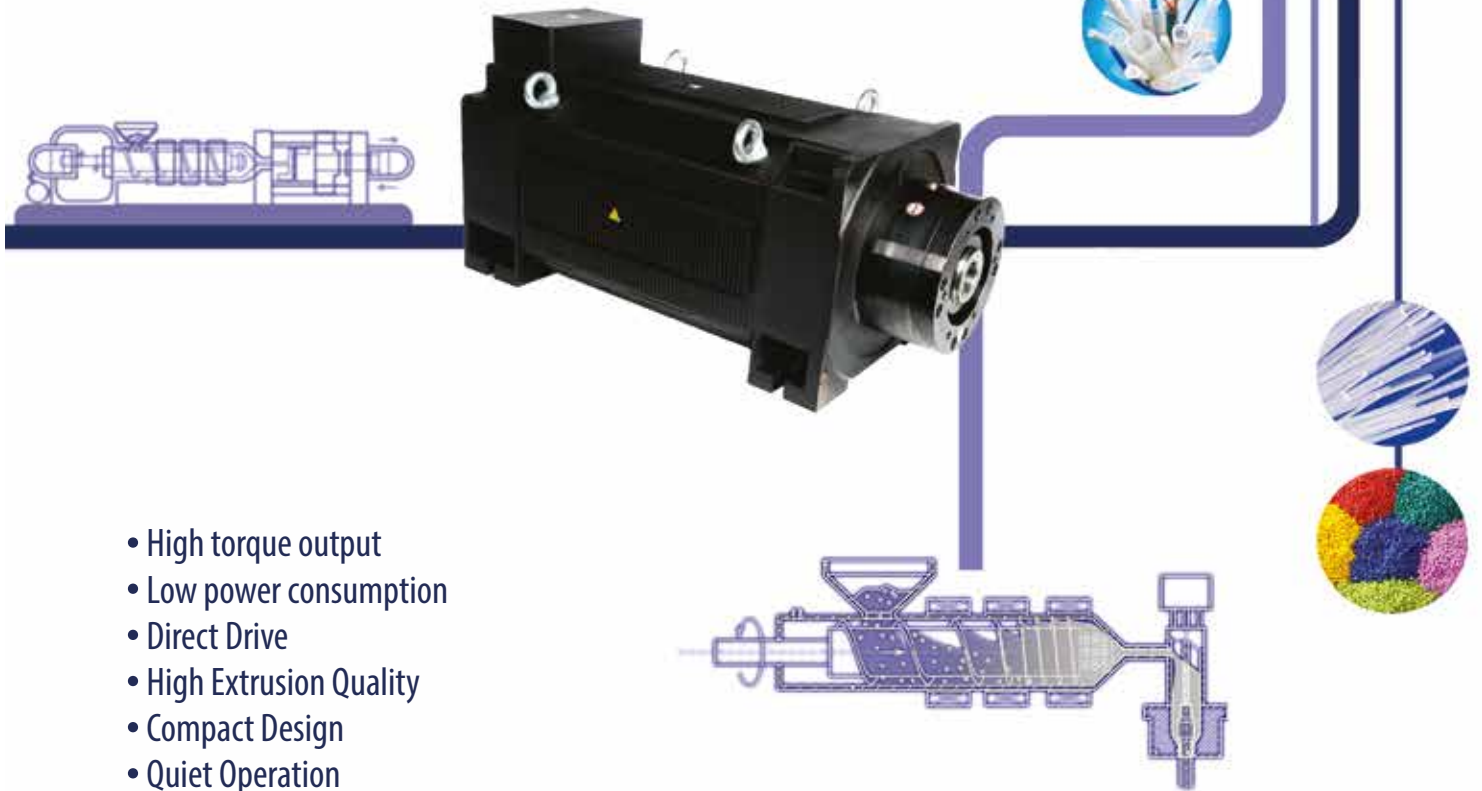


# Innovative Solution for excellent **EXTRUSION**

WITH SQME **TORQUE** MOTOR

EXTRUDER - INJECTION - BLOW MOULDING



- High torque output
- Low power consumption
- Direct Drive
- High Extrusion Quality
- Compact Design
- Quiet Operation
- No water cooling
- Integrated thrust bearing
- Hollow motor shaft

**EMF Motor**<sup>®</sup>

# EMF Motor

## *Only the Best wins ...*

Every solution comes from a real understanding of the challenges facing designers and users.

