

Elliptical gear design system

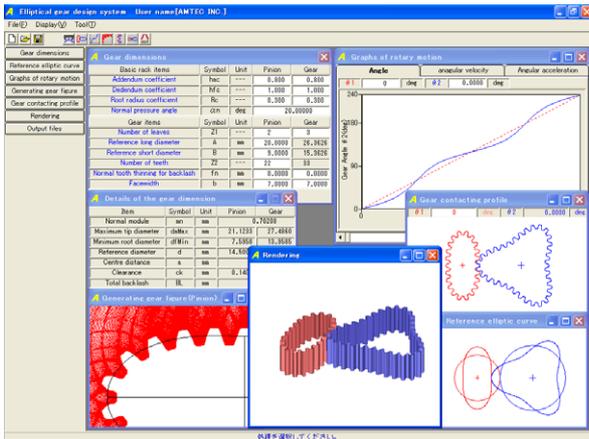


Fig. 1 Elliptical gear design system

1 Outline

The Elliptical gear design system software is also possible on the design of not only the same the number of leaves but also different the number of leaves, as it is shown in Fig.1.

The sliding is less than the cam for the elliptical gear, and the compact design compared to the link mechanism is possible. And, it is possible to surely transmit the load and has the very advantageous features.

2 Gear dimensions inputting form

Show the gear dimension input form in Fig.2.

In this case, Pinion number of leaves is 2 and Gear number of leaves is 3. The input range is from 1 to 10 leaves.

Gear dimensions				
Basic rack items	Symbol	Unit	Pinion	Gear
Addendum coefficient	hac	---	0.800	0.800
Dedendum coefficient	hfc	---	1.000	1.000
Root radius coefficient	Rc	---	0.300	0.300
Normal pressure angle	α_n	deg	20.00000	
Gear items				
Number of leaves	Symbol	Unit	Pinion	Gear
	Z1	---	2	3
Reference long diameter	A	mm	20.0000	26.3626
Reference short diameter	B	mm	9.0000	15.3626
Number of teeth	Z2	---	22	33
Normal tooth thinning for backlash	fn	mm	0.0000	0.0000
Facewidth	b	mm	7.0000	7.0000

Fig 2. Gear dimensions

3 Details of the gear dimension

Show details of gear dimension form in Fig.3.

Details of the gear dimension				
Item	Symbol	Unit	Pinion	Gear
Normal module	mn	mm	0.70208	
Maximum tip diameter	daMax	mm	21.1233	27.4860
Minimum root diameter	dfMin	mm	7.5958	13.9585
Reference diameter	d	mm	14.5000	20.8626
Centre distance	a	mm	17.6813	
Clearance	ck	mm	0.1404	0.1404
Total backlash	BL	mm	0.0000	

Fig. 3 Details of the gear dimension

4 Reference elliptic curve

Show the reference elliptic curve form in Fig.4.

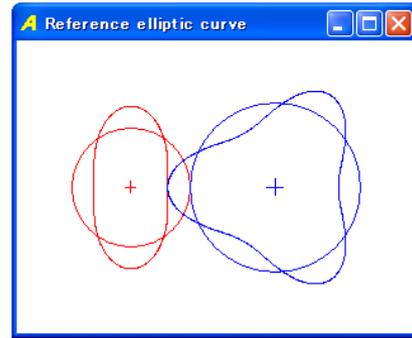


Fig. 4 Reference elliptic curve

5 Graphs of rotary motion

Show the graphs of rotary motion form in Fig. 5, 6 and 7. They have shown the angle displacement, the angular velocity and the angular acceleration.

The horizontal scroll bar under these forms are linked with pinion rotation angle of the gear contacting form of Fig.10 and Fig.11.

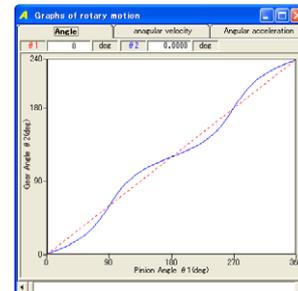


Fig. 5 Angle

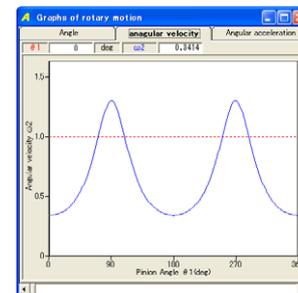


Fig 6. Angular velocity

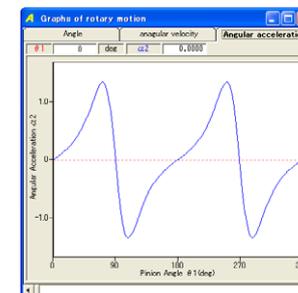


Fig 7. Angular acceleration

6 Generating gear figure

Show the generating gear profile form in Fig.8 and 9.

