

# A.G.M.A. & Service Factor Load Class Information

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# A.G.M.A. & Service Factor Load Class Information

## Class of Service and Service Factors

The ratings for gear drives in this manual are based on a service factor of 1.00, for uniform load and uniform power source, up to 10 hours of operation per day. For other operating conditions, the application horsepower or torque must be multiplied by the appropriate service factor, to determine the equivalent gear drive power rating. A gear drive should be selected with a rated capacity equal to or greater than the equivalent rating.

A condensed service factor chart is located in the selection information pages for each type of gear drive or reducer.

AGMA service factors for worm and helical worm gearmotors and reducers are listed on pages A-3 to A-4.

AGMA load classification numbers for spur, helical & bevel gearmotors and shaft mount reducers are listed on pages A-5 to A-6.

AGMA service factors for spur, helical & bevel gear drives and reducers are listed on pages A-7 to A-8.

Table 1 indicates the relationship between service factors and load classification numbers.

The AGMA load classification numbers and service factors are based on a uniform power source. If other power sources are used, the service factors must be converted using Table 2. Determine the required service factor with uniform power source. Locate that service factor in the first column and read straight across to obtain required service factor with multi-cylinder or single cylinder engines.

Service factors do not need to be used with thermal ratings.

The Class Number and Service Factor charts are for general guidelines in determining required service factors. Past experience may indicate that different service factors are required. Consult the factory for unusual or severe applications, or when there are any safety considerations.

TABLE 1 – LOAD CLASSIFICATION NUMBERS

<b>LOAD CLASS (S.F.)</b>	<b>UP TO 3 HRS. TOTAL OPERATION PER DAY</b>	<b>3 TO 10 HRS. TOTAL OPERATION PER DAY</b>	<b>OVER 10 HRS. TOTAL OPERATION PER DAY</b>
I (1.0)	Moderate Shock Load	Uniform Load	
II (1.4)	Heavy Shock Load	Moderate Shock Load	Uniform Load
III (2.0)		Heavy Shock Load	Moderate Shock Load

TABLE 2 – SERVICE FACTOR CONVERSION BASED ON TYPE OF POWER SOURCE

<b>STEAM OR GAS TURBINE HYDRAULIC OR ELECTRIC MOTOR</b>	<b>MULTI-CYLINDER ENGINE</b>	<b>SINGLE CYLINDER ENGINE</b>
1.00	1.25	1.50
1.25	1.50	1.75
1.50	1.75	2.00
1.75	2.00	2.25
2.00	2.25	2.50
2.50	2.75	3.00
3.00	3.25	3.50

# A.G.M.A. & Service Factor Load Class Information

## A.G.M.A. Service Factors

### Worm, Helical Worm Gearmotors & Reducers with Uniform Power Source

Application	Total Operation		
	Up to 3 hrs. per day	3 to 10 hrs per day	Over 10 hrs. per day
Agitators (mixers)			
Pure liquids	*	1.00	1.25
Liquids and solids	1.00	1.25	1.50
Liquids - variable density	1.00	1.25	1.50
Blowers			
Centrifugal	*	1.00	1.25
Lobe	1.00	1.25	1.50
Vane	*	1.00	1.25
Brewing and distilling			
Bottling machinery	*	1.00	1.25
Brew kettles - continuous duty	*	1.00	1.25
Cookers - continuous duty	*	1.00	1.25
Mash tubs - continuous duty	*	1.00	1.25
Scale hopper - frequent starts	1.00	1.25	1.50
Can filling machines	*	1.00	1.25
Car dumpers	1.25	1.50	1.75
Car pullers	1.00	1.25	1.50
Clarifiers	*	1.00	1.25
Classifiers	1.00	1.25	1.50
Clay working machinery			
Brick press	1.25	1.50	1.75
Briquette machine	1.25	1.50	1.75
Pug mill	1.00	1.25	1.50
Compactors	1.50	1.75	2.00
Compressors			
Centrifugal	*	1.00	1.25
Lobe	1.00	1.25	1.50
Reciprocating, multi-cylinder	1.00	1.25	1.50
Reciprocating, single - cylinder	1.25	1.50	1.75
Conveyors - general purpose			
Uniformly loaded or fed	*	1.00	1.25
Not uniformly fed	1.00	1.25	1.50
Reciprocating or shaker	1.25	1.50	1.75
Cranes 1)			
Dry dock			
Main hoist	1.25	1.50	1.75
Auxiliary hoist	1.25	1.50	1.75
Boom hoist	1.25	1.50	1.75
Slewing drive	1.25	1.50	1.75
Traction drive	1.50	1.50	1.50
Container			
Main hoist	Refer to Manufacturer		
Boom hoist	Refer to Manufacturer		
Trolley drive			
Gantry drive	Refer to Manufacturer		
Traction drive	Refer to Manufacturer		
Mill duty			
Main hoist	Refer to Manufacturer		
Auxiliary	Refer to Manufacturer		
Bridge	Refer to Manufacturer		
Trolley travel	Refer to Manufacturer		
Industrial duty			
Main	Refer to Manufacturer		
Auxiliary	Refer to Manufacturer		
Bridge	Refer to Manufacturer		
Trolley travel	Refer to Manufacturer		
Crusher			
Stone or ore	1.50	1.75	2.00
Dredges			
Cable reels	1.00	1.25	1.50
Conveyors	1.00	1.25	1.50
Cutter head drives	1.25	1.50	1.75
Pumps	1.00	1.25	1.50
Screen drives	1.25	1.50	1.75
Stackers	1.00	1.25	1.50
Winches	1.00	1.25	1.50
Elevators			
Bucket	1.00	1.25	1.50
Centrifugal discharge	*	1.00	1.25
Escalators	Refer to Manufacturer		
Freight	Refer to Manufacturer		
Gravity discharge	*	1.00	1.25
Extruders			
General	1.25	1.25	1.25
Plastics			
Variable speed drive	1.50	1.50	1.50
Fixed speed drive	1.75	1.75	1.75
Rubber			
Continuous screw operation	1.50	1.50	1.50
Intermittent screw operation	1.75	1.75	1.75

