

ISO 18629-42 :2006-08 (E)

Contents	Page
1 Scope.....	1
2 Normative References	1
3 Terms, definitions and abbreviations	2
3.1 Terms and definitions	2
3.2 Abbreviations.....	5
4 Overview of parts 41 to 49 of ISO 18629.....	5
5 Organization of this part of ISO 18629	6
5.1 Introduction	6
5.2 Extensions in ISO 18629-42	6
6 State-based preconditions for activities.....	7
6.1 Primitive lexicon of the State-based preconditions for activities	7
6.2 Defined lexicon for concepts of State-based preconditions for activities.....	7
6.3 Core theories required by State-based preconditions for activities	8
6.4 Definitional extensions required by State-based preconditions for activities	8
6.5 Definitions of concepts for State-based preconditions for activities	8
6.5.1 state_equiv.....	8
6.5.2 markov_precond.....	8
6.5.3 partial_state	9
6.5.4 rigid_state.....	9
6.6 Grammar for relations of State-based preconditions for activities	9
7 Time-based preconditions for activities.....	10
7.1 Primitive lexicon of Time-based preconditions for activities	10
7.2 Defined lexicon for concepts of Time-based preconditions for activities	10
7.3 Theories required by Time-based preconditions for activities.....	11
7.4 Definitional extensions required by Time-based preconditions for activities	11
7.5 Definitions of Time-based preconditions for activities.....	11
7.5.1 begin_equiv	11
7.5.2 time_precond	11
7.5.3 partial_time_precond	11
7.5.4 rigid_time	12
7.6 Grammar for process descriptions of Time-based preconditions for activities.....	12
8 Preconditions based on state and time.....	13
8.1 Primitive lexicon of Preconditions based on state and time	13

8.2	Defined lexicon of Preconditions based on state and time	13
8.3	Theories required by Preconditions based on state and time.....	13
8.4	Definitional extensions required by Preconditions based on state and time	13
8.5	Definitions of Preconditions based on state and time.....	14
8.5.1	mixed_precond.....	14
8.5.2	partial_mixed	14
8.5.3	rigid_mixed	14
8.6	Grammar for Preconditions based on state and time	14
9	Occurrence-based preconditions for activities	15
9.1	Primitive lexicon of Occurrence-based preconditions for activities	15
9.2	Defined relations of Occurrence-based preconditions for activities	15
9.3	Theories required by Occurrence-based preconditions for activities.....	16
9.4	Definitional extensions required by Occurrence-based preconditions for activities.....	16
9.5	Definitions of Occurrence-based preconditions for activities.....	16
9.5.1	tree_equiv	16
9.5.2	occurrence_constrained	16
9.5.3	occurrence_dependent	17
9.5.4	occurrence_independent	17
9.6	Grammar for Occurrence-based preconditions for activities	17
10	Preventable conditions for activities.....	18
10.1	Primitive lexicon of Preventable conditions for activities.....	18
10.2	Defined relations of Preventable conditions for activities	18
10.3	Theories required by Preventable conditions for activities	18
10.4	Definitional extensions required by Preventable conditions for activities	18
10.5	Definitions of Preventable conditions for activities	19
10.5.1	preventable.....	19
10.5.2	possibly_preventable	19
10.5.3	unpreventable	19
10.6	Grammar for process descriptions of Preventable conditions for activities	20
11	Periodic preconditions for activities	20
11.1	Primitive lexicon of Periodic preconditions for activities	20
11.2	Defined lexicon of Periodic preconditions for activities.....	20
11.3	Theories required by Periodic preconditions for activities	20
11.4	Definitional extensions required by Periodic preconditions for activities.....	21
11.5	Definitions of Periodic preconditions for activities	21
11.5.1	periodic.....	21
11.5.2	intermittent	21
11.5.3	aperiodic	21

11.6	Grammar for of Periodic preconditions for activities.....	22
12	Spoilage preconditions for activities	22
12.1	Primitive lexicon of Spoilage preconditions for activities	22
12.2	Defined lexicon of Spoilage preconditions for activities.....	22
12.3	Theories required by Spoilage preconditions for activities	23
12.4	Definitional extensions required by Spoilage preconditions for activities	23
12.5	Definitions of Spoilage preconditions for activities	23
12.5.1	spoilage	23
12.5.2	possible_spoilage.....	23
12.5.3	nonspoilage.....	24
12.6	Grammar of Spoilage preconditions for activities.....	24
13	Effects of activities.....	24
13.1	Primitive lexicon of Effects of activities.....	24
13.2	Defined lexicon of Effects of activities	24
13.3	Theories required by Effects of activities	25
13.4	Definitional extensions required by Effects of activities	25
13.5	Definitions of Effects of activities	25
13.5.1	effects_equiv.....	25
13.5.2	context_free.....	25
13.5.3	null	25
13.6	Grammar for Effects of activities	26
14	State-based effects of activities.....	26
14.1	Primitive lexicon of State-based effects of activities.....	26
14.2	Defined lexicon of State-based effects of activities	26
14.3	Core theories required by State-based effects of activities	27
14.4	Definitional extensions required by State-based effects of activities	27
14.5	Definitions of State-based effects of activities	27
14.5.1	markov_effects.....	27
14.5.2	partial_state_effects.....	27
14.5.3	rigid_state_effects.....	28
14.6	Grammar for State-based Effects Activities.	28
15	Time-based effects of activities.....	28
15.1	Primitive lexicon of Time-based effects of activities.....	28
15.2	Defined lexicon of Time-based effects of activities	28
15.3	Core theories required by Time-based effects of activities.....	29
15.4	Definitional extensions required by Time-based effects of activities	29

