



INTERNATIONAL INSTITUTE OF WELDING  
A world of joining experience

# Report of the International Institute of Welding on priorities of the global welding industry / February 2023

The International Institute of Welding was founded in 1948 by Welding Institutes and Associations in 13 Countries, as a consequence of the experience from the second World War, when the importance of the technology was proven to be essential for the industrial development of countries, and not only for military applications. The main goal of IIW has been set “to allow the exchange of knowledge in the field of welding”.

Since then, welding technologies have developed, widened, and embraced allied technologies and related approaches. IIW followed this development and enlarged in membership having now more than 50 members on the 5 continents, and considered a widened scope to include all welding processes as applied to metallic and polymeric materials, from the nano- to the full-scale, and approaching design, fabrication, repair and life extension, quality management and also covering training and certification. The science and technology excellence in research and industrial institutions constitute the IIW community of experts with over 2500 individuals, meeting at least twice every year to discuss research topics, construction and failure cases and to develop collaborative work in form of books, ISO standards, recommendations, statements, training guidelines and other industrial tools.

It is well recognized the paramount importance of the relationship between the IIW, its owners Members Societies and the Industry. IIW is active in developing discussions, deriving decisions and assisting its wide range of stakeholders.

## Industrial focus on welding and allied processes

In 2018 IIW reconsidered its mission and vision, which were stated as follows:

- IIW Mission: “Advance welding and joining through a worldwide network”
- IIW Vision: “The leading global community linking industry, research and education to the advancement of welding and joining for a safer and sustainable world”.

The latter reinforces the role of IIW as an organisation supporting Industry through its scientific network and the education, training, qualification and certification system. One of the key actions in this respect is identifying those aspects that are really affecting the welding industry, to ensure that these are properly taken care of. To support this strategic goal, a discussion started with the main stakeholders on the role of IIW in industry.



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A survey titled “what can IIW do for your industry” was conducted amongst main industrial representatives. The result of the survey was presented, discussed and approved by the “IIW Advisory council”, a consulting body of the IIW providing industrial advice to the strategic decisions of the organisation.

### Global issues affecting industry

On the question to order by relevance the “global issues affecting your industry”, those interviewed returned the following list of issues, ordered by relevance:

1. Lack of welders and welding personnel in general
2. Lack of interest in welding, specifically in young generations
3. Inhomogeneity of welding regulations and requirements, locally and globally
4. Health, Safety, and environment
5. Limited support to manufacturing in developing countries

Answers received underline the importance of developing knowledge of all aspects related to welding, and that the knowledge has to be shared on a global scale and at all levels, including all personnel directly involved (welders to welding engineers), indirectly involved (standardisation and inspection bodies, design and purchasing departments, etc) and the regulatory institutions.

### How IIW can help industry

Those interviewed also identified the areas of study where IIW can help the industry to deal with the technical issues affecting manufacturing.

1. Less conservative fatigue approach (optimised fatigue design to consider a probabilistic approach)
2. Characterization of failures,
3. Automation for production
4. Joining of new materials and multi-materials
5. Sustainability (H&S, Cost, Quality Assurance)
6. Energy transition industry (battery, lightweight, ITER)
7. Management and prediction of welding distortions
8. Virtual domain: digitalization, big data, Artificial intelligence, digital Twins

The result identifies that the industry is interested in IIW focussing on the reliability of welded products, associated with the costs and sustainability. The virtual domain seems to be too far ahead in the practical implementation to be considered or, otherwise, not an area for the prioritised interest of the welding industry.

### Concentrating on Industrial needs

In this 2022 IIW consulted the main stakeholders to identify the strategic directions for the future. IIW members, industry representatives, standard developers, training and research institutions as well as global association representatives were involved in a survey.

The result strengthens the importance that IIW assists industry while maintaining a strong liaison with fundamental and applied research institutions and training organisations, as this is part of the IIW history, values and future.

## The future of welding science, technology, and applications



The IIW develops its activities through working groups. Each is devoted to a specific aspect of welding, and they gather more than 2,100 highly qualified experts in several areas and disciplines. From this privileged observation point, IIW has always focussed on identifying trends in science, technology, and applications for welding and allied processes.

The most recently published document expressing the IIW perspective of the welding world is the “IIW White paper – improving the global quality of life through optimum and innovation of Welding and joining Technologies”, delivered in 2012 under the authorship of IIW and edited by Mr Chris Smallbone and Dr Mustapha Koçak. The book describes strategic challenges and agendas for the welding industries, personnel, scientists, and end-users through the years 2012 to 2022. The content is visionary, and the time span can be further extended onwards.

Taking the content of the IIW White paper as still mostly valid in 2023, the following items are considered of the highest impact and relevance from the leaders of the IIW scientific and technical work, i.e. the Chairs of IIW Working Groups:

- Efficient design of welded structures, specifically for the long-term behaviour
- Behaviour of joints with new, high-performance materials, and development of appropriate consumable materials and joining techniques
- Modern welding technologies, manufacturing processes, digitalisation and big data
- Welding personnel to meet industrial needs in a global market, technical and soft skills
- Healthier and Safer welding environment with harmonisation of rules and requirements at the global level.
- Modern communication in meetings, training, qualification, certification and witnessing.

## **Coping with trends in welding science, technology and applications**

The items above offer just a rough idea of those aspects that may impress a change to the welding industry in the next years. They are also giving a taste of the sense of joining the IIW community.

Further information is available on the IIW website [www.iiwelding.org](http://www.iiwelding.org), through the national IIW member societies (<http://iiwelding.org/iiw-members>) or the IIW secretariat ([iiw@iiwelding.net](mailto:iiw@iiwelding.net)).

Everyone is welcome to join the IIW community of experts, access the IIW knowledge bank of documents and be contributor to the work of the association or a driver for the future of welding.

Members of our community are given the opportunity to stop chasing trends in welding, by starting to develop future trends in welding science, technology, and applications.