

1. Dangerous Goods

Dangerous Goods - algorithm

To create shipments with Dangerous Goods - DHL Express expects 'DHL Service Code' and 'DHL ContentId' in the request to their API.

Additionally for some use cases additional details like 'Custom Description' might be required.

A default value has to be applied to `[packages.products.dangerous_goods.regulation_set]`, *IF this value is NULL or EMPTY we assume it should be treated as "IATA" for backwards compatibility.*

Because there are no relevant parameters in the SE Connect data model, in agreement with DHL Express we have decided to build a logic, which will calculate DHL parameters required to send DG shipments.

Please find the proposed logic to calculate 'DHL Service Code' and 'DHL Content Id' (logic has been approved by the carrier - see more in the attached email conversation):

Logic to calculate DangerousGoods should be triggered only if **object with DG data is not empty** `[shipment.packages.products.dangerous_goods]` - because DG product level data are used to calculate relevant DHL parameters.

Logic for Dangerous Goods:

#1st step -> NEW STEP, which takes priority over the current logic.

In the request to our platform customer can pass different format of ID_Number:
UN12345 or UN 12345 or 12345 or ID8000 or 8000

SE CONNECT PARAMETER:

`[packages.products.dangerous_goods.id_number]`

All formats are accepted:

UN12345

UN 12345

12345

ID8000

8000

NOTE: In the algorithm to calculate relevant ServiceCode/ContentId -> please take digits only

#2nd STEP

Check against SpecialProvision

Parameters used in this step:

[*packages.products.dangerous_goods.special_provisions*]

If [packages.products.dangerous_goods.special_provisions] = A199 or 199,

Then

ContentId = HU6

ServiceCode = HU

If [packages.products.dangerous_goods.special_provisions] is not null, and is different than A199 or 199,

Then

ContentId = HU5

ServiceCode = HU

Exception:

IF [packages.products.dangerous_goods.id_number] = 3496

THEN

ContentId = HU5

ServiceCode = HU

—

#3rd step

Check against UN ID (without other parameters)

Parameters used in this step:

[*packages.products.dangerous_goods.id_number*]

[*packages.products.dangerous_goods.technical_name*]

For the following UN ID - find matching ServiceCode/ContentId based on the values in the table:

1845

3373

3245

2807

8000

3164*

Regardless of other parameters

***NOTE:**

For UN 3164

Additionally it is required to check `[packages.products.dangerous_goods.technical_name]`

If it contains “PNEUMATIC” → then HU2 contentID should be assigned.

else

for UN 3164 → HU1 contentID should be assigned

#4th step - A02 vs A01

`[packages.products.dangerous_goods.regulation_set]` (IATA or ADR)

`[packages.products.dangerous_goods.regulation_level]`

`[shipment.packages.products.dangerous_goods.transport_category]`

IF `[packages.products.dangerous_goods.regulation_set]` = “IATA”

THEN Content ID based on the table - move to the next step if not possible at this stage.

ELSE IF

`[packages.products.dangerous_goods.regulation_set]` = “ADR”

AND

`[packages.products.dangerous_goods.regulation_level]` = NOT

`[limited_quantities]` or `[excepted_quantity]`

AND

`[shipment.packages.products.dangerous_goods.transport_category]` = NOT NULL

THEN ContentID = A02

ELSE IF

`[packages.products.dangerous_goods.regulation_set]` = “ADR”

AND

`[packages.products.dangerous_goods.regulation_level]` = “`limited_quantities`” or “`excepted_quantity`”

AND

`[shipment.packages.products.dangerous_goods.transport_category]` = NULL

THEN ContentID = A01

#5th step

RegulationLevel

Parameters used in this step:

`[packages.products.dangerous_goods.regulation_level]`

[*packages.products.dangerous_goods.id_number*]

[*packages.products.dangerous_goods.regulation_set*] (IATA or ADR)

IF [*packages.products.dangerous_goods.regulation_level*] = "limited_quantities" AND
[*packages.products.dangerous_goods.regulation_set*] = "IATA" -> find matching ServiceCode and
ContentID based on the values in the table.

