



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited with "A" Grade by NAAC

Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai - 600 119.

Phone: 044 - 2450 3150 / 51 / 52 / 54 / 55 Fax: 044 - 2450 2344

www.sathyabama.ac.in



List of Faculties who received Awards and recognition at International, level from
Government/Govt. recognised bodies during the year
2019-2020

- Mr. R.Kaja Bantha Navas, Assistant Professor, Department of Aeronautical Engineering was awarded Global Engineer Leadership Scholarship as he has successfully completed a research internship in Department of Industrial engineering and Engineering Management, College of Engineering, National Tsing Hua University, Taiwan from 10th may 2019 to 10th July 2019. He also received an amount of Rs,40,000/- along with the certificate.
- Mr. R.Kaja Bantha Navas, Assistant Professor, Department of Aeronautical Engineering was awarded CMI Level 5 Recognition Certificate in Management and Leadership from Certified Profession for Change Management, CMI Institute, Dudley College, UK and AICTE
- Mr. S,Manigandan, Assistant Professor, Department of Aeronautical Engineering received an amount of Rs. 45435/- (Rupees Forty-Five Thousand Four Hundred and Thirty-Five only) from Science & Engineering Research Board (SERB) for the purpose of International Travel Support to visit Taiwan.
- Mr. S,Manigandan, Assistant Professor, Department of Aeronautical Engineering has been selected to undergo the short term internship funded by Ministry of Taiwan and Kaohsiung medical university with the standard stipend of 15000 \$NTD. Further, he was co-funded by the Sathyabama Institute of Science and Technology by offering the six months' salary and round-trip air tickets. During his visit to the Taiwan, he attended the international conference held in Taichung, International conference on alternative fuels, energy and environment (ICAFEE series): 2019.



Certificate of Completion

National Tsing Hua University

College of Engineering

This is to certify that

Kaja Bantha Navas R

was awarded the *Global Engineer Leadership Scholarship* and has successfully completed a research internship in the Department of Industrial Engineering and Engineering Management, College of Engineering starting from May 10, 2019 to July 10, 2019.

Chih-Huang Lai

Dean of College of Engineering
July 2019

This is to certify

Kaja Bantha Navas

has been awarded the

CMI Level 5 Certificate in Management and Leadership

600/9453/9

Date Issued

24/04/2020

Learner Number

P04669948



Cofre d'ydarno cydnabyddedig



Ann Francke
Ann Francke, Chief Executive

ofqual
REGULATED
register.ofqual.gov.uk

Credit Certificate

Kaja Bantha Navas

This certificate has been issued to mark the attainment of unit(s) and credits.

Unit No.	Unit Title	Credits	Level
D/504/9029	Conducting a management project	10	5
T/504/9036	Leadership practice	7	5

Date Issued

24/04/2020

Learner Number

P04669948



Conf. dylarno cydnabyddedig




Ann Francke, Chief Executive

ofqual
REGULATED
register.ofqual.gov.uk

FILE NO. ITS/2019/000652
SCIENCE & ENGINEERING RESEARCH BOARD(SERB)
(a statutory body of the Department of Science & Technology, government of India)

5 & 5A, Lower Ground Floor
Vasant Square Mall
Plot No. A, Community Centre
Sector-B, Pocket-5, Vasant Kunj
New Delhi-110070

Dated: 02-Jul-2019

ORDER

Subject: Reimbursement of travel grant to **Mr. Manigandan sekar (Young Scientist)**, Aeronautical, Sathyabama Institute of Science and Technology , Sathyabama university, jeppiar nagar, rajiv gandhi road, chennai, Chennai, Tamil nadu-600119 for attending "8th Global Conference on Global Warming, Qatar (22 April, 2019 to 25 April, 2019)" held in "Doha, Qatar".

1. Sanction of the **Science & Engineering Research Board (SERB)** is hereby accorded to the payment of a sum of **Rs. 45435/- (Rs. Forty Five Thousand Four Hundred and Thirty Five Only)** for meeting the expenses incurred towards participating in the above International event.

2. Sanction of the grant is subject to the condition as detailed in Terms & Conditions available at website (www.serb.gov.in and www.serbonline.in).

3. The expenditure involved is debitable to "**Fund for Science & Engineering Research (FSER)**".

4. **This grant is being reimbursed under the ITS scheme.**

5. The Sanction has been issued to Sathyabama Institute Of Science And Technology, Sathyabama University, Jeppiar Nagar, Rajiv Gandhi Road, Chennai with the approval of the competent authority under delegated powers on **25 June, 2019** and vide Diary No. **SERB/F/2073/2019-2020** dated **27 June, 2019**.

