

ISO 13584-24:2003-11 (E)

Industrial automation systems and integration — Parts library — Part 24: Logical resource: Logical model of supplier library

Contents	Page
1	Scope 1
2	Normative references..... 2
3	Terms, definitions and abbreviations 3
4	Structure of ISO 13584-24 19
4.1	Generic resources..... 19
4.1.1	ISO13584_instance_resource_schema..... 19
4.1.2	ISO13584_library_expressions_schema 19
4.1.3	ISO13584_table_resource_schema 19
4.1.4	ISO13584_variable_semantics_schema 20
4.1.5	ISO13584_domain_resource_schema 20
4.2	Parts library specific resources 20
4.2.1	ISO13584_extended_dictionary_schema 20
4.2.2	ISO13584_library_content_schema..... 20
4.2.3	ISO13584_external_file_schema..... 21
4.2.4	ISO13584_method_schema..... 21
4.3	Library integrated information models..... 21
4.3.1	ISO13584_g_m_iim_schema and LIIM 24-1 21
4.3.2	ISO13584_f_m_iim_schema and LIIM 24-2 21
4.3.3	ISO13584_f_v_iim_schema and LIIM 24-3 22
5	Fundamental concepts and assumptions 22
5.1	Conceptual model of a supplier library 22
5.2	Implicit versus explicit description of a parts library 22
5.2.1	Explicit modelling of simple families of parts: by set extension 22
5.2.2	Implicit modeling of simple families by entity data type 23
5.2.3	Explicit and implicit description of classes in this part of ISO 13584 24
5.3	Direct use of EXPRESS versus meta-modelling for implicit description 25
5.3.1	Direct use of the EXPRESS language for modelling classes 25
5.3.2	Meta-modelling of classes using EXPRESS..... 26
5.4	Two level description of a supplier library and the ISO/IEC common dictionary schema..... 27
5.4.1	Common dictionary description for ISO 13584 and IEC 61360 28
5.4.2	Dictionary descriptions for ISO 13584 28
5.4.3	Interoperability of ISO 13584 and IEC 61360 28
5.5	Independence between dictionary_elements and content_items: the BSU mechanism 28
5.5.1	Reference between several EXPRESS schema populations via the BSU mechanism .. 29
5.5.2	Expressing constraints between dictionary entries 29
5.6	ISO 13584 and the Internet 29
5.6.1	Documents represented within a library exchange context 29
5.6.2	Support of the HTTP protocol and local Internet server 29
5.6.3	Particular HTTP formats to be supported by an implementation..... 30
5.6.4	Remote access to a document through the Internet..... 31
6	ISO13584_instance_resource_schema..... 31
6.1	Introduction to the ISO13584_instance_resource_schema 33
6.2	Fundamental concepts and assumptions for the ISO13584_instance_resource_schema 34
6.2.1	Two-fold description of classes and instance representation 34
6.2.2	Representation of a context-dependent characteristic value 37
6.2.3	Optional properties..... 37
6.3	ISO13584_instance_resource_schema type definitions 37
6.3.1	Null_value 37

6.3.2	Primitive_value.....	38
6.3.3	Null_or_primitive_value.....	38
6.3.4	Simple_value.....	38
6.3.5	Null_or_simple_value.....	39
6.3.6	Number_value.....	39
6.3.7	Null_or_number_value.....	39
6.3.8	Integer_value.....	39
6.3.9	Null_or_integer_value.....	40
6.3.10	Real_value.....	40
6.3.11	Null_or_real_value.....	40
6.3.12	Boolean_value.....	40
6.3.13	Null_or_boolean_value.....	41
6.3.14	Translatable_string_value.....	41
6.3.15	Translated_string_value.....	41
6.3.16	String_value.....	42
6.3.17	Null_or_translatable_string_value.....	42
6.3.18	Complex_value.....	42
6.3.19	Null_or_complex_value.....	43
6.3.20	Entity_instance_value.....	43
6.3.21	Null_or_entity_instance_value.....	44
6.3.22	Defined_entity_instance_value.....	44
6.3.23	Controlled_entity_instance_value.....	44
6.3.24	STEP_entity_instance_value.....	45
6.3.25	PLIB_entity_instance_value.....	45
6.3.26	Uncontrolled_entity_instance_value.....	46
6.3.27	Property_or_data_type_BSU.....	46
6.4	ISO13584_instance_resource_schema entity definitions.....	46
6.4.1	Level_spec_value.....	46
6.4.2	Null_or_level_spec_value.....	47
6.4.3	Int_level_spec_value.....	47
6.4.4	Null_or_int_level_spec_value.....	48
6.4.5	Real_level_spec_value.....	48
6.4.6	Null_or_real_level_spec_value.....	48
6.4.7	Class instances.....	48
	Property_value.....	56
	Context_dependent_property_value.....	57
6.5	ISO13584_instance_resource_schema rule definition.....	58
6.5.1	Valued_properties_are_allowed_for_implicit_spec_rule rule.....	58
6.5.2	Valued_properties_are_allowed_for_explicit_spec_rule rule.....	59
6.5.3	Identification_properties_are_valued_for_implicit_spec_rule rule.....	59
6.5.4	Identification_properties_are_valued_for_explicit_spec_rule rule.....	60
6.5.5	Fm_valued_properties_are_allowed_for_implicit_spec_rule rule.....	61
6.5.6	Fm_valued_properties_are_allowed_for_explicit_spec_rule rule.....	62
6.5.7	Fm_free_properties_are_valued_for_implicit_spec_rule rule.....	63
6.5.8	Fm_free_properties_are_valued_for_explicit_spec_rule rule.....	64
6.6	ISO13584_instance_resource_schema function definitions.....	64
6.6.1	Compatible_class_and_class function.....	64
6.6.2	Right_values_for_level_spec function.....	66
6.6.3	Compatible_level_type_and_instance function.....	67
6.6.4	Compatible_type_and_value function.....	68
6.6.5	Collects_assigned_instance_properties function.....	71
6.6.6	Correct_view_from_model function.....	72
6.6.7	Is_condition_det function.....	72
6.6.8	Is_dependent_p_det function.....	73
6.6.9	All_context_parameters_referenced function.....	73
6.6.10	Collects_property_context function.....	74
6.6.11	Check_class_type_for_dic_item_instance function.....	75
6.6.12	Check_class_type_for_dic_f_model_instance function.....	76

