## **Contents**

1	The 7	Types of Waste	1
	1.1	Why Do We Distinguish Waste?	1
	1.2	Waste 1: Overproduction	2
	1.3	Waste 2: Stock	4
	1.4	Waste 3: Transport	6
	1.5	Waste 4: Motion	8
	1.6	Waste 5: Waiting	9
	1.7	Waste 6: Unnecessary Processes	10
	1.8	Waste 7: Scrap and Rework	11
	1.9		12
	1.10	Now It Is Your Turn	14
2	The 9 Principles for Eliminating Waste		
	2.1	With 9 Principles to Ideal Production	15
	2.2	Principle 1: Pull Principle	16
	2.3	Principle 2: Flow Principle	18
	2.4	Principle 3: Takt Principle	25
	2.5	Principle 4: 0-Defect Principle	27
	2.6	Principle 5: Separation of Waste and Value Creation	32
	2.7	Principle 6: FIFO Principle	33
	2.8	Principle 7: Minimum Distance	34
	2.9	Principle 8: Value Stream Orientation	35
	2.10	Principle 9: Standardization	36
	2.11	Now It Is Your Turn	38



3	Lean	Methods to See the Waste	39
	3.1	Caution: Methods!	39
	3.2	Welcome to LeanClean Inc.	40
	3.3	First Analyze, Then Act	47
	3.4	Method 1: Process Map	49
	3.5	Method 2: Value Stream Analysis	54
	3.6	Method 3: OEE	64
	3.7	Method 4: Handling Step Analysis	70
	3.8	Method 5: Operator Balance Chart	74
	3.9	Method 6: Spaghetti Diagram	78
	3.10	Method 7: Pareto Chart	81
	3.11	Method 8: Inventory Analysis	84
4	Meth	ods for Implementing the 9 Principles	89
	4.1	Only the Implementation Brings the Benefit	90
	4.2	Method 9: 5S	91
	4.3	Method 10: Zoning	98
	4.4	Method 11: SMED	104
	4.5	Method 12: Lean Shelf	116
	4.6	Method 13: The Milk Run = Takted Route Trains	119
	4.7	Method 14: Kanban	126
	4.8	Method 15: Line Balancing	137
	4.9	Method 16: Set Building	139
	4.10	Method 17: Sequencing	142
	4.11	Method 18: A3	146
	4.12	Method 19: Poka-yoke	150
	4.13	Method 20: Andon	154
	4.14	Method 21: KPIs	158
	4.15	Method 22: Shopfloor Management	164
5	Lean Change		167
	5.1	Change Never Ends	167
	5.2	The Change Control Loop	169
	5.3	Step 1: Wanting the Change	170
	5.4	Step 2: Build Knowledge	176

		Contents	xvii
5.5	Step 3: Develop a Vision		178
5.6	Step 4: Plan Implementation		182
5.7	Step 5: Implement Change		187
5.8	And What Happens Next?		189
Referenc	ces		191