Application	Total Operation		
	Up to 3 hrs. per day	3 to 10 hrs per day	Over 10 hrs. per day
Fans			
Centrifugal	*	1.00	1.25
Cooling towers	Refer to Manufacturer		
Forced draft	1.25	1.25	1.25
Induced draft	1.00	1.25	1.50
Industrial & mine	1.00	1.25	1.50
Feeders			
Apron	*	1.25	1.50
Belt	1.00	1.25	1.50
Disc	*	1.00	1.25
Reciprocating	1.25	1.50	1.75
Screw	1.00	1.25	1.50
Food industry			
Cereal cooker	*	1.00	1.25
Dough mixer	1.00	1.25	1.50
Meat grinders	1.00	1.25	1.50
Slicers	1.00	1.25	1.50
Generators and exciters	*	1.00	1.25
Hammer mills	1.50	1.50	1.75
Hoists			
Heavy duty	1.25	1.50	1.75
Medium duty	1.00	1.25	1.50
Skip hoist	1.00	1.25	1.50
Laundry			
Tumblers	1.00	1.25	1.50
Washers	1.25	1.25	1.50
Lumber industry			
Barkers - spindle feed	1.25	1.25	1.50
Main drive	1.50	1.50	1.50
Conveyors - burner	1.25	1.25	1.50
Main or heavy duty	1.50	1.50	1.50
Main log	1.50	1.50	1.75
Re-saw, merry-go-round	1.25	1.25	1.50
Conveyors			
Slab	1.50	1.50	1.75
Transfer	1.25	1.25	1.50
Chains			
Floor	1.50	1.50	1.50
Green	1.50	1.50	1.50
Cut-off saws			
Chain	1.50	1.50	1.50
Drag	1.50	1.50	1.50
Debarking drums	1.50	1.50	1.75
Feeds			
Edger	1.25	1.25	1.50
Gang	1.50	1.50	1.50
Trimmer	1.25	1.25	1.50
Log deck	1.50	1.50	1.50
Log hauls - incline - well type	1.50	1.50	1.50
Log turning devices	1.50	1.50	1.50
Planer feed	1.25	1.25	1.50
Planer tilting hoists	1.50	1.50	1.50
Rolls - live-off bearing - roll cases	1.50	1.50	1.50
Sorting table	1.25	1.50	1.50
Tipple hoist	1.25	1.25	1.50
Transfers			
Chain	1.50	1.50	1.50
Craneway	1.50	1.50	1.50
Tray drives	1.25	1.25	1.50
Veneer lathe drives	Refer to Manufacturer		
Metal mills			
Draw bench carriage and main drive	1.00	1.25	1.50
Runout table			
Non-reversing			
Group drives	1.00	1.25	1.50
Individual drives	1.50	1.50	1.75
Reversing	1.50	1.50	1.75
Slab pushers	1.25	1.25	1.50
Shears	1.50	1.50	1.75
Wire drawing	1.00	1.25	1.50
Wire winding machine	1.00	1.25	1.50
Metal strip processing machinery			
Bridles	1.25	1.25	1.50
Coilers & uncoilers	1.00	1.00	1.25
Edge trimmers	1.00	1.25	1.50
Flatteners	1.25	1.25	1.50
Loopers (accumulators)	1.00	1.00	1.00
Pinch rolls	1.25	1.25	1.50
Scrap choppers	1.00	1.25	1.50

\* UNSPECIFIED SERVICE FACTORS SHOULD BE 1.00 OR AS AGREED UPON BY USER AND MANUFACTURER.

1) CRANE DRIVES ARE TO BE SELECTED BASED ON GEAR TOOTH BENDING STRENGTH, USING THE NUMERIC SERVICE FACTORS IN THIS TABLE. SERVICE FACTOR IN DURABILITY SHALL BE A MINIMUM OF 1.0.

