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- 34<sup>th</sup> Conference “Tagung Werkstoffprüfung 2016” Progress in Materials Testing for Research and Practice
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## Energy

### Involvement of the steel industry in the Energy Efficiency Networks initiative

- 86 networks have already been set up.
- 4 networks are currently operating with the involvement of the steel industry – with crude steel production amounting to 27.5 mill. tonnes (approx. 65% of crude steel production in Germany):
  - > Sector network: the “Electric Steel Energy Efficiency Network”.
  - > Group network: “thyssenkrupp steel energy+” as an internal group network.
  - > Group network: “EnERGY” – Salzgitter’s Energy Efficiency Network.
  - > IVH<sup>1</sup> municipal network: “Energy Efficiency Network for Hamburg’s industry”.

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### Award for the efficiency network on electrical steel for their work on Energy Efficiency

The first annual conference of the Energy Efficiency Network Initiative took place in September. The energy efficiency network on electrical steel which is organized and moderated by the Steel Institute VDEh got an award for their good benefits for climate protection and their work on energy efficiency within the initiative. Dr. Peter Dahlmann - Executive Member of the Managing Board of the Steel Institute VDEh - representing the eleven participants of the network on electrical steel received the certificate from Federal Environment Minister, Dr. Barbara Hendricks (BMUB), and the Secretary of the Federal Ministry for Economic Affairs and Energy, Uwe Beckmeyer (BMWi).

For more information please visit: [www.effizienz-mit-stahl.de](http://www.effizienz-mit-stahl.de)

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<sup>1</sup> Industrieverband Hamburg (IVH) according to the initiative’s website

## worldsteel association

### 48<sup>th</sup> TECO Meeting of worldsteel from 17 - 20 April 2016 in Beijing, China

49 representatives from 16 companies in China, Japan, South Korea, the USA, Turkey, Saudi Arabia, India, Sweden (SSAB), Austria (voestalpine) and Germany (VDEh) attended.

Hesteel (formerly the Hebei Group) – with 20 subsidiaries – hosted this year's Technology Committee Meeting. The company employs about 110,000 personnel, of which roughly 60,000 are in the Steel Division. The company's Steel Division has a capacity of 50 mill. tonnes of crude steel and, according to its figures, produced 47.75 mill. tonnes of crude steel in 2015. The entire group's R&D expenditure was approximately EUR 400 mill. The final day consisted of a visit to the Hesteel works in Tangshan. The works was founded in 1943, employs 33,000 personnel, has a capacity of 18 mill. tonnes of crude steel, and claims to be the "birthplace of converter steelmaking in China". The committee members examined the water preparation plant, one blast furnace and two production lines for automotive steels.

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## Metallurgy

### Roadmap iron ore reduction with hydrogen

The working group for the roadmap is currently investigating in the topics kinetics of the reduction of iron ores with H<sub>2</sub>, effect of formed H<sub>2</sub>O steam on the reduction kinetic in a shaft furnace and thermodynamic at temperatures over 700 °C and evaluation of economy.

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### Compendium Refractory Materials for Steel Production

During its meeting on 13 March 2016 in Völklingen, TC Refractory Materials invited 10 high ranking speakers from refractories industry to address the most important grades of refractory materials. Starting from definition, composition and characterisation the focus was laid on the applications and latest refractory developments. The results were compiled within a "Compendium Refractory Materials for Steel Production". Target group of the booklet are the users in the steelworks.

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**50 Years of Collaborative Work in Ingot Casting - 1<sup>st</sup> VDEh-JK-IMF-Symposium on Ingot Casting Metallurgy.** The first VDEh-JK-IMF Joint Meeting on Ingot Casting took place in Düsseldorf on 19 May 2016. This event was dedicated to the 50<sup>th</sup> anniversary of scientific-technical cooperation of ingot casting steel companies today organised in Steel Institute VDEh. Although it was the 9<sup>th</sup> meeting between the ingot casting works from Swedish Jernkontoret (JK) and those from Steel Institute VDEh, the meeting was the first with represents from American Ingot Metallurgy Forum (IMF). With 50 participants from Austria, Germany, Mexico, the Netherlands, Norway, Sweden and USA the interest was huge.

