

A view from the insurance industry

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A nanometre is inconceivably small and yet man has been using materials of these dimensions since time immemorial. What is new, however, is the ability to make these minuscule structures visible; to manufacture and tailor them to a precise size; and to modify them to obtain materials with entirely new properties and functions.

Nanotechnologies are opening up opportunities that seem as limitless as the nanometre is small. Enthusiasm has spread beyond the small group of nano-experts to growing numbers in the business and scientific communities who claim that a real industrial revolution is under way, embracing one sector after another.

But opportunity is always accompanied by risk. Insurers, as risk-carriers, must be able to recognize and understand emerging risks; only then can they safeguard their clients over the

long term against the financial consequences of adverse events, and so enable society to take the risks that allow it to move forward.

Characterizing nanomaterials

What new kinds of risk are typical of the numerous applications of nanotechnologies? There is no clear-cut answer yet and nanomaterials are as diverse as the industrial sectors and applications in which they are found. It is not possible to draw a sharp borderline between nano- and macromaterials – such as the frequently proposed threshold of 100 nanometres in at least one or two dimensions.

Additionally, the same chemical formula and substance name is often used for both nanoscale and macroscale materials. This restriction of the present nomenclature makes it difficult to distinguish between a conventional material and a nanomaterial that might have radically different properties.

It is also unclear whether a material or product that is already approved for use at macroscale, must be reassessed for nanoscale – and where does nanoscale begin? Familiar methods

and approval requirements no longer offer adequate protection against emerging risks.

Thus regulators, licensing authorities or insurers aren't in a position to deal with prospective risks before the underlying properties and characteristics have been identified and described.

Such properties would include mobility of the particles, their persistence in the environment, their potential for being absorbed into the human body, and any possible chronic health impacts.

Conversely, once this is done, safety standards can be drawn up irrespective of whether the definition problem has been resolved or not. Such an approach might also help to avert unsatisfactory catch-all wording in both the legal and insurance areas.

Regulatory efforts

Hasty attempts at regulating nanomaterials could impede efforts to deal effectively with emerging risks, and create legal uncertainty as well. Thus, the priority must be to gain clarity on the scientific facts and what needs regulation, in particular with regard to industrial safety.



This will entail scientific and political debate on nanoproperties which should make recertification necessary or new thresholds which go beyond just mass criteria.

To avoid overregulation and licensing bottlenecks, administrative authorities should concentrate on potentially harmful properties. In fact, the private sector's efforts are orientated mainly towards self-policing international agreements on research and commerce, such as voluntary codes of conduct and contractual restrictions, as well as best practice.



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Best practice is based on generally accepted standards, including standard reference materials, standardized and validated test methods, and labeling guidelines that protect the consumer by providing understandable information related to risk criteria.

About the author



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for bio- and nanotechnology, and brings his expertise and consulting skills to bear in risk assessment and in defining and implementing strategies for these lines. He represents Swiss Re on various national and international expert bodies dealing with the business, social and political impacts of these young technologies.

The aim should be a flexible, universally accepted and scientifically credible code of standards and regulations, which enables comparative risk assessments. One prerequisite is a universally valid and internationally accepted nomenclature, without which there will be problems of definition, differentiation, and interpretation.

The role of insurance

With nanotechnology – as always with any technological quantum leap – no specific claims data are yet available, and comparisons with claims caused by traditional technologies are often of limited value. Assessing these risks is unknown territory and conclusions from the past are dubious.

If insurers are to offer long-term cover at reasonable premiums, they need to know better how the hazard potential of nanomaterials differs from conventional materials regarding health, property damage and environmental impacts. For this reason, the insurance industry is closely observing the scientific and social debate and also encourages international organizations in defining nanomaterials and endeavours to identify, quantify and manage risk potential.

As a rule, nanotechnology risks continue implicitly to be covered in the insurance products already on the market, and insurers do not intend to put them under general suspicion by exclusion.

Nevertheless an urgent solution is needed for the definition and demarcation problems in order to deal effectively with novel loss patterns.

The purpose of insurance, especially liability insurance, is to mitigate the potential consequences of calculated risks, enabling industry and business to engage in activities they might otherwise find too risky.

There are two sides to risk mitigation: first, policyholders are protected against the financial consequences of a loss, and secondly, any harmed party (claimant) is also indemnified for the harm suffered, at least to the limit of the cover purchased by the party responsible for the harm.

By accepting that potential harm may be indemnified with money, society must also accept that there are causes that might lead to harm. In the case of a technology, it means that society accepts the risk inherent in the insured business, presupposing a consensus has been reached as to which tangible and intangible assets can be indemnified in money at all.

Society

Nanotechnology is going to have an impact not only on society itself, but also on how it deals with risks, and sooner or later this will require lawmakers to amend the legal framework.

However, a special law to regulate nanotechnologies would confront the courts with a riddle: which law would apply to the increasing number of products combining both macro- and nanocomponents?

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Public authorities can avoid this problem by concentrating on the ordinance level and adapting test procedures and licensing conditions at an early stage.

Such measures help to establish the foundations for coping effectively with risks. Because nanotechnology is evolving rapidly and more consumer goods based on nanotechnology are coming onto the market, insurers and industry should jointly participate in shaping the framework.

A fixation on technological progress will lead to inadequate risk assessments. Even today, insurers find themselves applying the “precautionary principle”, with regard to legislation and the debate on key technologies.

However, the “precautionary principle” is often erroneously equated with “zero risk”. As a result, many demand that innovative but unfamiliar products rule out risk altogether, reflected in significantly tougher liability regulations.