Specials are Standard at Bayside

Bayside has geared our design and manufacturing capabilities to make custom or modified gearheads quickly and inexpensively.

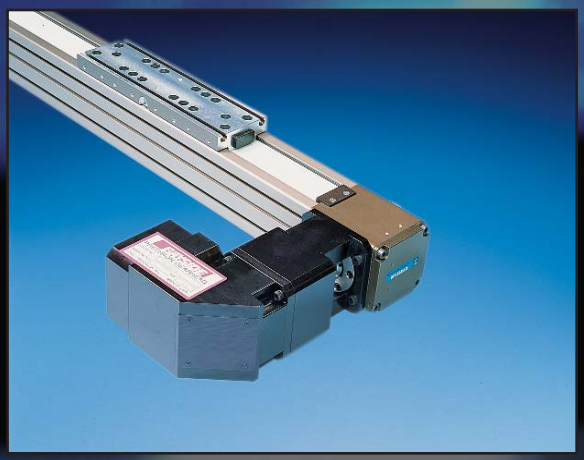
'Standard' specials include many of the products shown on this page. In addition, we have designed hundreds of gearheads for a wide variety of applications including military, aerospace, food processing, paper mills and other specialized applications. Or, if you simply need a smaller shaft or a different gear ratio, we can accommodate modifications quickly and easily.

Linear Slide

Gearheads ready-to-mount to linear slides.

Most belt driven linear slides need a gearhead to reduce inertia. Bayside has pre-engineered in-line and right angle gearheads to mount directly to most popular linear slides, eliminating the need for couplings or adapters. Standard gearheads are available for the following linear slides: (partial list)

- Bishop Wiscarver
- Daedal
- Hauser
- IKO
- Item Products
- INA
- NSK
- Star Linear
- THK
- Tol-o-Matic
- Warner Rapidtrak
- Warner Tollo



Input Shaft / Speed Reducer

Increased design flexibility.

Stealth gearheads are available with an input shaft option. The input shaft option allows more design flexibility, as options like brakes, encoders, or safety couplings can be used between the motor and the gearhead. Also, non-standard or oversized motors can be easily attached to a Stealth gearhead via an input shaft. Standard input shaft options are available for each model and frame size.

Bayside Gearheads mount to motors from the following companies: (partial list)

AEG	DIGIPLAN	KOLLMORGEN	RELIANCE
AEROTECH	EASTERN AIR DEVICES	MAGNETEK	ROCKWELL AUTOMATION
ALLEN BRADLEY	ELAU	MAVILOR	SANYO DENKI
AMERICAN PRECISION	EMERSON	MITSUBISHI	SEIDEL
AMK	FANUC	MOOG	SEM
ANAHEIM AUTOMATION	GETTYS	NIKKI DENSO	SHINKO
APPLIED MOTION PRODUCTS	GIDDINGS & LEWIS	NUM	SIEMENS
BALDOR	HITACHI	NYDEN	SINANO
BAUTZ	INDRAMAT	OMRON	SONY
BAYSIDE	INDUSTRIAL DEVICES	ORIENTAL MOTOR	SUPERIOR ELECTRIC
BODINE	INDUSTRIAL DRIVES	ORMEC	TAMAGAWA
BOSCH	INDUSTRIAL INDEXING	PACIFIC SCIENTIFIC	TOEI
CMC TORQUE SYSTEMS	INFRANOR	PANASONIC	VICKERS
CONTROL TECHNIQUES	INLAND MOTOR	PARVEX	WARNER
COMPUMOTOR	INTELLICO	PITTMAN	YOKOGAWA
CUSTOM SERVO MOTORS	KEB	PMI	YASKAWA

Patented ServoMount® system for easy mounting to ANY servo motor.

Military Spec Gearheads

Mil-spec quality at commercial prices.

Bayside has extensive experience in military and aerospace applications. The Stealth Bomber, M1 Tank and the Space Shuttle all used Bayside gearheads. Bayside's quality system has been approved by NASA and the US Government to MIL-I-45208A. In today's world of tight military budgets, Bayside can give you a mil-spec gearhead at commercial pricing.

Special Environment

Put A Bayside Anywhere!

Bayside can supply gearheads to operate in the harshest environments:

Vacuum - Available as a standard option to 10^{-7} Torr vacuum ratings.

