ITTESPOT[®] Coolant Driven Angle Heads

Angle Heads In-line Heads Spindle Speeders

 Indexable Machine at multiple positions with one angle head

 Machine in bores down to 1" diameter

 Eliminate secondary operations, multiple angle heads, expensive part indexers

ELTOOL

Made in USA

Catalog T-3

A New Technology Solution

Coolant Driven Drill Heads—How They Work

Proliferation in the use of high pressure coolant systems as a machining aid fostered the development of Titespot® Coolant Driven Drill Heads by Eltool Corporation.

Unlike mechanically driven heads, Titespot Drill Heads do not depend upon spindle rotation for power. Instead, they utilize your high-pressure coolant system (200 to 1500 PSI depending on the "load" of the application) to drive an integral positive displacement ball piston motor. They clamp rigidly in the tool spindle or lathe turret and load easily from an automatic tool changer. Manufactured to exacting standards, Titespot Drill Heads feature hardened spiral miter gears for efficient power transfer and durability.

Titespot[®] Angle Heads vs. Mechanical Heads

Titespot Coolant Driven Angle Heads are *a new technology solution* to the old problem of right angle machining in confined areas and/or at multiple radial positions. When compared to conventional mechanically driven heads, Titespot Angle Heads offer *these important advantages:*

- *Indexability:* Spindle rotation is not required to drive a Titespot Angle Head. Your spindle is free to function as an indexer, *allowing multi-position machining with one angle head and one set-up. It's like adding a new axis of motion to your machining center. For instructions on how to index your spindle, see our Operations Manual at www.eltool.com.*
- *Accessibility:* Eltool's proprietary elliptical head design allows machining in areas not accessible to mechanically driven heads. Titespot Angle Heads can machine *radially in bores or cavities as small as 1" in diameter, and within 1/4 inch of a base, shoulder, or wall.*
- *Rigidity:* Titespot Angle Heads do not depend on large bearings for housing support as do mechanically driven heads. *Bearing "play" is eliminated. System rigidity, durability, and accuracy are improved.*
- *Simplicity:* Titespot Angle Heads load directly from your ATC like any tool. *No cumbersome stop-blocks are required.*
- *Durability:* High volume coolant flow through the Titespot Angle Head eliminates destructive heat buildup commonly associated with mechanically driven heads. *As a result, Titespot Angle Heads are capable of much higher speeds and longer duty cycles than are mechanically driven heads.*

In-Line Heads

Both the Angle and In-Line version of our Coolant Driven Drill Head provides a low cost way to *convert an ordinary lathe to live tooling*. Capable of *speeds up to 13,500 rpm*, the In-Line head also functions as *a spindle speeder on machining centers*.

A Proven Solution

For more than a decade, Titespot Angle Heads have been reducing costs, improving accuracy and increasing throughput for a wide range of customers including **GE**, **Eaton Corp.**, **Boeing**, **John Deere**, **Rolls-Royce**, **Parker Hannifin**, **Lockheed**, **Raytheon**, **General Motors**, **Goodyear** and many more. To review an application, please call our **Application Engineering Dept. toll free 1-877-4ELTOOL (435-8665)**.

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Typical Applications



Multi-position exhaust ports drilled radially in the bore of an aluminum overhead door closer (cutaway)



Two rows of bleeder ports drilled radially in the piston bore of a cast iron hydraulic motor housing



Spiral grease channels milled and drilled in the bore of a bronze bushing

Sizes and Dimensions



Notes:

1. Milling heads are recommended for heavier duty milling applications. They incorporate two preloaded angular contact bearings on the front for improved performance and durability in side load applications.

2. "Taperlock" and "Eltool" Spindles are proprietary spindles designed to minimize the profile of the angle heads.

3. Please specify the size of Weldon spindle when ordering.



| H | lead Size | Spindle | L | E | F | G | MBS | MSD | MTC |
|---|----------------|-----------|-------|------|-------|-------|-------|------|------|
| 1 | 1D Drilling | Taperlock | 3.000 | .500 | .465 | .813 | 1.000 | .115 | .094 |
| | | Eltool | 3.000 | .500 | .688 | .985 | 1.125 | .125 | .094 |
| | | Weldon | 3.000 | .500 | .500 | .813 | 1.000 | .125 | .125 |
| 1 | 1M Milling | Taperlock | 3.000 | .375 | .625 | .938 | 1.125 | .115 | .125 |
| | | Eltool | 3.000 | .375 | .670 | .985 | 1.125 | .125 | .125 |
| | | ER-8 | 3.000 | .375 | 1.000 | 1.312 | 1.438 | .196 | .125 |
| | | Weldon | 3.000 | .375 | .730 | 1.045 | 1.312 | .250 | .188 |
| 2 | 2D Drilling | Eltool | 4.000 | .625 | .720 | 1.125 | 1.625 | .156 | .281 |
| | | ER-11 | 4.000 | .625 | 1.250 | 1.650 | 1.875 | .275 | .140 |
| | | Weldon | 4.000 | .625 | .906 | 1.312 | 1.500 | .312 | .125 |
| | 2M Milling | Eltool | 4.000 | .625 | .975 | 1.375 | 1.625 | .156 | .281 |
| | | ER-11 | 4.000 | .625 | 1.538 | 1.938 | 1.875 | .275 | .140 |
| 2 | | Weldon | 4.000 | .625 | 1.100 | 1.500 | 1.500 | .312 | .125 |
| 3 | 3D Drilling | ER-11 | 5.000 | .688 | 1.595 | 2.355 | 2.875 | .275 | .390 |
| | 3M | ER-16 | 5.000 | .688 | 1.812 | 2.625 | 3.000 | .406 | .250 |
| 3 | Milling | Weldon | 5.000 | .688 | 1.353 | 2.188 | 2.625 | .500 | .250 |