# A.G.M.A. & Service Factor Load Class Information

## A.G.M.A. Service Factors

### Worm, Helical Worm Gearmotors & Reducers with Uniform Power Source (cont'd)

Application	Total Operation			Application	Total Operation		
	Up to 3 hrs. per day	3 to 10 hrs per day	Over 10 hrs. per day		Up to 3 hrs. per day	3 to 10 hrs per day	Over 10 hrs. per day
Metal strip processing machinery (cont'd)				Plastics industry (cont'd)			
Shears	1.50	1.50	1.75	Secondary processing (cont'd)			
Slitters	1.00	1.25	1.50	Film	1.25	1.25	1.25
Mills, rotary type				Pipe	1.25	1.25	1.25
Ball & rod				Pre-plasticizers	1.50	1.50	1.50
Spur ring gear	1.50	1.50	1.75	Rods	1.25	1.25	1.25
Helical ring gear	1.50	1.50	1.50	Sheet	1.25	1.25	1.25
Direct connected	1.50	1.50	1.75	Tubing	1.25	1.25	1.50
Cement kilns	1.50	1.50	1.50	Pullers - barge haul	1.00	1.50	1.75
Dryers & coolers	1.50	1.50	1.50	Pumps			
Mixers				Centrifugal	*	1.00	1.25
Concrete	1.00	1.25	1.50	Proportioning	1.00	1.25	1.50
Paper mills				Reciprocating			
Agitator (mixer)	1.50	1.50	1.50	Single acting, 3 or more cylinders	1.00	1.25	1.50
Agitator for pure liquors	1.25	1.25	1.25	Double acting, 2 or more cylinders	1.00	1.25	1.50
Barking drums	1.75	1.75	1.75	Rotary			
Barkers - mechanical	1.75	1.75	1.75	Gear type	*	1.00	1.50
Beater	1.50	1.50	1.50	Lobe	*	1.00	1.25
Breaker stack	1.25	1.25	1.25	Vane	*	1.00	1.25
Calendar 2)	1.25	1.25	1.25	Rubber industry			
Chipper	1.75	1.75	1.75	Intensive internal mixers			
Chip feeder	1.50	1.50	1.50	Batch mixers	1.50	1.75	1.75
Coating rolls	1.25	1.25	1.25	Continuous mixers	1.25	1.50	1.50
Conveyors				Mixing mill - 2 smooth rolls (if corrugated rolls are used, then use the same service factors that are used for a cracker warmer)	1.50	1.50	1.50
Chip, bark, chemical	1.25	1.25	1.25	Batch drop mill - 2 smooth rolls	1.50	1.50	1.50
Log (including slab)	1.75	1.75	1.75	Cracker warmer - 2 rolls; 1 corrugated roll	1.75	1.75	1.75
Couch rolls	1.25	1.25	1.25	Cracker - 2 corrugated rolls	1.75	1.75	1.75
Cutter	1.75	1.25	1.75	Holding, feed & blend mill - 2 rolls	1.25	1.25	1.25
Cylinder molds	1.25	1.25	1.25	Refiner - 2 rolls	1.50	1.50	1.50
Dryers 2)				Calenders	1.50	1.50	1.50
Paper machine	1.25	1.25	1.25	Sand muller	1.00	1.25	1.50
Conveyor type	1.25	1.25	1.25	Sewage disposal equipment			
Embossor	1.25	1.25	1.25	Bar screens	*	1.00	1.25
Extruder	1.50	1.50	1.50	Chemical feeders	1.00	1.00	1.25
Fourdrinier rolls (includes lump breaker, dandy roll, wire turning, and return rolls)	1.25	1.25	1.25	Dewatering screens	1.00	1.25	1.50
Jordan	1.25	1.25	1.25	Scum breakers	1.00	1.25	1.50
Kiln drive	1.50	1.50	1.50	Slow or rapid mixers	1.00	1.25	1.50
Mt. Hope roll	1.25	1.25	1.25	Sludge collectors	1.00	1.00	1.25
Paper rolls	1.25	1.25	1.25	Thickeners	1.00	1.25	1.50
Platter	1.50	1.50	1.50	Vacuum filters	1.00	1.25	1.50
Presses - felt & suction	1.25	1.25	1.25	Screens			
Pulper	1.50	1.50	1.75	Air washing	*	1.00	1.25
Pumps - vacuum	1.50	1.50	1.50	Rotary - stone or gravel	1.00	1.25	1.50
Reel (surface type)	1.25	1.25	1.50	Traveling water intake	*	1.00	1.25
Screens				Sugar industry			
Chip	1.50	1.50	1.50	Beet slicer	1.50	1.50	1.75
Rotary	1.50	1.50	1.50	Cane knives	1.50	1.50	1.50
Vibrating	1.75	1.75	1.75	Crushers	1.50	1.50	1.50
Size press	1.25	1.25	1.25	Mills (low speed end)	1.50	1.50	1.50
Super calendar 4)	1.25	1.25	1.25	Textile industry			
Thickener (AC motor)	1.50	1.50	1.50	Batchers	1.00	1.25	1.50
(DC motor)	1.25	1.25	1.25	Calenders	1.00	1.25	1.50
Washer (AC Motor)	1.50	1.50	1.50	Cards	1.00	1.25	1.50
(DC motor)	1.25	1.25	1.25	Dry cans	1.00	1.25	1.50
Wind and unwind stand	1.00	1.00	1.00	Dryers	1.00	1.25	1.50
Winders (surface type)	1.25	1.25	1.25	Dyeing machinery	1.00	1.25	1.50
Yankee dryers 2)	1.25	1.25	1.25	Looms	1.00	1.25	1.50
Plastics industry				Mangles	1.00	1.25	1.50
Primary processing				Nappers	1.00	1.25	1.50
Intensive internal mixers				Pads	1.00	1.25	1.50
Batch mixers	1.75	1.75	1.75	Slashers	1.00	1.25	1.50
Continuous mixers	1.50	1.50	1.50	Soapers	1.00	1.25	1.50
Batch drop mill - 2 smooth rolls	1.25	1.25	1.25	Spinners	1.00	1.25	1.50
Continuous feed, holding & blend mill	1.25	1.25	1.25	Tenter frames	1.00	1.25	1.50
Compounding mill	1.25	1.25	1.25	Washers	1.00	1.25	1.50
Calenders	1.50	1.50	1.50	Winders	1.00	1.25	1.50
Secondary processing							
Blow molders	1.50	1.50	1.50				
Coating	1.25	1.25	1.25				

