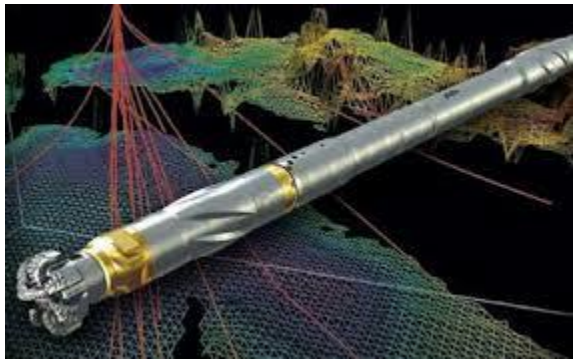
NanoDiamond Products

pioneering nanodiamond solutions

NDP

NDP – PDC & TSP



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Company Profile

- NDP is a privately owned independent company located in Shannon, Ireland
  Enterprise Ireland (Irish Government) is a key stakeholder

- The directors of the company have a combined experience in the diamond industry of over 100 years

  - We are a team of engineers, chemists and scientists dedicated to providing customised solutions

  - **John Sexton, Chairman**
  - **Derek Wright, CEO**
  - **Karl Tuffy, Exec Director**
  - **Alex Engels, Development**
  - **Siobhan Boyd, CFO**
  - **Natasha Donovan, Quality**

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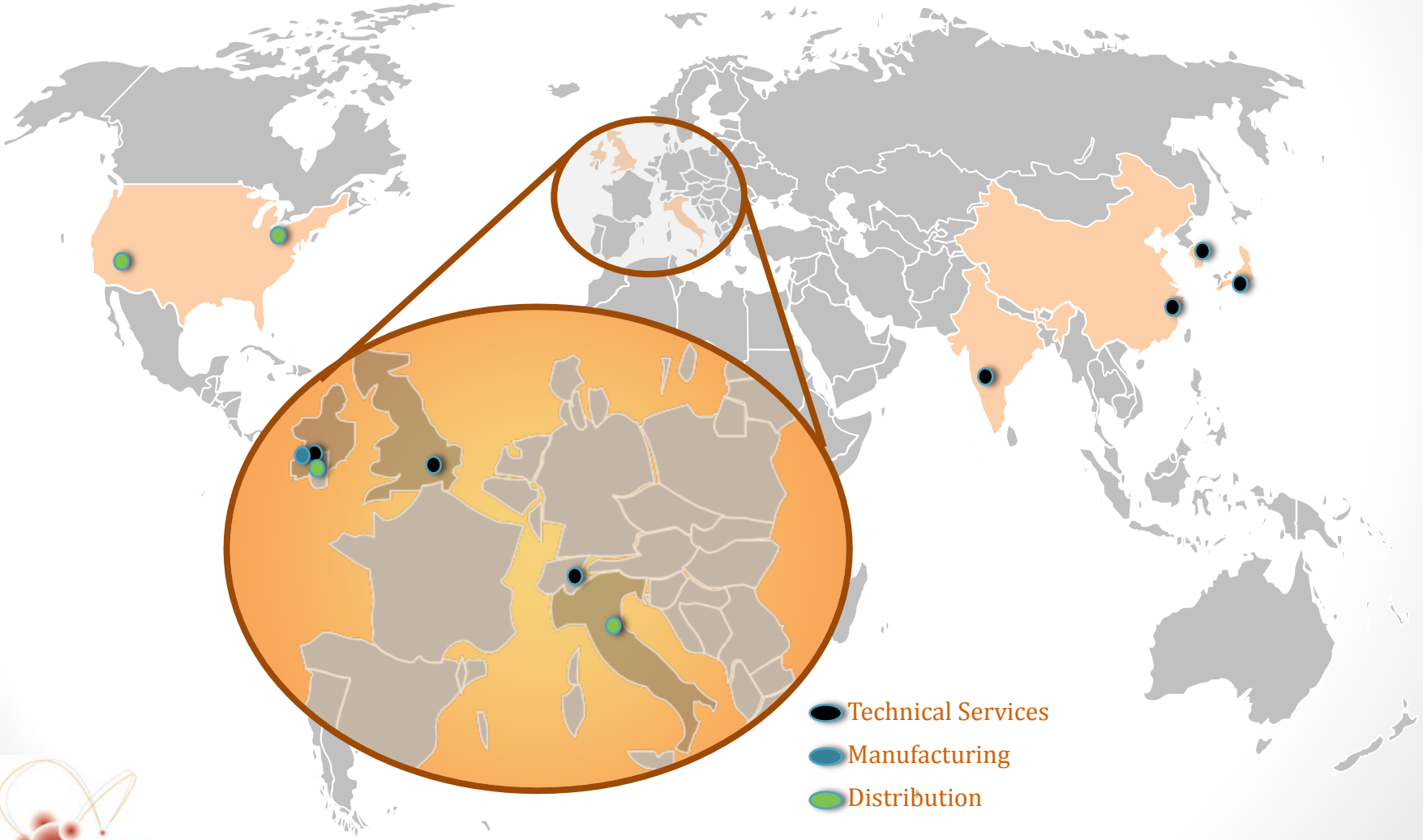
Company Profile

