

# Civil Liability to Nanotechnology Products: An Appraisal with Special Reference to Strict Liability



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**Abstract:** *The present advantage of progress in terms of materials and their application is very much discernible in nanotechnology products. By using nanotechnology products there can be instances in which people will suffer harm and sometime death too. Some of these harm may be accidental and manufacturers may have no clue of it. However, in some cases it may happen that the producer or manufacturer knowingly release the products for economic benefits and undertook associated risks. In theoretical perspective strict liability focus more on the no fault theory rather than conduct or behavior of the manufacturers or the learned intermediaries. Thus, a manufacturer of nanotechnology product will be liable for distributing defective products directly to consumers or through retailers or distributors. At the same time the plaintiff must prove that the defect in question was the actual and proximate cause of injury and it incurred damages. In this paper an attempt has been made to examine critically the risks and civil liability, especially strict liability under Tort law of nanotechnology products.*

**Key words:** *civil liability, nanotechnology, strict liability, tort.*

## I. INTRODUCTION

The human mind has tried to understand the material world through philosophy as well as science. In fact, the emergence of new materials and the technology based on them has marked the present age of technology. The present advantage of progress in terms of materials and their application is very much discernible in nanotechnology products. "People are often concerned about a technology being used in a way that conflicts with some deeply held value, and some uses of nano may create such conflict" [1]. Nano (means one-billionth of something) technology is relatively new. Examples of nanotechnology products containing nanoparticle are: biomedicine, drugs and pharmaceuticals, transport, paints, sports goods, vehicle bodies, packaging etc. Moreover, presence of nanoparticles in other areas are- children toys, dental adhesives, food products, preservation of fish and chicken etc.

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"The driving force behind the huge investment in nanotechnology is its promise of a different world without many of the negative developments that today degrade the quality of human life"[2]. But in reality, the nanotechnology products though offered comforts to human life but may spell danger also. With this kept in mind in this paper an attempt has been made to examine critically the risks and civil liability, especially strict liability under Tort law of nanotechnology products.

## II. WHO IS LIABLE FOR NANOTECHNOLOGY PRODUCT?

The first question that may be raised in this connection should the Scientists be held liable for use of their creations? J. Robert Oppenheimer referred a famous philosophical quote from *Bhagavat -Gita* "I am become death, the destroyer of worlds"[3]. The same philosophical question may be upturned in application of nanotechnology. In producing nanotechnology consumer goods, there are instances in which consumers suffered injury or harm though some of those harms may be unforeseeable. However, in some cases it may happen that the producer or manufacturer even knowingly release the products on profit motive and produce the goods and ignored the risks. Some argue that scientists should foresee the risks involved of their discoveries and hence are liable. But Oppenheimer summed up the argument by explaining that we should not make the scientists liable as tort -feasors, the harm or injury generally caused because we have changed certain conditions of productions and technology[4]. Therefore, liability for nanotechnology products shall lie on manufacturer or retailer or learned intermediary.

## III. PRODUCT LIABILITY UNDER COMMON LAW

To discuss on product liability under common law we have to bring principles of negligence in tort law as developed in England. According to Anderson B. in *Blyth v. Birmingham Waterworks Co:* (1856) 11 Ex.781, at 784) "Negligence is the omission to do something which a reasonable man, guided upon those considerations which ordinarily regulate the conduct of human affairs, would do, or doing something which a prudent and reasonable man would not do."[5]. In *Donoghue v. Stevenson*, (1932 A.C. 562, at 579) . Lord Atkin observed that it is very difficult to state when actually duty of the party arises under law.



Thus, courts will examine whether in the specific circumstances of the case duty exists between parties in those circumstances. In law of negligence manufacturer of an article of food, medicine or the like, sold by him to a distributor and the distributor or the purchaser or ultimate consumer has no opportunity to discover any defect, then the manufacturer has a legal duty to the ultimate purchaser or consumer to see that the article is free from any defect which may cause injury to health [6].

The degree of care require for imputation of negligence varies from situation to situation and the risks involved. However, in examining the duty of care court will apply good sense and equity principle of law. Law expect not perfect mind or sensitive mind from a person who is expected to perform some duty or who has a duty of care. As regards product liability Dias observed that to protect the consumers in the present social context the manufacturer or retailer will be liable for defective and unsafe products. To make the manufacturer liable one has to cut across the traditional boundaries of the law[7](Dias and Markesinis,1984: 105-106).

