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技術資料
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Present Situation of Education and Research on Foundry Engineering in Korea

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1. Introduction

The field of manufacturing engineering is the basis of a national industry. More than 80% of Korean annual exports is from the products of manufacturing industry. It is not possible to continue the economical progress without continuous development of this field. Especially the upgrade of manufacturing technology and the promotion of new technologies and engineers are very important. One of the basic areas in manufacturing industry is foundry engineering.

Even though foundry products are being used as basic components, some of these are being replaced by wrought products or other materials. However, castings have also successfully replaced many parts made by pressing and welding. There are around 560 foundries in Korea and the majority of the foundries are producing cast iron and steel products. The foundry production has increased from 1998 to 2000 and has surpassed the status before the financial crisis in 1997, mainly due to the increased automobile production. Korea has produced around 1.65 million tons of castings in 2000 and is expected to increase its production in the future in accordance with the automobile and machine industry.

In the following, the education and research institutes for foundry technologies in Korea will be surveyed.

2. Universities and Research Institutes

The foundry industry in Korea is confronting difficulties due to the lack of workers and new invest-

ments, environmental problems, negative images with 3D-industry and the competition with the foreign foundry industries with cheap labor cost.

The engineers are constantly confronted with the challenge of bringing new ideas and designs into reality to reduce the cost and increase the quality and productivity. To do this effectively he requires a broad background of materials and manufacturing knowledge. There are 25 universities in which solidification and foundry oriented courses are offered in the department of metallurgical engineering or materials science and engineering. They usually offer one or two courses on foundry engineering and/or solidification for undergraduate and graduate students. The metallurgical engineering oriented departments have been producing around 1200 bachelors every year, but not many of them go to the foundry industry nowadays because they think the foundry jobs as dirty, difficult and dangerous ones and their future not bright.

The metallurgical engineering oriented departments have also significantly contributed to the foundry industry by doing research. There are around 40 professors in universities and technical colleges who are now members of the KFS. Many of them are doing research on solidification technologies rather than traditional foundry engineering. This is supposed to be one of the problems nowadays.

More than 20 foundry researchers are working at national and industrial research institutes. The researchers from national research institutes are working usually on the research projects funded jointly by the government

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and the small and medium industrial companies or only by the government. Those from industrial research institutes which are established by industrial companies are working on the research projects to develop new products or technologies for their own companies.

Among national research institutes, the Foundry Technology Research Center in the Korea Institute of Industrial Technology (KITECH) which is based in Incheon is most active.

3. Korean Foundrymen's Society

The number of members of the Korean Foundrymen's Society is 860, including 60 companies and 34 organizations in the year 2001. The average number is maintained in the same level in recent years. Fifteen per cent of 766 personal members are university faculties, whereas 11% from national research institutes or research institutes established by private company. There are 73 student members. They are graduate students of universities, whose major is foundry engineering. More than 63 per cent of personal members are from industrial companies. Presently, not many of the engineers from foundries are joining the Society. This is supposed to be a problem of the society. If we take a look at the distribution of age of members, more than 70% of personal members are between 41 and 60. This is another problem of the society. This is because not many young peoples are joining the society nowadays.

There are 3 full time staffs in the KFS office, one is the general secretary and the other two ladies for publishing the Journal of KFS, which is issued 6 times a year, and for seminars etc. KFS holds three annual meetings in spring, summer and fall. During the spring and fall meetings, usually about 30 research papers are presented and about 10~15 technological talks are given. The summer meeting is only with about 20 technological talks. Usually technological talks are given by the engineers from companies, university faculties and researchers from institutes and often also by foreign experts.

4. Seminars and training courses on foundry technology.

As far as the education and training on foundry technology are concerned, unfortunately there's no regular series of seminar or program in Korea presently. Only a few universities, technical colleges and government organization and research institutes like Korea Small and Medium Business Development Corporation are organizing seminars and training courses temporarily on the subjects of pattern making, molding, melting, heat-treating, finishing and etc. Some seminars on the computer simulation of solidification or that on materials are given by a few universities, technical college and especially the Korea Institute of Industrial Technology. A few workshops on the subjects like die casting, high technology materials and etc. are held at some universities and technical colleges.

The qualifying examinations for foundry technicians who are graduating from technical high school and for foundry engineers who are graduating from technical college and universities are organized by the Ministry of Labor. Two classes of each for technicians and engineers respectively are given on the bases of the results of written and practical examination.

The KFS is going to start systematically regular series of seminars and education programs for the industrial engineers and technicians from 2002. There are good examples of such courses offered by AFS in U.S.A. and VDG in Germany.

5. Final comments

At almost all universities in Korea, Two or more departments like the Department of Metallurgical Engineering and the Department of Inorganic Materials Engineering had been merged to one School or Division of Materials Science and Engineering to pursue the progress and expansion for the future. One of the purposes is to promote the quality of students and another to give students broader opportunities to choose their own major field. The curricula of university courses have been significantly changed to give students more flexibility to suit themselves later for their industrial fields. The abilities of english conversation and using computer are emphasized also in the university courses.

The names of departments having "Metallurgical Engineering" have been changed to new ones having "Materials Science and Engineering" because two or more departments had been merged. Of course, there are two or more major fields such as metals, ceramics, electronic materials and/or macromolecular engineering. Foundry metallurgy or engineering which is one of the subfield of the metallurgical engineering takes a minor position in most departments. The reformation of

reorganization should be profoundly considered for the future education and research systems for foundry engineering. Especially, the research and education field for the basic production technology should not be neglected and the casting method will remain as a very competitive one also in the next 100 years. The balance among these fields and other advanced ones should be maintained.

國內外鑄物關聯行事

2001

10. 8~10. 11

Metals Engineering 2001
Birmingham, 영국

10. 12~10. 15

The 7th Asian Foundry Congress
Taipei, 대만

10. 22~10. 25

일본주조공학회 제139차 전국강연대회
Hiroshima, 일본

10. 29~11. 1

21st International Die Casting Congress and
Exposition
Dallas, TX, 미국

11. 2~11. 3

KFS Annual Fall Meeting
광주, 한국

11. 5~11. 8

국제심포지움PMP2
Sanfransisco, 미국

11. 13~11. 16

The 1st China International Foundry Material
Conference & Exhibition
Shanghai, 중국

11. 22~11. 23

BelSlit Snnual Foundry Conference
Minsk, 블라로스

11. 27~11. 29

Sanghai Metal Expo
Shanghai, 중국

12. 3~12. 4

ALUCAST 2001
New Delhi, 인도