NOTES:

- \* UNSPECIFIED SERVICE FACTORS SHALL BE 1.00 OR AS AGREED UPON BETWEEN USER AND MANUFACTURER.
- 2) ANTI-FRICTION BEARINGS ONLY. USE 1.5 FOR SLEEVE BEARINGS.
- 4) A SERVICE FACTOR OF 1.00 MAY BE APPLIED AT BASE SPEED OF A SUPER CALENDER OPERATING OVER-SPEED RANGE OF PART RANGE CONSTANT HORSEPOWER, PART RANGE CONSTANT TORQUE WHERE THE CONSTANT HORSEPOWER SPEED RANGE IS GREATER THAN 1.5 TO 1. A SERVICE FACTOR OF 1.25 IS APPLICABLE TO SUPER CALENDERS OPERATING OVER THE ENTIRE SPEED RANGE AT CONSTANT TORQUE OR WHERE THE CONSTANT HORSEPOWER SPEED RANGE IS LESS THAN 1.5 TO 1.

# A.G.M.A. & Service Factor Load Class Information

## A.G.M.A. Load Classification Numbers

### Spur, Helical & Bevel Gearmotors & Shaft Mount Reducers with Uniform Power Source

Application	Class Numbers		
	Up to 3 hrs. per day	3 to 10 hrs per day	Over 10 hrs. per day
Agitators (mixers)			
Pure liquids	I	I	II
Liquids and solids	I	II	II
Liquids - variable density	I	II	II
Blowers			
Centrifugal	I	I	II
Lobe	I	II	II
Vane	I	II	II
Brewing and distilling			
Bottling machinery	I	I	II
Brew kettles - continuous duty	II	II	II
Cookers - continuous duty	II	II	II
Mash tubs - continuous duty	II	II	II
Scale hopper - frequent starts	I	I	II
Can filling machines	I	I	II
Car dumpers	I	III	III
Car pullers	I	II	II
Clarifiers	I	I	II
Classifiers	I	II	II
Clay working machinery			
Brick press	II	III	III
Briquette machine	II	III	III
Pug mill	I	II	II
Compactors	III	III	III
Compressors			
Centrifugal	I	I	II
Lobe	I	II	II
Reciprocating, multi-cylinder	II	II	III
Reciprocating, single-cylinder	III	III	III
Cranes 1)			
Dry dock			
Main hoist	2.50	2.50	2.50
Auxiliary hoist	2.50	2.50	3.00
Boom hoist	2.50	2.50	3.00
Slewing drive	2.50	2.50	3.00
Traction drive	3.00	3.00	3.00
Container		1.25	1.50
Main hoist	3.00	3.00	3.00
Boom hoist	2.00	2.00	2.00
Trolley drive			
Gantry drive	3.00	3.00	3.00
Traction drive	2.00	2.00	2.00
Mill duty			
Main hoist	3.50	3.50	3.50
Auxiliary	3.50	3.50	3.50
Bridge travel	2.50	3.00	3.00
Trolley travel	2.50	3.00	3.00
Industrial duty			
Main	2.50	2.50	3.00
Auxiliary	2.50	2.50	3.00
Bridge travel	2.50	3.00	3.00
Trolley travel	2.50	3.00	3.00
Crusher			
Stone or ore	III	III	III
Dredges			
Cable reels	II	II	II
Conveyors	II	II	II
Cutter head drives	III	III	III
Pumps	III	III	III
Screen drives	III	III	III
Stackers	II	II	II
Winches	II	II	II
Elevators			
Bucket	I	II	II
Centrifugal discharge	I	I	II
Escalators	I	I	II
Freight	I	II	II
Gravity discharge	I	I	II
Extruders			
General	II	II	II
Plastics			
Variable speed drive	III	III	III
Fixed speed drive	III	III	III
Rubber			
Continuous screw operation	III	III	III
Intermittent screw operation	III	III	III
Fans			
Centrifugal	I	I	II
Cooling towers	III	III	III
Forced draft	II	II	II
Induced draft	II	II	II
Industrial & mine	II	II	II

