

# IMO A Membership

## Adding value for Steel Makers



## **Market Development Influence**

Opportunity to influence market development activities that drive awareness and market demand for moly-bearing alloys e.g. high strength steel, stainless steels etc.



## **Sustainability**

Industry-wide collaboration in identifying and promoting the role of molybdenum-containing steel in sustainable development e.g. cost benefit/environmental project analysis



## **Access to International Industry Expertise**

Direct access to metallurgical expertise to foster skills, knowledge and best practice in exploiting molybdenum's effects in alloy processing and final product properties



## **Networking & Knowledge Sharing**

Unrivalled networking opportunities with members in the molybdenum supply chain. Participation in cost-sharing joint working projects with other associations and access to resources and publications



## **HSE Information & Support**

Access to joint industry stewardship of moly-containing material including HSE knowledge-sharing and guidance. Opportunity to be involved in HSE centrally-funded programs aimed at delivering robust scientific data to ensure appropriate legislation



## **Market Insight**

Access to comprehensive molybdenum demand data and trends and end-use market analysis.



Opportunity	Benefit
Participate and shape the IMO A market development (MD) activities and influence decisions on IMO A MD and research projects	Influence and collaborate in market development activities to increase potential market growth in your specialty sector
Access to data emerging from R&D programs designed to develop improved quality and higher performing steels	Expand knowledge and exploit potential opportunities emerging from joint research projects

# Molybdenum in ultra-high strength steel

## Focus areas

Press hardening steel, DQ steel, automotive & structural applications

## Strategy

Focus on improving properties: Hydrogen embrittlement resistance, combination of strength and toughness. Systematic variation of alloy composition and benchmarking tests.

## Project Highlights

- Hardenability improvement including synergies with other alloying elements.
- Improvement of delayed cracking resistance by up to 400%.
- Superior combinations of strength and low-temperature toughness.
- Improving weldability of UHSS.

## Results

- Meeting acceptance criteria for PHS >1500 MPa and DQ steels >900 MPa
- Enhanced processing robustness.
- >1,000 tons of Moly / year (recurring).
- High-value added steel.



# Molybdenum in line pipe steel

## Focus areas

X70 / X80 pipe steel, weldability

## Strategy

Laboratory trials using various alloy designs and TMCP schedules. Continuous improvement under industrial production conditions. Welding simulation and industrial weld qualification.

## Project Highlights

- Enhanced austenite pancaking.
- Suppression of dynamic recrystallization.
- Promotion of fine-grained acicular ferrite formation.
- Improved low-temperature toughness and BDWTT properties.
- Superior HAZ properties after welding.

## Results

- Efficient production of X70/X80 especially on strip mills.
- Project-based Mo consumption: 150 – 10,000 tonnes.
- Enabling good weldability.





# Molybdenum in gear steel

## Focus areas

High-performance carburized gear for automotive, wind power, machinery

## Strategy

Development of innovative alloy concepts.  
 Testing of various carburizing treatments.  
 Performance benchmarking on lab gear simulator and real-life verification.

## Project Highlights

- Favourable tailoring of hardenability behaviour.
- Alloy cost reduction possible.
- Improved strength and fatigue properties.
- Reduced grain coarsening and quench distortion.
- Enhanced pitting resistance (>30% above established top level).

## Results

- Solution to avoid pre-mature failure of highly loaded gear.
- Allows utilization of most efficient processing.
- Enabling next generation wind mills.





Opportunity	Benefit
Collaborate in and identify sustainability initiatives	Documentation of the environmental and societal benefits of molybdenum containing products
Promote the sustainability credentials of your moly-containing products based on outputs generated by IMO A	Industry-wide and global communications support in driving awareness of molybdenum's role in sustainable development disseminated through social and international trade media

# Sustainability awareness



**IMO A**  
INTERNATIONAL  
MOLYBDENUM ASSOCIATION

A sustainable world with molybdenum

**MoRE FOR LESS**

www.imoa.info

**PE INTERNATIONAL**

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INTERNATIONAL  
MOLYBDENUM ASSOCIATION

Benefits of Molybdenum Use:  
Hydrosulfurization Catalysts

**WSP**

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BENEFITS OF MOLYBDENUM USE:  
The Myllysaari Bridge, Finland

**WSP**

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Benefits of Molybdenum Use:  
Ford Fusion B-Pillar

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Molybdenum in Architecture, Building and Construction  
Federal Building, San Francisco

Molybdenum's contribution to sustainable development in:

- Alloy steels
- Superalloys
- Cast iron
- Stainless
- Chemicals

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Molybdenum in Architecture, Building and Construction  
Friends Arena, Stockholm

Molybdenum's contribution to sustainable development in:

- Alloy steels
- Superalloys
- Cast iron
- Stainless
- Chemicals

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Molybdenum in Power Generation  
Supercritical and Ultra-supercritical Power Plants

Molybdenum's contribution to sustainable development in:

- Alloy steels
- Superalloys
- Cast iron
- Stainless
- Chemicals

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Molybdenum in Power Generation  
Thin Film Photovoltaic Solar Panels

Molybdenum's contribution to sustainable development in:

- Alloy steels
- Superalloys
- Cast iron
- Stainless
- Chemicals

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Opportunity	Benefit
Tailored expert metallurgical advice and guidance offering steel makers a potential market edge when developing and producing new or improved products	Develop improved steel products
Support to raise awareness of molybdenum-containing alloys for new and existing applications	Market development opportunities that promotes the reputation of alloy and carbon steels as the materials of choice
Molybdenum Metallurgical Digest providing a periodical distillation of molybdenum related metallurgical effects (sourced from literature, projects, conferences etc...)	Convenient overview of how to benefit from molybdenum alloying and enhance product performance.



Opportunity	Benefit
Member-only AGM facilitates relationships between members over the three-day event	Access to members in the molybdenum supply chain, keynote presentations on market statistics, emerging trends and innovative market development activity
Access to information on the metallurgical effects of molybdenum	Development of improved steels



Opportunity	Benefit
Centrally funded information and guidance on relevant HSE issues	Access to readily available information and knowledge-sharing regarding compliance with relevant laws
Involvement in HSE activity to deliver robust scientific data to ensure appropriate legislation	Cost savings from participating in industry-wide HSE programs instead of on an individual basis.



## Opportunity

Access to centrally funded industry statistics

## Benefit

Trade data, comprehensive historical production and use of molybdenum and end-use analysis plus forecasting by industry segment