6.6.13	Check_class_type_for_dic_f_view_instance function.....	76
6.6.14	Check_property_values_translations function	77
6.6.15	Same_translations function	77
6.6.16	Compatible_item_caseof_with_class_definition function.....	78
6.6.17	Compatible_model_caseof_with_class_definition function.....	79
6.6.18	superclass_closure function	79
6.6.19	compute_superclass_closure procedure.....	80
6.6.20	item_caseof_closure function	81
6.6.21	next_item_caseof function.....	81
6.6.22	compute_item_caseof_closure procedure.....	82
6.6.23	model_caseof_closure function	83
6.6.24	next_model_caseof function.....	83
6.6.25	compute_model_caseof_closure procedure.....	84
7	ISO13584_library_expressions_schema	85
7.1	Introduction to the ISO13584_library_expressions_schema.....	86
7.2	Fundamental concepts and assumptions for the ISO13584_library_expressions_schema	87
7.2.1	Information model of a variable	87
7.2.2	Strong typing of variables and expressions	87
7.3	ISO13584_library_expressions_schema type definitions.....	88
7.3.1	Library_expression.....	88
7.3.2	Library_variable.....	88
7.4	ISO13584_library_expressions_schema entity definitions.....	89
7.4.1	Level_spec_expression	89
7.4.2	Entity_instance_expression	93
7.4.3	Class_instance_expression	95
7.4.4	Exists_value.....	102
7.4.5	Instance_comparison_equal.....	102
7.5	ISO13584_library_expressions_schema rule definition	103
7.5.1	Two_fold_variable_representation_rule.....	103
1.	ISO13584_library_expressions_schema function definitions.....	104
7.5.2	Syntax_of function	104
7.5.3	Semantics_of function	104
7.5.4	Collects_assigned_properties function	105
7.5.5	Collects_referenced_library_expressions function	105
7.5.6	Compatible_simple_type_and_expression function	106
7.5.7	Compatible_type_and_library_expression function	107
7.5.8	Compatible_variable_and_expression function	109
7.5.9	Compatible_variable_and_library_expression function	110
8	ISO13584_table_resource_schema.....	111
8.1	Introduction to the ISO13584_table_resource_schema.....	113
8.2	Fundamental concepts and assumptions for the ISO13584_table_resource_schema	114
8.2.1	Description of tables	114
8.2.2	Description of table expressions.....	115
8.3	ISO13584_table_resource_schema entity definitions.....	115
8.3.1	Table_identification	115
8.3.2	Table_specification	116
8.3.3	Table_extension.....	117
8.3.4	Column.....	119
8.3.5	Simple_column	120
8.3.6	Complex_column	123
8.3.7	Table expressions.....	126
8.4	ISO13584_table_resource_schema functions definition.....	136
8.4.1	Compatible_column_and_variable function.....	136
8.4.2	Compatible_column_and_variable_semantics function.....	139
8.4.3	Compatible_list_variable_semantics_and_columns function	139
8.4.4	Compatible_variable_semantics_and_expression function.....	140
8.4.5	Compatible_list_variable_semantics_and_expressions function.....	141