#### IV. LIABILITY IN RESPECT OF NANOTECHNOLOGY PRODUCTS

Liability in respect of products developed by application of nanotechnology or products or consumer goods having nanoparticles may be divided into three aspects, such as (a)health risks; (b) learned intermediaries; and (c) strict liability or no-fault liability.

##### A. Health risks

Nanotechnology products now entered into areas of consumer goods. There some instances of harm occurred from those consumer goods from nanoparticles that identifies health risks. Asbestos is a good example of such harm caused to human health. In such cases normally tortious principle of negligence under common law will be enforced. Product liability for infringement of consumer rights may be based on other doctrines or principles of law. Sometimes it is very difficult to prove negligence and breach of duty directly though there exists harm or injury. In such cases liability of learned intermediaries or no-fault liability is applied.

##### B. Learned Intermediary

Some consumer goods are distributed or provided through some learned intermediaries or sophisticated intermediaries. This we normally find in medical services that incorporate nanotechnology, particularly in use of medical devices under the guidance of a physician.

In such cases a warning is necessary as regards information about the benefits and the risks associated with the said products to the physicians about his or her duty in the treatment of the patient. It is the duty of the physicians to inform the patient about the risks involved in application of the nanotechnology products and at the same time he is required to exercise his professional duty and decision in such a manner that it is reasonable and supported by a competent professional opinion. Failure of that duty will bring an action against the physician by the patient on doctrine of negligence.

#### C. Strict Liability or No-fault liability

The principles of strict liability means that even if there is no fault on the part of the manufacturer or any party the defendant shall be liable for the product. The liability of the party arises the moment it introduced a defective product in the market. Here parties include manufacturer, retailers, distributors and the like. Thus, the liability arises not from breach of duty but simply because the part introduced a defective product. Therefore, if the primary cause of harm or injury caused to the plaintiff is a defective product and that was the proximate and actual cause of action the party will be liable under doctrine of strict liability under tort law. Nanoparticles are used in hundreds of consumer products as nanotechnology becoming an emergent technology. Any plaintiff if willing to prove negligence of the manufacturer of nanotechnology products and to apply doctrine of strict or no-fault liability he has to prove the presence of any one of these defects- design defects, manufacturing defects or warning defects.

#### V. NANOTECHNOLOGY PRODUCTS AND PRINCIPLES OF STRICT LIABILITY

The principles of strict liability focus more on the no fault theory rather than conduct or behavior of the manufacturers or the learned intermediaries. The general principles of common law under Tort to find out the fault of the defendant is withering away in strict liability. Thus, a manufacturer of nanotechnology products will be liable for distributing defective products directly to consumers or through retailers or distributors. To prove liability in nanotechnology products the plaintiff is required to place before the court the actual and immediate cause of injury and how it damages. The doctrine of strict liability for nanotechnology products identified three main forms or cause of actions, such as- (I) design defects, (II) manufacturing defects and (III) warning defects.

##### A. Design Defects

In designing a product, a number of considerations are influencing the decision making, such as, economic considerations, cos of the product and its marketability. These considerations have direct impact on the consumers as regards its attractiveness, safety and the risk involved in using the product. All these considerations are very much relevant for nanotechnology products also. The fundamental issues are what is an ideal design and how far a deviation from ideal is permissible. These are very difficult to answer. We have to remember that a producer or manufacturer or seller are exposing themselves to liability by developing or accepting a design. This is a real concern of the producers or seller since judicial interpretation is that a design may be condemned if its harmed others. There are two main criteria in identifying design defects: the consumer expectation test and the risk-utility test. The first one, i.e., consumer expectation test, focuses on whether a particular design develops a reasonable expectation in the mind of a consumer.

In this context we may compare the general perception for a child’s toy covered with antimicrobial nanoparticles coating and military weaponry that incorporates nanotechnology. In both the items nanotechnology have been used, but expectations of the consumers are different. Whereas in case of children’s toys it is perceived that products shall meet the required safety standards, but products like the military weapons always perceived to be lethal.