6. The release amount of **Rs. 45435/-** (Rupees Forty Five Thousand Four Hundred and Thirty Five only) will be drawn by the Under Secretary of the SERB and will be disbursed by means of RTGS transaction as per their Bank details given below:

Account Name	SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY- RESEARCH
Account Number	6089858032
Bank Name & Branch	INDIAN BANK INDIAN BANK, SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY BRANCH, Jeppiaar Nagar, Chennai, Tamil Nadu 600119
IFSC/RTGS Code	IDIB000S201
Email id of A/C Holder	provc@sathyabama.ac.in
Email id of PI	manisek87@gmail.com

7. It is certified that original boarding passes have been received along with other documents and retained in the Board.

8. In the eventuality of any excess payment arising on account of typographical errors, etc., the excess amount should be refunded immediately to the Science and Engineering Research Board (SERB) by way of an a/c payee cheque in favour of the "Fund for Science & Engineering Research". Non-compliance would lead to the SERB initiating recovery procedures which would also attract applicable penal interest which would be decided by the SERB.

9. In case of any discrepancy you may contact ITS Section at ms.its@serb.gov.in.


(Dr. Rajwant)
Scientist E
ms.its@serb.gov.in

To,
Under Secretary
SERB, New Delhi

Copy forwarded for information and necessary action to: -

1.	The Principal Director of Audit, A.G.C.R.Building, IIIrd Floor I.P. Estate, Delhi-110002
2.	Sanction Folder, SERB , New Delhi.
3.	File Copy
4.	Mr. Manigandan sekar (Young Scientist) Aeronautical Sathyabama Institute of Science and Technology , Sathyabama university, jeppiar nagar, rajiv gandhi road, chennai, Chennai, Tamil nadu-600119 Email: manisek87@gmail.com Mobile: 919791025158
5.	DIRECTOR, Sathyabama Institute Of Science And Technology, Sathyabama University, Jeppiar Nagar, Rajiv Gandhi Road, Chennai


(Dr. Rajwant)
Scientist E
ms.its@serb.gov.in

Mr.Manigandan Sekar from the department of Aeronautical Engineering, has been selected to undergo the short term internship funded by Ministry of Taiwan and Kaohsiung medical university with the standard stipend of 15000 \$NTD. Further, he was co-funded by the Sathyabama Institute of Science and Technology by offering the six months' salary and round-trip air tickets.

Program details as follows:

Program:	Short-Term Research Internship (STRI) Program
Fields:	Food & Environmental Toxicology, Analysis, Environmental Medicine
Organizer:	Research Center of Environmental Medicine, Kaohsiung Medical University (KMU), Taiwan
Co-Organizer:	Taiwan Experience Education Program (TEEP), MOE, Taiwan
Internship Period:	2~6 months (Minimum term should be atleast 2 months)
Internship Period:	Starts at 2019/10/01
Internship covers:	1) Free Medical & Accident Insurance during your intern stay at KMU 2) Free access to Research facilities and High instruments 3) Attending Conferences and Special Lectures at KMU

Supervisor details

Vinoth Kumar, M.Sc., PhD., MBA.,

Assistant Professor and Research faculty, Department of Medicinal and Applied Chemistry &
Research Center for Environmental Medicine, Research

Group: <http://kumarslab.wixsite.com/kumarslab>

Kaohsiung Medical University, Taiwan

Email: kumar@kmu.edu.tw, Cell: +886-928648004.



高雄醫學大學
環境醫學研究中心
Kaohsiung Medical University
Research Center for Environmental Medicine



FET-RCEM/STRI@KMU Acceptance and Invitation Letter

Date: Sep 20, 2019

Student Name: Sekar Manigandan (Passport No: N2143145)
Studentship/University: Sathyabama University
Country: India

Dear Sekar Manigandan:

We are pleased to inform you on behalf of Research Center of Environmental Medicine, Kaohsiung Medical University that your application and proposal for Short-Term Research Internship (STRI) Program has been accepted by our review committee.

This letter is to confirm that you have been offered with STRI program under Prof. Ming-Tsang Wu, and Prof. Vinoth Kumar as your supervisors, and your duties and assignments for this position will be described to you at program opening orientation by your internship supervisors.

