

New Iron Age Steel

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ABSTRACT

Steel is one of the oldest materials known to mankind and has been used for at least 3,000 years. While modern society utilizes many types of advanced materials, steel can still be considered the backbone of industry and often the material of choice due to its combination of superior properties including its ease of manufacturing, ability to be recycled, its availability, and relatively low price. Over its history, driven by its importance to society, steel has been extensively studied and more is known about steel than any other class of material with more than 25,000 different records of steels in 51 different ferrous groups. As we enter a new millennia and look forward, is basic research on steels a part of the past in lieu of exotic “hi-tech” materials, or alternatively, will it indeed flourish resulting in the development of a New Iron Age? Concurrently, is the future of materials nanotechnology programmable assemblies, replicators, and swarms of nanomachines acting in unison, as some have suggested, or is it instead the bulldozer, the mining crusher, and the automobile? In this talk, recent developments will be explored related to the structure/property/processing characteristics of nanostructured steels and the potential impact of this class of materials on future manufacturing and industry. This talk is structured through a series of key thought provoking questions and answers to track the promise and possibilities inherent in nanomaterials technology. This build-up in thought will then be followed with actual demonstrated benchmarks which have been achieved in a number of material properties. The ideas presented in the talk will be explored within the context of the formation of The NanoSteel Company, including it’s history, vision, and focus, which is the commercial development of this class of materials.