The second test is the risk utility test. In this test among various alternative designs the manufacturer is to select which is less injurious and risk of injury outweighed the utility. A design is preferable if it is more useful than harmful. We may take an example that adopted traditional a design with nanotechnology-based enhancement. Suppose a manufacturer of socks used nanosized silver particles which is odor resistant. Later on, if it is found that silver particles absorbed through skin of the consumer’s feet which is increasing the risk of gallstone formation. Here the design will be alleged as defective design compare to cotton socks traditionally used in the market.

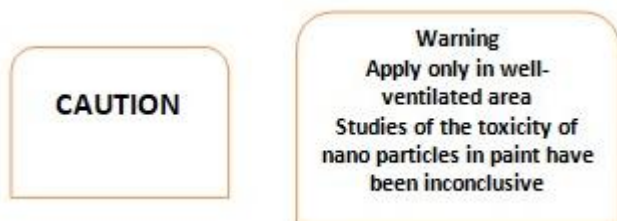
**B. Manufacturing Defects**

The question of manufacturing defects may arise when there is a deviation from the pre-decided design and the said deviation resulted injury to the consumer or ultimate user. In such cases the manufacturer cannot take the defense of stringent quality control or adoption of highest safety standards. Moreover, sometime a product is manufactured by participation of multiple parties. We may take an example of sporting goods, say a tennis racket. The manufacturer of tennis racket may order fullerenes from another party to increase strength at a lighter weight. If the supplier sends defective material by shipment which could not be detected by the manufacturer and the products were sold which turn out to be brittle then the consumer is entitled for damages from the supplier of fullerenes with nanotech material. In such cases the consumer or the party suffered loss may recover damages either from the manufacturer or from the wholesaler or the retailer whoever took part in the manufacturing and selling chain.

**C. Warning Defects**

It is a usual practice that the manufacturer shall give warning relating to defects or risks associated with the products. It is not only a need to give a warning but also it should be sufficient one. There may be various types of warning. We may note the following illustration:

**Figure I.**



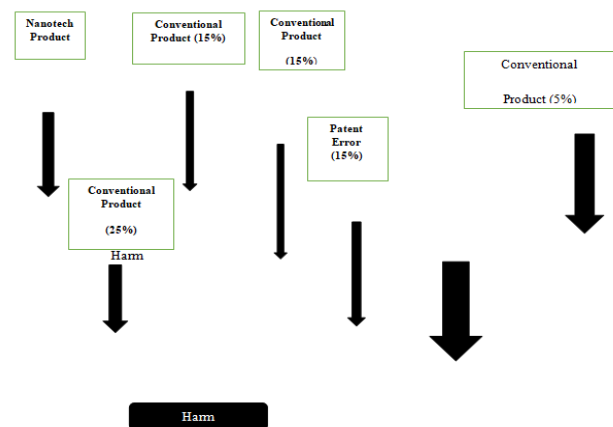
In the left-hand side, there is written “caution” only and it is not sufficient and not mentioned anything about the risk. But the second one is a better approach and right type of warning. About any product it is presumed that a consumer

accept risk from his or her knowledge and that is what we expect from a reasonable man. Therefore, the manufacturer should provide warning regarding risks involved in a product which is foreseeable only. Thus, risk which is not reasonably foreseeable the manufacturer or the intermediary will not be liable. To understand the degree of risk clearly the warning should be specific and not a vague one. Specific warning means that it should specify what the risk is. Warning not only be judged from the content but also how it is conveyed and its effectiveness in conveying the risks to the consumers. Moreover, warning should be legally acceptable if it is visible considering the features like eye-catching symbols, color, size and also whether it was displayed in a conspicuous place. Therefore, if the location of warning located or placed in such a place which is not noticeable easily then notice will be treated as inadequate. In connection with warning defects there is another aspect which is known as learned or sophisticated intermediaries. Sometime a product like medical devices or which is used in medical treatment that incorporate nanotechnology requires warning only which is necessary information to the physicians.

**VI. RESULT**

In cases of allegation of negligence in nanotechnology products there are number of ways to defend it. In nanotechnology there may be two types of action under negligence that may be either causation or breach of duty. It is a fact that nanotechnology products are very small structure and difficult to detect. To prove causation element of the plaintiff, it is necessary for the defendant to identify potential causes which may be quite difficult to differentiate. We may compare the conventional products individually and the nanotechnology product. The probability tests of conventional products and nanotech products may be analyzed as follows:

**Figure II**



There is another defense in nanotechnology products liability which is called ‘contributory negligence’. While a doctor or physician administered nanotechnology-based treatment, he may argue that the treatment which was followed by him is an established medical protocol. Moreover,



the physician may also bring before the court that the plaintiff's own actions contributed to the injury or harm suffered by the plaintiff and in such cases, plaintiff will not get any damages.