Program details as follows:

Program:	Short-Term Research Internship (STRI) Program
Fields:	Food & Environmental Toxicology, Analysis, Environmental Medicine
Organizer:	Research Center of Environmental Medicine, Kaohsiung Medical University (KMU), Taiwan
Co-Organizer:	Taiwan Experience Education Program (TEEP), MOE, Taiwan
Internship Period:	2~6 months (Minimum term should be at least 2 months)
Internship Period:	Starts at 2019/10/01 and ends at 2020/01/31
Internship covers:	1) Free Medical & Accident Insurance during your intern stay at KMU 2) Free access to Research facilities and High instruments 3) Attending Conferences and Special Lectures at KMU

Please report to the Research Center of Environmental Medicine, Kaohsiung Medical University, Taiwan on or before Oct 15, 2019 along with the appropriate original documents as you submitted with application for review. If you have any further questions, please feel free to contact your supervisors or coordinator staff Dr. Yu-Ming Hsu. We look forward to seeing you soon in KMU and offer a very warm welcome.

Sincerely,

Ming-Tsang Wu, MD, ScD, MOH
Director
Research Center for Environmental Medicine
Kaohsiung Medical University
100, Shih-Chuan 1st Road, Kaohsiung, 80708, Taiwan



止本

檔 號：
保存年限：



教育部 函

地址：10051臺北市中山南路5號
聯絡人：吳亞君
電話：(02)77365645
Email：jennie@mail.moe.gov.tw

80708
高雄市三民區十全一路100號

已電子交換(未確認)

受文者：高雄醫學大學
發文日期：中華民國108年9月5日
發文字號：臺教文字第1080128353號
速別：普通件
密等及解密條件或保密期限：
附件：108高醫大TEEP0904

主旨：貴校執行108年「新南向及先進國家優秀青年學子來臺蹲點計畫」(TEEP@AsiaPlus)招收6名學員名冊(如附件)，本部同意備查。

說明：復貴校108年8月30日高醫國際字第1081103003號函。

正本：高雄醫學大學
副本：外交部領事事務局(含附件)

部長潘文忠

依分層負責規定授權單位主管決行

MAJOR FIGUREPRINTS



Figure 1. Interaction with industry people related to Automobile sector



Figure 2. Interaction with the IAEA, Director, USA



Figure 3. Presentation of the project final report to MOE

LABORATORY STRENGTH



Figure 6. Material characterization



Figure 4. GC-MS and LC-MS facility



Figure 5. Electrochemical analyzer facility

MAJOR OUTCOME

Collaborative laboratory and network

Faculty name	Affiliation
Eldon raj	Department of Environmental Engineering and Water Technology, IHE Delft Institute for Water Education, Westvest 7, 2611 AX Delft, The Netherlands
A.E. Atabani	Alternative Fuels Research Laboratory (AFRL), Energy Division, Department of Mechanical Engineering, Faculty of Engineering, Erciyes University, Kayseri 38039, Turkey
Yadav G	Department of Chemical Engineering, École Polytechnique de Montreal, H3C 3A7, Canada
Shashi Kant Bhatia	Department of Biological Engineering, College of Engineering, Konkuk University, Seoul, 05029, Republic of Korea
Gopalakrishnan Kumar	Institute of Chemistry, Bioscience and Environmental Engineering, Faculty of Science and Technology, University of Stavanger, Box 8600 Forus, 4036 Stavanger, Norway
Yasin Sohret	Suleyman Demirel University, School of Civil Aviation, Department of Airframe and Power Plant Maintenance, TR-32260, Isparta, Turkey
Vinoth Kumar P	Department of Medicinal and Applied Chemistry, and Research Center for Environmental Medicine, Kaohsiung Medical University, Kaohsiung City-807, Taiwan
Anburajan Parthiban	School of Civil and Environmental Engineering, Yonsei University, Seoul, 03722, Republic of Korea
Sabarathinam Shanmugam	Key Laboratory of Low-grade Energy Utilization Technologies and Systems, Chongqing University, Ministry of Education, Chongqing 400044, China
Sunday Ayoola Oke	Department of Mechanical Engineering, Faculty of Engineering, University of Lagos, Nigeria
Jamal S.M. Sabir	Centre of Excellence in Bionanoscience Research, King Abdulaziz University (KAU), Jeddah 21589, Saudi Arabia
Nguyen Thuy Lan Chi	Faculty of Environment and Labour Safety, Ton Duc Thang University, Ho Chi Minh City, Viet N

