
From the Challenge of Innovation to USPTO Patent Application

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Nano Parmin Khavaran's innovative plan in the development of rubber technology with the help of nanoclay, which had previously obtained the first ranking of Innovation and Technology Challenge of Iran Nanotechnology Innovation Council (INIC), was registered as a patent in the USPTO.

Sayed Amin Ronaghi, CEO of [Nano Parmin Khavaran](#), says in this regard: "In this patent, we have introduced a special grade of nanoclay which can be specifically utilized for enhancing the properties of rubber. It is also noteworthy that this patent has reached the publishing stage."

Commenting on the differences between the nanoclay described in this patent and the nanoclay available on the market, Dr. Ronaghi posits: "The nanoclay technology present on the market uses additives that are not naturally part of rubber and are, in fact, additional elements added to rubber. Introducing these additives into rubber layers renders the curing time of different rubber layers variable, causing incompatibilities in the production process. In fact, with the addition of the already existing nanoclay, the curing time of rubber parts changes in a way that adversely affects the final properties of the rubber. However, in the nanoclay developed by Nano Parmin Khavaran, the problem of variations in the curing time of rubber components used is obviated. In other words, we do not use a third-party substance in the process, and this has mitigated the problem of additive interference."

Elaborating on the additional advantages of this technology, this graduate of [Ferdowsi University of Mashhad](#), PhD in Materials Engineering, says: "One of the major challenges in using nanoclay is when nanoclay-bearing plates are not opened successfully, resulting in uneven distribution of nanoclay in the rubber. In order for nanoclay to have desirable effects on the rubber, the plates must be opened apart and have a uniform distribution. This presents a challenge as rubber is a paste-like material. To cope with the issue, we opted for a

different mechanism where a part of the whole opens before it is combined, which in turn leads to a significantly more favorable distribution than in the case of the clay present on the market.”

"The [United States](#) is the largest producer of nanoclay in the world, and there are multifarious powerful rubber companies in the country. Therefore, registering this patent in the [United States](#) was of strategic importance to us," said the CEO of Nano Parmin Khavaran.

Regarding the activities of Nano Parmin Khavaran in the Iranian market, he added: “The main idea behind this technology was presented in the Innovation Challenges Program of INIC, where we succeeded in achieving the first ranking. In the aforementioned challenge, 100 tires were produced using this technology and tests were performed on them. We are currently negotiating terms and conditions with Kavir Tire Company to talk about possible opportunities for cooperation, aspiring to be able to introduce this technology into the Iranian market.”

Competitive innovation challenge schemes are devised to obtain a technical response to a specific issue over a determined period of time. Currently, the [INIC](#) is responsible for implementing such innovation challenges. The group identifies the needs and problems industrial companies are confronted with through its brokers and, having performed various evaluations, if an already available response is not attained, it publishes a call and holds a competition.