IF [*packages.products.dangerous_goods.regulation_level*] = "limited_quantities" AND
[*packages.products.dangerous_goods.regulation_set*] = "ADR" -> find matching ServiceCode/ContentId
based on the values in the table. -> find matching ServiceCode based on the values in the table
(ContentID is based on previous step)

If it is equal to "excepted_quantity" + take relevant [*packages.products.dangerous_goods.id_number*] ->
find matching ServiceCode/ContentId based on the values in the table and use id_number as 'UNCode'
in additional node 'UNCodes' in the request to MyDHL API

#6th step

Check if DG data meets **Lithium Batteries** Criteria

Parameters used in this step:

[*packages.products.dangerous_goods.regulation_level*]

[*packages.products.dangerous_goods.id_number*]

[*packages.products.dangerous_goods.packaging_instruction*]

[*packages.products.dangerous_goods.packaging_instruction_section*]

[*packages.products.dangerous_goods.transport_mean*]

[*packages.products.dangerous_goods.regulation_set*]

Check if [*packages.products.dangerous_goods.regulation_level*] is EMPTY or is NOT equal to
[*limited_quantities*] or [*excepted_quantity*]

try to find matching records in the Dangerous Goods table, based on the following parameters
combination:

([*packages.products.dangerous_goods.id_number*] +
[*packages.products.dangerous_goods.packaging_instruction*] +
[*packages.products.dangerous_goods.packaging_instruction_section*] +
[*packages.products.dangerous_goods.transport_mean*])

Matching result is found in the table:

IF [*packages.products.dangerous_goods.regulation_set*] = "IATA" THEN assign Content ID / Service Code

IF [packages.products.dangerous_goods.regulation_set] = "ADR" THEN assign Service Code from the table and Content ID based on step 4.

ADDITIONAL NOTES

1. For some LithiumBatteries it is possible to find matching ContentId / Service Code based on [id_number] + [packing_instruction_section]

3481	-	-	-	967	II	967	HV
3090	-	-	-	-	IA	910	HE
3090	-	-	-	-	IB	910	HE

2. for other ones [id_number] + [packing_instruction_section] + [packaging_instruction] will be enough: [transport_mean] might be empty in this case

3481	-	(empty or other than cargo_aircraft_only)	-	966	I	910	HE	
3481		(empty or other than cargo_aircraft_only)		967	I	910	HE	

3. Some of the Lithium Batteries requires full combination [id_number] + [packing_instruction_section] + [packaging_instruction] + [transport_mean]

)						
3480	-	cargo_aircraft_only	-	965	IA	911	HE	
3480	-	cargo_aircraft_only	-	965	IB	911	HE	

#7th Step

Check against Class Code and Transport Mean

This step is only applicable IF `[packages.products.dangerous_goods.regulation_set] = "IATA". ADR flow does not need transport_mean recognition.`

Parameters used in this step:

`[packages.products.dangerous_goods.product_class]`

`[packages.products.dangerous_goods.transport_mean]`

If find a matching result -> then assign Content ID/Service Code

If `[packages.products.dangerous_goods.product_class]` is provided

AND

`[packages.products.dangerous_goods.transport_mean] = cargo_aircraft_only`

then

assign ContentId = 911 and ServiceCode: HE

else*

ContentId = 910 + ServiceCode: HE

#8th step

If we are not able to calculate ContentID based on provided DangerousGoods parameters.

example:

UN ID `[packages.products.dangerous_goods.id_number] = 2000`

Class Code `[packages.products.dangerous_goods.product_class] = 7`

then return an error message, that 'System cannot calculate [DHL Dangerous Goods ContentId] and [Service Code] based on the provided Dangerous Goods details. Please verify the correctness of input parameters or ensure if specific [DHL Dangerous Goods ContentId] is supported.'