Arivalagan Pugazhendhi	Innovative Green Product Synthesis and Renewable Environment Development Research Group, Faculty of Environment and Labour Safety, Ton Duc Thang University, Ho Chi Minh City, Viet Nam
Sang-Hyoun Kim	School of Civil and Environmental Engineering, Yonsei University, Seoul 03722, Republic of Korea
Aran Incharoensakdi	Laboratory of Cyanobacterial Biotechnology, Department of Biochemistry, Faculty of Science, Chulalongkorn University, Bangkok 10330, Thailand

During his visit to the Taiwan, he attended the international conference held in Taichung, **International conference on alternative fuels, energy and environment (ICAFEE series): 2019.**



Figure 7. ICAFE conference session speaker

OTHER INTERACTIONS AND ACTIVITIES



Figure 8. Cultural programme activity



Figure 9. Presentation (MOE) ceremony

NOTABLE PUBLICATIONS



Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Fuel

journal homepage: www.elsevier.com/locate/fuel



Full Length Article

Impact of additives in Jet-A fuel blends on combustion, emission and exergetic analysis using a micro-gas turbine engine



S. Manigandan^{a,b,*}, A.E. Atabani^c, Vinoth Kumar Ponnusamy^{b,d,e,*}, P. Gunasekar^a

^a Department of Aeronautical Engineering, Faculty of Engineering, Sathyabama Institute of Science and Technology, India

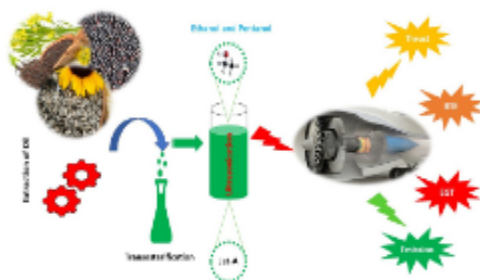
^b Department of Medicinal and Applied Chemistry, Kaohsiung Medical University, Kaohsiung City 807, Taiwan

^c Alternative Fuels Research Laboratory (AFRL), Energy Division, Department of Mechanical Engineering, Faculty of Engineering, Erciyes University, Kayseri 38039, Turkey

^d Research Center for Environmental Medicine, Kaohsiung Medical University, Kaohsiung City 807, Taiwan

^e Department of Medical Research, Kaohsiung Medical University Hospital, Kaohsiung City 807, Taiwan

GRAPHICAL ABSTRACT



ARTICLE INFO

Keywords:

Gas turbine engine
Combustion
Emission
Jet-A fuel
Ethanol
Biofuel

ABSTRACT

This study focuses on combustion, emission, and performance analysis of JET-A fuel blends with various additives using a micro gas turbine engine. The amount of oxygen in fuel blends and atomization are the crucial parameters in the production of a higher combustion rate with less emission. Therefore, various ratios of additives (ethanol and pentanol) are blended with biofuel (rapeseed and canola-sunflower oil) to form the JET-A fuel blends by using Kay's and Grunberg-Nissan mixing rules. The combustion, performance and emission parameters under different engine loads were examined. Results showed that all the blends logged higher static thrust with an appreciable reduction rate in the consumption of the fuel. Among different fuel blends, R20E (Jet-A 70% fuel, 20% Rapeseed, and 10% ethanol) showed 35% increase in static thrust associated with 41% reduction in thrust specific fuel consumption. Moreover, the blends R20E and CS20E (Jet-A fuel 70%, Canola-Sunflower 20% and 10% ethanol) indicated 24% and 10% increase in thermal efficiency respectively due to the influence of ethanol concentration and higher oxygen content. In addition, these fuel blends generate less emission of environmental unfriendly harmful gases, including NO_x, CO, and HC, compared to neat Jet-A fuel. Results revealed that the exergy destruction values are higher for the combustion chamber than the other conventional fuel components.



Full Length Article

Effect of hydrogen and multiwall carbon nanotubes blends on combustion performance and emission of diesel engine using Taguchi approach



S. Manigandan^{a,b,*}, A.E. Atabani^c, Vinoth Kumar Ponnusamy^{b,d,e,*}, Arivalagan Pugazhendhi^f, P. Gunasekar^a, S. Prakash^a

^a Department of Aeronautical Engineering, Faculty of Engineering, Sathyabama Institute of Science and Technology, Chennai City, Tamil Nadu, India

^b Department of Medicinal and Applied Chemistry, Kaohsiung Medical University, Kaohsiung City-807, Taiwan