EMF continues to be a company made up of innovative individuals striving to design, create and build products and solutions that improve industrial demands. We design our products for durability and we test them rigorously to ensure the highest of reliability.

Our products are the **“next big thing”** in electric motors. Our patented technology provides the ground to attract world’s most talented and motivated engineers. EMF products will benefit design engineers to innovate compact products that will respond to the increasing demand from customers.

**“Precise motion”** is our focus. SQM Torquemotor can distinctly differentiate your product, your efficiency and your operations and deliver a market place advantage by improving its performance. This means totally increased efficiency which is the expectation in every company. Perfectly deployed motion can make your product more reliable and efficient and enhance accuracy.

### **How is this all possible? What is so different with SQM Torquemotor?**

SQM Torquemotor works with patented motor principle that is most suitable for high torque at low speed applications. SQM works synchronously and the windings have no influence on the pole number. The high pole number is achieved by intelligent magnetic field.

As a result SQM Torquemotor, as a direct drive, offers great advantages in all performance criterias, such as very high energy efficiency, high dynamics, high overload capacity, quiet and practically maintenance free operation.

## SQME Synchronous Torque Motor

Patented and most efficient Direct Drive Extrusion Motor Patent Nr: EP 0910154

SQME is permanent magnet brushless motor, working after a patented motor principle, suitable for low speed and high torque applications. SQME has unusual high pole number 66, 88 or 110, which is achieved by a magnetic principle. (European Patent No: EP0910154)

### This new patented motor principle brings many advantages:

- Direct drive; no more gearbox
- No more maintenance and no more typical gearbox problems
- Very high pole servo motor offers excellent dynamic performance due to the accurate speed regulation. The result is high extrusion quality.
- SQME has highest torque density and has very compact design.
- Silent operation
- SQME has "Ultra Premium" efficiency and helps to save very high energy. The reason is simple. The motor winding has no effect on the pole number of the motor. The windings of SQME has 6 to 10 poles, where the motor has 66, 88 or 110 poles. In this way SQME has very low copper losses and very high efficiency.

### Technical Specifications:

- Torque range Up to 10.000 Nm
- Nominal Speed 20-400 rpm for SQME100, SQME132  
20-200 rpm for SQME160, SQME200, SQME315
- Rated voltage 380, 400, 480 up to 690 VAC supply voltage
- Cooling IC 410 – water cooling is not needed
- Shaft heights 100, 132, 160, 200 and 315 mm
- Degree of protection IP 54
- Thermal protection PT100 or KTY and PTC
- Shaft Hollow shaft (Customized interfaces available on request)
- Thrust bearing SKF xxxx
- Feedback sensor EnDat Encoder as standard (SinCos and Resolver option)

