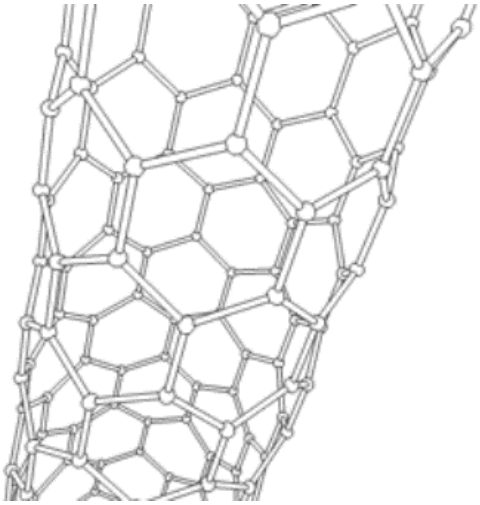
A look into what we may and will have to deal with in the future.

With the increase in UHSS (Ultra High Strength Steel)etc that we are faced with on vehicles today, and the associated problems, guess what, it gets even better, with the development of Carbon nanotubes.



Carbon Nanotubes (**CNTs**) are allotropes of carbon with a cylindrical nanostructure. Nanotubes have been constructed with length-to-diameter ratio of up to 28,000,000:1, which is significantly larger than any other material. These cylindrical carbon molecules have novel properties that make them potentially useful in many applications in nanotechnology, electronics, optics, and other fields of materials science, as well as potential uses in architectural fields. They exhibit extraordinary strength and unique electrical properties, and are efficient conductors of heat and electricity.

CNTs are currently being designed for auto body construction.

This chart shows a comparison of Tensile strengths of different steels.

Advanced Boron and Carbon Nanotubes are future materials that we will start seeing in the next few years.

STEEL	MPa	PSI
Structural Steel	400 MPa	58,000 psi
Titanium	900 MPa	130,500 psi
TWIP	1,200 MPa	174,000 psi
USIBOR	1,800 MPa	260,000 psi
Advanced Boron	3,100 MPa	450,000 psi
Carbon Nanotube	62,000 MPa	8,992,000 psi

Material	Young's Modulus (TPa)	Tensile strength (GPa)	Elongation at break (%)

SWNT	~1 (from 1 to 5)	13-53[E]	16
Armchair SWNT	0.94[T]	126.2[T]	23.1
Zigzag SWNT	0.94[T]	94.5[T]	15.6-17.5
Chiral SWNT	0.92		
MWNT	0.8-0.9[E]	11-150[E]	
Stainless Steel	~0.2	~0.65-3	15-50
Kevlar	~0.15	~3.5	~2
Kevlar[T]	0.25	29.6	

Material	Young's modulus (GPa)	Tensile Strength (GPa)	Density (g/cm^3)
Single wall nanotube	1054	150	1.4
Multi wall nanotube	1200	150	2.6
Diamond	600	130	3.5
Kevlar	186	3.6	7.8
Steel	208	1.0	7.8
Wood	16	0.008	0.6

The long-range goal is to build planes, automobiles and other things with buckypaper composites. The military also is looking at it for use in armour plating and stealth technology.

http://en.wikipedia.org/wiki/Carbon_nanotube

Toyota Solar Panal

Toyota plans to install solar panels on the roof of the next generation of Prius hybrid cars, according to a report in Monday's edition of the *Nikkei* newspaper.

The panels, which are expected to begin appearing on the high-end version of the gasoline-electric hybrid car as early as next spring, will supply part of the 2 to 5 kilowatts needed to power the air conditioning, MarketWatch cited the Japanese business daily as reporting. Kyocera will reportedly supply the panels.

The move would make Toyota the first major automaker to incorporate a solar-power generation system into a mass-produced car.

http://news.cnet.com/8301-11128_3-9984384-54.html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