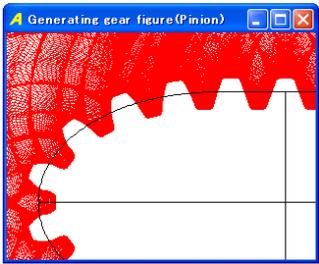


Fig. 8 Pinion generating

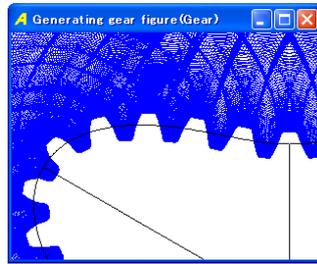


Fig 9. Gear generating

7 Gear contacting profile

Show the gear contact profile form in Fig. 10 and the expanded gear profile form in Fig.11

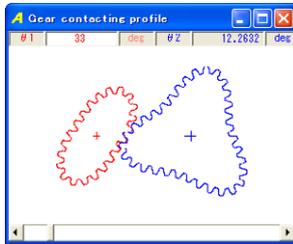


Fig. 10 Gear contacting

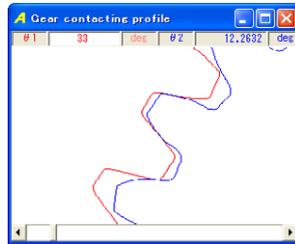


Fig. 11 Profile extension

8 Rendering

Show the rendering profile form in Fig. 12. It is possible to change the viewpoint in the control form of the right side of the figure.

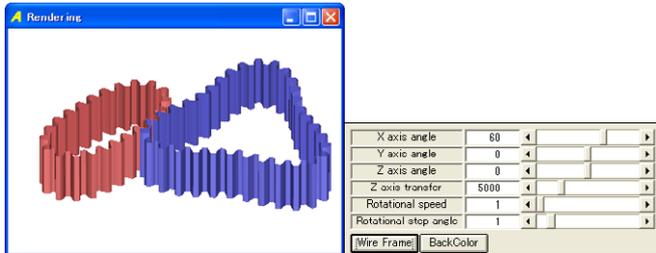


Fig. 12 Rendering

9 Output tooth profile data

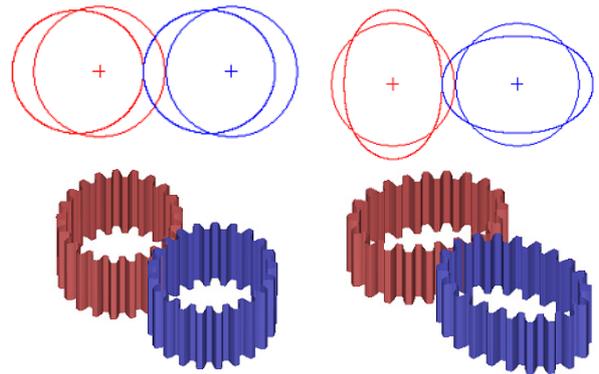
Show the DXF file output form in Fig. 13.

It is possible to output the teeth profile by the DXF type CAD file.

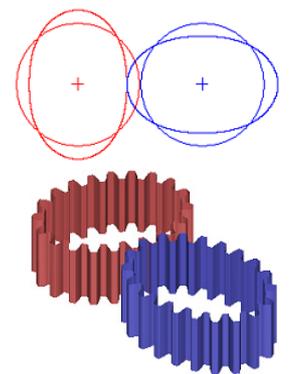


Fig 13. DXF file outputting form

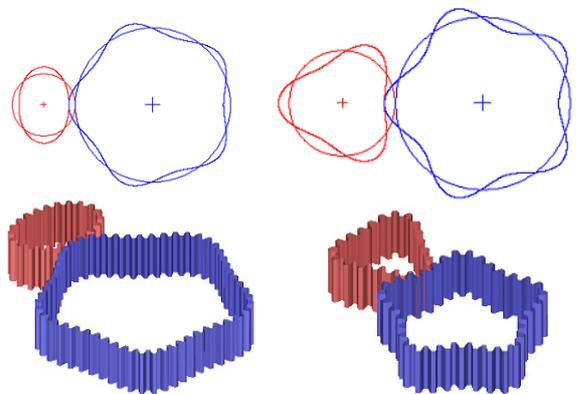
10 Examples



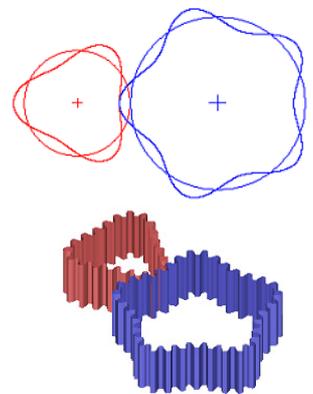
1 leaf x 1 leaf



2 leaves x 2 leaves



2 leaves x 5 leaves



3 leaves x 5 leaves