The lecture program comprised 13 presentations focussing the topics cleanliness during ingot casting, stresses, defects and electro slag remelting. Deoxidation, reoxidation, coagulation and separation of non-metallic inclusions but also reactions of refractory materials with the melt have crucial impact on cleanliness of ingots. The development of the electro slag remelting process made huge steps forward during the last 10 years, especially.

JK, IMF and VDEh ingot casting experts appointed to continue the cooperation. Jernkontoret therefore invited the "2<sup>nd</sup> JK-VDEh-IMF Joint Meeting on Ingot Casting" to Sweden in 2019.

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## Steel materials

### Light construction initiative by the BMWi

Right from the start, the VDEh was involved in the light construction initiative of the Federal Ministry for Economic Affairs and Energy (BMWi), implemented in collaboration with the IG-Metall union, and also participated in a study by the VDI Centre for Resource Efficiency. This initiative is currently continuing with the creation of a Light-Construction Competence Atlas which will include all the relevant players in this field and will be made available to the public. It should be finished by the end of the year.

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### 2<sup>nd</sup> Costumer Conference „Massiver Leichtbau im Automobil: Werkstoffe & Bauteile, Potentiale & Lösungen“ on the 31 May/1 June 2016 in Stuttgart

The Initiative Lightweight Forging (Initiative Massiver Leichtbau, [www.massiverLEICHTBAU.de](http://www.massiverLEICHTBAU.de)), a cooperation of the Steel Institute VDEh and the Industrieverband Massivumformung, presented the results of the second industrial project which analyzed the lightweight potential of a light commercial vehicle in their 2<sup>nd</sup> costumer conference in Stuttgart. More than 150 people from car producing companies, component suppliers, forging companies and steel producers got together in order to discuss the lightweight potential of 99 kg that had been identified in workshops prior to the conference. Innovative steels, modern processes and intelligent manufacturing can reduce the weight of vehicles significantly by using already existing know-how of steel producers and forging companies. Additionally, first results from the research cluster Lightweight forging, led by FOSTA, were presented so a further potential weight reduction can be expected in the future.

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After the successful **Materials Week/Werkstoffwoche** 2015 the Steel Institute VDEh and the DGM Deutsche Gesellschaft für Materialkunde again agreed a common organization: The next Materials Week/Werkstoffwoche will take place on 3 days from Wednesday, 27 September to Friday, 29 September 2017 in Dresden. The Steel Institute VDEh represents the material steel on this event.

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### SCT 2017 Conference

The 5<sup>th</sup> International Conference on Steels in Cars and Trucks to be hosted by the Steel Institute VDEh will take place from the 18 to 22 June 2017 in Amsterdam-Schiphol. 'Bringing the automotive, supplier and steel industries together' is one of the two goals behind this year's SCT 2017. This motto reinforces what the modern steel industry is all about: partnerships across value chains being made up of industry, research and development professionals. The second motto of SCT 2017 is: 'Future trends in steel development, processing technologies and applications'. The ability to steadily innovate

one of the traditional and most innovative materials for industrial use is reflected in the increasing amount of steel being consumed across the world. Steel delivers a lot of solutions for solving such future global challenges as living and mobility in megacities or the preservation of material resources due to steel's excellent possibilities for recycling. [www.sct2017.com](http://www.sct2017.com)

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### ECCC 2017 Conference

The 4<sup>th</sup> International ECCC Creep & Fracture Conference hosted by the Steel Institute VDEh will take place from the 10 to 14 September 2017 in Düsseldorf. During ECCC 2017, experts, both from industry and science, will meet to present and discuss the most recent developments and experiences in all aspects of creep behavior of high temperature industrial materials and components for the energy industry. Conference Topics will include high temperature materials development, creep data analysis and



methodology recommendations, component design and life assessment, microstructural and damage studies, high temperature damage interaction, effects of flexible operation on high temperature materials, lifetime assessment and determination as well as new creep testing and modeling methods. For more information please check [www.eccc2017.com](http://www.eccc2017.com).  
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## 34<sup>th</sup> Conference "Tagung Werkstoffprüfung 2016" – Progress in Materials Testing for Research and Practice

The conference takes place in Neu-Ulm/Germany from 1 to 2 December 2016 and is hosted by the German Society for Materials Science (DGM) (<https://wp.dgm.de/home/>) in cooperation with the German Association for Materials Research and Testing (DVM) and the Steel Institute VDEh.  
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## Steel and Iron Test Sheet – SEP 1928 "Non-destructive surface hardness testing on ferromagnetic steel products with electromagnetic methods" 1<sup>st</sup> Edition, date of issue 06/2016, is published.