Application	Class Numbers		
	Up to 3 hrs. per day	3 to 10 hrs per day	Over 10 hrs. per day
Feeders			
Apron	I	II	II
Belt	I	II	II
Disc	I	I	II
Reciprocating	II	III	III
Screw	I	II	II
Food industry			
Cereal cooker	I	I	II
Dough mixer	II	II	II
Meat grinders	II	II	II
Slicers	I	II	II
Generators and exciters	II	II	II
Hammer mills	III	III	III
Hoists			
Heavy duty	III	III	III
Medium duty	II	II	II
Skip hoist	II	II	II
Laundry			
Tumblers	II	II	II
Washers	II	II	III
Lumber industry			
Barkers - spindle feed			
Main drive	III	III	III
Conveyors - burner	II	II	II
Main or heavy duty	II	II	II
Main log	III	III	III
Re-saw, merry-go-round	II	II	II
Slab	III	III	III
Transfer	II	II	II
Chains			
Floor	II	II	II
Green	II	II	III
Cut-off saws			
Chain	II	II	III
Drag	II	II	III
Debarking drums	III	III	III
Feeds			
Edger	II	II	II
Gang	III	III	III
Trimmer	II	II	II
Log deck	III	III	III
Log hauls - incline - well type	III	III	III
Log turning devices	III	III	III
Planer feed	II	II	II
Planer tilting hoists	II	II	II
Rolls - live-off bearing - roll cases	III	III	III
Sorting table	II	II	II
Tipple hoist	II	II	II
Transfers			
Chain	II	II	III
Craneway	II	II	III
Tray drives	II	II	II
Veneer lathe drives	II	II	II
Metal mills			
Draw bench carriage and main drive	II	II	II
Runout table			
Non-reversing			
Group drives	II	II	II
Individual drives	III	III	III
Reversing	III	III	III
Slab pushers	II	II	II
Shears	III	III	III
Wire drawing	II	II	II
Wire winding machine	II	II	II
Metal strip processing machinery			
Bridles	II	II	II
Coilers & uncoilers	I	I	II
Edge trimmers	I	I	II
Flatteners	II	II	II
Loopers (accumulators)	I	I	I
Pinch rolls	II	II	II
Scrap choppers	II	II	II
Shears	III	III	III
Slitters	I	II	II
Mills, rotary type			
Ball & rod			
Spur ring gear	III	III	III
Helical ring gear	II	II	II
Direct connected	III	III	III
Cement kilns	II	II	II
Dryers & coolers	II	II	II

1) CRANE DRIVES ARE TO BE SELECTED BASED ON GEAR TOOTH BENDING STRENGTH, USING THE NUMERIC SERVICE FACTORS IN THIS TABLE. SERVICE FACTOR IN DURABILITY SHALL BE A MINIMUM OF 1.0.

# A.G.M.A. & Service Factor Load Class Information

## A.G.M.A. Load Classification Numbers

### Spur, Helical & Bevel Gearmotors & Shaft Mount Reducers with Uniform Power Source (cont'd)

Application	Class Numbers			Application	Class Numbers		
	Up to 3 hrs. per day	3 to 10 hrs per day	Over 10 hrs. per day		Up to 3 hrs. per day	3 to 10 hrs per day	Over 10 hrs. per day
Mixers				Pumps			
Concrete	II	II	II	Centrifugal	I	I	II
Paper mills				Proportioning	II	II	II
Agitator (mixer)	II	II	II	Reciprocating			
Agitator for pure liquors	II	II	II	Single acting, 3 or more cylinders	II	II	II
Barking drums	III	III	III	Double acting, 2 or more cylinders	II	II	II
Barkers - mechanical	III	III	III	Rotary			
Beater	II	II	II	Gear type	I	I	II
Breaker stack	II	II	II	Lobe	I	I	II
Calender 2)	II	II	II	Vane	I	I	II
Chipper	III	III	III	Rubber industry			
Chip feeder	II	II	II	Intensive internal mixers			
Coating rolls	II	II	II	Batch mixers	III	III	III
Conveyors				Continuous mixers	II	II	II
Chip, bark, chemical	II	II	II	Mixing mill -			
Log (including slab)	III	III	III	2 smooth rolls	II	II	II
Couch rolls	II	II	II	1 or 2 corrugated rolls	III	III	III
Cutter	III	III	III	Batch drop mill - 2 smooth rolls	II	II	II
Cylinder molds	II	II	II	Cracker warmer - 2 rolls; 1 corrugated roll	III	III	III
Dryers 2)				Cracker - 2 corrugated rolls	III	III	III
Paper machine	II	II	II	Holding, feed & blend mill - 2 rolls	II	II	II
Conveyor type	II	II	II	Refiner - 2 rolls	II	II	II
Embosser	II	II	II	Calenders	II	II	II
Extruder	II	II	II	Sand muller	II	II	II
Fourdrinier rolls (includes lump breaker, dandy roll, wire turning, & return rolls)	II	II	II	Sewage disposal equipment			
Jordan	II	II	II	Bar screens	II	II	II
Kiln drive	II	II	II	Chemical feeders	II	II	II
Mt. Hope roll	II	II	II	Dewatering screens	II	II	II
Paper rolls	II	II	II	Scum breakers	II	II	II
Platter	II	II	II	Slow or rapid mixers	II	II	II
Presses - felt & suction	II	II	II	Sludge collectors	II	II	II
Pulper	III	III	III	Thickeners	II	II	II
Pumps - vacuum	II	II	II	Vacuum filters	II	II	II
Reel (surface type)	II	II	II	Screens			
Screens				Air washing	I	I	II
Chip	II	II	II	Rotary - stone or gravel	II	II	II
Rotary	II	II	II	Traveling water intake	I	I	I
Vibrating	III	III	III	Screw Conveyors			
Size press	II	II	II	Uniformly Loaded or Fed	I	I	II
Super calender 3)	II	II	II	Heavy Duty	I	II	II
Thickener (AC motor)	II	II	II	Sugar industry			
(DC motor)	II	II	II	Beet slicer	III	III	III
Washer (AC motor)	II	II	II	Cane knives	II	II	II
(DC motor)	II	II	II	Crushers	II	II	II
Wind and unwind stand	I	I	I	Mills (low speed end)	III	III	III
Winders (surface type)	II	II	II	Textile industry			
Yankee dryers 2)	II	II	II	Batchers	II	II	II
Plastics industry				Calenders	II	II	II
Primary processing				Cards	II	II	II
Intensive internal mixers				Dry cans	II	II	II
Batch mixers	III	III	III	Dryers	II	II	II
Continuous mixers	II	II	II	Dyeing machinery	II	II	II
Batch drop mill - 2 smooth rolls	II	II	II	Looms	II	II	II
Continuous feed, holding & blend mill	II	II	II	Mangles	II	II	II
Calenders	II	II	II	Nappers	II	II	II
Secondary processing				Pads	II	II	II
Blow molders	II	II	II	Slashers	II	II	II
Coating	II	II	II	Soapers	II	II	II
Film	II	II	II	Spinners	II	II	II
Pipe	II	II	II	Tenter frames	II	II	II
Pre-plasticizers	II	II	II	Washers	II	II	II
Rods	II	II	II	Winders	II	II	II
Sheet	II	II	II				
Tubing	II	II	II				
Pullers - barge haul	II	II	II				