8.4.6	Collects_columns function	141
8.4.7	Diff_columns function	143
8.4.8	Return_key function	143
8.4.9	Is_SQL_mappable_table_expression function	145
8.4.10	Used_table_literals function	147
8.4.11	Check_iterator_context function	148
8.4.12	Check_iterator_domain_uniqueness function.....	148
8.4.13	No_null_values_in_key_columns function	149
8.4.14	Same_translations_for_string_values function	150
8.4.15	Same_translations_for_table_extension function	151
8.4.16	Get_translated_string_values_of_tuple function.....	151
9	ISO13584_variable_semantics_schema.....	152
9.1	Introduction to the ISO13584_variable_semantics_schema.....	153
9.2	Fundamental concepts and assumptions for the ISO13584_variable_semantics_schema.....	153
9.2.1	Instance related operation	153
9.2.2	Instance structure	153
9.2.3	Context of a method	154
9.3	ISO13584_variable_semantics_schema type definition	154
9.3.1	Property_semantics_or_path	154
9.4	ISO13584_variable_semantics_schema entity definitions.....	154
9.5	Property_semantics.....	154
9.6	Sub_property_path.....	155
9.7	Variable_semantics referring to the SELF entity.....	156
9.7.1	Self_variable_semantics.....	156
9.7.2	Self_property_semantics	156
9.7.3	Self_property_value_semantics.....	157
9.7.4	Self_property_name_semantics	157
9.7.5	Self_class_variable_semantics.....	161
9.7.6	Self_class_name_semantics	161
9.8	Variables referring to the open view characteristics.....	164
9.8.1	Open_view_variable_semantics	164
9.8.2	Open_view_property_semantics.....	164
9.8.3	Open_view_property_value_semantics	165
9.9	ISO13584_variable_semantics_schema function definitions.....	165
9.9.1	BSU_of_property_semantics function	165
9.9.2	Check_property_semantics function.....	166
10	ISO13584_domain_resource_schema	166
10.1	Introduction to the ISO13584_domain_resource_schema.....	167
10.2	Fundamental concepts and assumption for the ISO13584_domain_resource_schema	168
10.3	ISO13584_domain_resource_schema type definition	169
10.3.1	Boolean_expression_or_others	169
10.4	ISO13584_domain_resource_schema entity definitions.....	170
10.4.1	Others	170
10.4.2	Domain_restriction	170
10.4.3	Guarded_simple_domain.....	171
10.4.4	Simple_domain	172
10.4.5	Table_defined_domain	172
10.4.6	Type_defined_domain	173
10.4.7	Subclass_defined_domain.....	173
10.4.8	Constant_range_defined_domain.....	174
10.4.9	Variable_range_defined_domain	175
10.4.10	Predicate_defined_domain.....	177
10.4.11	Functional_domain_restriction	177
10.4.12	Guarded_functional_domain	178

10.4.13	Simple_functional_domain	178
10.4.14	Library_expression_defined_value.....	178
10.4.15	Table_defined_value	179
10.4.16	Null_defined_value.....	180
10.5	ISO13584_domain_resource_schema function definitions.....	181
10.5.1	Collects_variables function	181
10.5.2	Collects_var_sem function.....	181
10.5.3	Used_tables_in_domain function.....	182
10.5.4	Used_variables_in_domain function	183
10.5.5	Variables_belong_to_assumes function	184
11	ISO13584_extended_dictionary_schema	185
11.1	Introduction to the ISO13584_extended_dictionary_schema	187
11.2	Fundamental concepts and assumptions for the ISO13584_extended_dictionary_schema	188
11.2.1	Dictionary structure	188
11.2.2	Class related elements	188
11.2.3	Supplier related elements	188
11.2.4	Three-fold description of dictionary elements.....	189
11.2.5	Unique identification of dictionary elements.....	189
11.2.6	Applicable elements.....	189
11.2.7	Visibility rule	189
11.2.8	Semantic relationships between classes	190
11.2.9	A priori semantic relationships and importation rule	190
11.2.10	Type checking for the tables referenced in the dictionary.....	191
11.3	ISO13584_extended_dictionary_schema constant definitions	191
11.3.1	Element_code_len	191
11.3.2	Dictionary_code_len.....	192
11.4	ISO13584_extended_dictionary_schema type definitions	192
11.4.1	Document_code_type	192
11.4.2	Program_library_code_type.....	192
11.4.3	Table_code_type	193
11.4.4	Absolute_URL_type	193
11.4.5	Dictionary_code_type.....	193
11.5	ISO13584_extended_dictionary_schema identification of a dictionary.....	194
11.6	ISO13584_extended_dictionary_schema overall architecture of a dictionary.....	195
11.7	Dictionary_in_standard_format	200
11.8	Data_exchange_specification_identification	201
11.9	Library_iim_identification.....	202
11.10	View_exchange_protocol_identification	202
11.11	ISO13584_extended_dictionary_schema entity definitions: additional entity instance types.....	203
11.11.1	Representation_type	203
11.11.2	Geometric_representation_context_type	203
11.11.3	Representation_reference_type	204
11.11.4	Program_reference_type.....	204
11.12	ISO13584_extended_dictionary_schema entity definitions: additional basic semantic units.....	205
11.12.1	Program_library_BSU	205
11.12.2	Table_BSU	206
11.12.3	Document_BSU.....	207
11.13	ISO13584_extended_dictionary_schema entity definitions: supplier BSU relationship	208
11.13.1	Supplier_program_library_relationship.....	208
11.14	ISO13584_extended_dictionary_schema entity definitions: class BSU relationships.....	209
11.14.1	Class_table_relationship	209
11.14.2	Class_document_relationship	209
11.15	ISO13584_extended_dictionary_schema entity definitions: properties of functional models and functional views	210
11.15.1	Representation_P_DET	210

