The 16th Clayteam Seminar

"Material Development of Automobile in Tohoku"

Date and Time : Feb. 13, 2014 (Thur.)12:30-17:20 *Reception Starts 12:00-
Venue : Hall A/B, AER 21st Floor, TKP Garden City Sendai
3-1, Chuo 1-chome, Aoba-ku, Sendai, 980-6121, Miyagi, Japan
***Language : Japanese**

[Program]

12:30-12:40 The 16th Clayteam Seminar
【The Opening Remark】

12:40-13:40 【Chairperson】 Dr. Takeo Ebina, AIST
Speaker1 Keynote
"Automotive industries in Japan/ A history of Market and Planning and Development of Product"
Uzawa Takashi (Ritsumeikan University)

13:40-14:10 Speaker2
"Technical development of Automotive industries in Tohoku region and a support menu"
Naomitsu Imoto (Tohoku Bureau of Economy,Trade and Industry)

14:10-14:40 Speaker3
"The present state of the automotive industries in Tohoku area, and the perspectives towards the next generation."
Seiko Hayashi (Japan Industrial Location Center)(JILC)

14:40-16:00 Poster session (Hall B)

16:00-16:20 【Chairperson】 Dr. Hiroshi Nanjo, AIST
Speaker4
"A gas barrier layer of a hydrogen composite tank of fuel cell vehicles"
Dr. Takeo Ebina (AIST)

16:20-16:40 Speaker5
"Application development and deployment of non-combustible transparent composite material according to the industry-academia-government collaboration in the Tohoku region."
Akihiko Oyama (MIYAGIKASEI Co.,Ltd.)

16:40-17:00 Speaker6
"Joining of steel plate by metal caulking and its application for car industry"
Takenobu Hongou (ASTER CO.，LTD)

17:00-17:20 Speaker7
"Electrical insulating properties of Toughclaist and the Development of the heat releasing materials"
Takushi Yamamoto (SUMITOMO SEIKA CHEMICAL CO., LTD)

17:20 【The Closing Remark】

［Get-Together-Reception］
Venue: Hall C, TKP Garden City Sendai (AER 30F)
Fee: 5,000yen

The 16th Clayteam Seminar

<Short Abstract>

[Speaker1] **"Automotive industries in Japan/ A history of Market and Planning and Development of Product"**

Takashi Uzawa (Ritsumeikan University)

It has been around 100 years since the automobile, which had been invented at Europe (Germany) in the end of 19th Century, was established that mass production method by Ford at the U.S.A.in the beginning of 20th.

In this 21st century, now, the competitiveness of the automobile industry exists in the individual market of each country, and at the same time it is becoming how to build up their global net-work. The competitiveness is not only on the side of R&D and production, but also on the consumer market.

[Speaker2] **"Technical development of Automotive industries in Tohoku area and a support menu"**

Naomitsu Imoto (Tohoku Bureau of Economy,Trade and Industry)

Automobile Industry Office of Tohoku METI have been promoting advancement and innovation of material-related industries, especially "uniqe technology".

Today, we introduce importance of proposing and developing technology in automobile industry in Tohoku, our prioritized supporting technologies and our support measures.

[Speaker3] **"The present state of the automotive industries in Tohoku region , and the perspectives towards the next generation."**

Seiko Hayashi (Japan Industrial Location Center)(JILC)

Various business categories such as car-electronics, HV, EV, PHEV, FCV, automatic driving, small mobility, ITS, etc. are included in the next-generation automotive industry, and creating innovation is expected to promote competitive power of industries in our country.

In such circumstances, aiming at increase of local supply rate at a production base of 500,000 cars per year, actions to join in automotive industry from local companies, progress in R & D, and improvement of production technologies, are becoming active in Tohoku area via industry-university-government cooperation and industry-industry cooperation.

Under "the strategic promotion project for new local industries by Tohoku Bureau of Economy, Trade and Industry", the actual situations of the automotive related companies are now surveyed in the Tohoku area I will introduce the present state of the automotive industries in Tohoku area, and show the perspectives towards the next generation.

[Speaker4] **“A gas barrier layer of a hydrogen composite tank of fuel cell vehicles”**
Dr. Takeo Ebina (AIST)

We have been developing a novel film "Claist" composed mainly of clay. One of the characteristics of Claist is very high gas barrier property; particularly, it has a high barrier property against hydrogen gas. Applications that take advantage of this feature, we evaluate the material as a gas barrier layer of a hydrogen composite tank of fuel cell vehicles. In this lecture, some hopeful applications including the hydrogen tank will be introduced.

[Speaker5] **“Application development and deployment of non-combustible transparent composite material according to the industry-academia-government collaboration in the Tohoku region.”**
Akihiko Oyama (MIYAGIKASEI Co.,Ltd.)

To improve flame retardant property of plastic materials, conventionally a method of adding a metal compound or a flame-retardant resin has been used. The developed-transparent composite material has high non-flammable property by coating Claist (clay film) on the surface layer of GFRP (glass fiber reinforced plastic), the technology was completely different from the conventional flame retardant methods. Using this technology, we have successfully developed the transparent GFRP which simultaneously satisfies incombustible property, optical transparency, light weight, and safety. I will introduce an overview of the research and development to date based on an industry-academia-government collaboration, for the future development toward commercialization.

[Speaker6] **"Joining of steel plate by metal caulking and its application for car industry"**
Takenobu Hongou (ASTER CO.，LTD)

In the automotive industry, the use of composites and aluminum is now popular for body rigidity and to improve fuel efficiency, but spot welding (from 4,000 to 5,000 per vehicle places) has a problem due to the combination of different materials. Our caulking technique by plastic deformation of the plural steel plates, it is possible to easily joined high-strength different materials, one of the effective means as an alternative technique for existing method. This bonding method has been widely used as very reliable procedure in Europe; the Japanese automaker has also attracted attention in recent years. In the lecture, we will introduce the features of metal caulking that we have developed, and the development for automotive industry.

［Speaker7］ **“Electrical insulating properties of Toughclaist and the Development of the heat releasing materials”**
Takushi Yamamoto (SUMITOMO SEIKA CHEMICAL CO., LTD)

Toughclaist is a composite material consisting of non-swelling clay and polyimide. It has been developed under the joint research program between Sumitomo Seika Chemicals and Dr.Takeo Ebina (a leader of the Advanced Functional Materials Team, the Research Center for Compact

Chemical System, National Institute of Advanced Industrial Science and Technology
" AIST"), with technical guidance from Dr.Takashi Yamashita (an associate professor at Tokyo University of Science, Department of Science and Technology).

Toughclaist has high heat resistant properties, superior weather resistance properties, incombustible properties, low linear coefficient of expansion, low thermal contraction property, excellent electrical insulating properties, thermal conductance properties and superior heat radiation properties, and is expected to be suitable for a wide variety of applications such as heat release materials, sealing materials, incombustible composite materials, base material for PED, coating materials.

Toughclaist as commercial products can be provided by self-sustained films, coated films with aluminum foil or copper foil, composite films with heat resistance cloth materials, coated metal molding materials and so on.

At this presentation the heat releasing materials consisting of coated film with aluminum foil or copper foil will be main topics and also a part of many applications will be introduced.