15.5	Definitions of Time-based effects of activities.....	29
15.5.1	temporal_effects.....	29
15.5.2	partial_temporal.....	29
15.5.3	nontemporal.....	29
15.6	Grammar for Time-based effects of activities	30
16	Occurrence-based effects of activities.....	30
16.1	Primitive lexicon of Occurrence-based effects of activities.....	30
16.2	Defined lexicon of Occurrence-based effects of activities	30
16.3	Core theories required by Occurrence-based effects of activities.....	30
16.4	Definitional extensions required by Occurrence-based effects of activities	31
16.5	Definitions of Occurrence-based effects of activities.....	31
16.5.1	occ_effects.....	31
16.5.2	occ_depend_effects	31
16.5.3	nonocc_effects	31
16.6	Grammar for Occurrence-based effects of activities	32
17	Effects of activities: Occurrence Constraints.....	32
17.1	Primitive lexicon of Effects of activities: Occurrence Constraints	32
17.2	Defined lexicon of Effects of activities: Occurrence Constraints	32
17.3	Core theories required by Effects of activities: Occurrence Constraints.....	32
17.4	Definitional extensions required by Effects of activities: Occurrence Constraints	32
17.5	Definitions of Effects of activities: Occurrence Constraints.....	33
17.5.1	quantum	33
17.5.2	semiclassical	33
17.5.3	classical	33
17.6	Grammar for Effects of activities: Occurrence Constraints	34
18	Effects of activities: Temporal and Occurrence Constraints	34
18.1	Primitive lexicon of Effects of activities: Temporal and Occurrence Constraints	34
18.2	Defined lexicon of Effects of activities: Temporal and Occurrence Constraints.....	34
18.3	Core theories required by Effects of activities: Temporal and Occurrence Constraints	34
18.4	Definitional extensions required by Effects of activities: Temporal and Occurrence Constraints.....	35
18.5	Definitions of Effects of activities: Temporal and Occurrence Constraints	35
18.5.1	relativistic	35
18.5.2	seminewton.....	35
18.5.3	newtonian	35
18.6	Grammar for Effects of activities: Temporal and Occurrence Constraints	36
19	Fluent trees.....	36

19.1	Primitive lexicon of Fluent trees	36
19.2	Defined relations of Fluent trees	36
19.3	Core theories required by Fluent trees.....	36
19.4	Definitional extensions required by Fluent trees	37
19.5	Definitions of Fluent trees.....	37
19.5.1	achieved	37
19.5.2	falsified	37
19.5.3	irreversible	37
19.5.4	unachievable.....	37
19.5.5	bounded	38
19.6	Grammar for process descriptions of Fluent trees.....	38
20	Distribution of complex activities.....	38
20.1	Primitive lexicon of Distribution of complex activities	38
20.2	Defined relations of Distribution of complex activities	38
20.3	Core theories required by Distribution of complex activities.....	38
20.4	Definitional extensions required by Distribution of complex activities.....	38
20.5	Definitions of Distribution of complex activities.....	39
20.5.1	profile.....	39
20.5.2	root_equiv.....	39
20.5.3	universal	39
20.5.4	local.....	40
20.5.5	restricted.....	40
20.6	Grammar for process descriptions of Distribution of complex activities.....	40
21	State-based distribution of complex activities	41
21.1	Primitive lexicon of State-based distribution of complex activities	41
21.2	Defined relations of State-based distribution of complex activities	41
21.3	Theories required by State-based distribution of complex activities.....	41
21.4	Definitional extensions required by State-based distribution of complex activities.....	41
21.5	Definitions of State-based distribution of complex activities.....	41
21.5.1	trigger	42
21.5.2	partial_trigger.....	42
21.5.3	nontrigger.....	42
21.6	Grammar for process descriptions of State-based distribution of complex activities...	43
22	Time-based distribution of complex activities	43
22.1	Primitive lexicon of Time-based distribution of complex activities	43
22.2	Defined relations of Time-based distribution of complex activities.....	43
22.3	Theories required by Time-based distribution of complex activities	43
22.4	Definitional extensions required by Time-based distribution of complex activities.....	43