### VII. CONCLUSION

In previous discussion we have observed the importance of warnings and its' requirement to avoid strict liability. Therefore, the manufacturer should disclose the risks in the warning in appropriate place of the finished product.

If proper warnings are there, the consumers have hardly any ground to file a case against the nanotechnology products either for a warning defect or a design defect. Thus, it is a legal duty of the manufacturer or producer to provide the ultimate consumer adequate information about the product risks and warnings otherwise in the long-term the manufacturer is to bear huge liability cost.

Tortious liability in general and strict liability in particular in respect of nanotechnology products arises generally from a breach of duty. When we talk about general duty it is presumed consumers will behave like a reasonable man in a particular context. The strict liability for nanotechnology products is based on common law theory of negligence. Accordingly, every producer or manufacturer of nanotechnology product has a legal duty to take care that the products are free from warning defects or design defects. But it is a fact that from nanotechnology we are getting faster, cheaper and better products. I will like to conclude with the positive words that - "scientific progress should not be readily obstructed and the risks of new technologies should be weighed in the balance with the potential benefits to humankind"[8].

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### AUTHORS PROFILE



**After graduating** from the University of Calcutta, Dr. Nirmal Kanti Chakrabarti did his LL.B, M.A. (Political Science) and LL.M. (Tort and Crime) from the University of Calcutta and got his Ph.D. from the University of Burdwan on "Probation System in the Administration of Criminal Justice in West Bengal". Immediately after passing LL.M. in 1985 Dr. Chakrabarti joined in West Bengal Education Service and posted as Lecturer in Law in Govt. of West Bengal Hooghly Mohsin College on 5th July, 1985. On 27th November, 1996 he joined in the University of Calcutta and retired as Professor in the Department of Law w.e.f. 31-08-2015. Prof. Chakrabarti also worked as Director, School of Law, KIIT University, Bhubaneswar from 2009 to 2019, Now he is working as Vice-Chancellor, West Bengal National university of Juridical Sciences since 3<sup>rd</sup> July 2019. As a prolific writer Dr. Chakrabarti has so far authored **eight (8) Books**, He has also **published more than 80 articles and research papers** in various

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**Dr. Arpita Mitra** has more than fifteen years of experience in teaching and research. Mitra graduated from Presidency College, Kolkata in 1998 with Sociology major and stood 2<sup>nd</sup> from the University of Calcutta. She completed her Masters in Sociology with specialization in Crime and Deviance with a first class degree. Following which she joined Jadavpur University, Department of Sociology as a Ph.D research fellow and was conferred the doctoral degree in 2012 in Sociology on "Police, Policing and New Technology: A Study of Kolkata Police". Mitra has more than thirty publications in national and international journals of repute. She joined Kalinga Institute of Industrial Technology in 2009 and is continuing as Associate Professor Senior Grade in the School of Law. Her research interest includes Criminology, Police Science and Management and Research Methodology. She has presented papers in more than twenty national and international conferences which includes world congresses of Sociology and Criminology. She is an active member of International Sociological Association, International Society of Criminology, World Society of Victimology, Indian Sociological Society, Indian Society of Victimology. Recently her maiden book "ICTs, Police and Metropolitan Cities: Towards 21<sup>st</sup> Century Policing in India" has been launched. Dr. Mitra is the Vice President of Research Committee 29: Deviance and Social Control of the International Sociological Association for a term of four years- 2018-22. Mitra has delivered invited lectures in national and international forum which also includes MPI of Foreign and International Criminal Law, Freiburg, Germany. She was also granted research stay as guest scholar twice at Max Planck Institute of Foreign and International Criminal Law, Freiburg, Germany in 2017 and 2018. She has successfully guided five scholars for Ph.D and more than ten for masters degree dissertation. A passionate researcher, Dr. Mitra has been granted ICSSR IMPRESS research project on Policing a Smart City: Challenges and Priorities towards Urban Transformation of Kolkata and Bhubaneswar in 2019.