Dangerous Goods - table

This table is used to retrieve 'DHL Dangerous Goods Content ID' and 'DHL Dangerous Goods Value Added Service Code' and 'Additional Details' based on the Dangerous Goods level data provided in the 'Create Label' request,

Green - DG product level parameters used to calculate DHL Content ID/ DHL DG Service Code

Orange - Values to be provided in the request to DHL API for specific DG product level combination

Grey - Information / Not supported

Dangerous Goods parameters required for calculation ContentId/Service Code							DHL Dangerous Goods ContentId	DHL Dangerous goods	Additional Details/Additional Comments	IATA description on the label
UN ID / ID Number [id_number]	Regulation Level Code [regulation_level]	Transportation Mean [transport_mean]	Class Code [product_classes]	Packing Instruction [packaging_instruction]	Packing Instruction Section [packaging_instruction_section]	Regulation Set (IATA OR ADR)				(For information only: generated by DHL based on the ContentID/ServiceCode + Additional Details)
	LQ [limited_quantities]					<p>[packages.products.dangerous_goods.[packages.products.dangerous_goods.regulation_set] = "ADR"]</p> <p>AND</p> <p>[packages.products.dangerous_goods.regulation_level] = "limited_quantities" or "excepted_quantity"</p> <p>AND</p> <p>[shipment.packages.products.dangerous_goods.transport_category] = NULL</p>	A01	HL		LIMITED QUANTITIES ROAD ONLY

Dangerous Goods parameters required for calculation ContentId/Service Code							DHL Dangerous Goods ContentId	DHL Dangerous goods Value Added Service Code	Additional Details/Additional Comments	IATA description on the label
UN ID / ID Number [id_number]	Regulation Level Code [regulation_level]	Transportation Mean [transport_mean]	Class Code [product_classes]	Packing Instruction [packaging_instruction]	Packing Instruction Section [packaging_instruction_section]	Regulation Set (IATA OR ADR)				(For information only: generated by DHL based on the ContentID/ServiceCode + Additional Details)
						<i>based on step 2 logic</i>				
	EQ [exceptioned_quantity]						E01	HH	Additional node 'UNCodes' must be present and filled in with UN ID [id_number]	DANGEROUS GOODS IN EXCEPTED QUANTITIES, UN **** **** -> UN ID
ID8000 or 8000		-	-	-	-		700	HK	*TBC where MP customer can pass ID8000	DANGEROUS GOODS AS PER ASSOCIATED DGD
3373	-	-	-	-	-		650	HY		Biological substances UN3373 Applies to this UN code only.
3245	-	-	-	-	-		651	HY		UN3245 GMO/GMOMO
2807	-	-	-	-	-		HT1	HX		UN2807 MAGNETIZED MATERIAL NOT SUBJECT TO AN APPROVAL PI953
3164*	-	-	-	-	-		HU1	HU	*If technical_name is other than PNEUMATIC	UN3164 ARTICLES, PRESSURIZED, HYDRAULIC PI208A
3164*	-	-	-	-	-		HU2	HU	*Check if technical_name contains PNEUMATIC, otherwise for 3164 assign HU1	UN3164 ARTICLES, PRESSURIZED, PNEUMATIC PI208A
1845	-	-	-	-	-		901	HC	For dangerous goods shipment with Dry Ice example: UN1845 (Content ID – 901), an additional node must be	Dry Ice UN1845 Applies to this UN code only. Note: it is required to provide DangerousPackagingTypeUnitQuantity value.

Dangerous Goods parameters required for calculation ContentId/Service Code							DHL Dangerous Goods ContentId	DHL Dangerous goods Value Added Service Code	Additional Details/Additional Comments	IATA description on the label
UN ID / ID Number [id_number]	Regulation Level Code [regulation_level]	Transportation Mean [transport_mean]	Class Code [product_classes]	Packing Instruction [packaging_instructions]	Packing Instruction Section [packaging_instruction_section]	Regulation Set (IATA OR ADR)				(For information only: generated by DHL based on the ContentID/ServiceCode + Additional Details)
									populated – "DryIceTotalNetWeight." *TBC where MP and SE customers can pass DryIceTotalNet Weight	
3480	-	(empty or other than cargo_aircr aft_only)	-	965	IA		910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD [packages.products.dangerous_goods.regulation_set] = "ADR"
3480	-	(empty or other than cargo_aircr aft_only)	-	965	IB		910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD
3480	-	cargo_aircr aft_only	-	965	IA		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
3480	-	cargo_aircr aft_only	-	965	IB		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
3481	-	(empty or other than cargo_aircr aft_only)	-	966	I		910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD
3481		(empty or other		967	I		910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD

Dangerous Goods parameters required for calculation ContentId/Service Code							DHL Dangerous Goods ContentId	DHL Dangerous goods Value Added Service Code	Additional Details/Additional Comments	IATA description on the label
UN ID / ID Number [id_number]	Regulation Level Code [regulation_level]	Transportation Mean [transport_mean]	Class Code [product_classes]	Packing Instruction [packaging_instructions]	Packing Instruction Section [packaging_instruction_section]	Regulation Set (IATA OR ADR)				(For information only: generated by DHL based on the ContentID/ServiceCode + Additional Details)
		than cargo_aircr aft_only)								
3481	-	cargo_aircr aft_only	-	966	I		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
3481		cargo_aircr aft_only		967	I		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
3481	-	(empty or other than cargo_aircr aft_only)	-	966	II		966	HD		LITHIUM ION BATTERIES IN COMPLIANCE WITH SECTION II OF PI966
3481	-	(empty or other than cargo_aircr aft_only)	-	967	II		967	HV		LITHIUM ION BATTERIES IN COMPLIANCE WITH SECTION II OF PI967
3090	-	(empty or other than cargo_aircr aft_only)	-	-	IA		910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD
3090	-	(empty or other than cargo_aircr aft_only)	-	-	IB		910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD

Dangerous Goods parameters required for calculation ContentId/Service Code							DHL Dangerous Goods ContentId	DHL Dangerous goods Value Added Service Code	Additional Details/Additional Comments	IATA description on the label
UN ID / ID Number [id_number]	Regulation Level Code [regulation_level]	Transportation Mean [transport_mean]	Class Code [product_classes]	Packing Instruction [packaging_instruction]	Packing Instruction Section [packaging_instruction_section]	Regulation Set (IATA OR ADR)				(For information only: generated by DHL based on the ContentId/ServiceCode + Additional Details)
3090	-	cargo_aircraft_only	-	-	IA		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
3090	-	cargo_aircraft_only	-	-	IB		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
3091	-	(empty or other than cargo_aircraft_only)	-	969	I		910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD
3091	-	(empty or other than cargo_aircraft_only)	-	970	I		910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD
3091	-	cargo_aircraft_only	-	969	I		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
3091	-	cargo_aircraft_only	-	970	I		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
3091	-	(empty or other than cargo_aircraft_only)	-	969	II		969	HM		LITHIUM METAL BATTERIES IN COMPLIANCE WITH SECTION II OF PI969
3091	-	(empty or other than cargo_aircraft)	-	970	II		970	HW		LITHIUM METAL BATTERIES IN COMPLIANCE WITH SECTION II OF PI970

Dangerous Goods parameters required for calculation ContentId/Service Code							DHL Dangerous Goods ContentId	DHL Dangerous goods Value Added Service Code	Additional Details/Additional Comments	IATA description on the label
UN ID / ID Number [id_number]	Regulation Level Code [regulation_level]	Transportation Mean [transport_mean]	Class Code [product_classes]	Packing Instruction [packaging_instruction]	Packing Instruction Section [packaging_instruction_section]	Regulation Set (IATA OR ADR)				(For information only: generated by DHL based on the ContentID/ServiceCode + Additional Details)
		aft_only)								
3552				977	I or II		977	HB		SODIUM ION BATTERIES IN COMPLIANCE WITH SECTION II OF PI977
3552				978	I or II		978	HA		SODIUM ION BATTERIES IN COMPLIANCE WITH SECTION II OF PI978
The rules below: For ID_Numbers Other than "3090", "3091", "3480" "3481", "2807", "3164", "1845", "8000"/ "ID800 0"										
-	-	2.1	-	-			910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD
-	-	2.2	-	-			910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD
-	-	3	-	-			910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD
-	-	4.1	-	-			910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD
-	-	4.2	-	-			910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD
-	-	4.3	-	-			910	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD

Dangerous Goods parameters required for calculation ContentId/Service Code							DHL Dangerous Goods ContentId	DHL Dangerous goods Value Added Service Code	Additional Details/Additional Comments	IATA description on the label
UN ID / ID Number [id_number]	Regulation Level Code [regulation_level]	Transportation Mean [transport_mean]	Class Code [product_classes]	Packing Instruction [packaging_instruction]	Packing Instruction Section [packaging_instruction_section]	Regulation Set (IATA OR ADR)				(For information only: generated by DHL based on the ContentID/ServiceCode + Additional Details)
-	-	5.1	-	-	-	910	HE			DANGEROUS GOODS AS PER ASSOCIATED DGD
-	-	5.2	-	-	-	910	HE			DANGEROUS GOODS AS PER ASSOCIATED DGD
-	-	6.1	-	-	-	910	HE			DANGEROUS GOODS AS PER ASSOCIATED DGD
-	-	8	-	-	-	910	HE			DANGEROUS GOODS AS PER ASSOCIATED DGD
-	-	9	-	-	-	910	HE			DANGEROUS GOODS AS PER ASSOCIATED DGD
-	-	cargo_aircraft_only	2.1	-	-	911	HE			DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO

Dangerous Goods parameters required for calculation ContentId/Service Code							DHL Dangerous Goods ContentId	DHL Dangerous goods Value Added Service Code	Additional Details/Additional Comments	IATA description on the label
UN ID / ID Number [id_number]	Regulation Level Code [regulation_level]	Transportation Mean [transport_mean]	Class Code [product_classes]	Packing Instruction [packaging_instructions]	Packing Instruction Section [packaging_instruction_section]	Regulation Set (IATA OR ADR)				(For information only: generated by DHL based on the ContentID/ServiceCode + Additional Details)
-	-	cargo_aircraft_only	2.2	-	-		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
-	-	cargo_aircraft_only	3	-	-		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
-	-	cargo_aircraft_only	4.1	-	-		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
-	-	cargo_aircraft_only	4.2	-	-		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
-	-	cargo_aircraft_only	4.3	-	-		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
-	-	cargo_aircraft_only	5.1	-	-		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
-	-	cargo_aircraft_only	5.2	-	-		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
-	-	cargo_aircraft_only	6.1	-	-		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
-	-	cargo_aircraft_only	8	-	-		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO
	-	cargo_airc	9	-	-		911	HE		DANGEROUS GOODS AS PER ASSOCIATED DGD - CAO

Dangerous Goods parameters required for calculation ContentId/Service Code							DHL Dangerous Goods ContentId	DHL Dangerous goods Value Added Service Code	Additional Details/Additional Comments	IATA description on the label	
UN ID / ID Number [id_number]	Regulation Level Code [regulation_level]	Transportation Mean [transport_mean]	Class Code [product_classes]	Packing Instruction [packaging_instruction]	Packing Instruction Section [packaging_instruction_section]	Regulation Set (IATA OR ADR)				(For information only: generated by DHL based on the ContentID/ServiceCode + Additional Details)	
		raft_only									
	LQ [regulation_level] = NULL, EMPTY					<p>[packages.products.dangerous_goods.regulation_set] = "ADR"</p> <p>AND</p> <p>[packages.products.dangerous_goods.regulation_level] = NOT</p> <p>[limited_quantities] or [excepted_quantity]</p> <p>AND</p> <p>[shipment.packages.products.dangerous_goods.transport_category] = NOT NULL</p> <p>based on step 2 logic</p>	A02	HN			LOAD RESTRICTIONS ROAD ONLY Supported and based on Limited Quantities value
							YN1	YN		TAIL LIFT TRUCK EV BATTERIES Not supported by ShipEngine/Metapack	
							HU4	HU		EXEMPT ANIMAL SPECIMEN Not supported by ShipEngine/Metapack	
							HU5	HU		EXEMPT ANIMAL SPECIMEN	

Dangerous Goods parameters required for calculation ContentId/Service Code							DHL Dangerous Goods ContentId	DHL Dangerous goods Value Added Service Code	Additional Details/Additional Comments	IATA description on the label
UN ID / ID Number [id_number]	Regulation Level Code [regulation_level]	Transportation Mean [transport_mean]	Class Code [product_classes]	Packing Instruction [packaging_instructions]	Packing Instruction Section [packaging_instruction_section]	Regulation Set (IATA OR ADR)				(For information only: generated by DHL based on the ContentID/ServiceCode + Additional Details)
										Not supported by ShipEngine/Metapack