



## TRIBOLOGICAL SERIES

**DLC**

**Multi Source**

**Tribological Solution**

**Hard Coating Solution**

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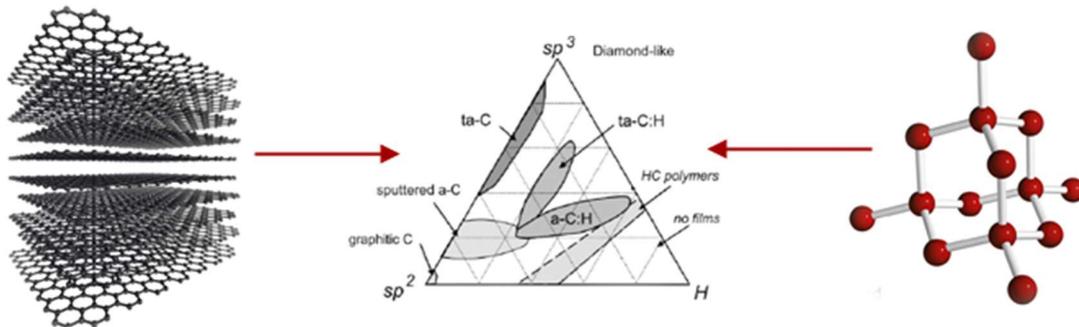
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## System Summary

Diamond-like-Carbon coatings are high performing and easy operating, equipped with arc sputtering system, which are used in demanding automotive, non-ferrous material machining and industrial engineering environments where component surfaces are subjected to high contact pressure, intermittent lubrication or dry sliding and rolling environments where severe abrasive and adhesive wear conditions exist. DLC coatings are also commonly applied onto various medical and dental instruments and implants to provide a dark black, anti-reflective and bio-compatible surface with enhanced tribological protection properties.

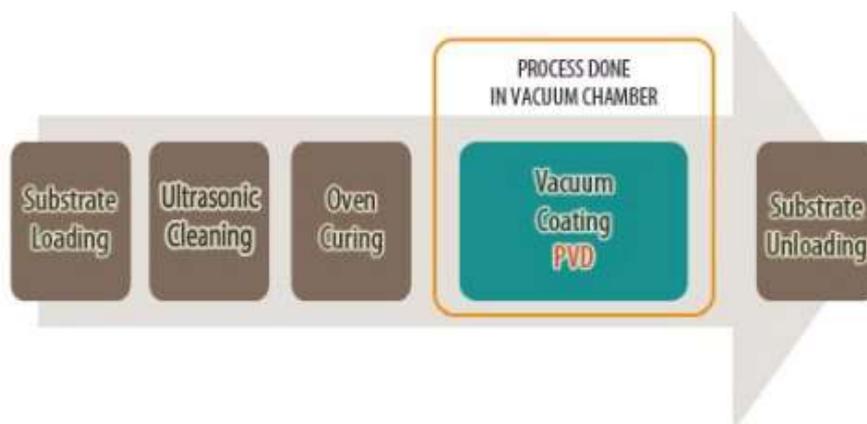
Amorphous Diamond-like-Carbon coatings, typically deposited at substrate temperature  $<250^{\circ}\text{C}$ , possess a unique combination of physical, mechanical, chemical and optical properties. The percentage of bonded  $\text{sp}^2$  &  $\text{sp}^3$  carbon atoms, metal content and hydrogen content of the films can be manipulated by both the deposition chemistry & methodology (sputter, evaporation, PACVD etc). Danko Vacuum Systems offers a series of deposition chambers and chamber sizes to deposit a range of low friction, highly wear resistant diamond-like-carbon (DLC) and dry lubricant coatings.



## System Type

Vertical Batch – Single or double door

PROCESS:



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**MACHINE CONFIGURATION:**

| Model     | Chamber size | target | time           | Standard coating       | configuration  |
|-----------|--------------|--------|----------------|------------------------|--|
| DKDLC-380 | Ø380×H450mm  | 2pcs×3 | 3-5hours/cycle | TiN, CrN, AlTiN, AlCrN | Mechanical pump, Roots pump, holding pump and diffusion pump or molecular pump |
| DKDLC-600 | Ø600×H650mm  | 2pcs×3 | 4-6hours/cycle | TiN, CrN, AlTiN, AlCrN | Mechanical pump, Roots pump, holding pump and diffusion pump or molecular pump |
| DKDLC-650 | Ø650×H700mm  | 4pcs×3 | 3-6hours/cycle | TiN, CrN, AlTiN, AlCrN | Mechanical pump, Roots pump, holding pump and diffusion pump or molecular pump |
| DKDLC-900 | Ø900×H950mm  | 6pcs×3 | 5-8hours/cycle | TiN, CrN, AlTiN, AlCrN | Mechanical pump, Roots pump, holding pump and diffusion pump or molecular pump |

**Coating:**

TiN, TiC, TiCN, TiAlN, TiAlCN, TiCrN, TiCrN, TiCrCN, TiAlCrN and other multilayer super hard coatings.

**APPLICATION:**

Cutting &amp; Forming Tools

General Wear Resistance

Military / Armaments

Aerospace Components

Automotive Components

Transportation

Medical &amp; Dental Tools / Implants

Decorative / Color

**PRODUCTS IMAGES:**

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**COATING PARAMETERS:**

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|                 | Color             | Hardness (HV) | Thickness (μm) | Max Temp (°C) | Friction Coefficient Vs 100Cr6 | Most Common Equipment Configuration    |
|-----------------|-------------------|---------------|----------------|---------------|--------------------------------|--|
| TiN             | Gold              | 2400-3000     | 1-4            | 500           | 0.5                            | 2-4-6 Cathode Steered Arc Or Sputter   |
| TiCN            | Blue/Grey         | 2400-3200     | 1-3            | 400           | 0.3                            |  |
| ZrN             | Champagne         | 2000-2700     | 1-4            | 500           | 0.5                            |  |
| ZrCN            | Various           | 2000-3000     | 1-3            | 400           | 0.35                           |  |
| CrN             | Silver            | 1700-2800     | 1-5            | 700           | 0.5                            |  |
| TiAlN           | Dark Grey /Purple | 2300-3000     | 1-4            | 800           | 0.55                           |  |
| TiAlCN          | Grey/Black        | 2500-3200     | 1-3            | 700           | 0.4                            |  |
| AlTiN           | Blue/Black        | 2400-3100     | 1-4            | 850           | 0.55                           |  |
| AlCrN           | Grey              | 2600-3200     | 1-4            | 950           | 0.5                            |  |
| Ti-DLC          | Grey-Black        | 700-1500      | 1-5            | 250           | 0.15                           |  |
| Cr+WC/C         | Grey-Black        | 800-1800      | 1-4            | 250           | 0.15                           |  |
| Graphite/Low H  | Grey              | 500-2000      | 1-3            | 250           | 0.1                            |  |
| CVD a-C:H       | Grey-Black        | 1000-3000     | 1-3            | 280           | 0.05                           | Dual Cathode Sputter with Hot Filament |
| CVD Doped a-C:H | Grey-Black        | 1000-3000     | 1-3            | 280-350       | 0.05                           |  |



## AFTER-SALES SERVICE & SUPPORTING:

Danko Vacuum Systems and our global service partners can provide onsite installation, repair service, preventative maintenance, applications and service training. We are available to provide support for your system 24/7.

Free warranty for full equipment for 12 months.

Long term providing the target, vacuum materials and accessories at reduced prices.

Providing vacuum coating machine operation and training of personnel at site.

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