

MEM30007A Select Common Engineering Materials  
Product Study: Materials/Processing

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See the below table with the information of the 3 parts.

**Part 1:**

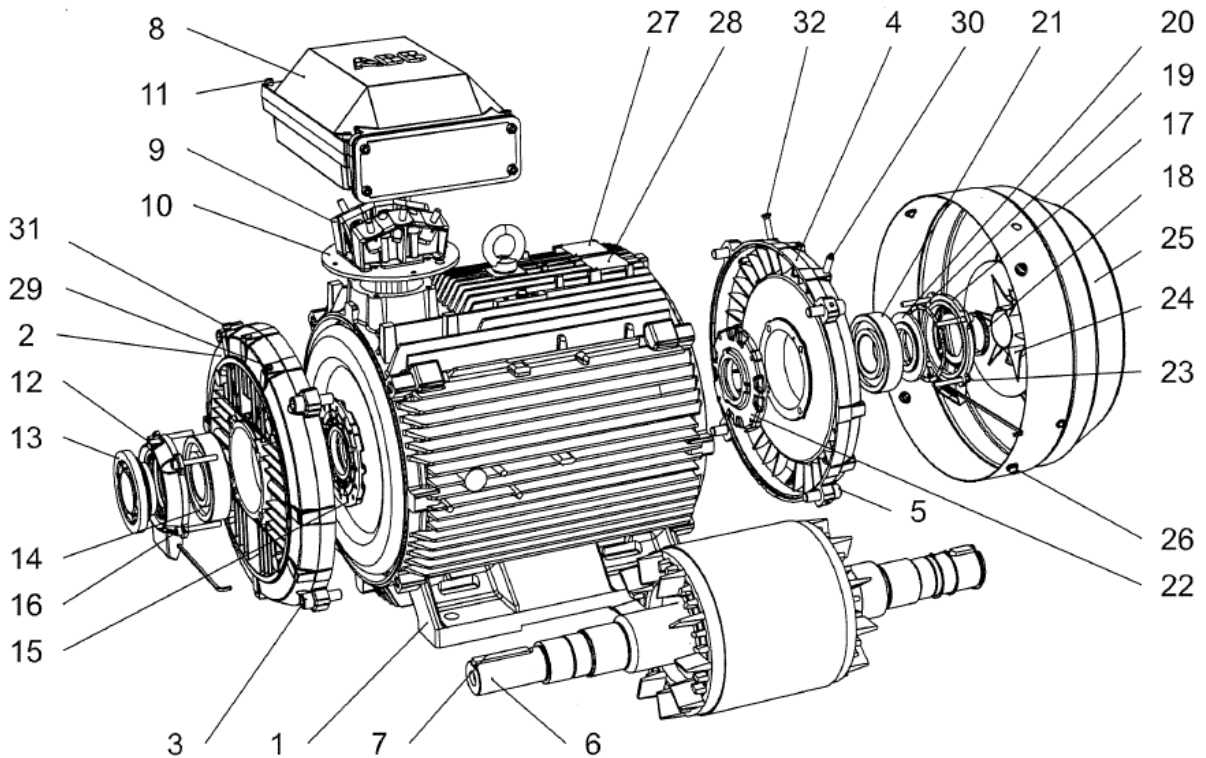
List all the components. (There should be at least 25 parts). Give every part a number, and also make up names for each component - an interesting task in itself! Designers and engineers often get the job of making up a name for something, and it's not always easy. Try to make each name unique.

**Part 2:**

Identify/estimate/assume the material that each component is made of.  
State how you made your identification.  
List some alternative materials that could have been used instead.

**Part3:**

Identify/estimate/assume and describe the processes that were probably used to produce each component listed in Part 2 - from the semi-finished materials. (i.e. Don't describe the process of making a steel spring from iron ore, but from steel wire)  
Identify post-treatment processes such as heat treatment, coating, plating, painting etc for any relevant components.