11.16	ISO13584_extended_dictionary_schema entity definitions: specific dictionary elements.....	211
11.16.1	Supplier_related_dictionary_element.....	211
11.16.2	Class_related_dictionary_element.....	211
11.16.3	Program_library_element.....	212
11.17	ISO13584_extended_dictionary_schema entity definitions: class related elements.....	212
11.17.1	Table_element.....	212
11.17.2	RDB_table_element.....	214
11.17.3	Document_element.....	214
11.17.4	Document_element_with_http_access.....	215
11.17.5	Document_element_with_translated_http_access.....	215
11.17.6	Referenced_document.....	216
11.17.7	Referenced_graphics.....	217
11.18	ISO13584_extended_dictionary_schema entity definitions: feature class.....	217
11.19	ISO13584_extended_dictionary_schema entity definitions: a priori semantic relationship.....	218
11.20	ISO13584_extended_dictionary_schema entity definitions: functional model class.....	219
11.20.1	Abstract_functional_model_class.....	220
11.20.2	Functional_model_class.....	223
11.20.3	Fm_class_view_of.....	224
11.21	ISO13584_extended_dictionary_schema entity definitions: functional view class.....	225
11.21.1	Functional_view_class.....	226
11.21.2	Non_instantiable_functional_view_class.....	228
11.21.3	Specification of the range of a view control variable.....	228
11.22	ISO13584_extended_dictionary_schema entity definitions: item class a priori case of.....	229
11.22.1	Item_class_case_of.....	229
11.22.2	Component_class_case_of.....	230
11.22.3	Material_class_case_of.....	231
11.22.4	Feature_class_case_of.....	231
11.23	ISO13584_extended_dictionary_schema entity definitions: a posteriori semantic relationships.....	231
11.23.1	A_posteriori_semantic_relationship.....	232
11.23.2	A_posteriori_case_of.....	232
11.23.3	A_posteriori_view_of.....	233
11.24	ISO13584_extended_dictionary_schema entity definitions: table contents.....	234
11.24.1	Table_content.....	234
11.24.2	RDB_table_content.....	235
11.25	ISO13584_extended_dictionary_schema: RULE definitions.....	236
11.25.1	Representation_properties_for_model_and_view_rule rule.....	236
11.25.2	Allowed_named_type_usage_rule rule.....	237
11.25.3	Assert_oneof_for_table_rule rule.....	238
11.25.4	Assert_oneof_for_class_rule rule.....	238
11.25.5	No_forward_reference_from_table_rule rule.....	239
11.25.6	Imported_properties_are_visible_or_applicable_rule rule.....	240
11.25.7	Imported_data_types_are_visible_or_applicable_rule rule.....	240
11.25.8	Imported_tables_are_visible_or_applicable_rule rule.....	241
11.25.9	Imported_documents_are_visible_or_applicable_rule rule.....	241
11.26	ISO13584_extended_dictionary_schema: function definitions.....	242
11.26.1	Visible_properties function.....	242
11.26.2	Visible_types function.....	243
11.26.3	Visible_tables function.....	244
11.26.4	Visible_documents function.....	245
11.26.5	Applicable_properties function.....	246
11.26.6	Applicable_types function.....	247
11.26.7	Applicable_tables function.....	248
11.26.8	Retrieve_tables function.....	249
11.26.9	Applicable_documents function.....	249
11.26.10	Retrieve_documents function.....	251

11.26.11	Makes_reference_outside function	251
11.26.12	Prefix_ordered_class_list function	253
11.26.13	Functional_view_v_c_v function.....	256
11.26.14	Retrieve_functional_view_v_c_v function	257
11.26.15	Data_type_named_type function.....	258
11.26.16	Data_type_typeof function.....	259
11.26.17	Data_type_class_of function	260
11.26.18	Data_type_type_name function.....	261
11.26.19	Data_type_level_spec function	262
11.26.20	Data_type_level_value_typeof function.....	264
11.26.21	Simple_type_data_type function	265
11.26.22	Complex_type_data_type function	265
11.26.23	Compatible_subclass function	266
11.26.24	Compatible_types function	267
11.26.25	Ordered_index_value function	270
11.26.26	Makes_sub_list.....	271
11.26.27	Sub_list_until	271
11.26.28	Get_property_BSU_from_property_semantics function.....	272
11.26.29	Compatible_list_library_types_and_columns function	272
11.26.30	Data_type_non_quantitative_int_type function.....	276
11.26.31	Data_type_non_quantitative_code_type function.....	278
11.26.32	Applicable_properties_for_applicable_tables function	279
11.26.33	Superclass_of_item_is_item function.....	280
11.26.34	Compatible_content_and_specification function.....	280
11.26.35	Check_view_of_instance_datatype function	281
11.26.36	View_control_variables_attributes_belong_to_domain function	281
11.26.37	Created_view_is_functional_view function.....	282
11.26.38	Check_is_case_of_referenced_classes_definition function	282
12	ISO13584_library_content_schema.....	284
12.1	Introduction to the ISO13584_library_content_schema	286
12.2	Fundamental concepts and assumption for the ISO13584_library_content_schema.....	287
12.2.1	Class extension of non-leaf classes	287
12.2.2	Explicit description of class extensions.....	287
12.2.3	Implicit description of class extensions.....	288
12.2.4	Common pieces of information in implicit description and in explicit description of class extensions 288	
12.2.5	Properties modeling in explicit description of class extensions	289
12.2.6	Typical usage of explicit description of class extensions.....	290
12.2.7	Properties modeling in implicit description of class extensions	292
12.2.8	Assemblies modeling in explicit description of class extensions	294
12.2.9	Assemblies modeling in implicit description of class extensions	295
12.2.10	Instances satisfying a class definition in an implicit description of a class extension	296
12.2.11	Mandatory support of the user selection process when implicit description of class extensions are used	298
12.3	ISO13584_library_content_schema constant definitions	301
12.3.1	Classification_value	302
12.4	ISO13584_library_content_schema: overall architecture of a library.....	302
12.5	Library_in_standard_format	303
12.6	Extension of a class	304
12.6.1	Class_extension.....	304
12.6.2	Opt_or_mand_property_BSU	304
12.6.3	Property_classification	305
12.6.4	Property_value_recommended_presentation.....	305
12.6.5	Model_class_extension.....	306
12.6.6	Explicit_model_class_extension	308
12.6.7	Explicit_item_class_extension	310
12.6.8	Explicit_functional_model_class_extension.....	311
12.6.9	Implicit_model_class_extension	315