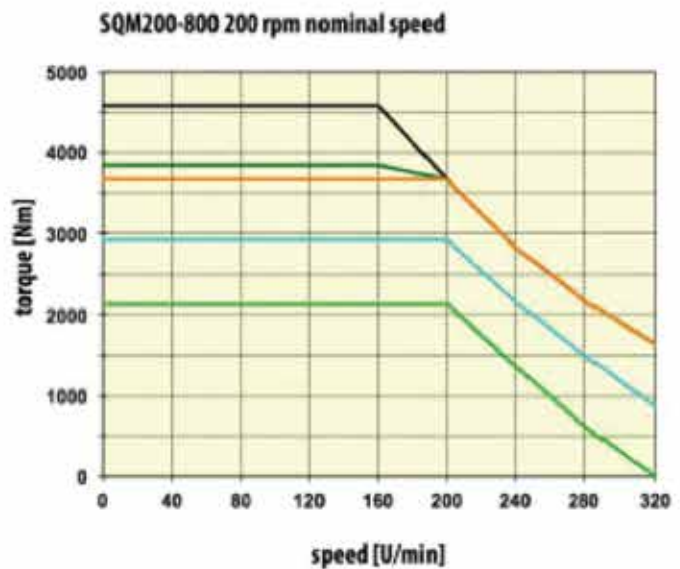
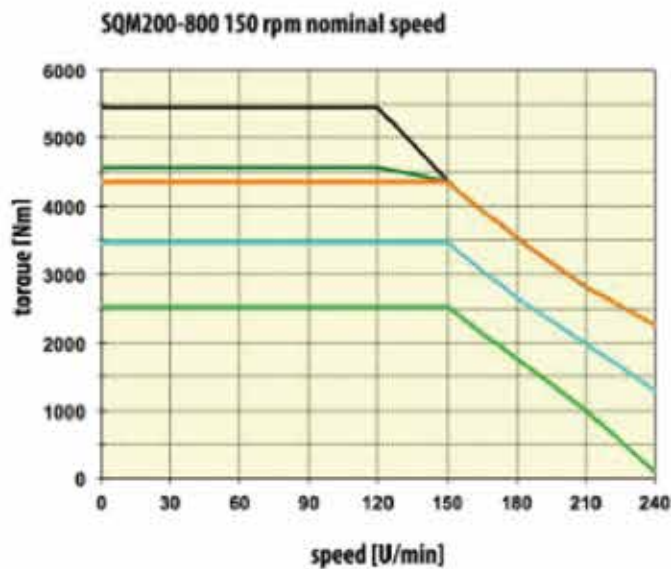
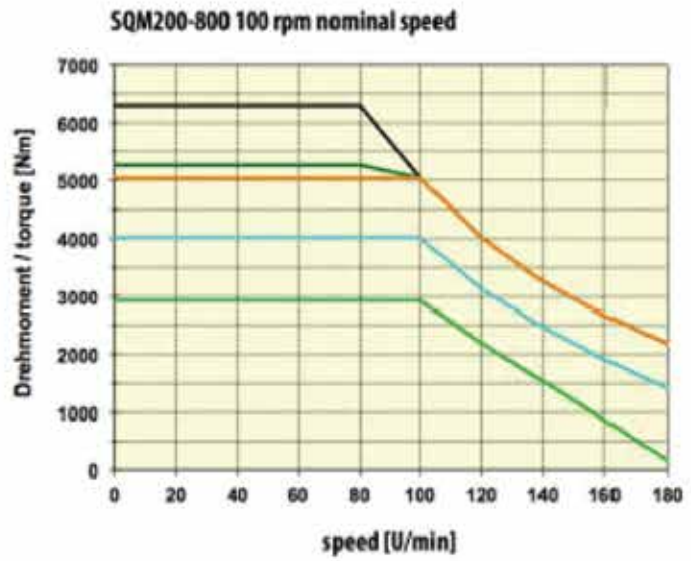
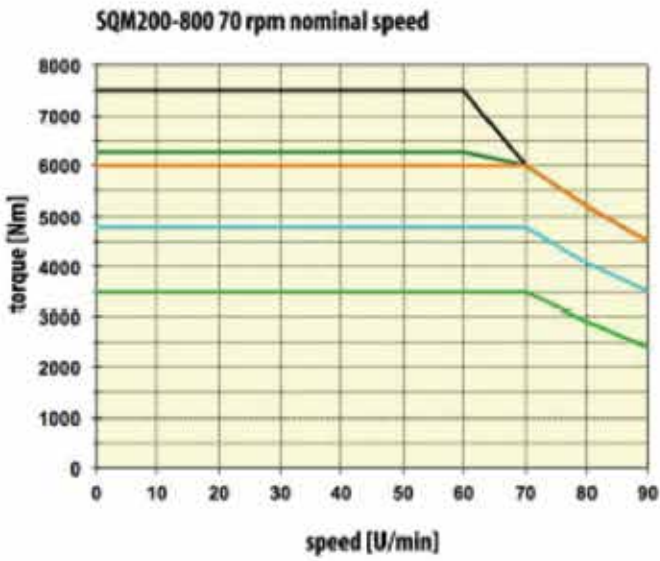
### Bearings