Part 1		Part 2		Part 3		
Item No.	Part No. / Description	Identify/estimate/assume the material that each component is made of.	State how you made your identification.	List some alternative materials that could have been used instead.	Identify/estimate/assume and describe the processes that were probably used to produce each component listed in Part 2 - from the semi-finished materials.	Identify post-treatment processes such as heat treatment, coating, plating, painting etc. for any relevant components.
1	080D001 Base Frame	Cast iron, machined finish	By inspecting the surface finishes of the raw and machined areas.	Most other steel or steel alloys that can be machined easily	Raw casting produced by sand casting process, then CNC machined to give final produce.	Heat Treated after casting, painted after machining
2	080D002 End cover Drive End	Cast iron, machined finish	By inspecting the surface finishes of the raw and machined areas.	Most other steel or steel alloys that can be machined easily	Raw casting produced by sand casting process, then CNC machined to give final produce.	Heat Treated after casting, painted after machining
3	080D003 End Cover bolts	M8 x 25mm Neck cap bolts Class 8.8, Steel bolt	Marking on the head of the bolt	Stainless steel Bolt Class A4-80	Cold forced bolt made from steel rod.	Heat Treated and zinc plated
4	080D004 End cover non-drive end	Cast iron, machined finish	By inspecting the surface finishes of the raw and machined areas.	Most other steel or steel alloys that can be machined easily	Raw casting produced by sand casting process, then CNC machined to give final produce.	Heat Treated after casting, painted after machining
5	080D005 End Cover bolts	M8 x 25mm Neck cap bolts Class 8.8, Steel bolt	Marking on the head of the bolt	Stainless steel Bolt Class A4-80	Cold forced bolt made from steel rod.	Heat Treated and zinc plated
6	080D006 Rotor assembly c/w shaft	Rotor lamination assembly made from silicon steel riveted together with steel pins on a cast aluminium frame, on a shaft made out of 1020 CS	By inspection of parts, feel/weight, industry knowledge and if magnetic or not	Silicon Steel would stay the same, frame could be made of any other steel or steel alloy and shaft could also be made out of any other easily machinable steel	Rotor assembly - Punch from sheets of silicon steel approx. 0.5mm thick, then riveted together with steel rods. Shaft - CNC Machined down from a CS1020 Aluminium frame Casting by sand casting and machined bore only. Whole assembly then press fitted together.	Heat Treated and zinc plated
7	080D007 Key for drive end	Key Steel, Bright Mild Steel	Tested by resistance to indentation or marking	Stainless steel.	Produced from bright mild steel which is machined down to shaft key way.	
8	080D008 Terminal Box	Cast aluminium	By inspection of part, feel/weight and if magnetic or not	Cast steel, or a polymer	Raw casting produced by sand casting, then mounting holes drilled and tapped	Painted after machining
9	080D009 Terminal Board	Brass bolts on a polymer housing	By inspection and industry knowledge	Housing could be made out of a fiberglass	Injection moulded polymer housing	
10	080D010 Terminal Box Base Plate	Mild steel with rubber gasket	By inspection of parts, feel/weight, industry knowledge and if magnetic or not	Polymer or cork gasket.	Punch mild steel plate, with a punch rubber gasket	Plate painted after punching then gasket glued to plate.
11	080D011 Terminal Box Bolts	M6 x 30 Phillips Head Class 8.8	Marking on the head of the bolt	Stainless steel Bolt Class A4-80	Cold forced bolt made from stainless steel rod	Heat Treated and zinc plated
12	080D012 Outer Bearing Cover - Drive end	Cast iron, machined finish	By inspecting the surface finishes of the raw and machined areas.	Most other steel or steel alloys that can be machined easily	Raw casting produced by sand casting process, then CNC machined to give final produce.	Heat Treated after casting, painted after machining
13	080D013 Grease seal assembly, Labyrinth Seal style	Aluminium	By inspection of part, feel/weight and if magnetic or not	Most other steel, steel alloy or brass	Machined from aluminium blank	