12.6.10	Item_class_extension.....	319
12.6.11	Functional_model_class_extension.....	322
12.7	ISO13584_library_content_schema: RULE definitions.....	326
12.7.1	Assert_oneof_for_library_rule rule.....	326
12.7.2	Declared_created_views_are_created_rule rule.....	327
12.7.3	Complete_identification_for_instance_rule rule.....	327
12.7.4	Complete_identification_for_item_instance_rule rule.....	328
12.7.5	Complete_identification_for_model_instance_rule rule.....	329
12.7.6	All_views_available_for_each_component_rule rule.....	330
12.8	ISO13584_library_content_schema function definitions.....	330
12.8.1	Acyclic_class_extension_definition.....	330
12.8.2	Acyclic_order.....	331
12.8.3	Defined_domain function.....	332
12.8.4	Defined_derivation_function function.....	332
12.8.5	Allowed_properties function.....	333
12.8.6	Provided_properties_list function.....	333
12.8.7	Provided_properties_or_method_variables function.....	334
12.8.8	Selectable_properties_list function.....	335
12.8.9	Required_defined_properties function.....	335
12.8.10	Derived_properties_list function.....	336
12.8.11	Optional_properties_list function.....	337
12.8.12	Method_variables function.....	338
12.8.13	Gm_identification_characteristics_list function.....	338
12.8.14	Fm_free_model_properties_list function.....	339
12.8.15	Exists_super function.....	340
12.8.16	Super function.....	341
12.8.17	Is_in_v_c_v_range function.....	341
12.8.18	Get_v_c_v_range function.....	342
12.8.19	All_v_c_v_range_available function.....	342
12.8.20	Make_ordered_list_of_v_c_v_range function.....	343
12.8.21	Cdr_list function.....	344
12.8.22	Make_tuple function.....	344
12.8.23	Computable_set_of_created_views_from_model.....	345
12.8.24	Declared_created_views function.....	346
12.8.25	Created_views_by_methods function.....	347
12.8.26	In_typeof function.....	347
12.8.27	Referenced_veps_exist_in_supported_veps function.....	348
12.8.28	Referenced_protocols_exist_in_supported_protocols function.....	348
12.8.29	Required_properties_are_non_dependent_p_det function.....	349
12.8.30	Required_properties_are_imported_properties function.....	350
12.8.31	Same_order_for_properties function.....	351
12.8.32	All_properties_are_applicable function.....	353
12.8.33	Required_values_are_non_dependent_p_det function.....	353
12.8.34	Required_values_are_imported_properties function.....	355
12.8.35	Data_type_of_BSU function.....	356
12.8.36	Presentation_unit_is_correct function.....	357
12.8.37	Exists_representation_for_instanciable_view function.....	358
12.8.38	Is_provided_once_property_value function.....	359
12.8.39	Number_of_instance_representations.....	360
12.8.40	Correct_parameters_for_explicit_program function.....	361
12.8.41	Get_dic_item_instances_from_required_item_properties function.....	362
12.8.42	Get_list_of_required_properties function.....	364
12.8.43	Properties_projection_on_population function.....	364
12.8.44	All_views_available_for_components function.....	365
12.8.45	Available_components_views function.....	366
12.8.46	All_view_control_variables_belong_to_each_view function.....	368
12.8.47	Check_all_view_control_variables_belong_to_view function.....	369
12.8.48	All_vcvs_belong_to_instance_identification function.....	369