NDP Global Network



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Thermally stable polycrystalline (TSP)

- NanoPak – polycrystalline diamond ("binder") compact
  - TSP – thermally stable polycrystalline diamond
  - Drilling, oil & gas exploration, mining
  - Wear parts

- TSP's available for wear protection and gage protection
  - All shapes including domes
  - 2 grades available
    - Wear – extra wear resistance
    - Drilling grade – extra toughness
- Surface enhancement on TSP's available from NDP for a wide range of attachment technologies
  - Brazing
  - Press fit

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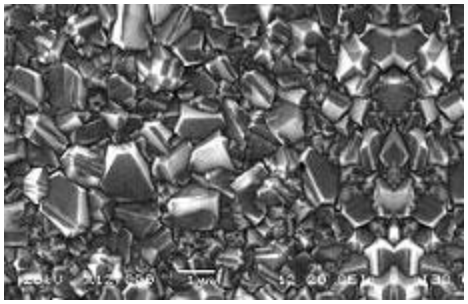
NDP Polycrystalline Diamond (PDC) - SynPak

- SynPak – polycrystalline diamond (“binder”) compact
  - PDC – polycrystalline diamond compact
    - Drilling, oil & gas exploration, mining
  - Planar or non-planar interface
  - Single or multimodal diamond layer
  - Polished or lapped diamond layer



PDC structure

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Drilling PDC

- Drilling market
  - Standard or Premium grade PDC available
  - Premium High impact available

- PDC stud cutters with Diffusion bonded WC for oil and gas drilling

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Mining PDC

- Mining market
  - PDC mining domes for percussive drilling
    - Innovative custom designed for extreme impact resistance
    - 16mm in diameter and larger available
      - Diametric tolerances to suit press fit

- Mining market
  - PDC Premium mining cutters

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PDC Grades and sizes

Cutter Grade	NDP Nomenclature	Diameter	Total Thickness	Dia layer thickness	Dia layer chamfer	WC layer chamfer
Premium Mining Grade	PDC M 1308-RU0	13.44±0.05	8.00±0.10	1.4±0.1	Radius	0
	PDC M 1308-CLC	13.44±0.05	8.00±0.10	1.4±0.1	0.25±0.05	0.25±0.05
Cutter Grade	NDP Nomenclature	Diameter	Total Thickness	Dia layer thickness	Dia layer chamfer	WC layer chamfer
Standard Grade for oil & Gas	PDC S 1308-CLC	13.44±0.03	8.00±0.05	2.0±0.2	0.25±0.05	0.50±0.05
	PDC S 1313-CLC	13.44±0.03	13.20±0.05	2.0±0.2	0.25±0.05	0.50±0.05
	PDC S 1613-CLC	16.00±0.03	13.20±0.05	2.0±0.2	0.25±0.05	0.50±0.05
	PDC S 1913-CLC	19.05±0.03	13.20±0.05	2.0±0.2	0.25±0.05	0.50±0.05
Premium Grade for Oil & Gas High wear resistance	PDC WR 1308-CLC	13.44±0.03	8.00±0.05	2.1±0.2	0.45±0.05	0.70±0.05
	PDC WR 1313-CLC	13.44±0.03	13.20±0.05	2.1±0.2	0.45±0.05	0.70±0.05
	PDC WR 1613-CLC	16.00±0.03	13.20±0.05	2.1±0.2	0.45±0.05	0.70±0.05
	PDC WR 1913-CLC	19.05±0.03	13.20±0.05	2.1±0.2	0.45±0.05	0.70±0.05
Premium Grade for Oil & Gas High impact (chip) resistance	PDC CR 1308-CLC	13.44±0.03	8.00±0.05	$2.1^{\pm 0.2}$	0.45±0.05	0.70±0.05
	PDC CR 1313-CLC	13.44±0.03	13.20±0.05	$2.1^{\pm 0.2}$	0.45±0.05	0.70±0.05
	PDC CR 1613-CLC	16.00±0.03	13.20±0.05	$2.1^{\pm 0.2}$	0.45±0.05	0.70±0.05
	PDC CR 1913-CLC	19.05±0.03	13.20±0.05	$2.1^{\pm 0.2}$	0.45±0.05	0.70±0.05

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NDP Development and Inspection Capabilities

- C-Scan at source
- In-house Metrology laboratory
  - Microscopes (Stereo & Compound)
  - Dimensional measurements
  - µg Scales
- Local INAB certified Metrology Laboratory
  - Micron accuracy CMM
- Local University, Materials & Surface Science Institute