Clean Room - Special gearheads for Class 100 clean room applications.

High Temperature - Special lubricants and seals for temperatures up to 250° Celsius.

Radiation - Gearheads customized to operate within radioactive environments.

Food Grade - Gearheads customized to operate within food handling environments

Bayside Gearhead Selection

Selecting a gearhead for a particular application involves the consideration of a number of interrelated parameters. These are:

- Speed
- Continuous torque
- Repetitive peak torque or acceleration torque
- Emergency stop torque
- Duty cycle
- Ambient temperature
- Radial and axial shaft load

Bayside has prepared the following procedure that will provide a straight forward method for selecting a gearhead that will provide an L-10 life of 10,000 hours.

In this procedure, two rating factors must be used, which derate the gearhead to compensate for thermal and application related torque effects.

- **K_T** - The Torque Thermal Factor

  This factor derates the transmitted torque to prevent case temperature from exceeding 100 degree C.
  The Thermal Factors given in the table are for ambient temperature 25 degree C, medium size indoor space, with the gearheads mounted to a metal base with a surface area more than 3 times larger than the gearhead surface area.

TORQUE THERMAL FACTOR, K_T

		Output Speed, (RPM)									
Frame Size	**Ratio**	**100**	**200**	**400**	**600**	**800**	**1,000**	**1,500**	**2,000**	**2,500**	**3,000**
PS40		1	1	1	1	1	1	—	—	—	—
PS, PX, RS60		1	1	1	1	1	1	—	—	—	—
PS, PX, RS90		1	1	1	1	1	1.2	—	—	—	—
PS, PX, RS115		1	1	1	1	1.2	1.5	—	—	—	—
PS, RS142		1	1	1	1.3	1.7	—	—	—	—	—
PS, RS180	1 stage (1)	1	1	1.5	2.3	—	—	—	—	—	—
	2 stage (2)	1.1	1.5	—	—	—	—	—	—	—	—
PS, RS220	1 stage (1)	1	1.2	2.1	3.2	—	—	—	—	—	—
	2 stage (2)	1.3	2.5	—	—	—	—	—	—	—	—
PS ,RS300	1 stage (1)	1	1.5	3.1	—	—	—	—	—	—	—
	2 stage (2)	1.9	—	—	—	—	—	—	—	—	—
R_90	1	1	1	1	1	1	1	1	1	1.25	1.5
	2-30	1	1	1	1	1	1	1.1	—	—	—
R_115	1	1	1	1	1	1	1	1	1.3	1.7	—
	2-30	1	1	1	1	1	1.3	2	—	—	—
R_142	1	1	1	1	1	1	1.3	2	2.7	3.4	—
	2-30	1	1	1	1	1.3	1.6	—	—	—	—
R_180	1	1	1	1	1	1.3	1.7	2.5	3.4	—	—
	2-30	1	1	1	1.4	1.8	2.3	—	—	—	—
R_220	1	1	1	1.2	1.8	2.4	3.0	4.5	—	—	—
	2-30	1	1	1.3	2.0	2.6	—	—	—	—	—

(1) Data given for PS 3:1 to 10:1 and all RS ratios (2) Data given for PS ratios above 10:1

- **K_S** - The Shock Factor

  This factor is used to derate the transmitted torque for applications where the application is not well defined, has random duty cycles or experiences varying peak torques subjecting the gear teeth to torques above the estimated torques.

  A K_S has been defined for four general application categories, as shown below, and is independent of gearhead size. If your application does not fit into one of these categories, contact Bayside to discuss your requirements.

	Load Type	**Application**	**K_S**
Known Load Data		All Industries	1.00
Unknown Load Data	Light	Textiles, liquid mixers, can filling, food, conveyors, plastics, fans	1.25
	Moderate	Paper mills, rubber industry, sugar industry, metal mills, lumber, robotics	1.50
	Heavy	Cranes, punching machines, rolling mills	1.75

9 Step Procedure

1 Load Parameters

Evaluate the following requirements of the load:

- Load inertia
- Acceleration time (t_{acc})
- Continuous run time (t_{cont})
- Deceleration time (t_{dec})
- Dwell time (t_{dwell})
- Maximum continuous speed (N_{cont})

From these, calculate:

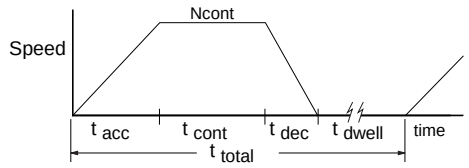
- Acceleration torque (T_{acc})
- Continuous run torque (T_{cont})
- Deceleration torque (T_{dec})
- Dwell torque (T_{dwell})*

*Although not used in the following torque calculations, torque requirements during dwell (zero speed) must be considered when selecting gearhead size.