22.5	Definitions of Time-based distribution of complex activities	44
22.5.1	launch	44
22.5.2	partial_launch	44
22.5.3	rigid_launch	44
22.6	Grammar for process descriptions of Time-based distribution of complex activities ...	45
23	Mixed distribution of complex activities	45
23.1	Primitive lexicon of Mixed distribution of complex activities	45
23.2	Defined relations of Mixed distribution of complex activities	45
23.3	Core theories required by Mixed distribution of complex activities	45
23.4	Definitional extensions required by Mixed distribution of complex activities	45
23.5	Definitions of Mixed distribution of complex activities	46
23.5.1	conditional_launch	46
23.5.2	partial_conditional_launch	46
23.5.3	unconditional_launch	47
23.6	Grammar for process descriptions of Mixed distribution of complex activities	47
24	Variation of complex activities	47
24.1	Primitive lexicon of Variation of complex activities	47
24.2	Defined relations of Variation of complex activities	47
24.3	Theories required by Variation of complex activities	48
24.4	Definitional extensions required by Variation of complex activities	48
24.5	Definitions of Variation of complex activities	48
24.5.1	min_equiv	48
24.5.2	uniform	48
24.5.3	variegated	48
24.5.4	multiform	49
24.6	Grammar for process descriptions of Variation of complex activities	49
25	State-based variation of complex activities	50
25.1	Primitive lexicon of State-based variation of complex activities	50
25.2	Defined relations of State-based variation of complex activities	50
25.3	Theories required by State-based variation of complex activities	50
25.4	Definitional extensions required by State-based variation of complex activities	50
25.5	Definitions of State-based variation of complex activities	50
25.5.1	conditional	51
25.5.2	partial_conditional	51
25.5.3	rigid_conditional	51
25.6	Grammar for process descriptions of State-based variation of complex activities	52
26	Time-based variation of complex activities	52

26.1	Primitive lexicon of Time-based variation of complex activities.....	52
26.2	Defined relations of Time-based variation of complex activities.....	52
26.3	Theories required by Time-based variation of complex activities	52
26.4	Definitional extensions required by Time-based variation of complex activities	52
26.5	Definitions of Time-based variation of complex activities	53
26.5.1	time_conditional	53
26.5.2	partial_time_conditional.....	53
26.5.3	rigid_time_conditional	53
26.6	Grammar for process descriptions of Time-based variation of complex activities	54
27	Mixed variation of complex activities.....	54
27.1	Primitive lexicon of Mixed variation of complex activities.....	54
27.2	Defined relations of Mixed variation of complex activities.....	54
27.3	Theories required by Mixed variation of complex activities	55
27.4	Definitional extensions required by Mixed variation of complex activities	55
27.5	Definitions of Mixed variation of complex activities	55
27.5.1	mixed_conditional	55
27.5.2	partial_mixed_conditional.....	55
27.5.3	rigid_mixed_conditional	56
27.6	Grammar for process descriptions of Mixed variation of complex activities	56
28	Embedded activities: plans	56
28.1	Primitive lexicon of Embedded activities: plans.....	57
28.2	Defined relations of Embedded activities: plans.....	57
28.3	Theories required by Embedded activities: plans	57
28.4	Definitional extensions required by Embedded activities: plans	57
28.5	Definitions of Embedded activities: plans	57
28.5.1	plan	57
28.5.2	nondet_plan.....	58
28.5.3	unplan.....	58
28.6	Grammar for process descriptions of Embedded activities: plans	58
29	Embedded activities: temporal spread	59
29.1	Primitive lexicon of Embedded activities: temporal spread.....	59
29.2	Defined relations of Embedded activities: temporal spread.....	59
29.3	Theories required by Embedded activities: temporal spread	59
29.4	Definitional extensions required by Embedded activities: temporal spread	59
29.5	Definitions of Embedded activities: temporal spread	59
29.5.1	spread	60
29.5.2	partial_spread.....	60

