Activities of Forging in Japan
September 2014-August 2015

S. Isogawa, Chairman of Forging Committee in JSTP

1. Activities of Forging Committee in JSTP

The total number of the JSTP Forging Committee members was slightly increased (145 members: 99 from companies, 46 from universities and institutes).

The following meetings were held during the period from September 2014 to August 2015 by the committee.

(1) Technical Meeting (November 27, 2014 in Hiroshima-city, Hiroshima)

Technical meeting entitled “Evolution of production technology in Automobile” was held, and 3 lectures and technical visit to Mazda Motor Corporation in Hiroshima-city were prepared for 46 attendants.

(2) Annual Seminar of forging lectures by Engineers from companies (February 23-24, 2015 in Nagoya-city, Aichi)

Annual Seminar entitled “Forging Technology that supplies high added value” was held at Daido University, 16 lectures and a technical visit to Asahi Sanuc Corporation were prepared for the record-high 143 attendants. The fields of lectures were Divided Flow, Closed die Forging, Hollow shaft and Plate Forging. Every 4 technical field introduced 3 specific examples for practical use.

(3) Plenary Meeting and Technical Meeting (June 12, 2015 in Osaka-city, Osaka)

The 2014 Plenary meeting of Forging Committee was held at New Osaka Maru Building with 33 participants. After Plenary Meeting, two forging engineers from companies were commended for their outstanding achievement in developing of forging technology. And then, 3 presentations about “Latest forging die Production Technology in Dijet Industrial Company” were given. The technical visit with 26 attendants to Dijet Industrial Company was carried out.

(4) JSTP Awards

At JSTP Plenary conference dated on June 29 in 2015, Dr. Y. Yoshida from Gifu University in the field of forging won the JSTP Medal for Scientific/Technological Achievement entitled with “Development of Ductile Fracture Parameter Identification Method and Its Application for Numerical Simulation”.

(5) Cooperation with Japan Forging Association

Japan Forging Association, JSTP forging committee and Nagoya University continue the program, which develops human resources in forging industries. JSTP forging committee plays roles in making curriculum and textbook and lecture in the program.

2. ICTP2014

The 11th ICTP was held in Nagoya, Japan on October 19th -24th, 2014. It was organized on behalf of the Japan Society for Technology of Plasticity (JSTP).

About 580 abstracts have been submitted from 37 countries. A total of 403 papers were accepted.
after a rigorous reviewing process for presentation and inclusion in Procedia Engineering as the
conference proceedings. In addition, 55 valuable papers were recommended as candidate papers
of the JMPT journal by the SAB/ICTP members. The proceedings include 8 invited plenary
keynote papers by distinguished experts.
About 43 papers in forging secessions were presented and open accessed from the ELESVIER
home page (http://www.journals.elsevier.com/procedia-engineering/).

3. Activities in Industry

Grand total weight of Japan forging production in 2014 was 2,244,268 tons, slightly increase
total production in 2014 and about 80% of the peak year 2007. For transport machinery, total
weight of production in 2014 was 1,592,087 tons, 101.0% of production last year.

The 4th MF-Tokyo was held during July 15-18, 2015 at Tokyo Big Sight. Press machines,
sheet metal machines (including laser and plasma processing machines), forming machines and
its peripheral equipment are major exhibiting products of the fair.

The sub-theme of MF-Tokyo 2015 was “Forming technologies are advancing delivering,
smart and cool metal forming machinery.” The scope of exhibits were Sheet metal processing
machines including laser and plasma processing machines, punching press and press brakes,
Forming machines including metal processing products, automation equipment, safety
equipment, CAD/CAM, welding machines and Die and Molds, Press machines including servo
presses, mechanical presses, hydraulic presses and forming presses.

JSTP was one of the co-organizer and had a symposium and seminar in the exhibition. In the
technical seminar section, 4 special forging related topics were presented such as Development
of Synchronous Integrated Production System with 1/N Processing Machine, Revolution of
Lubrication in Cold Forging by Dry In-place Type Coating System “PLUS”, Development of
Two-point Servo Press with New Mechanism Using Fan-shaped Support Rod and Trends of
Light-weight Forging Components.

SOKEIZAI gave citation to 15 companies in 30th SOKEIZAI Industrial Technology Award
Winner ceremony in 2014 including the development of “Development of Hot Press Forming
technology of 1800MPa class Vehicle Body Component”, “Development of Press Forming
Technology of Emboss Heat Shield Plate” and “Development of Press Forming technology of
Magnesium Lithium Alloy” in the forging and related field.

Bulletin of JSTP on 2014-9 specialized “Mini Special Issue on challenges of Small and
Medium-sized companies in Metal forming”. The following topics were published.