This test specification sheet treats the non-destructive surface hardness testing on ferromagnetic steel products by means of quantitative electromagnetic methods. The objective of the testing is to identify discrete hardness values for the tested product. The specification is applicable for the testing of uncoated ferromagnetic steel products, i.e. rolled semi-finished, heavy plates, strips, pipes and forgings made of ferromagnetic steel and steel products which have been formed from it.  
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## Standardization

### Standardization strategy

Based on the decision of the executive board of VDEh on 16 March 2016 in Düsseldorf, concerning the standardization strategy of the steel industry, the working group (STAG) has started its permanent work since the meeting on 9 September 2016. The scope and frame procedures to the further work of STAG were discussed and agreed. Mr. Dr. Burkhard Raith was voted unanimously as Chairman of the strategic working group. The next meeting has been fixed on 3 March 2017 in Düsseldorf.

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### Management of DIN- Standard committee for Iron and Steel (FES)

Mr. Eberhard Barthel former manager of DIN- Standard committee for Iron and Steel (FES) retired by 1 September 2016. The management board of Steel Institute VDEh and DIN nominated Dr. Richard D. Knobloch as new manager of the DIN- Standard committee for Iron and Steel (FES) by 1 September 2016.

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## European Scientific Steel Panel

**3<sup>rd</sup> European Scientific Steel Panel.** The 3<sup>rd</sup> European Scientific Steel Panel (ESSP) addressed the topic "Steel in Circular Economy" in Düsseldorf on 29 April 2016. It became very clear: Circular economy will not work without metallurgical recycling. Present research focusses have been identified in improving the metallurgical recycling in terms of new separation techniques for so called tramp elements in steel scrap. A brochure summarized the results of the previous ESSP's starting in December 2014.

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## Research and Development

**BFI is playing a very active role for steel research in European programs:** in the current RFCS call, BFI has submitted 28 proposals. In Horizon 2020, 5 projects with participation of BFI were accepted in this year: 4 are in the area of water management, recycling and recovery of valuable resources, and an additional project dealing with the optimisation of complex industrial processes.

On national level, BFI is now playing a stronger role in the representation of interests of independent non-profit research organisations and of steel research: Prof. Sievering has been elected member of the executive committee of the Zuse association (Zuse Gemeinschaft). The Zuse association (founded in 2015) is the representation of the industrial non-profit research institutes in Germany, manifesting the third pillar of the German research system beside universities and public research institutions like Max Plank, Helmholtz or Fraunhofer.

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### FOSTA – Research Association for Steel Application

#### *Study: High performance steels in agricultural machine technology*

FOSTA has initiated a **Study about high performance steels for agricultural machine technology**. The study contents business data, requirements and solutions with steel. In this field of steel application nearly 30 % of weight savings might be possible by using high strength steels and new construction principles. The study also listed projects of FOSTA within this area of research.

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### BMBF visit

Representatives from the Federal Ministry for Education and Research (BMBF) attended a presentation on new materials at the Stahl-Zentrum on 14 September 2016. The activities of the technical-scientific organisations were presented, followed by a visit to the VDEh Institute for Applied Research (BFI) and the MPIE. Planned research projects and proposals for the Steel Research Agenda in Spring 2017 were also discussed.

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## Steel Academy

From 18 to 20 May 2016 the Steel Academy held in Cologne the 1<sup>st</sup> international VDEh-seminar “Oxygen Steel Making”. Participants attended the fully booked seminar from Austria, Belgium, Brasil, Finland, France, Germany, Great Britain, the Netherlands, Spain, Sweden and Turkey. The programme combined theoretical lectures with a lot of discussions on converter operation practices. Seminar chairmen were Prof. Karl-Heinz Spitzer and Jochen Schlüter.

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