

Understanding the New Electric Motor Energy Efficiency Regulations

November 2, 2011

What are the new regulations?

NRCan's new regulations state that electric motors manufactured on or after April 12, 2012 must meet the new efficiency levels.

What are the efficiency levels in the regulations?

NRCan defines two efficiency levels: Table 1 (NEMA premium) and Table 2 (high efficiency). See the tables below for the minimum efficiency levels...

What products are included in the regulations?

- an electric induction motor of a polyphase, squirrel cage type design,
- has an output rating of 1 HP (0.746 kW) and up to and including 500 HP (375 kW),
- has a rated voltage of not more than 600 volts AC,
- has a rated frequency of 50/60 Hz or 60 Hz,
- is of open or enclosed construction and includes explosion-proof enclosures,
- is constructed to NEMA T frame or U frame dimensions or constructed to IEC equivalent dimensions,
- is NEMA design A, B or C, or IEC (metric) design N or H,
- is designed to operate at a single speed,
- has 2 Pole (3600 RPM), 4 Pole (1800 RPM), 6 Pole (1200 RPM) or 8 Pole (900 RPM) construction,
- is of foot mounted construction or flange mounted construction with or without feet or detachable feet,
- has an IP code from 00 to 66

But does not include:

Motors larger than 200 HP and not larger than 500 HP that are a NEMA design A or C

A motor includes any such product that is incorporated into any other product, whether or not the other product is an energy-using product and subject to the Regulation.

What Products must meet Table 1 (Nema Premium)?

- Nema Motors from 1 HP upto and including 200 HP or IEC (metric) design Motors larger than 0.746 kW and up to and including 150 kW
- 2 Pole (3600 RPM), 4 Pole (1800 RPM) or 6 Pole (1200 RPM)
- Nema T frame or IEC (metric) design
- NEMA design A or B, or IEC (metric) design N
- Standard shaft, R-shaft (tapered) or S-shaft (short) or an IEC (metric) design equivalent

What Products must meet Table 2 (High Efficiency)?

- 8-pole (900 RPM) construction, or
- U frame or equivalent IEC (metric) design dimensions, or
- NEMA design C or IEC (metric) design H, or
- Close-coupled pump motor (JM, JP, P Base etc.), or
- Fire pump duty motor, or
- Vertically-mounted solid shaft normal thrust motor, as tested in the horizontal configuration, or
- Footless construction, or
- NEMA design B motors of size greater than 200 HP and up to and including 500 HP or IEC design N motor of size greater than 150 kW and up to and including 375 kW.
- integral gear motors

Restrictions on motors in Canada that do not meet the new regulations:

Motors manufactured between January 1st 2011 and April 12th 2012 that are in Canada after April 12th 2012 cannot be sold and/or transported between Provinces – they must be used in the Province that they are sold in.

How do the Canadian Regulations differ from the USA?

These efficiency levels attempt to harmonize with regulations that came into effect in the United States beginning December 19, 2010 as outlined in the U.S. Energy Security and Independence Act.



Table 1: Minimum Nominal Efficiency Standard (Premium)

Item	Power (HP)	Power (kW)	Energy Efficiency Standard (Percentage)					
			Open			Closed		
			2 Pole 3600 RPM	4 Pole 1800 RPM	6 Pole 1200 RPM	2 Pole 3600 RPM	4 Pole 1800 RPM	6 Pole 1200 RPM
1.	1	0.75	77.0	85.5	82.5	77.0	85.5	82.5
2.	1.5	1.1	84.0	86.5	86.5	84.0	86.5	87.5
3.	2	1.5	85.5	86.5	87.5	85.5	86.5	88.5
4.	3	2.2	85.5	89.5	88.5	86.5	89.5	89.5
5.	4	3.0	86.5	89.5	89.5	88.5	89.5	89.5
6.	5	3.7	86.5	89.5	89.5	88.5	89.5	89.5
7.	5.5	4.0	86.5	89.5	89.5	88.5	89.5	89.5
8.	7.5	5.5	88.5	91.0	90.2	89.5	91.7	91.0
9.	10	7.5	89.5	91.7	91.7	90.2	91.7	91.0
10.	15	11	90.2	93.0	91.7	91.0	92.4	91.7
11.	20	15	91.0	93.0	92.4	91.0	93.0	91.7
12.	25	19	91.7	93.6	93.0	91.7	93.6	93.0
13.	30	22	91.7	94.1	93.6	91.7	93.6	93.0
14.	40	30	92.4	94.1	94.1	92.4	94.1	94.1
15.	50	37	93.0	94.5	94.1	93.0	94.5	94.1
16.	60	45	93.6	95.0	94.5	93.6	95.0	94.5
17.	75	55	93.6	95.0	94.5	93.6	95.4	94.5
18.	100	75	93.6	95.4	95.0	94.1	95.4	95.0
19.	125	90	94.1	95.4	95.0	95.0	95.4	95.0
20.	150	110	94.1	95.8	95.4	95.0	95.8	95.8
21.	175	132	95.0	95.8	95.4	95.4	96.2	95.8
22.	200	150	95.0	95.8	95.4	95.4	96.2	95.8