Cylindrical Cup with inner upper and lower cup and outer cup was made by utilizing Divided
Flow by Fuji Press Corporation. The principal deformation mechanism is that the wall made by
depth drawn cup with a hole is compressed and bottom inner hole wall is divided into two
directions, which lead to the inner upper and lower cup.

Uchida Soki Co., Ltd. made the Injector Housing by combination of Deep drawing and Plate
forging. The starting material SUS430 with 2.5 mm thickness was made into cup with 1.5 mm
wall thickness and 4.2 mm bottom thickness.

HEIAN MFG. CO., Ltd. made Conventional Drive plate welded with press plate and ring gear
into one piece Mono block gear, part of which was net shaped with high accuracy by Plate
Forging Technology. The starting plate thickness is 2.3 mm thickness and gear thickness is 9
mm.
4. Paper presentations in JSTP annual meeting

Following is the list of papers concerning forging technology that were presented at the annual meeting of JSTP2014-2015.

(1) Risa Harada, Yasuhiro Yogo, Masatoshi Sawamura, Michiaki Kamiyama, Noritoshi Iwata & Takashi Ishikawa: Measurement of flow stress of Al depending on strain rate in the largest train range by High pressure torsion
(2) Takehiko Makino, Toshinari Michimoto & Shinpei Moriyama: Contact potential difference measurement of adhesion process in micro/meso-scale injection upsetting
(3) Hayato Usui, Takashi Iizuka & Yoshihiro Kawasaki: Production of a Dumbbell-shaped in Thickness Direction Specimen by Incremental Continuous Sheet Forging
(4) Osamu Kada, Kei Miyanishi, Yukari Nose & Hidekazu Yanagi: Evaluation of anti-seizure performance of cold forging lubricant coating by backward extrusion
(5) Osamu Kada, Kei Miyanishi, Yukari Nose & Hidekazu Yanagi: Influence of weight of cold forging lubricant coating on lubricating performance
(6) Yoshiki Sakai, Yoshinari Tsuchiya & Zhigang Wang: Effect of Surface Profile of Work Piece on Lubricity of White Type Lubricants
(7) Tomoyoshi Maeno, Minoru Sugawara & Ken-ichiro Mori: Optimization of slide motion in inner spline backward extrusion having environmentally benign lubrication system by low-cycle oscillation
(8) Ayami Nagai, Sumio Sugiyama, Tadahisa Mera & Jun Yanagimoto: Acquisition of Material Genome for Ti-6Al-4V Alloy
(9) Jun Yanagimoto, Sumio Sugiyama & Jinyu Lin: Physical simulation on the effects of hot deformation style on the evolution microstructure
(10) I Liyana Tajul, Tomoyoshi Maeno, Takaya Kinoshita & Ken-ichiro Mori: Improvement of surface quality of tailor forged blank produced by successive forging for hot stamping by optimization of punch shape
(11) Takashi Ueda, Shinichi Enoki & Takashi Iiduka: Establishment of Method to Set Material Properties on Forging Analysis of Blank Consisting of Two Metals
(12) Kodaira Yuya, Kodaira Naommi, Kobayashi Nobuhiko, Saijo Koichi & Nakayama Noboru: Influence of die positioning accuracy by main gear phase difference of two points Servo Press
(13) Takuma Kagechika, Ryo Matsumoto & Hiroshi Utsunomiya: Influence of heat generation by plastic deformation on shape accuracy of forged product in cold backward extrusion with step ram motion
(14) Tomoyoshi Maeno, Minoru Sugawara & Ken-ichiro Mori: Improvement of surface quality in inner spline backward extrusion by low-Cycle oscillation using Servo Press
(15) Chikage Kato, Hideo Yokoi, Yutaro Sugimoto & Yoshitaka Kuroda: Improvement of
surface hardness by orbital forging (2)
(16) Tadatsugu Yoshida: Study of CAE Solver Based on Elementary Processes of Deformation -2
(19) Tetsuo Oya & Masaharu Usami: Estimation of the Work Hardening Curve for Large Deformation Analysis (3rd report)
(20) Takashi Nomuma, Nguyen Sinh Con, Kazuhiko Kitamura & Keiichi Matsunaga: Influence of material flow on asymmetry shape on upsetting
(21) Junfeng Zhang, Yoshinari Tsuchiya & Zhigang Wang: Observation of behavior change of white type hot forging lubricants by heating
(22) Akito Ishikawa, Yoshinari Tsuchiya & Zhigang Wang: Improvement of spray conditions applying white type lubricants to hot forging Production lines.