Patented New Direct Drive Technology for Plastics

- High extrusion quality
- Direct drive system without gearbox
- Stable torque even at low speeds
- Precise speed control
- Very high efficiency, even at low speeds
- No water cooling
- High performance

EMF Motor®
EMF Motor

Only the Best wins ...

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

EMF Motor continues to be a company made of innovative individuals striving to design, create and build products and solutions that help to improve industrial technology. We design our products for durability and we test them rigorously to ensure the highest levels 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 Motor 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 within 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 about the SQM Torquemotor?

SQM Torquemotor works with a patented motor principle that is most suitable for applications with high torque at low speed. SQM Torquemotor is a synchronous machine 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 Gearless Extruder Motor

Patented and most efficient Direct Drive Technology for the Extruder Industry

SQME-Series torque motors are the perfect direct-drive solution for low speed high torque applications based on permanent magnet synchronous motor technology. SQME is the latest direct drive concept to replace the traditional gearbox system for applications such as extruders, injection moulding machines, winders-unwinders, mixers, etc. The High Performance SQME Gearless Extruder Motor generates constant torque from zero to rated speed. No more maintenance and no more typical gearbox problems. Due to the very high magnetic pole numbers, accurate speed regulation and smooth, dynamic performance results in the highest extrusion quality. SQME-Series have the “ULTRA Premium” efficiency despite their high pole number (such as 66, 88 or 110 poles)

Characteristics that produce the HIGHEST extrusion quality for the LOWEST Energy cost!

- Direct Drive System without gearbox
- No water cooling required
- No heat exchanger kit for oil cooling
- High efficiency across the full speed range
- Low energy consumption
- High performance
- High torque output
- Highest torque density
- Stable torque across the full speed range
- Precise speed control
- Integrated thrust bearing
- Compact design
- Silent operation
- Hollow motor shaft
- No maintenance

Technical Specifications

- Motor Technology: Permanent magnet synchronous motor
- Frame Size: 100, 132, 160, 200, 250 and 315 mm
- Torque Range: up to 13,000 Nm (*)
- Number of Poles: 66 – 88 - 110
- 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: IC410 - water cooling is not required for standard motors. IC416 - optional for special projects
- Protection level: IP 54, IP 55
- Thermal protection: PT100 or KTY and PTC
- Shaft Hollow shaft: (Customized mechanical interfaces available on request)
- Thrust bearing: Mounted on motor with special housing
- Feedback sensor: EnDat Encoder as standard (SinCos and Resolver option)
- Extruder Specific Features: Integrated thrust bearing
- Marking: CE

(*) with the blower kit

Special Motors

- Custom motor design options for different torque and speed values according to customer requirements without the need for a gearbox.
- Mounting can also be optimized according to customer needs.
EMF customise SQME motors according to customer’s needs. The motors are optimized per torque and speed requirements.

<table>
<thead>
<tr>
<th>Motor Code</th>
<th>Pole Number</th>
<th>( P_n ) kW</th>
<th>( n_n ) rpm</th>
<th>( M_n ) Nm</th>
<th>( f_n ) Hz</th>
<th>( k ) Nm/A</th>
<th>( I_n ) A</th>
<th>Efficiency %</th>
<th>( J ) (kgm²)</th>
<th>W (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQME 100-140</td>
<td>66</td>
<td>1.47</td>
<td>100</td>
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<td>86</td>
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<td>4.52</td>
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<td>156</td>
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<td>1000</td>
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</tbody>
</table>

The data is valid for 400 V supply voltage. Please contact EMF for different torque, speed and voltage levels.
EMF customise SQME motors according to customer’s needs. The motors are optimized per torque and speed requirements.

<table>
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<th>( M_n ) Nm</th>
<th>( f_n ) Hz</th>
<th>( k ) Nm/A</th>
<th>( I_n ) A</th>
<th>Efficiency %</th>
<th>( J ) (kgm²)</th>
<th>W (kg) No Brake Fitted</th>
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<tbody>
<tr>
<td>SQM 200-800</td>
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<td>25.58</td>
<td>70</td>
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<td>51</td>
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<td>SQM 250-400SE</td>
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<td>24.9</td>
<td>70</td>
<td>3400</td>
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<td>SQM 250-600SE</td>
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<td>35.2</td>
<td>70</td>
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<tr>
<td>SQM 250-800SE</td>
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<td>48.4</td>
<td>70</td>
<td>6600</td>
<td>51.3</td>
<td>43.4</td>
<td>152</td>
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</tr>
</tbody>
</table>

SQME200-800 Performance Diagarams

SQME Dimensions
There are 2D drawings and 3D softcopies of every SQME Motor available. Please contact info@emfmotor.com

For further performance diagrams please contact info@emfmotor.com
Applications with SQME

Medical hose, Edge profile, Cartilaginous hose, Cable, Bin liner, Carpet yarn, Cable co-extruders
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

Tension Control with Torque Motors
Comparison of energy cost saving

<table>
<thead>
<tr>
<th>Extruder case</th>
<th>EMF Motor 10,000 Nm, 112 rpm</th>
<th>Standard Torque Motor 10,200 Nm, 120 rpm</th>
<th>AC Geared Motor 10,500 Nm, 120 rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_{\text{mech, Load}}$</td>
<td>118 kW</td>
<td>118 kW</td>
<td>118 kW</td>
</tr>
<tr>
<td>$P_{\text{elec}}$</td>
<td>121,65 kW</td>
<td>129,67 kW</td>
<td>136,45 kW</td>
</tr>
<tr>
<td>Energy costs in €</td>
<td>105.106 €</td>
<td>112,035 €</td>
<td>117,893 €</td>
</tr>
<tr>
<td>Extra costs per year</td>
<td>-</td>
<td>6.929 €</td>
<td>12.787 €</td>
</tr>
<tr>
<td>Motor size</td>
<td>315</td>
<td>400</td>
<td>355</td>
</tr>
<tr>
<td>Cooling</td>
<td>No</td>
<td>Water</td>
<td>Forced cooling</td>
</tr>
<tr>
<td>Cooling expense</td>
<td>No</td>
<td>7 kW 5.760 €</td>
<td>7.5 kW 7.144 €</td>
</tr>
<tr>
<td>TOTAL EXTRA COSTS</td>
<td>No</td>
<td>12.689 €</td>
<td>19.931 €</td>
</tr>
</tbody>
</table>

Load: *10.000 Nm - 112 rpm  * Assumption: Energy costs 0,12 € / kWh  300 days / 24 hours / year

Efficiency Diagram in full range of speed and torque

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.
EMF Motor®

1st 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

TET R&D Project Market 2017 Smart Transportation Category

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Industry 4.0