29.5.3	tight	60
29.6	Grammar for process descriptions of Embedded activities: temporal spread	61
30	Variation for upwards atomic activities	61
30.1	Primitive lexicon of Variation for upwards atomic activities	61
30.2	Defined relations of Variation for upwards atomic activities	61
30.3	Theories required by Variation for upwards atomic activities	62
30.4	Definitional extensions required by Variation for upwards atomic activities	62
30.5	Definitions of Variation for upwards atomic activities	62
30.5.1	state_filter	62
30.5.2	partial_state_filter	63
30.5.3	rigid_state_filter	63
30.5.4	time_filter	63
30.5.5	partial_time_filter	64
30.5.6	rigid_time_filter	64
30.5.7	state_nonfilter	65
30.5.8	partial_state_nonfilter	65
30.5.9	rigid_state_nonfilter	65
30.5.10	time_nonfilter	66
30.5.11	partial_time_nonfilter	66
30.5.12	rigid_time_nonfilter	66
30.6	Grammar for process descriptions of Variation for upwards atomic activities	67
31	Variation for downwards atomic activities	67
31.1	Primitive lexicon of Variation for downwards atomic activities	67
31.2	Defined relations of Variation for downwards atomic activities	67
31.3	Theories required by Variation for downwards atomic activities	68
31.4	Definitional extensions required by Variation for downwards atomic activities	68
31.5	Definitions of Variation for downwards atomic activities	68
31.5.1	state_ideal	68
31.5.2	partial_state_ideal	68
31.5.3	rigid_state_ideal	69
31.5.4	time_ideal	69
31.5.5	partial_time_ideal	69
31.5.6	rigid_time_ideal	70
31.5.7	state_nonideal	70
31.5.8	partial_state_nonideal	71
31.5.9	rigid_state_nonideal	71
31.5.10	time_nonideal	71
31.5.11	partial_time_nonideal	72
31.5.12	rigid_time_nonideal	72
31.6	Grammar for process descriptions of Variation for downwards atomic activities	73
32	Preconditions for concurrent activities	73

32.1	Primitive lexicon of Preconditions for concurrent activities	73
32.2	Defined relations of Preconditions for concurrent activities	73
32.3	Theories required by Preconditions for concurrent activities.....	73
32.4	Definitional extensions required by Preconditions for concurrent activities.....	73
32.5	Definitions of Preconditions for concurrent activities.....	73
32.5.1	preserved_filter.....	74
32.5.2	noninterfering	74
32.5.3	interfering.....	74
32.5.4	imperial.....	74
32.5.5	global_interfere.....	74
32.6	Grammar for process descriptions of Preconditions for concurrent activities.....	75
33	Effects for concurrent activities	75
33.1	Primitive lexicon of Effects for concurrent activities	75
33.2	Defined relations of Effects for concurrent activities.....	75
33.3	Theories required by Effects for concurrent activities	75
33.4	Definitional extensions required by Effects for concurrent activities.....	75
33.5	Definitions of Effects for concurrent activities	76
33.5.1	preserved_effects	76
33.5.2	nonclobbering	76
33.5.3	clobbering.....	76
33.5.4	meddling.....	76
33.5.5	global_clobber.....	77
33.6	Grammar for process descriptions of Effects for concurrent activities	77
34	Variation of interfering preconditions.....	77
34.1	Primitive lexicon of Variation of interfering preconditions	77
34.2	Defined relations of Variation of interfering preconditions	77
34.3	Theories required by Variation of interfering preconditions.....	77
34.4	Definitional extensions required by Variation of interfering preconditions	78
34.5	Definitions of Variation of interfering preconditions.....	78
34.5.1	state_interfere	78
34.5.2	partial_interfere.....	78
34.5.3	unconditional_interfere.....	79
34.5.4	time_interfere.....	79
34.5.5	sometime_interfere	79
34.5.6	rigid_interfere.....	80
34.6	Grammar for process descriptions of Variation of interfering preconditions.....	80
35	Variation off clobbering effects.....	80
35.1	Primitive lexicon of Variation off clobbering effects.....	80
35.2	Defined relations of Variation off clobbering effects	80

35.3	Theories required by Variation off clobbering effects	80
35.4	Definitional extensions required by Variation off clobbering effects	81
35.5	Definitions of Variation of clobbering effects	81
35.5.1	state_clobber	81
35.5.2	partial_state_clobber.....	81
35.5.3	unconditional_clobber.....	82
35.5.4	time_clobber.....	82
35.5.5	sometime_clobber	82
35.5.6	rigid_clobber	83
35.6	Grammar for process descriptions of Variation off clobbering effects	83
Annex A (normative)	ASN.1 Identifier of ISO 18629-42	84
Annex B (informative)	Example of process description using ISO 18629-42	85
Bibliography	94
Index	95

Figures :

Figure B.1:	TOP level process for manufacturing a GT350.....	86
Figure B.2:	PROCESS for manufacturing the 350–Engine	87
Figure B.3:	PROCESS for manufacturing the 350–Block	89
Figure B.4:	PROCESS for manufacturing the 350–Harness.....	90
Figure B.5:	PROCESS for manufacturing the harness wire.....	91
Figure B.6 :	Process for manufacturing the 350-Wire	92