Motor Code	Drive End Bearing	Non Drive Bearing	Thrust Bearing
SQME 100	6310-ZZ	6209-ZZ	29412-E1
SQME 132	3214-Z2-C0	6214-Z2-C0	29412-E1
SQME 160	6316-Z2-C0	6316-Z2-C0	29416-E1
SQME 200	6320-Z2-C0	6320-Z2-C0	29420-E1
SQME 315	6228-Z2-C0	6226-Z2-C0	29432-E1

Motor Code	Pole Number	Pn (kW)	nnom (rpm)	Mn (Nm)	fn (Hz)	kt	In (A)	Efficiency (%)	J (kgm2)	W (kg) No brake fitted
SQME 100-140	66	1,47	100	140	55	35,0	4,0	86	0.036692	67,4
		2,26	200	108	110	20,4	5,3	90		
		3,08	300	98	165	14,6	6,7	92		
		3,48	400	83	220	11,9	7,0	93		
SQME 100-200	66	2,09	100	200	55	35,1	5,7	88	0.051189	85,2
		3,35	200	160	110	19,8	8,1	91		
		4,18	300	133	165	15,1	8,8	93		
		4,52	400	108	220	12,3	8,8	94		
SQME 100-240	66	2,30	100	220	55	35,5	6,2	88	0.060847	97,0
		3,77	200	180	110	20,5	8,8	93		
		4,90	300	156	165	16,4	9,5	94		
		5,24	400	125	220	12,9	9,7	94		
SQME 132-140	66	2,62	100	250	55	34,7	7,2	82	0.166800	160
		4,61	200	220	110	19,1	11,5	87		
		5,50	300	175	165	14,6	12,0	90		
		5,86	400	140	220	11,9	11,8	92		
SQME 132-200	66	3,74	100	357	55	35,0	10,2	85	0.230455	190
		6,58	200	314	110	19,5	16,1	90		
		7,85	300	250	165	14,3	17,5	91		
		8,38	400	200	220	11,7	17,1	92		
SQME 132-240	66	4,48	100	428	55	34,2	12,5	86	0.272891	210
		7,90	200	377	110	18,8	20,1	91		
		9,42	300	300	165	14,0	21,4	92		
		10,05	400	240	220	11,7	20,5	92		
SQME 160-200	66	3,74	70	510	39	49,5	10,3	90	0.456095	258
		5,08	100	485	55	35,9	13,5	92		
		7,23	150	460	83	24,9	18,5	93		
		9,21	200	440	110	19,5	22,6	94		
SQME 160-300	66	5,61	70	765	39	49,4	15,5	91	0.669536	335
		7,61	100	727	55	35,0	20,8	93		
		9,97	150	635	83	25,9	24,5	95		
		11,94	200	570	110	20,2	28,2	95		
SQME 160-400	66	7,48	70	1020	39	46,6	21,9	91	0.876796	412
		10,16	100	970	55	36,3	26,7	93		
		12,49	150	795	83	26,8	29,7	94		
		14,66	200	700	110	22,4	31,2	95		
SQME 160-500	66	9,35	70	1275	39	49,0	26,0	91	1.100037	489
		12,69	100	1212	55	36,7	33,0	94		
		14,67	150	934	83	28,2	33,1	95		
		16,82	200	803	110	22,4	35,8	96		
SQME 200-300	88	10,04	70	1370	51	45,7	30,0	92	1.474654	562
		12,04	100	1150	73	35,4	32,5	93		
		16,02	150	1020	110	25,1	40,6	95		
		18,01	200	860	147	21,3	40,3	96		
SQME 200-400	88	13,39	70	1827	51	44,6	41,0	92	2.046779	672
		16,05	100	1533	73	35,9	42,7	94		
		20,58	150	1310	110	24,7	53,0	95		
		21,99	200	1050	147	21,9	48,0	96		
SQME 200-500	88	15,98	70	2180	51	45,4	48,0	93	2.389074	781
		19,16	100	1830	73	35,9	51,0	95		
		27,33	150	1740	110	23,8	73,0	95		
		28,27	200	1350	147	20,7	65,1	96		
SQME 200-600	88	19,18	70	2617	51	45,6	57,4	93	2.846651	890
		23,04	100	2200	73	37,3	59,0	94		
		32,20	150	2050	110	24,7	83,0	95		
		34,14	200	1630	147	21,2	77,0	96		
SQME 200-700	88	22,38	70	3053	51	43,6	70,0	93	3.398674	1000
		26,81	100	2560	73	33,7	76,0	95		
		36,60	150	2330	110	24,5	95,2	96		
		39,79	200	1900	147	19,3	98,5	97		
SQME 200-800	88	25,58	70	3490	51	44,2	79,0	93	3.851964	1110
		30,89	100	2950	73	33,1	89,0	96		
		39,74	150	2530	110	27,8	91,0	97		
		45,03	200	2150	147	22,3	96,3	97		
SQME 315-500	110	34,45	70	4700	64	54,7	86,0	95	24,62503	2115
		44,50	100	4250	92	40,5	105,0	95		
		58,12	150	3700	138	31,1	119,0	96		
		59,69	200	2850	183	23,4	122,0	96		
SQME 315-700	110	46,55	70	6350	64	50,4	126,0	95	33,53582	2650
		60,73	100	5800	92	38,7	150,0	96		
		75,39	150	4800	138	29,1	165,0	97		
		79,58	200	3800	183	24,2	157,0	97		
SQME 315-900	110	54,97	70	7500	64	49,7	151,0	95	42,44662	3180
		69,11	100	6600	92	39,8	166,0	96		
		87,96	150	5600	138	24,9	225,0	96		
		96,34	200	4600	183	24,9	185,0	97		