14	080D014 Roller Bearing	Steel Alloy, AISI 52100, Bearing Steel	Marking on bearings	Other bearing alloys with high carbon content so items can be hardened	Machined from AISI 52100 steel and assembled	Grease packed into bearing before fitting
15	080D015 Inner Bearing Cover - Drive end	Cast iron, machined finish	By inspecting the surface finishes of the raw and machined areas.	Most other steel or steel alloys that can be machined easily	Raw casting produced by sand casting process, then CNC machined to give final produce.	Heat Treated after casting, painted after machining
16	080D016 Drive end holding bolts	M8 x 75 Hex HD Class 8.8	Marking on the head of the bolt	Stainless steel Bolt Class A4-80	Cold forced bolt made from steel rod.	Heat Treated and zinc plated
17	080D017 Outer bearing cover, Non-drive end	Cast iron, machined finish	By inspecting the surface finishes of the raw and machined areas.	Most other steel or steel alloys that can be machined easily	Raw casting produced by sand casting process, then CNC machined to give final produce.	Heat Treated after casting, painted after machining
18	080D018 Grease seal assembly, Labyrinth Seal style	Aluminium	By inspection of part, feel/weight and if magnetic or not	Most other steel, steel alloy or brass	Machined from aluminium blank	
19	080D019 Clip	Carbon spring steel	By inspection and industry knowledge	Stainless spring steel or a composite material spring (e.g. Fiberglass)	Hot formed from spring steel	Heat Treated and shot peened after shaping
20	080D020 Bearing seal, Non Drive end	Mild steel	By inspection of parts, feel/weight, industry knowledge and if magnetic or not	Most other steel or steel alloys that can be machined easily	Machined from steel blank	zinc plated
21	080D021 Roller Bearing	Steel Alloy, AISI 52100, Bearing Steel	Marking on bearings	Other bearing alloys with high carbon content so items can be hardened	Machined from AISI 52100 steel and assembled	Grease packed into bearing before fitting
22	080D022 Inner Bearing Cover - Non drive end	Cast iron, machined finish	By inspecting the surface finishes of the raw and machined areas.	Most other steel or steel alloys that can be machined easily	Raw casting produced by sand casting process, then CNC machined to give final produce.	Heat Treated after casting, painted after machining
23	080D023 Non-drive end holding bolts	M8 x 75 Hex HD Class 8.8	Marking on the head of the bolt	Stainless steel Bolt Class A4-80	Cold forced bolt made from stainless steel rod	Heat Treated and zinc plated
24	080D024 Fan	Polyethylene	By inspection of part, feel/weight and if magnetic or not	carbon or stainless steel.	Injection moulded polymer housing	
25	080D025 Fan Cover	Pressed mild steel	By inspection of parts, feel/weight, industry knowledge and if magnetic or not	Polymer or stainless steel	Form/pressed from mild steel plate, with spot welds	Painted
26	080D026 Fan Cover bolts	M6 x 15 Phillips Head Class 8.8	Marking on the head of the bolt	Stainless steel Bolt Class A4-80	Cold forced bolt made from stainless steel rod	Heat Treated and zinc plated
27	080D027 Name Plate	Aluminium	By inspection of part, feel/weight and if magnetic or not	Brass or a printed plastic label	Aluminium plate, cut to size and drilled.	Detail printed on finished item
28	080D028 Service Plate	Aluminium	By inspection of part, feel/weight and if magnetic or not	Brass or a printed plastic label	Aluminium plate, cut to size and drilled.	
29	080D029 Grease Nipple Drive end	Brass	By inspection of part, feel/weight and if magnetic or not	Stainless steel	Machined from brass blank with spring and ball bearing fitted	
30	080D030 Grease Nipple Non-drive end	Brass	By inspection of part, feel/weight and if magnetic or not	Stainless steel	Machined from brass blank with spring and ball bearing fitted	
31	080D031 Shock Pulse Measuring Nipple, Drive end	Brass with internal electric components	By inspection of part, feel/weight and if magnetic or not	Stainless steel	Machined from brass blank and electric components fitted	
32	080D032 Shock Pulse measuring nipple, Non-drive	Brass with internal electric components	By inspection of part, feel/weight and if magnetic or not	Stainless steel	Machined from brass blank and electric components fitted	