12.8.49	Same_string_values_translations_for_class_extension function.....	370
13	ISO13584_external_file_schema	371
13.1	Introduction to the ISO13584_external_file_schema	373
13.2	Fundamental concepts and assumptions for the ISO13584_external_file_schema.....	375
13.2.1	Representations of items	375
13.2.2	Explicit and implicit description of item representations	376
13.2.3	Support of user dialogue.....	376
13.2.4	Http files storage.....	376
13.2.5	Hyper-text link usage	377
13.2.6	Escape mechanism from document navigation to data retrieval and selection.....	377
13.2.7	Common Gateway Interface access.....	378
13.2.8	Common Gateway Interface implementation rule.....	380
13.3	ISO13584_external_file_schema constant definitions	380
13.3.1	Compiler_version_length	380
13.3.2	External_file_address_length.....	380
13.3.3	External_item_code_length	381
13.3.4	Http_file_name_length.....	381
13.3.5	Http_directory_name_length.....	381
13.4	ISO13584_external_file_schema type definitions	381
13.4.1	External_file_address	381
13.4.2	External_item_code_type	382
13.4.3	Http_file_name_type	382
13.4.4	Http_directory_name_type.....	383
13.4.5	MIME_type	383
13.4.6	MIME_subtype	384
13.4.7	IAB_RFC.....	384
13.4.8	Character_set_type.....	385
13.4.9	Content_encoding_type	385
13.4.10	Program_status.....	385
13.4.11	Program_reference_name_type	386
13.4.12	Compiler_version_type.....	386
13.4.13	Illustration_type	387
13.5	ISO13584_external_file_schema entity definitions: external_file_protocols	387
13.5.1	External_file_protocol	387
13.5.2	Standard_protocol.....	388
13.5.3	Non_standard_protocol.....	389
13.5.4	Data_protocol.....	389
13.5.5	Program_protocol	390
13.5.6	Simple_program_protocol.....	390
13.5.7	Standard_simple_program_protocol.....	391
13.5.8	Non_standard_simple_program_protocol.....	391
13.5.9	Linked_interface_program_protocol	392
13.5.10	Standard_data_protocol.....	393
13.5.11	Non_standard_data_protocol.....	393
13.5.12	Http_protocol.....	393
13.6	ISO13584_external_file_schema entity definitions: dictionary external items	394
13.6.1	External_item	394
13.6.2	Dictionary_external_item	395
13.6.3	Supplier_BSU_related_content.....	395
13.6.4	Program_library_content.....	396
13.6.5	Class_BSU_related_content.....	396
13.6.6	Document_content.....	397
13.7	ISO13584_external_file_schema entity definition: class extension external items.....	397
13.7.1	Class_extension_external_item	398
13.7.2	Representation_reference	399
13.7.3	Program_reference.....	399
13.7.4	Dialogue_resource.....	400
13.7.5	Message	400

13.7.6	Illustration.....	401
13.7.7	A6_illustration	402
13.7.8	A9_illustration	402
13.8	ISO13584_external_file_schema entity definition: property_value_external_item.....	402
13.9	ISO13584_external_file_schema rule definition.....	403
13.9.1	Unique_http_file_name_per_supplier_element_rule rule	403
13.9.2	Unique_http_directory_name_per_supplier_rule rule	404
13.9.3	No_http_directory_for_supplier_related_file_rule rule	404
13.9.4	Http_directory_refers_to_bsu_related_class_rule rule	405
13.9.5	Http_directory_refers_to_class_extension_rule rule.....	405
13.9.6	Illustration_is_not_a_referenced_graphics_rule rule	406
13.10	ISO13584_external_file_schema entity definitions: external content.....	406
13.10.1	External_content	407
13.10.2	Translated_external_content.....	408
13.10.3	Not_translated_external_content	408
13.10.4	Not_translatable_external_content.....	409
13.10.5	Language_specific_content.....	409
13.10.6	External_file_unit.....	410
13.10.7	Http_file	411
13.10.8	Http_class_directory.....	413
13.11	ISO13584_external_file_schema function definitions	413
13.11.1	Supplier_associated_http_files.....	413
13.11.2	Control_compiler_version_format	415
14	ISO13584_method_schema	415
14.1	Introduction to the ISO13584_method_schema.....	417
14.2	Fundamental concepts and assumptions for the ISO13584_method_schema	417
14.3	ISO13584_method_schema type definitions	419
14.3.1	Accessible_variable_for_method.....	419
14.3.2	Assignment_allowed_variable	420
14.3.3	Control_allowed_variable.....	421
14.4	ISO13584_method_schema entity definitions.....	422
14.4.1	Method	422
14.4.2	Method_specif.....	423
14.4.3	Method_body	424
14.4.4	Method_statement.....	426
14.4.5	Guarded_statement.....	427
14.4.6	Simple_statement	428
14.4.7	Null_statement	428
14.4.8	Modelling statement.....	428
14.4.9	Set_reference_lcs	429
14.4.10	Begin_set	431
14.4.11	Close_set	432
14.4.12	Set_2d_relative_view_level.....	432
14.4.13	Predefined_representation_call_statement.....	433
14.4.14	Send_representation_statement	434
14.4.15	Send_representation_reference_statement.....	436
14.4.16	Call_program_statement.....	438
14.4.17	Assignment_statement.....	440
14.4.18	Sub_object_view_statement	442
14.4.19	Referenced_sub_item_view_statement.....	443
14.4.20	Constructed_sub_model_view_statement	444
14.5	ISO13584_method_schema rules definitions	446
14.5.1	Created_view_v_c_v_rule rule.....	446
14.5.2	V_c_v_values_set_and_created_view_v_c_v_set_equality_rule rule	446
14.5.3	No_v_c_v_in_assigned_variables_set_rule rule.....	447
14.6	ISO13584_method_schema function definitions	447
14.6.1	Checks_classes_in_path function	447