2 Duty Cycle

Determine if the application is to be considered as **intermittent** or **continuous** by calculating the duty cycle as follows:

$$\text{Duty Cycle} = \frac{(t_{acc} + t_{cont} + t_{dec})}{t_{total}} \times 100$$

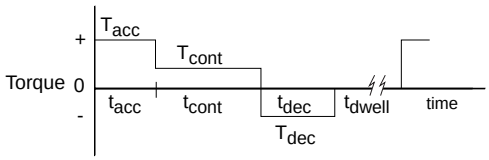


If the duty cycle is< 60%, and $(t_{acc} + t_{cont} + t_{dec})$ is less than 20 minutes, the motion is considered to be **intermittent**.

If the duty cycle is ≥ 60%, or $(t_{acc} + t_{cont} + t_{dec})$ is greater than 20 minutes, the motion is considered to essentially be **continuous**.

3 Calculate the Root Mean Cube Output Torque, T_{mean}.

$$T_{mean} = \sqrt[3]{\frac{\frac{(T_{acc}^3)(N_{cont})(t_{acc})}{2} + (T_{cont}^3)(N_{cont})(t_{cont}) + \frac{(T_{dec}^3)(t\ dec)}{2}}{\frac{(N_{cont})(t_{acc})}{2} + (N_{cont})(t\ cont) + \frac{(N_{cont})(t\ dec)}{2}}}$$



4 Select a gearhead type; PS, PX, RS, Multi-drive, NE or NR (Match gearhead frame size to motor frame size)

5 Review the catalogue listings and determine the gearhead size (40 thru 300) which can meet the following criteria:

$T_{mean} \leq T_{nomr}$

T_{acc} and $T_{dec} \leq T_{accr}$

6 Determine the maximum rated input speed (N_{maxr}) for the selected gearhead.

7 Using $N_{cont.}$ and N_{maxr} from step 6, determine the maximum allowable ratio as:

$$\text{Max ratio} = \frac{N_{maxr}}{N_{cont.}}$$

8 Select an actual ratio from the catalogue listing and calculate the mean input speed, N_{meani} and the maximum input speed, N_{maxi}, as follows:

$$N_{meani} = \left(\frac{\frac{(N_{cont})(t\ acc)}{2} + (N\ cont)(t\ cont) + \frac{(N\ cont)(t\ dec)}{2}}{t\ acc + t\ cont + t\ dec} \right) (\text{RATIO})$$

$$N_{maxi} = (N_{cont})(\text{RATIO})$$

Note: Reflected inertia requirement may determine the actual ratio, as long as it does not exceed the maximum value calculated in STEP 7.

9

	CONTINUOUS MOTION	INTERMITTENT MOTION
Select factor	K_T and K_S	K_S
Calculate	$(T_{mean})(K_T)(K_S)$	$(T_{mean})(K_S)$
Determine that	$T_{nomr} > \mathbf{(T_{mean})(K_T)(K_S)}$	$T_{nomr} > \mathbf{(T_{mean})(K_S)}$

- Compare the required accelerate and decelerate torques, T_{acc} / T_{dec}, to the rated accelerate torque, T_{accr} .

T_{accr} must be greater than the larger of T_{acc} or T_{dec}.

- Check the Emergency Stop Torque rating.
- Compare N_{meani} with the nominal rated speed, N_{nomr}.

N_{nomr} must be greater than N_{meani}

- Compare the maximum input speed N_{maxi} with the maximum input speed rating, N_{maxr}.

N_{maxr} must be greater than N_{maxi}

- Verify radial and axial shaft load.
- If any of these comparisons are not met, then:
  - Choose a larger gearhead
  - Reevaluate the ratio
  - Reevaluate the torque
  - Reevaluate the speed
  - Reevaluate the duty cycle
  - Reevaluate shaft load

SELECTION PROCESS IS COMPLETE !