

IMOA Membership Adding value for Steel Makers

Value proposition





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 costsharing 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

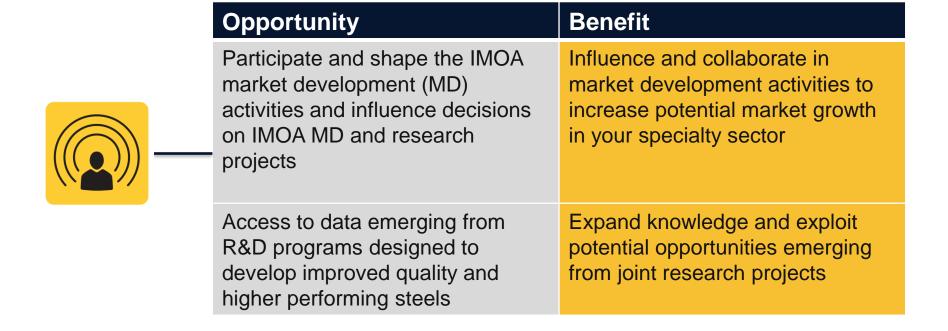


Market Insight

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

Market Development Influence





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.

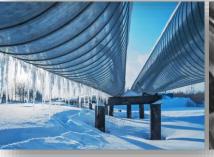


- Enhanced austenite pancaking.
- Suppression of dynamic recrystallization.
- Promotion of fine-grained acicular ferrite formation.
- Improved low-temperature toughness and BDWTT properties.
- Superior HAZ properties after welding.



- 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.









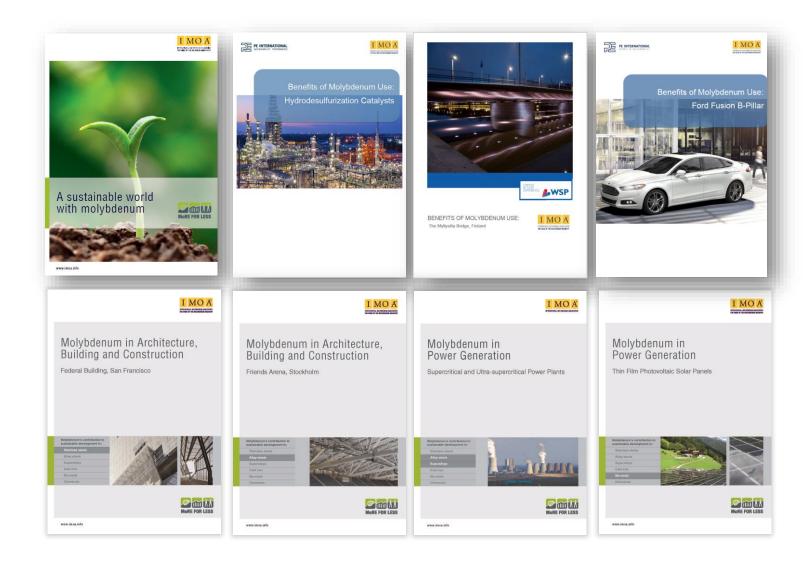
Sustainability



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 IMOA	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







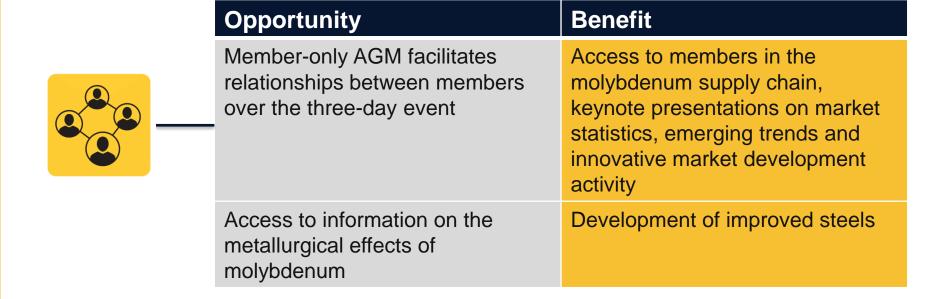
Access to International Industry Expertise



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.

Networking & Knowledge Sharing





HSE Information & Support

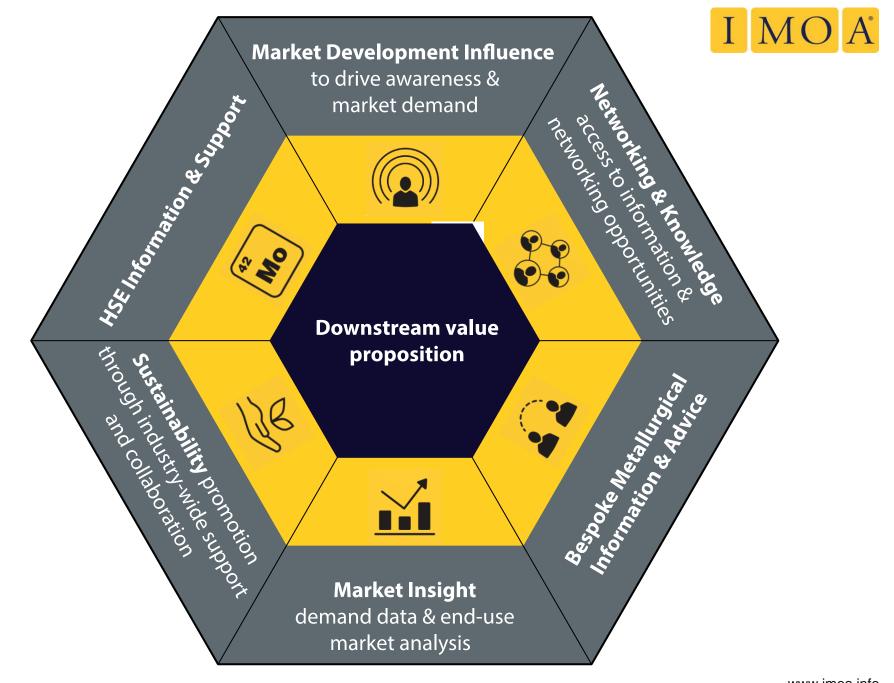


	Opportunity	benefit
42 Mo	Centrally funded information and guidance on relevant HSE issues	Access to readily available information and knowledge-sharing regarding compliance with relevant laws
	Involvement in HSE activity to deliver robust scientific data to ensure appropriate legislation	Cost savings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

Market Insight



Opportunity	Benefit
Access to centrally funded industry statistics	Trade data, comprehensive historical production and use of molybdenum and end-use analysis plus forecasting by industry segment



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