

ISO 18459:2015-05 (E)

Biomimetics - Biomimetic structural optimization

Contents		Page
Foreword		iv
Introduction		v
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Symbols and abbreviated terms	3
5	Principles of self-optimization in nature and hence transferred optimization methods	3
6	Application of methods	5
6.1	Application range and limits	5
6.2	Computer Aided Optimization (CAO)	6
6.2.1	Stress-controlled growth	6
6.2.2	Shrinking	7
6.2.3	Finite elements in practical applications (FEA)	8
6.3	Soft Kill Option (SKO)	8
6.3.1	Principle of the SKO method	8
6.3.2	Implementing the SKO principle in the finite element analysis	9
6.3.3	Examples of applications of the SKO method	11
6.4	Computer Aided Internal Optimization (CAIO)	12
6.4.1	Example of the CAIO method: bent cylinder	13
6.5	Method of Tensile Triangles	14
6.5.1	General	14
6.5.2	Tensile triangles for saving material	15
6.5.3	Tensile triangles for optimization of fibre orientation	17
6.5.4	Example of the Method of Tensile Triangles: shoulder fillet	18
Bibliography		20