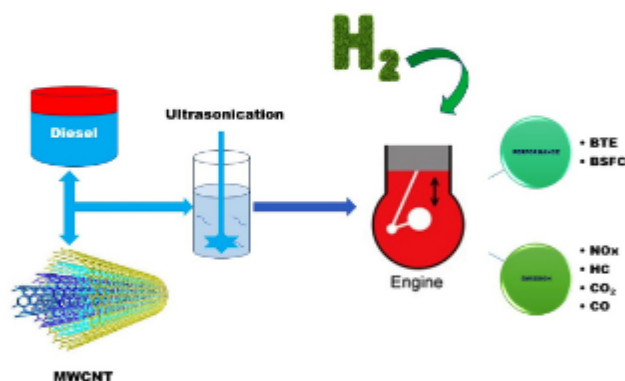
^c Alternative Fuels Research Laboratory (AFRL), Energy Division, Department of Mechanical Engineering, Faculty of Engineering, Erciyes University, Kayseri 38039, Turkey

^d Research Center for Environmental Medicine, Kaohsiung Medical University, Kaohsiung City-807, Taiwan

^e Department of Medical Research, Kaohsiung Medical University Hospital, Kaohsiung City-807, Taiwan

^f Innovative Green Product Synthesis and Renewable Environment Development Research Group, Faculty of Environment and Labour Safety, Ton Duc Thang University, Ho Chi Minh City, Viet Nam

GRAPHICAL ABSTRACT



ARTICLE INFO

Keywords:

Hydrogen fuel
Diesel
Multiwall carbon nanotubes
Combustion
Engine emission

ABSTRACT

The analysis of optimum engine conditions operating under hydrogen and multiwall carbon nanotubes (MWCNTs) blends using the Taguchi L16 approach were examined. The effect of hydrogen (10%, 20%, and 30%) and MWCNTs (30 ppm, 50 ppm, and 80 ppm) with different fuel blend proportions were evaluated at different engine loads of 25%, 50%, 75%, and 100%. Further, the influence of ignition pressure was evaluated at four intervals of 180 bar, 200 bar, 220 bar, and 240 bar. In addition, the ignition timing varied at different intervals of 21°bTDC, 23°bTDC, 27°bTDC and 31°bTDC, respectively. Taguchi L16 approach was designed according to the combinations of the array, including load, hydrogen, MWCNTs, ignition pressure, and timing with four optimal conditions. Results revealed that the L16 orthogonal array was a suitable method to find the optimized working conditions of the diesel engine for higher performance and less emission of NOx, HC, CO, and CO₂. Compared to neat diesel, the addition of hydrogen and MWCNTs reduces the emission with improved brake

* Corresponding authors at: Department of Medicinal and Applied Chemistry, Kaohsiung Medical University, Kaohsiung City-807, Taiwan.
E-mail addresses: manisek87@gmail.com (S. Manigandan), kumar@kmu.edu.tw (V.K. Ponnusamy), arivalagan.pugazhendhi@tdtu.edu.vn (A. Pugazhendhi).

<https://doi.org/10.1016/j.fuel.2020.118120>

Received 16 March 2020; Received in revised form 13 May 2020; Accepted 15 May 2020

Available online 23 May 2020

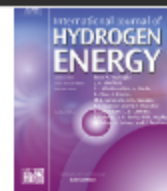
0016-2361/ © 2020 Elsevier Ltd. All rights reserved.



Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/he



Effect of nanoparticles and hydrogen on combustion performance and exhaust emission of corn blended biodiesel in compression ignition engine with advanced timing

S. Manigandan ^{a,*}, Vinoth Kumar Ponnusamy ^b, P.Booma Devi ^a,
Sunday Ayoola Oke ^c, Yasin Sohret ^d, S. Venkatesh ^a, M.Rakesh Vimal ^a,
P. Gunasekar ^a

^a Department of Aeronautical Engineering, Faculty of Engineering, Sathyabama Institute of Science and Technology, India

^b Department of Medicinal and Applied Chemistry, Kaohsiung Medical University, Kaohsiung City, 807, Taiwan

^c Department of Mechanical Engineering, Faculty of Engineering, University of Lagos, Nigeria

^d SuleymanDemirel University, School of Civil Aviation, Department of Airframe and Power Plant Maintenance, TR-32260, Isparta, Turkey

HIGHLIGHTS

- Dual fuelled hydrogen powered diesel engine studied with nano additives.
- Corn-hydrogen blends can be used without modifications to engine.
- BP and BTE is improved upon addition of hydrogen.
- Emission of CO, HC, NO_x and smoke opacity are less for all blends.
- TiO₂ nanoparticles performs superior than ZnO.