The data is valid for 400 V supply voltage. Please contact EMF for other torque, speed and voltage levels.

## SQM200-800 Performance Diagrams



Mpeak cold motor
  Mpeak at Delta T=80k
  Duty type: S3-40%, 1 min
  Duty type: S3-60%, 1 min
  Duty type: S1

For further performance diagrams please contact [info@emfmotor.com](mailto:info@emfmotor.com)

## SQME Dimensions

There are 2D drawings and 3D softcopies of every SQME Motor available. Please contact [info@emfmotor.com](mailto:info@emfmotor.com)

## Applications with SQME

Medical hose, Edge profile, Cartilaginous hose, Cable, Bin liner, Carpet yarn, Cable co-extrudes  
Plastic rope, Disposable Plastic Table Cloth, Floropolimer cable (high temp. Resistant cable)  
Profile extruder, Bottle extruder, Film extruder, Injection moulding pressing the row material into the screw



## Comparison of energy cost saving and efficiency

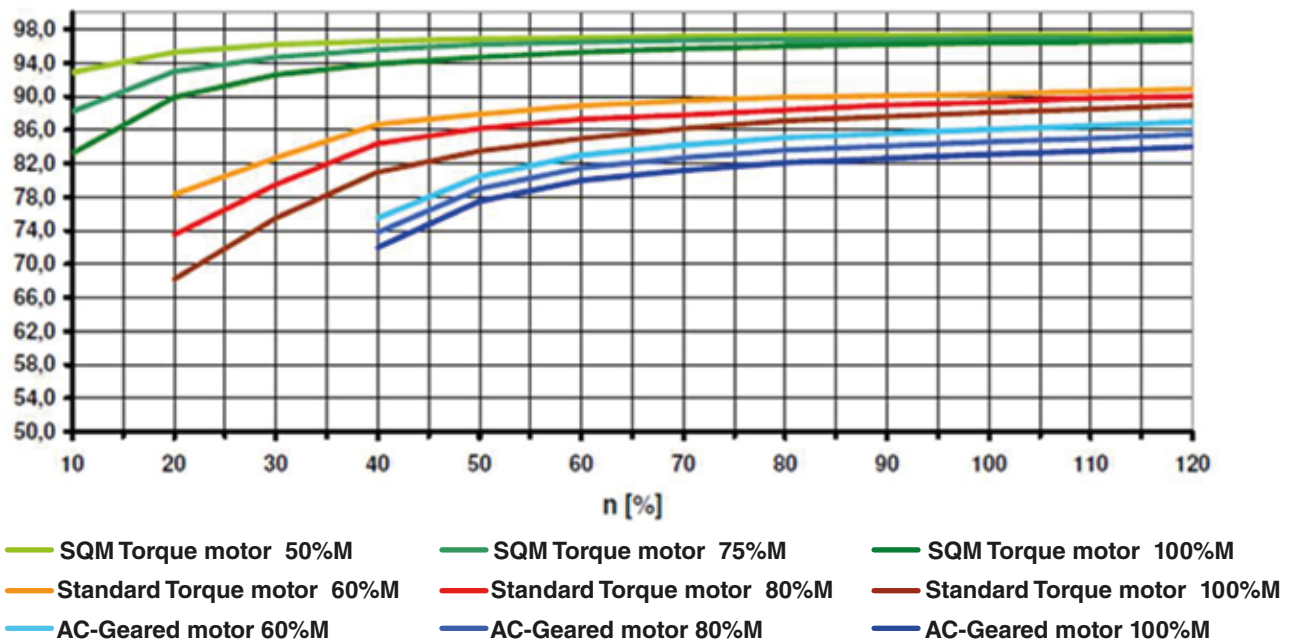
		$\eta_{motor}$ %	$\eta_{gear}$ %	$\eta_{total}$ %	$P_{mech}$ kW	$P_{elec}$ kW	Difference		Energy Cost in €*	Cost Saving*	Motor Size	Cooling
							in kW	%				
1. Example 5.375 Nm - 185 rpm	<b>EMF SQME Motor</b> <sup>2</sup> 5.375 Nm, 185 rpm	97	-	97	104	107,22			277.905	-	315	No
	<b>Standardtorquemotor</b> <sup>1</sup> 5.800 Nm, 200 rpm	90	-	90	104	115,56	8,34	7,78	299.520	21.615 €	315	Water
	<b>Geared AC Inductionmotor</b> <sup>1</sup> 707 Nm, 1.485 rpm, i = 8 5.656 Nm	93	94	87	104	118,97	11,75	10,96	308.360	30.454 €		