NOTES:

- 2) ANTI-FRICTION BEARINGS ONLY.
- 3) A CLASS NUMBER OF I MAY BE APPLIED AT BASE SPEED OF A SUPER CALENDER OPERATING OVER-SPEED RANGE OF PART RANGE CONSTANT HORSEPOWER, PART RANGE CONSTANT TORQUE WHERE THE CONSTANT HORSEPOWER SPEED RANGE IS GREATER THAN 1.5 TO 1. A CLASS NUMBER OF II IS APPLICABLE TO SUPER CALENDERS OPERATING OVER THE ENTIRE SPEED RANGE AT CONSTANT TORQUE OR WHERE THE CONSTANT HORSEPOWER SPEED RANGE IS LESS THAN 1.5 TO 1.

# A.G.M.A. & Service Factor Load Class Information

## A.G.M.A. Service Factors

### Spur, Helical & Bevel Gear Drives & Reducers with Uniform Power Source

Application	Class Numbers			Application	Class Numbers		
	Up to 3 hrs. per day	3 to 10 hrs per day	Over 10 hrs. per day		Up to 3 hrs. per day	3 to 10 hrs per day	Over 10 hrs. per day
Agitators (mixers)				Feeders			
Pure liquids	1.00	1.00	1.25	Apron	1.00	1.25	1.50
Liquids and solids	1.00	1.25	1.50	Belt	1.00	1.25	1.50
Liquids - variable density	1.00	1.25	1.50	Disc	1.00	1.00	1.25
Blowers				Reciprocating	1.50	1.75	2.00
Centrifugal	1.00	1.00	1.25	Screw	1.00	1.25	1.50
Lobe	1.00	1.25	1.50	Food industry			
Vane	1.00	1.25	1.50	Cereal cooker	1.00	1.00	1.25
Brewing and distilling				Dough mixer	1.25	1.25	1.50
Bottling machinery	1.00	1.00	1.25	Meat grinders	1.25	1.25	1.50
Brew kettles - continuous duty	1.25	1.25	1.25	Slicers	1.25	1.25	1.50
Cookers - continuous duty	1.25	1.25	1.25	Generators and exciters	1.00	1.00	1.25
Mash tubs - continuous duty	1.25	1.25	1.25	Hammer mills	1.75	1.75	2.00
Scale hopper - frequent starts	1.25	1.25	1.50	Hoists			
Can filling machines	1.00	1.00	1.25	Heavy duty	1.75	1.75	2.00
Car dumpers	1.50	1.75	2.00	Medium duty	1.25	1.25	1.50
Car pullers	1.00	1.25	1.50	Skip hoist	1.25	1.25	1.50
Clarifiers	1.00	1.00	1.25	Laundry			
Classifiers	1.00	1.25	1.50	Tumblers	1.25	1.25	1.50
Clay working machinery				Washers	1.50	1.50	2.00
Brick press	1.50	1.75	2.00	Lumber industry			
Briquette machine	1.50	1.75	2.00	Barkers - spindle feed	1.25	1.25	1.50
Pug mill	1.00	1.25	1.50	Main drive	1.75	1.75	1.75
Compactors	2.00	2.00	2.00	Conveyors - burner	1.25	1.25	1.50
Compressors				Main or heavy duty	1.50	1.50	1.50
Centrifugal	1.00	1.00	1.25	Main log	1.75	1.75	2.00
Lobe	1.00	1.25	1.50	Re-saw, merry-go-round	1.25	1.25	1.50
Reciprocating, multi-cylinder	1.50	1.50	1.75	Conveyors			
Reciprocating, single - cylinder	1.75	1.75	2.00	Slab	1.75	1.75	2.00
Cranes 1)				Transfer	1.25	1.25	1.50
Dry dock				Chains			
Main hoist	2.50	2.50	2.50	Floor	1.50	1.50	1.50
Auxiliary hoist	2.50	2.50	3.00	Green	1.50	1.50	1.75