ARTICLE INFO

Article history:

Received 23 July 2019

Received in revised form

10 November 2019

Accepted 21 November 2019

Available online 13 December 2019

Keywords:

Biodiesel

Emission

Zinc oxide

Nanoparticles

Titanium dioxide

Hydrogen fuel

ABSTRACT

In this study, we have evaluated the influence of Zinc oxide and Titanium dioxide nanoparticles addition in hydrogen-corn blended biodiesel combustion performance and exhaust emission using a dual direct-injection compression-ignition engine. 5% of Zinc oxide and Titanium dioxide were mixed with corn-vegetable oil methyl ester under ultrasonication. Results revealed that the addition of nanoparticles improved the Brake power by 22% (Titanium dioxide) and 4% (Zinc oxide). Consequently, 18% and 15% reduction in brake specific fuel consumption indeed at 50% load compared to neat diesel. Furthermore, the addition of nanoparticles also resulted in a reduction of emission values of 37% and 26% in hydrocarbon, 26% and 36% for carbon monoxide, 19% and 15% in nitrogen oxide and followed by 13% and 8% of smoke opacity. Therefore, the results proved that hydrogen-corn biodiesel blended with nanoparticles additive reports a positive effect on compression-ignition diesel engines without major modifications in engine.

© 2019 Hydrogen Energy Publications LLC. Published by Elsevier Ltd. All rights reserved.

* Corresponding author.

E-mail address: manisek87@gmail.com (S. Manigandan).

<https://doi.org/10.1016/j.ijhydene.2019.11.177>

Flight itinerary



Open with ▼

A STAR ALLIANCE MEMBER

Passenger: MANIGANDAN SEKAR MR (ADT)

Booking ref: SOHB5J

Ticket number: 217 2330871687



Issuing office:
THAI AIRWAYS DELHI, NOVOTEL PULLMAN HOTEL,
AEROCITY IGI AIRPORT, DELHI
Telephone: 4149 7777
Date: 04OCT2019

ELECTRONIC TICKET RECEIPT

The picture identification shall be presented at check-in. THAI reserves the right for checking credit/debit card used for purchase of the ticket (by phone or internet) at any time.

"Smart Baggage" – an innovation baggage with integrated and installed lithium batteries, motors, power banks, GPS, GSM, Bluetooth, RFID or Wi-Fi technology, is subject to specific requirements to ensure that it does not pose a hazard to aircraft systems due to electromagnetic radiation. If carried as checked baggage, the installed batteries must be removed from the baggage at check-in counter and the removed batteries must be carried as carry-on baggage. The dimension of baggage is permitted at maximum length 56 cm (22 inches), width 45 cm (18 inches) and thickness 25 cm (10 inches) at the same size as carry-on baggage.

From	To	Flight	Departure	Arrival	Last check-in
CHENNAI CHENNAI INTERNATIONAL Terminal: 4	BANGKOK SUVARNABHUMI INTL	TG338	01:10 19Oct2019	06:10 19Oct2019	
Class: H	Operated by: THAI AIRWAYS INTERNATIONAL Marketed by: THAI AIRWAYS INTERNATIONAL				
Baggage (4): 30K	Booking status (1): OK		NVA (3): 19OCT2020		
Fare basis: H7LOIIE			Duration: 03:30		
BANGKOK SUVARNABHUMI INTL	KAOHSIUNG KAOHSIUNG INTL Terminal: I	TG2688	10:00 19Oct2019	14:20 19Oct2019	
Class: H	Operated by: THAI SMILE AIRWAYS Marketed by: THAI AIRWAYS INTERNATIONAL				
Baggage (4): 30K	Booking status (1): OK		NVA (3): 19OCT2020		
Fare basis: H7LOIIE			Duration: 03:20		

(1) OK = confirm (2) NVB = Not valid before (3) NVA = Not valid after (4) Each passenger can check in a specific amount of baggage at no extra cost as indicated above in the column baggage. Each piece of baggage may not exceed 32 kilos

PAYMENT DETAILS

Fare Calculation: MAA TG X/BKK Q47.00TG
KHH234.90NUC281.90END ROE71.969030

Form of payment:

Endorsements: INR2000 NONREF - NON ENDORSE/
CANCELLATION/ CHANGE FEE APPLIED/RFND NOT LATER
THAN 90 DAYS AFTER TKT EXPIRY

FARE DETAILS

Fare: INR 20290

Tour Code: TGCCMAA901W

Taxes: INR PD 82E7
INR PD 35G8
INR PD 82IN