14.6.2	Checks_applicable_properties_in_path function	448
14.6.3	same_view_model_method	449
14.6.4	self_property_value_semantics_is_item_class.....	450
15	Conformance requirements	451
16	Exchange of general model classes: library integrated information model 24-1.....	453
16.1	ISO13584_g_m_iim_schema short listing	454
16.2	ISO13584_g_m_iim_schema global rule definitions	462
16.2.1	At_most_one_dictionary_rule rule	462
16.2.2	Class_associated_items_rule rule	462
16.3	Conformance class requirements	463
16.3.1	Conformance class 0	463
16.3.2	Conformance class 1	465
16.3.3	Conformance class 1E.....	467
16.3.4	Conformance class 2	467
16.3.5	Conformance class 2E.....	468
16.3.6	Conformance class 3	468
16.3.7	Conformance class 3E.....	470
16.3.8	Conformance class 4	470
16.3.9	Conformance class 4E.....	472
16.3.10	Conformance class 5	472
16.3.11	Conformance class 5E	473
16.3.12	Conformance class 6	474
16.3.13	Conformance class 6E	475
17	Exchange of functional model classes: library integrated information model 24-2	475
17.1	ISO13584_f_m_iim_schema short listing	477
17.2	ISO13584_f_m_iim_schema global rule definitions	485
17.2.1	Exactly_one_dictionary_rule rule	485
17.2.2	Class_associated_items_rule rule	485
17.2.3	Supplier_associated_items_rule rule	486
17.3	Conformance class requirements	487
17.3.1	Conformance class 1	487
17.3.2	Conformance class 1E.....	489
17.3.3	Conformance class 2	490
17.3.4	Conformance class 2E.....	490
17.3.5	Conformance class 3	490
17.3.6	Conformance class 3E.....	493
17.3.7	Conformance class 4	493
17.3.8	Conformance class 4E.....	495
17.3.9	Conformance class 5	495
17.3.10	Conformance class 5E	496
17.3.11	Conformance class 6	497
17.3.12	Conformance class 6E	498
18	Exchange of functional view classes: library integrated information model 24-3	498
18.1	ISO13584_f_v_iim_schema short listing.....	499
18.2	ISO13584_f_v_iim_schema global rule definitions	503
18.2.1	Exactly_one_dictionary_rule rule	503
18.2.2	Class_associated_items_rule rule	503
18.3	Conformance class requirements	504
18.3.1	Conformance class 1	504
18.3.2	Conformance class 1E.....	506
18.3.3	Conformance class 2	506
18.3.4	Conformance class 2E.....	507
	Annex A (normative) Short names of entities defined in this part	508
	Annex B (normative) Information object registration	515

Annex C (normative) ISO13584_g_m_iim_library_implicit_schema expanded listing	517
Annex D (informative) ISO13584_g_m_iim_schema short names of entities.....	519
Annex E (normative) Standard data requirements for the library integrated information model 24-1 .	520
Annex F (normative) Implementation method specific requirements for the library integrated information model 24-1	529
Annex G (normative) ISO13584_f_m_iim_library_implicit_schema expanded listing.....	530
Annex H (informative) ISO13584_f_m_iim_schema short names of entities.....	532
Annex I (normative) Standard data requirements for the library integrated information model 24-2...	533
Annex J (normative) Implementation method specific requirements for the library integrated information model 24-2.....	542
Annex K (normative) ISO13584_f_v_iim_library_implicit_schema expanded listing.....	543
Annex L (informative) ISO13584_f_v_iim_schema short names of entities.....	545
Annex M (normative) Standard data requirements for the library integrated information model 24-3	545
Annex N (normative) Implementation method specific requirements for the library integrated information model 24-3.....	555
Annex O (informative) Logical description of the compiling process of ISO 13584-conformant dictionaries and libraries	556
Annex P (informative) Commented example of Parts Library physical files.....	559
Annex Q (informative) Guidelines for creating functional model classes	609
Annex R (informative) EXPRESS-G diagrams.....	611
Annex S (informative) Notational Conventions and Generic Grammar for URL-encoded strings.....	640
Bibliography	642
Index.....	643

Figures

Figure 1 — Simplified example of an explicit information model for families of parts	23
Figure 2 — Example of explicit description of a family of parts	23
Figure 3 — Example of implicit description of a parts family in the EXPRESS language	24
Figure 4 — Capturing context parameters in an implicit description	25
Figure 5 — Simple meta-model of a part class in EXPRESS	26
Figure 6 — Model of a part family using a meta-modelling approach	27
Figure 7 — Planning model of the relationships between class definition and the instance level.....	36