Table 2: Minimum Nominal Efficiency Standard (Energy Efficient)

Item	Power (HP)	Power (kW)	Energy Efficiency Standard (Percentage)							
			Open				Closed			
			2 Pole 3600 RPM	4 Pole 1800 RPM	6 Pole 1200 RPM	8 Pole 900 RPM	2 Pole 3600 RPM	4 Pole 1800 RPM	6 Pole 1200 RPM	8 Pole 900 RPM
1.	1	0.75	75.5	82.5	80.0	74.0	75.5	82.5	80.0	74.0
2.	1.5	1.1	82.5	84.0	84.0	75.5	82.5	84.0	85.5	77.0
3.	2	1.5	84.0	84.0	85.5	85.5	84.0	84.0	86.5	82.5
4.	3	2.2	84.0	86.5	86.5	86.5	85.5	87.5	87.5	84.0
5.	4	3	84.0	86.5	86.5	86.5	85.5	87.5	87.5	84.0
6.	5	3.7	85.5	87.5	87.5	87.5	87.5	87.5	87.5	85.5
7.	5.5	4	85.5	87.5	87.5	87.5	87.5	87.5	87.5	85.5
8.	7.5	5.5	87.5	88.5	88.5	88.5	88.5	89.5	89.5	85.5
9.	10	7.5	88.5	89.5	90.2	89.5	89.5	89.5	89.5	88.5
10.	15	11	89.5	91.0	90.2	89.5	90.2	91.0	90.2	88.5
11.	20	15	90.2	91.0	91.0	90.2	90.2	91.0	90.2	89.5
12.	25	19	91.0	91.7	91.7	90.2	91.0	92.4	91.7	89.5
13.	30	22	91.0	92.4	92.4	91.0	91.0	92.4	91.7	91.0
14.	40	30	91.7	93.0	93.0	91.0	91.7	93.0	93.0	91.0
15.	50	37	92.4	93.0	93.0	91.7	92.4	93.0	93.0	91.7
16.	60	45	93.0	93.6	93.6	92.4	93.0	93.6	93.6	91.7
17.	75	55	93.0	94.1	93.6	93.6	93.0	94.1	93.6	93.0
18.	100	75	93.0	94.1	94.1	93.6	93.6	94.5	94.1	93.0
19.	125	90	93.6	94.5	94.1	93.6	94.5	94.5	94.1	93.6
20.	150	110	93.6	95.0	94.5	93.6	94.5	95.0	95.0	93.6
21.	175	132	94.5	95.0	94.5	93.6	95.0	95.0	95.0	94.1
22.	200	150	94.5	95.0	94.5	93.6	95.0	95.0	95.0	94.1
23.	250	185	94.5	95.4	95.4	94.5	95.4	95.0	95.0	94.5
24.	300	225	95.0	95.4	95.4	-	95.4	95.4	95.0	-
25.	350	260	95.0	95.4	95.4	-	95.4	95.4	95.0	-
26.	400	300	95.4	95.4	-	-	95.4	95.4	-	-
27.	450	335	95.8	95.8	-	-	95.4	95.4	-	-
28.	500	375	95.8	95.8	-	-	95.4	95.8	-	-