Waterproof System for Buildings and Infrastructure

Dr Sherry BAO, Dr Xinkun LU, Dr Richie CHEN and Dr Ivan SHAM

Nano and Advanced Materials Institute, Hong Kong, China

New Developments in Construction Chemicals for Precast Concrete

Ir Kiat Huat SEOW

BASF South East Asia Pte Ltd, Singapore

Experimental and Numerical Research on Cementitious Materials Degradation Caused by External Sulfate Attack

Dr Xu MA, Prof Xinxiang WANG and Prof Jianxin LI

Guangdong Provincial Academy of Building Research Group Co Ltd, Guangzhou, China

Chaired by Ir Daniel BROWN

Dinner Reception

Dinner Talk cum Best Paper Awards Presentation Ceremony

Royal One, 1/F, Tower 1 Enterprise Square, 9 Sheung Yuet Road, Kowloon Bay, Kowloon

Adapting the New Building Design Approach by Using Low Carbon Material in Building Eco-Friendly Skyscrapers

Ir Dr Julian LEE

Cinnatek International Group, Auckland, New Zealand

Day 2 – Smart Materials, Digital Quality Management and High Tech Startups

(09:00-17:30, 6 March 2020, Friday)

Chaired by Ir Dr WK FUNG

Progress of Chinese Cement Industry - Departing from Hong Kong

Prof Tongbo SUI

Sinoma International, China National Building Materials Group Co, Beijing, China

Mitigation on the Shrinkage of Concrete via the Use of MgO Expansive Additives

Prof Liwu MO, Prof Min DENG and Prof Lingling XU

State Key Laboratory of Materials-oriented Chemical Engineering; College of Materials Science and Engineering, Nanjing Tech University, Nanjing, China

Use of Silica Fume, Today and Tomorrow

Ben SEALEY, MICT

Elkem Silicon Materials, UK

Sustainability of Concrete Structures through Durability Enhancing Technologies

Mr Kevin YUERS

Kryton International Inc, Vancouver, Canada

CO₂-Reduced Calcium Aluminate Cement (CAC) Based Coatings and Concretes for Corrosion Resistant Sewer Applications

M SCHMID¹, BK YEO² and G Walenta¹

¹CALUCEM GmbH, Mannheim, Germany; ²CALUCEM Pte, Singapore

The Quality Control Strategy and Application of Concrete Durability in Urban Rail Transit Engineering

Prof Haiyong YU

Shanghai Research Institute of Building Sciences, Shanghai, China

Chaired by Ir Raymond WM WAN

CoDA - Concrete Damage Assessment by Coda Wave Interferometry

Dr Herbert WIGGENHAUSER

DFG Research Unit 2825, Berlin, Germany

Non-destructive Testing of Structural Steel Using Phased Array Ultrasonics over Conventional Ultrasonic Testing

Ir Dr Sajeesh Kumar BABU

ASTAR NDT Consultants Ltd, Hong Kong, China

Concrete Management System

Ir Gabriel WK CHAN¹, Mr Vincent KH MOK¹ and Mr Chun Ho TSE²

¹Gammon Construction Ltd; ²MTR Corporation Ltd, Hong Kong, China

High Performance Concrete "Glue" for Modular Integrated Construction

Dr Garfield X GUAN and Dr Anderson SH CHU

ConHubForm Construction Technology Co Ltd, Hong Kong, China

Using Machine Learning to Optimise Concrete Mix Designs for Performance, Cost, and CO₂

Issam ASHUR, Gideon FARRELL, Oliver GREET, Raphael SCHEPS and William TAI

Converge.io, London, UK

Closing Speech

Ir Raymond WM WAN

Chairman, Materials Division, The Hong Kong Institution of Engineers, Hong Kong, China

Note: (a) For paper with multiple authors, the name of the presenter is underlined. (b) Each timeslot includes 5 minutes Q&A.



Materials Science and Technology in Engineering Conference

Innovative Materials Science and Technology in the Greater Bay Area Construction

5-6 March 2020

Multi-Purpose Hall & Exhibition Area A, Zero Carbon Building, 8 Sheung Yuet Road, Kowloon Bay, Kowloon, Hong Kong

Registration Form

Personal Details

Name: (Ir/Prof/Dr/Mr/Mrs/Ms)

(First Name)

(Surname) (For printing onto the CPD Certificate)

HKIE Member: * Yes / No. If yes, please specify the Membership no.:

(*please delete as appropriate)

Company: _____

Position: _____

Email: _____ Tel: _____

Enrollment Fee

	Registration Fee	Registration (please "✓" as appropriate)
Members of The HKIE / Supporting Organizations	Early-bird (before 5 Feb 2020)	HK\$2,300
	Regular	HK\$2,600
HKIE Graduate Members under HKIE Scheme A / Full-time Students	HK\$1,900	

Remarks:

- The conference is designed for 2-CPD Days (12-hour). Attendance certificate will be issued after the conference.
- The fee includes a copy of Conference Programme Book, tea breaks and dinner on 5 Mar 2020 at Royal One (皇室 1 號東九龍), 1/F, Tower 1 Enterprise Square, 9 Sheung Yuet Road, Kowloon Bay, Kowloon (**Lunches NOT included**)
- Cancellation will be accepted only in writing via email no later than two weeks before the commencement of the Conference and only 50% of registration fee will be refunded.

Payment Method (Please ✓ as appropriate)

Check payable to "The HKIE Materials Division".

Visa / Master Card

I hereby authorize the Conference Secretariat, c/o Centre for Research & Professional Development, to debit the following credit card for registration fee payment of THE HKIE MATERIALS DIVISION - MaSTEC 2019 - to be held on 5-6 March 2020.

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Registration & Enquiries

For registration, please complete the registration form and have it returned to the Conference Secretariat with payment by check / credit card.

MaSTEC 2019 Conference Secretariat

c/o Centre for Research & Professional Development

Room 2108 Kimberland Centre, 55 Wing Hong Street, Kowloon, Hong Kong

For enquiries, please contact Ms May Ho at Tel : (852) 2796 1638; Fax : (852) 3016 8648;

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