Figure 8 – External_item planning model	374
Figure 9 — Class_extension_external_items planning model.....	398
Figure 10 — External_content planning model	407
Figure P.1 — PAW family description	559
Figure P.2 — Instance of a dictionary description	560
Figure P.3 — Explicit representation of a dictionary description	560
Figure P.4 — Implicit representation of a dictionary description	561
Figure P.5 — Identifiers of the concepts involved in the PAW family.....	562
Figure P.6 — The BSU / Dictionary element relationship.....	562
Figure P.7 — Dictionary_element of the concepts involved in the PAW family.....	563
Figure P.8 — The Dictionary Element / Library Content relationship	563
Figure P.9 — Description of one particular instance of the PAW parts family	564
Figure P.10 — Description of the PAW explicit class extension	564
Figure P.11 — Description of the supplier identifiers	564
Figure P.12 — Description of the class identifiers.....	565
Figure P.13 — Description of the general model property identifiers	565
Figure P.14 — Description of the functional model / view property identifiers	565
Figure P.15 — Functional model supplier description	565
Figure P.16 — Property description for referencing programs.....	566
Figure P.17 — View control variables range definition	566
Figure P.18 — Specification of the view created by a functional model class.....	567
Figure P.19 — Description by extension of the instances of a functional a functional model	567
Figure P.20 — References to FORTRAN programs that display geometry.	568
Figure P.21 — The BSU / Dictionary element relationship.....	568
Figure P.22 — Identifiers of the concepts involved in the PAW family.....	581
Figure P.23 — The BSU / Dictionary element relationship.....	582
Figure P.24 — Dictionary_element of the concepts involved in the PAW family.....	583
Figure P.25 — The Dictionary Element / Library Content relationship	583
Figure P.26 — Syntax / Semantics variable association	584

Figure P.27 — Data model of the variable that stands of the inner diameter of a PAW instance.....	584
Figure P.28 — Displayable and optional properties	584
Figure P.29 — Content of a table	585
Figure P.30 — Domain restriction description	585
Figure P.31 — Specification of a domain as a table.....	586
Figure P.32 — Derivation	586
Figure P.33 — Derivation by algebraic expressions.....	587
Figure P.34 — Specification of a property value by an algebraic expression.....	587
Figure P.35 — Derivation table.....	587
Figure P.36 — Specification of a property value by a table	588
Figure P.37 — Description of the PAW implicit class extension	588
Figure P.38 — Association mechanism between a general model and a functional model.....	589
Figure P.39 — View control variables range definition	591
Figure P.40 — Specification of the view created by a functional model class.....	591
Figure P.41 — The view creation mechanism.....	592
Figure P.42 — Description of a method	594
Figure P.43 — Library specification of a functional model class	594
Figure R.1 — ISO13584_instance_resource_schema diagram 1 of 3.....	612
Figure R.2 — ISO13584_instance_resource_schema diagram 2 of 3.....	613
Figure R.3 — ISO13584_instance_resource_schema diagram 3 of 3.....	614
Figure R.4 — ISO13584_library_expressions_schema diagram 1 of 3	615
Figure R.5 — ISO13584_library_expressions_schema diagram 2 of 3	616
Figure R.6 — ISO13584_library_expressions_schema diagram 3 of 3	617
Figure R.7 — ISO13584_table_resource_schema diagram 1 of 4	618
Figure R.8 — ISO13584_table_resource_schema diagram 2 of 4	619
Figure R.9 — ISO13584_table_resource_schema diagram 3 of 4	620
Figure R.10 — ISO13584_table_resource_schema diagram 4 of 4	621
Figure R.11 — ISO13584_variable_semantics_schema diagram 1 of 1	622
Figure R.12 — ISO13584_domain_resource_schema diagram 1 of 1	623

Figure R.13 — ISO13584_extended_dictionary_schema diagram 1 of 7	624
Figure R.14 — ISO13584_extended_dictionary_schema diagram 2 of 7	625
Figure R.15 — ISO13584_extended_dictionary_schema diagram 3 of 7	626
Figure R.16 — ISO13584_extended_dictionary_schema diagram 4 of 7	627
Figure R.17 — ISO13584_extended_dictionary_schema diagram 5 of 7	628
Figure R.18 — ISO13584_extended_dictionary_schema diagram 6 of 7	629
Figure R.19 — ISO13584_extended_dictionary_schema diagram 7 of 7	630
Figure R.20 — ISO13584_library_content_schema diagram 1 of 4.....	631
Figure R.21 — ISO13584_library_content_schema diagram 2 of 4.....	632
Figure R.22 — ISO13584_library_content_schema diagram 3 of 4.....	633
Figure R.23 — ISO13584_library_content_schema diagram 4 of 4.....	634
Figure R.24 — ISO13584_external_file_schema diagram 1 of 3.....	635
Figure R.25 — ISO13584_external_file_schema diagram 2 of 3.....	636
Figure R.26 — ISO13584_external_file_schema diagram 3 of 3.....	637
Figure R.27 — ISO13584_method_schema diagram 1 of 2	638
Figure R.28 — ISO13584_method_schema diagram 2 of 2	639

Tables

Table 1 — Conformance options of library integrated information model 24-1	454
Table 2 — Conformance options of library integrated information model 24-2	477
Table A.1 — Short names of entities	508
Table E.1 — ISO 13584 LIIM 24-1 conformance class specification	521
Table I.1 — ISO 13584 LIIM 24-2 conformance class specification.....	534
Table M.1 — ISO 13584 LIIM 24-3 conformance class specification.....	547
Table P.1 — View control variables of the geometry functional view class	590