Boom hoist	2.50	2.50	3.00	Cut-off saws			
Slewing drive	2.50	2.50	3.00	Chain	1.50	1.50	1.75
Traction drive	3.00	3.00	3.00	Drag	1.50	1.50	1.75
Container				Debarking drums	1.75	1.75	2.00
Main hoist	3.00	3.00	3.00	Feeds			
Boom hoist	2.00	2.00	2.00	Edger	1.25	1.25	1.50
Trolley drive				Gang	1.75	1.75	1.75
Gantry drive	3.00	3.00	3.00	Trimmer	1.25	1.25	1.50
Traction drive	2.00	2.00	2.00	Log deck	1.75	1.75	1.75
Mill duty				Log hauls - incline - well type	1.75	1.75	1.75
Main hoist	3.50	3.50	3.50	Log turning devices	1.75	1.75	1.75
Auxiliary	3.50	3.50	3.50	Planer feed	1.25	1.25	1.50
Bridge	2.50	3.00	3.00	Planer tilting hoists	1.50	1.50	1.50
Trolley travel	2.50	3.00	3.00	Rolls - live-off bearing - roll cases	1.75	1.75	1.75
Industrial duty				Sorting table	1.25	1.25	1.50
Main	2.50	2.50	3.00	Tipple hoist	1.25	1.25	1.50
Auxiliary	2.50	2.50	3.00	Transfers			
Bridge	2.50	3.00	3.00	Chain	1.50	1.50	1.75
Trolley travel	2.50	3.00	3.00	Craneway	1.50	1.50	1.75
Crusher				Tray drives	1.25	1.25	1.50
Stone or ore	1.75	1.75	2.00	Veneer lathe drives	1.25	1.25	1.50
Dredges				Metal mills			
Cable reels	1.25	1.25	1.50	Draw bench carriage and main drive	1.25	1.25	1.50
Conveyors	1.25	1.25	1.50	Runout table			
Cutter head drives	2.00	2.00	2.00	Non-reversing			
Pumps	2.00	2.00	2.00	Group drives	1.50	1.50	1.50
Screen drives	1.75	1.75	2.00	Individual drives	2.00	2.00	2.00
Stackers	1.25	1.25	1.50	Reversing	2.00	2.00	2.00
Winches	1.25	1.25	1.50	Slab pushers	1.50	1.50	1.50
Elevators				Shears	2.00	2.00	2.00
Bucket	1.00	1.25	1.50	Wire drawing	1.25	1.25	1.50
Centrifugal discharge	1.00	1.00	1.25	Wire winding machine	1.25	1.50	1.50
Escalators	1.00	1.00	1.25	Metal strip processing machinery			
Freight	1.00	1.25	1.50	Bridles	1.25	1.25	1.50
Gravity discharge	1.00	1.00	1.25	Coilers & uncoilers	1.00	1.00	1.25
Extruders				Edge trimmers	1.00	1.25	1.50
General	1.50	1.50	1.50	Flatteners	1.25	1.25	1.50
Plastics				Loopers (accumulators)	1.00	1.00	1.25
Variable speed drive	1.50	1.50	1.50	Pinch rolls	1.25	1.25	1.50
Fixed speed drive	1.75	1.75	1.75	Scrap choppers	1.25	1.25	1.50
Rubber				Shears	2.00	2.00	2.00
Continuous screw operation	1.75	1.75	1.75	Slitters	1.00	1.25	1.50
Intermittent screw operation	1.75	1.75	1.75	Mills, rotary type			
Fans				Ball & rod			
Centrifugal	1.00	1.00	1.25	Spur ring gear	2.00	2.00	2.00
Cooling towers	2.00	2.00	2.00	Helical ring gear	1.50	1.50	1.50
Forced draft	1.25	1.25	1.25	Direct connected	2.00	2.00	2.00
Induced draft	1.50	1.50	1.50	Cement kilns	1.50	1.50	1.50
Industrial & mine	1.50	1.50	1.50	Dryers & coolers	1.50	1.50	1.50