MBS-Minimum Bore Size MSD-Maximum Shank Diameter MTC-Maximum Tool Clearance

| Shank | "D" Dimension | | | | |
|----------------------|---------------|--------|--------|--|--|
| | Size 1 | Size 2 | Size 3 | | |
| CAT 40 / BT 40 | 4.125 | 4.125 | 4.531 | | |
| CAT 50 / BT 50 | 2.688 | 2.688 | 3.094 | | |
| STRAIGHT SHANK 1-1/4 | 3.025 | 3.025 | 3.438 | | |
| STRAIGHT SHANK 32mm | 3.025 | 3.025 | 3.438 | | |
| HSK-63A | 4.406 | 4.406 | 4.812 | | |
| HSK—100A | 3.406 | 3.406 | 3.812 | | |
| CAPTO C6 | 3.625 | 3.625 | 4.031 | | |

High Torque Models Available

For "heavy-duty" applications requiring higher torque at lower speeds, our *Angle Heads can be equipped with a 5:1 Ratio gear box.* Call our Engineering Department for more information.

- Also Available:
- ▼ External Coolant Delivery
- ▼ Custom Angles and Lengths
- ▼ Special Shanks
- ▼ VDI Live Tooling Models
- Optional Motors

Call toll-free 1-877-4ELTOOL (435-8665) or visit www.eltool.com

Performance Data

Speed is based on flow

To calculate speed: At 70% volumetric efficiency the motor will rotate at about 900 rpm per gallon of flow. *Example: A high pressure coolant system delivering 8 gpm of coolant flow will produce a tool speed of 7200 rpm.*

Torque is based on pressure

To calculate torque: Under test conditions, the motor develops 1.9 inch pounds of torque per each 100 psi of coolant pressure. *Example: A high pressure coolant system delivering coolant at 1000 psi will develop 19 inch pounds of torque.*

| FLOW IN GPM | | | | | | | | | |
|----------------|-------|------|------|------|------|--------|------|--------|--|
| | | 4 | 6 | 8 | 10 | 12 | | | |
| ISD IN JANSSAD | 1200 | 1.26 | 1.88 | 2.51 | 3.14 | 3.76 | 22 | TOR | |
| | ្1000 | 1.08 | 1.63 | 2.17 | 2.71 | 3.26 | 19 | | |
| | ₹ 800 | .86 | 1.30 | 1.74 | 2.17 | 2.60 | 15.2 | QUE IN | |
| | 600 | .65 | .98 | 1.30 | 1.63 | 1.95 | 11.4 | I INCH | |
| | 400 | .43 | .65 | .87 | 1.08 | 1.30 | 7.6 | LBS | |
| | 200 | .22 | .33 | .43 | .54 | .65 | 3.8 | | |
| | | 3600 | 5400 | 7200 | 9000 | 10,800 | | | |

This chart displays Titespot Angle Head horsepower at various combinations of coolant pressure (torque) and flow (speed).

Performance is affected by a number of factors including viscosity of coolant, condition of motor, and tool loading. This chart displays RPM at various pressures under different load conditions.



How to Order

Order example:

A CAT50, Size 2 Milling head, Standard Length, Thru Spindle Coolant Delivery, with an ER-11 Spindle is part **# CAT50**-**2M-ST-T-11. Note: to order Angle Heads with special shanks, external coolant delivery, a 5-2-1 gearbox, or In-Line Heads, please call the factory.**

> For Technical Assistance Call toll-free 1-877-4ELTOOL (435-8665)

Ask about our 30 day Trial!

For more information and to stay up-to-date, visit our website at www.eltool.com



Horsepower is a function of both

To calculate theoretical horsepower:

Example: For a high pressure coolant system delivering 8 gpm of coolant at 1000 psi:

(1000 x .019) x (8 x 900) = 2.171 Horsepower

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