



HAYDEN
DIAMOND BIT INDUSTRIES LTD.
HEAD OFFICE AND MANUFACTURING PLANT

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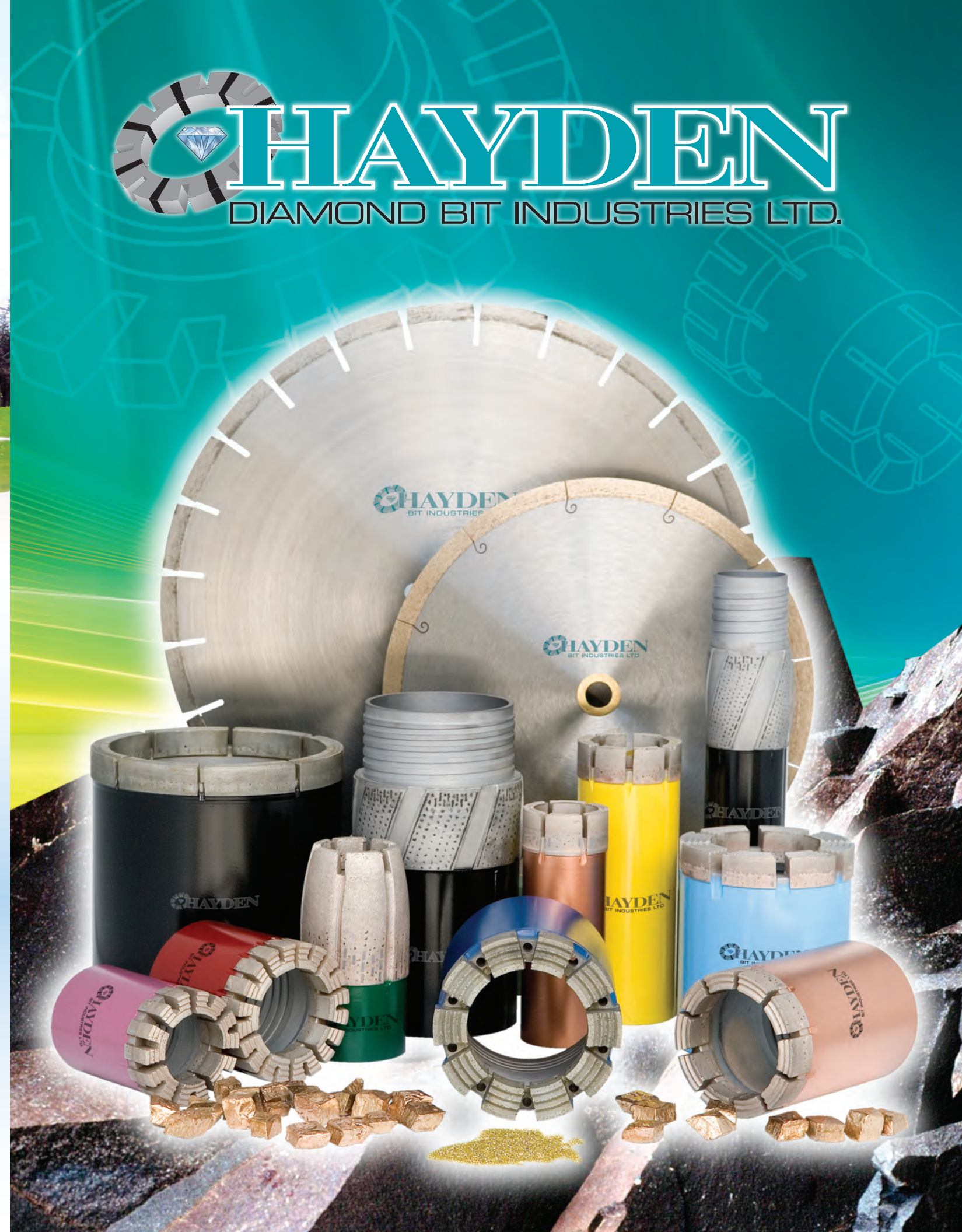
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A young and dynamic company founded in 2001.

Using sophisticated, state of the art furnacing techniques and experts in powder metallurgy, has enabled **HAYDEN** to manufacture a broad range of matrices to achieve the best possible bonds for every day drilling demands.

