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Tab.1 - Classification of the carbon films according to the VDI 2840 guideline. [1] / Classificazione dei rivestimenti base carbonio in accordo alla norma VDI 2840.

Carbon films																
Designation	2 Amorphous carbon films					3 Crystalline carbon films										
Thin film/ thick film	thin film					Diamond films										
Doping	hydrogen free					hydrogenated										
Additional elements	modified with metal					modified with metal / with non-metal										
Particle size on the growth side	(amorphous)					1 nm to 500 nm, nanocrystalline	0.5 µm to 10 µm, microcrystalline	15 µm to 80 µm	80 µm to 500 µm	500 µm						
Prevalent C-C bond type	sp ² or sp ³ , linear bond					sp ³										
Designation	1	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.3	3.6				
Designation	Plasma polymer film	hydrogen-free amorphous carbon film	hydrogenated amorphous carbon film	hydrogenated amorphous carbon film	hydrogenated amorphous carbon film	hydrogenated amorphous carbon film	hydrogenated amorphous carbon film	hydrogenated amorphous carbon film	Tetrahedral carbon film	Metal-carbon film	Modified carbon film	Nanocrystalline carbon film	Microcrystalline carbon film	Doped CVD diamond film	CVD diamond film	Doped CVD graphite film
Recommended abbreviation	-	a-C	ta-C	a-C:Me	a-C:H	ta-C:H	a-C:H:Me	a-C:H:X	-	-	-	-	-	-	-	-
Other designations commonly encountered but which should no longer be used	-	DLC, graphite-like carbon	DLC, amorphous diamond	-	-	-	-	-	-	-	-	-	-	-	-	-
Deposition methods	PA-CVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD, PA-CVD	CVD, PA-CVD	CVD, PA-CVD	CVD	CVD	CVD	CVD	CVD, PVD

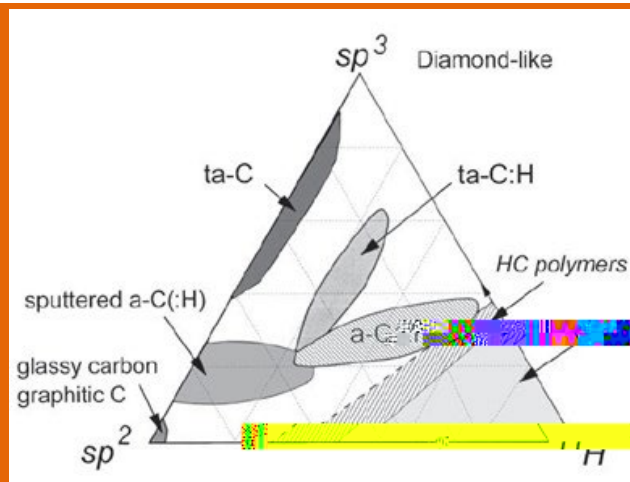


Fig.2 - Ternary phase diagram in amorphous C-H materials [3]. / Diagramma ternario di fase on leghe amorfie C-H.

The most widely known DLC coating type, hydrogenated amorphous carbon (a-C:H), is most often applied throu-

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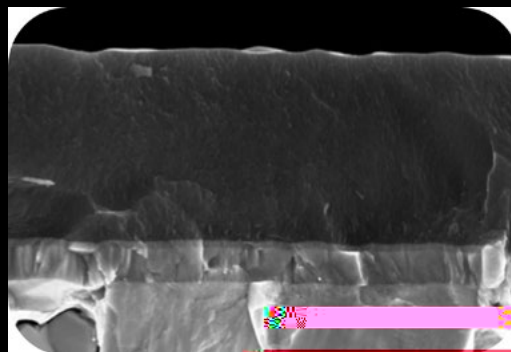


Fig.3 - S

Call to action

Given the number of variables involved with DLC coatings, it is important that OEMs better understand the range of options so they can select the ideal solution for the application while also taking into consideration the economics. Coatings are effectively an architecture of layers engineered to achieve specific properties.

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BIBLIOGRA

- [1] VDI-F
- [2] ISO 2
- [3] J. Rob

