

Q&A Session for Clutches & Brakes 101: Basics for Design Engineers
Date: February 26, 2009

Q: On BDNB clutches, what type of tolerance can I expect on mechanical clutches for torques between 10-150 in-lbs? How uniform is the slip torque in either direction?

A: The BDNB units are designed and rated at a minimum torque capacity. They are not designed to slip. Only hold a load.

Q: Can I get a "AKB" Power On Brake?

A: Contact DMAC with the P/N choice from our catalog.

Q: May we send our application questions directly to Deltran, or do you rely on skilled applications people in distributors or reps?

A: We have application engineers at the DMAC – 540-633-3549. If the application is more involved they will consult with us.

Q: Please explain again how a wrap spring clutch engages in the same time regardless of shaft speed. It seems the spring would "wrap" and grab faster if the shaft is going faster.

A: The wrap is instantaneous since the "wrap" distance is very small (clearance between the spring and the hubs).

Q: Have you used clutched Flywheels for torque disturbance rejection on servo motors?

A: No – not sure what you mean by torque disturbance. We can use a clutch to engage a Flywheel depending on the inertias and speeds.

Q: What is the linear repeatability of your products?

A: Our products are rotary. Depending on the mechanics and linkage the linear accuracy would vary.

Q: Is there minimum required annual revenue in order to ask for a customization? Thank you in advance.

A: This depends on what customization is required. We can change leads, plating, and sometimes bores if there is an order pending say for 100 units or so, we would not have the resources available to change 1 or 2 units.

Q: What predicted life equations are available for dynamic braking?

A: In our catalog (page 143) there are formulas for energy absorption. This must be calculated first

Q: How do you size life of a brake L10 etc?

A: Life depends on many factors, but most of all heat input. We would need application data such as RPM, Duty cycle, inertias etc to begin with. In our catalog (page 143) there are formulas for energy absorption

Q: What do you have that is rated below 100 rpm?

A: Most of all of our Clutches and Brakes can operate at 100 RPM (transfer torque, not slip)

Q: What is the linier repeatability of your products?

A: Our products are rotary. Depending on the mechanics and linkage the linier accuracy would vary

Q: What kind of life expectancy can we count on for the wrapped clutch? How about the friction clutch?

A: In general Wrap Spring Clutches have a longer life than Friction. Life depends on many factors, but most of all heat input. We would need application data such as RPM, Duty cycle, inertias etc to begin with. In our catalog (page 143) there are formulas for energy absorption

Q: Is this technology used in wind turbine systems?

A: We think there are brakes used at the back of generators that hold the turbines still when needed. We also manufacture custom Gearheads.

Q: In servo applications I want to use a brake for emergency stop. Has this been done before?

A: Yes all the time.

Q: Why the speed limitation with the wrapped clutches?

A: There is drag which develops heat (between the hubs and springs)

Q: What type of brake do you recommend for a wire tensioning application?

A: Hysteresis, Magnetic Particle, or Eddy Current – we do not manufacture these types. However, we do have a few “Slip” clutches shown in our catalog page 82 and 83, these are strictly mechanical.

Q: Wrt. PowerOnBrakes you have 2 frictions surfaces - are they made of steel or do you have a kind of fiction material in between?

A: Power On brakes work with steel to steel friction surfaces. There is a friction ring, but that is used to retard wear (distributes the magnetic force over a larger area)

Q: Do you have thermal sizing software?

A: No

Q: Would you give an estimated MTBF, then, for a clutch or brake?

A: Not normally, we have to sometimes for Aerospace and Defense applications but this is nothing we have handy. It can be a very lengthily calculation and every aspect of the application is required.

Q: We currently use a 405-34-017 wrap spring clutch in a printing operation. Do you have something more precise?

A: We may be able to enhance the performance. We need the details of the application and what quantities you need. Call our DMAC 540-633-3549

Q: How would you incorporate a clutch, instead of a servo, where there is a home position, and a position up, and a position down, and still getting back to home position?

A: Depending on the application. The “stop” collar on a Wrap Spring CB can have up to 24 stops or positions.

Q: Do you offer temp cutoff sw. or sensor in your clutches?

A: We have supplied custom OEM versions of our brakes with thermo cut offs embedded in the case coil assembly. We do not offer this as a standard feature

Q: Can you control brake torque with feedback signal of speed?

A: Our standard clutches and brake are not designed for variable torque except for our TFD. This unit with the proper controls will have varied torque with variable current input.

Q: Can the wrap spring line be used in a vacuum, such as a space application?

A: We believe so, but would need to investigate the oils used.

Q: Can you provide current draw for the friction clutches?

A: Most of the current data is in our standard catalog available at www.danahermotion.com

Q: How sensitive are these to concentricity?

A: Very – Our clutches and brakes must be in line within a few thousands of an inch (0.003")

Q: Is there generally a difference in cycle time between power-on and power-off models?

A: This depends on the loads and inertias involved. In general power on units get hotter because they have steel to steel friction surfaces. Power Off Brakes usually have friction material to steel surfaces.

Q: What is the angular fidelity?

A: This term usually relates to electronics. We are not sure what you are asking.

Q: What about power limitations (i.e. thermal limits)?

A: Can be calculated if the application information is known see page 143 of our catalog.

Q: What series what do I start with when looking for a power-off brake for a motor?

A: Need to start with the torque required, envelope size, and performance required.

Q: Do you supply 3D Solidworks/step file models of your products?

A: Yes. Thomson offers [configurable 2D and 3D downloadable product models](#) available in all major CAD formats that can drop right in to your existing design.



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Q: Is sizing an issue in deciding the type of clutch used?

A: Yes they must be sized properly for the application

Q: For regenerative brakes, what product has been developed for vehicles?

A: We have not developed any of these products

Q: What is the speed range available for the Torque Feedback Device?

A: The TFD is designed for very slow speeds such as turning a steering wheel. About 30 RPM max.

Q: Can we operate a brake or clutch in a vacuum environment (1.0E-5 torr) ?

A: If the proper materials are used in the coil and special friction materials are used. This would be very special for us.

Q: What is the radiation tolerance of the brakes and clutches?

A: We do not have a rating on them. They are not designed to be in radiation. We have manufactured special units in the medical field that have special materials used for the coil leads and friction materials.

Q: When would you recommend switching from a servo to a clutch?

A: Many customers designed in servos for increased speed, life, or because they are more familiar with motor drive technology. However, typically a servo system is many times more expensive than clutch/brake products. Clutches are a lower cost design option with the same level of performance.

Q: Can you use a clutch to slow down and then stop? How would you control the voltage to the clutch?

A: Our units can be designed in as a “dynamic stopping” brake or clutch but the length of slip time is generally in milliseconds. If you require more than a 1 second to stop or start, than a continuous slip clutch would be recommended. Hysteresis, Magnetic Particle, or Eddy Current – would be better suited for voltage controlled slow stop, we do not manufacture these types.