HAYDEN ensures the product arrives when and where it is needed. The **HAYDEN** team is dedicated to provide outstanding service and meaningful relationship with customers.

volume should be increased as penetration rates increase. The velocity of the fluid and its carrying ability of the cuttings depend on the fluid viscosity. Generally, cuttings should always have an upward velocity of 4 in/sec. (10 cm/sec).

HAYDEN uses a number reference guide (Hayden 1–15), corresponding to the matrix hardness for ease of selection. (HAYDEN 1 being the hardest matrix and **HAYDEN 15** being the softest.) The higher the number, the harder, finer grained, more competent and non-abrasive the rock type the bit is capable of drilling. Conversely, the lower the number, the more broken, fractured coarser grained and abrasive a formation the bit is capable of drilling.

HAYDEN engineers have expertise, experience and designed specialized bits for:

- Using precise techniques to ensure the product is designed to the customers specifications. **HAYDEN** engineers establish the objectives and criteria of the application and through synthesis, analysis, construction, testing and evaluation begin to design the bit. With the addition of computer aided design (or CAD) and high speed CNC machining **HAYDEN** is able to design and manufacture bits with the upmost of precision and efficiency.

HAYDEN engineers continue to explore areas and methods of identifying new product opportunities and manufacturing processes to rapidly bring new products to the ever growing market.

- Misalignment of the drill string with the hole
- Excessive bit weight or rotation speed
- Operating within critical ranges of the drill string
- Oversize annulus
- Bent core barrel or rods

Optimum rotational speeds depend on the formation types being drilled and inter-relationship between the rig capabilities, peripheral equipment being used, and the individual drilling styles.

Maintaining a good RPI ensures that the diamonds stay exposed and that the bit wears at an even and controlled rate. Ideally, the RPI should be between 200–250 for impregnated drill bits. Factors such as drill string vibration or rig constraints might prevent operating within an optimum RPI range, in which case a lower ratio should be used to optimize the bits performance under adverse drilling conditions.

The weight applied to the drill bit is the other important variable in optimizing bit life and achieving a desired RPI. The weight has to be sufficient to maintain a rate of advance relative to the rotational speed (to keep the bit penetrating), as indicated by the RPI factor. However, a weight that is too high can cause diamond re-impregnation or rapid wear due to stripping or even a mechanical failure of the matrix. Too low of a weight often leads to the diamonds becoming polished, requiring the matrix to be stripped to expose a new layer of diamonds.

Ideally, the matrix being used performs best when it wears at the same rate as the diamonds. If the matrix requires continuous stripping to achieve an acceptable penetration rate, then a softer matrix (higher HAYDEN number) should be used.

As a guideline, the weight on an impregnated bit should never exceed 2000-2500 psi or (1378 N/cm²-1723 N/cm²).

OPERATING RECOMMENDATIONS TABLE								
BIT SIZE	ROTATION	RPI RANGE	KERF AREA		BIT WEIGHT RANGE		FLUID VOLUME RANGE / min.	
			INCHES	CM	LBS	KN	US Gal.	Liters
LTK (46 mm)	1500-2500	200-250	1.099	7.09	1000-3000	4.5-13.25	2.5-3.5	9.5-13.5
JTK (48 mm)	1500-2500	200-250	1.289	8.32	1000-3000	4.5-13.25	2.5-3.5	9.5-13.5
AW34	1500-2500	200-250	1.438	9.28	1000-3000	4.5-13.25	2.5-3.5	9.5-13.5
AWL	1000-2000	200-250	1.920	12.39	2000-5000	8.9-22.25	4-5	15-16
BW44	1000-2000	200-250	1.955	12.62	2000-4000	8.9-17.75	3-4	13-17
BWL	800-1600	200-250	2.763	17.86	2000-5000	9.0-22.25	6-8	23-30
NWL	600-1400	200-250	4.214	27.19	3000-6000	13.25-26	8-10	30-38
CHD76	600-1400	200-250	4.670	30.13	3000-6000	13.25-26	8-10	30-38
HWL	400-1200	200-250	6.325	40.81	4000-8000	17.75-35	10-12	38-46
CHD101	400-1200	200-250	7.532	48.60	4000-8000	17.75-35	10-14	38-46
PWL	300-800	200-250	9.512	61.37	5000-10,000	22.45-44	18-23	68-87
CHD134	300-800	200-250	13.074	84.35	5000-10,000	22.45-44	18-23	68-87