1) CRANE DRIVES ARE TO BE SELECTED BASED ON GEAR TOOTH BENDING STRENGTH, USING THE NUMERIC SERVICE FACTORS IN THIS TABLE. SERVICE FACTOR IN DURABILITY SHALL BE A MINIMUM OF 1.0.

# A.G.M.A. & Service Factor Load Class Information

## A.G.M.A. Service Factors

### Spur, Helical & Bevel Gear Drives & Reducers with Uniform Power Source (cont'd)

Application	Class Numbers			Application	Class Numbers		
	Up to 3 hrs. per day	3 to 10 hrs per day	Over 10 hrs. per day		Up to 3 hrs. per day	3 to 10 hrs per day	Over 10 hrs. per day
Mixers				Pullers - barge haul	1.25	1.25	1.50
Concrete	1.25	1.25	1.50	Pumps			
Paper mills 2)				Centrifugal	1.00	1.00	1.25
Agitator (mixer)	1.50	1.50	1.50	Proportioning	1.25	1.25	1.50
Agitator for pure liquors	1.25	1.25	1.25	Reciprocating			
Barking drums	2.00	2.00	2.00	Single acting, 3 or more cylinders	1.25	1.25	1.50
Barkers - mechanical	2.00	2.00	2.00	Double acting, 2 or more cylinders	1.25	1.25	1.50
Beater	1.50	1.50	1.50	Rotary			
Breaker stack	1.25	1.25	1.25	Gear type	1.00	1.00	1.25
Calender 3)	1.25	1.25	1.25	Lobe	1.00	1.00	1.25
Chipper	2.00	2.00	2.00	Vane	1.00	1.00	1.25
Chip feeder	1.50	1.50	1.50	Rubber industry			
Coating rolls	1.25	1.25	1.25	Intensive internal mixers			
Conveyors				Batch mixers	1.75	1.75	1.75
Chip, bark, chemical	1.25	1.25	1.25	Continuous mixers	1.50	1.50	1.50
Log (including slab)	2.00	2.00	2.00	Mixing mill - 2 smooth rolls (if corrugated rolls are used, then use the same service factors that are used for a cracker warmer)	1.50	1.50	1.50
Couch rolls	1.25	1.25	1.25	Batch drop mill - 2 smooth rolls	1.50	1.50	1.50
Cutter	2.00	2.00	2.00	Cracker warmer - 2 rolls;			
Cylinder molds	1.25	1.25	1.25	1 corrugated roll	1.75	1.75	1.75
Dryers 3)				Cracker - 2 corrugated rolls	2.00	2.00	2.00
Paper machine	1.25	1.25	1.25	Holding, feed & blend mill - 2 rolls	1.25	1.25	1.25
Conveyor type	1.25	1.25	1.25	Refiner - 2 rolls	1.50	1.50	1.50
Embossor	1.25	1.25	1.25	Calenders	1.50	1.50	1.50
Extruder	1.50	1.50	1.50	Sand muller	1.25	1.25	1.50
Fourdrinier rolls (includes lump breaker, dandy roll, wire turning, and return rolls)	1.25	1.25	1.25	Sewage disposal equipment			
Jordan	1.50	1.50	1.50	Bar screens	1.25	1.25	1.25
Kiln drive	1.50	1.50	1.50	Chemical feeders	1.25	1.25	1.25
Mt. Hope roll	1.25	1.25	1.25	Dewatering screens	1.50	1.50	1.50
Paper rolls	1.25	1.25	1.25	Scum breakers	1.50	1.50	1.50
Platter	1.50	1.50	1.50	Slow or rapid mixers	1.50	1.50	1.50
Presses - felt & suction	1.25	1.25	1.25	Sludge collectors	1.25	1.25	1.25
Pulper	2.00	2.00	2.00	Thickeners	1.50	1.50	1.50
Pumps - vacuum	1.50	1.50	1.50	Vacuum filters	1.50	1.50	1.50
Reel (surface type)	1.25	1.25	1.25	Screens			
Screens				Air washing	1.00	1.00	1.25
Chip	1.50	1.50	1.50	Rotary - stone or gravel	1.25	1.25	1.50
Rotary	1.50	1.50	1.50	Traveling water intake	1.00	1.00	1.25
Vibrating	2.00	2.00	2.00	Sugar industry			
Size press	1.25	1.25	1.25	Beet slicer	2.00	2.00	2.00
Super calender 4)	1.25	1.25	1.25	Cane knives	1.50	1.50	1.50
Thickener (AC motor)	1.50	1.50	1.50	Crushers	1.50	1.50	1.50
(DC motor)	1.25	1.25	1.25	Mills (low speed end)	1.75	1.75	1.75
Washer (AC motor)	1.50	1.50	1.50	Textile industry			
(DC motor)	1.25	1.25	1.25	Batchers	1.25	1.25	1.50
Wind and unwind stand	1.00	1.00	1.00	Calenders	1.25	1.25	1.50
Winders (surface type)	1.25	1.25	1.25	Cards	1.25	1.25	1.50
Yankee dryers 3)	1.25	1.25	1.25	Dry cans	1.25	1.25	1.50
Plastics industry				Dryers	1.25	1.25	1.50
Primary processing				Dyeing machinery	1.25	1.25	1.50
Intensive internal mixers				Looms	1.25	1.25	1.50
Batch mixers	1.75	1.75	1.75	Mangles	1.25	1.25	1.50
Continuous mixers	1.50	1.50	1.50	Nappers	1.25	1.25	1.50
Batch drop mill - 2 smooth rolls	1.25	1.25	1.25	Pads	1.25	1.25	1.50
Continuous feed, holding & blend mill	1.25	1.25	1.25	Slashers	1.25	1.25	1.50
Compounding mill	1.25	1.25	1.25	Soapers	1.25	1.25	1.50
Calenders	1.50	1.50	1.50	Spinners	1.25	1.25	1.50
Secondary processing				Tenter frames	1.25	1.25	1.50
Blow molders	1.50	1.50	1.50	Washers	1.25	1.25	1.50
Coating	1.25	1.25	1.25	Winders	1.25	1.25	1.50
Film	1.25	1.25	1.25				
Pipe	1.25	1.25	1.25				
Pre-plasticizers	1.50	1.50	1.50				
Rods	1.25	1.25	1.25				
Sheet	1.25	1.25	1.25				
Tubing	1.25	1.25	1.50				

NOTES:

- SERVICE FACTORS FOR PAPER MILL APPLICATIONS ARE APPLIED TO THE NAMEPLATE RATING OF THE ELECTRIC DRIVE MOTOR AT THE MOTOR RATED BASED SPEED.
- ANTI-FRICTION BEARINGS ONLY. USE 1.5 FOR SLEEVE BEARINGS.
- A SERVICE FACTOR OF 1.00 MAY BE APPLIED AT BASE SPEED OF A SUPER CALENDER OPERATING OVER-SPEED RANGE OF PART RANGE CONSTANT HORSEPOWER, PART RANGE CONSTANT TORQUE WHERE THE CONSTANT HORSEPOWER SPEED RANGE IS GREATER THAN 1.5 TO 1. A SERVICE FACTOR OF 1.25 IS APPLICABLE TO SUPER CALENDERS OPERATING OVER THE ENTIRE SPEED RANGE AT CONSTANT TORQUE OR WHERE THE CONSTANT HORSEPOWER SPEED RANGE IS LESS THAN 1.5 TO 1.