**1** Catalogue value but calculation is done acc. to the needed torque. **2** SQME is customized

		$\eta_{motor}$ %	$\eta_{gear}$ %	$\eta_{total}$ %	$P_{mech}$ kW	$P_{elec}$ kW	Difference		Energy Cost in €*	Cost Saving*	Motor Size	Cooling
							in kW	%				
2. Example 10.000 Nm - 112 rpm	<b>EMF SQME Motor</b> <sup>2</sup> 10.000 Nm, 112 rpm	97	-	97	118	121,65			315.315	-	315	No
	<b>Standardtorquemotor</b> <sup>1</sup> 10.200 Nm, 120 rpm	91	-	91	118	129,67	8,02	6,59	336.105	20.790 €	400	Water
	<b>Geared AC Inductionmotor</b> <sup>1</sup> 10.505 Nm, 120 rpm	94	92	86	118	136,45	14,80	12,16	353.673	38.357 €		

\* **Assumptions** Energy cost 0,12 €/kWh 300 day 24 hours 3 years

\* **Not foreseen in the cost calculation** Water cooling and water cost  
Forced ventilation energy cost  
Maintenance cost and production stop



The above mentioned savings are theoretical values. In all applications the measured energy saving is about 20 %. The reason for this fact is that, the efficiency of SQME is almost constant over the torque and speed range.



1<sup>st</sup> Machine and Accessories Manufacturing  
Technologies R&D Project Market  
Industrialist Category 2012  
**Grand Prize**



Istanbul Chamber of Industry  
Energy Efficient Product  
**Jury Honourable Mention 2011**

**EMF Motor**<sup>®</sup> [info@emfmotor.com](mailto:info@emfmotor.com)

[www.emfmotor.com](http://www.emfmotor.com)



**Industry 4.0**

**Germany**

**EMF 97 GmbH**

Horchheimer StraÙe 74-78  
D 67547 Worms

T. +49 6241 935 210

F. +49 6241 935 215

**Turkey**

**EMF Motor A.Ş.**

Ramazanođlu Mah. Sanayi Cad. No:9  
TR 34906 İstanbul - Pendik / Türkiye

T. +90 216 595 19 00

F. +90 216 595 19 01

