# ISO/TR 14179-1:2001-07 (E)

## Gears - Thermal capacity - Part 1: Rating gear drives with thermal equilibrium at 95 °C sump temperature

## Contents

Page


Foreword ..... iv

Introduction ..... v

1 Scope ..... 1

2 Symbols and units, term and definition ..... 1

3 Rating criteria ..... 4

4 Service conditions ..... 5
4.1 Intermittent service ..... 5
4.2 Adverse conditions ..... 5
4.3 Favourable conditions ..... 5
4.4 Auxiliary cooling ..... 5

5 Methods for determining the thermal rating ..... 6

6 Method A -- Test ..... 6

7 Method B -- Calculations for determining the thermal power rating, PT ..... 6
7.1 Basis ..... 6
7.2 Heat generation ..... 7
7.3 Bearing power loss, PB ..... 7
7.4 Mesh power loss, PM, spur and helical gears ..... 11
7.5 Mesh power loss, PM, bevel gears ..... 14
7.6 Mesh power loss, PM, cylindrical worm gears ..... 14
7.7 Mesh power loss, PM, double enveloping worm gears ..... 14
7.8 Oil seal power loss, PS ..... 14
7.9 Gear windage and churning power loss, PW ..... 15
7.10 Bearing windage and churning power loss, PWB ..... 16
7.11 Oil pump power loss, PP ..... 19
7.12 Heat dissipation, PQ ..... 20

8 Modifications for non-standard operating conditions ..... 21

Annex A (informative) Bevel gear mesh and gear windage power losses ..... 24

Annex B (informative) Worm gear mesh power losses ..... 28

Bibliography ..... 30