IMDS Recommendation	IMDS 007

Steel Flat Products (strips and sheets)

metallic coated (hot-dipped or electrolytically)

1 Purpose

This recommendation describes the general requirements to create a MDS (Material Data Sheet) of a metallic coated steel flat products (e.g. in acc. to EN, ISO and JIS specifications). To declare a coated flat product in IMDS we should declare 2 different material (or more if e.g. more coatings like passivation are applied).

- The first material is the **„Base Material“** (substrate or unplated part)
- The 2nd material is the **„Metallic Coating“** (hot dip or e-plated).

The different materials should be declared as described in REC001.

2 References

REC001, EN 10130, EN 10346, EN 10152, EN 10271

3 Definitions

3.1 Base Material

The base material is the steel flat product without any coating. The composition of the base materials is defined in international norms and in many cases published by the SC (IMDS ID of the supplier 313 Stahl und Eisenliste, 424 IMDS-Committee and 18986 IMDS-Committee/ILI-metals).
See example in section 5.

3.2 Metallic Coating

Metallic coatings, defined in EN-norms may be for example:

- hot-dip deposited:
  - Zinc + Z
  - Zinc-Iron + ZF
  - Zinc-Aluminium + ZA
  - Aluminium-Silicon + AS
  - Aluminium-Zinc + AZ
- e-plated (electrolytically deposited):
  - Zinc + ZE
  - Zinc-Nickel + ZN
  - Zinc-Iron + ZF

The standard composition of these different layers can be referenced in IMDS as standard materials published by the SC. See examples in section 4.2.

3.3 Synonyms (for the metallic coating)

Metallic plating, Zn-plating, ZnNi-plating, ZnFe-plating, ZnAl-plating, AlSi-plating, AlZn-plating, hot dip galvanizing

4. Base materials and coatings

4.1 Base materials published by the SC

The following table shows an overview of **EN-specifications** for metallic coated steel flat products and **possible combinations of base materials and metallic coatings:**

Spec	Title	Material	Material number	IMDS ID	Comment
EN 10130 (2007)	Cold rolled low carbon flat products for cold forming (used in EN 10152 and EN 10217)	DC01 DC03 DC04 DC05 DC06 DC07	1.0330 1.0347 1.0338 1.0312 1.0387 1.0898	123 75 123 90 123 83 123 66 127 09 693 656 69	Base material Base material Base material Base material Base material Base material
EN 10346 (2009)	**Continuously hot-dip coated steel flat products**				
EN 10346 (2009)	Steels for cold forming	DX51D DX52D DX53D DX54D DX55D DX56D DX57D + Z + ZF +ZA +AZ +AS	1.0226 1.0350 1.0355 1.0306 1.0309 1.0322 1.0853	180 006 579 183 546 639 183 546 641 183 106 666 183 086 763 183 106 628 194 307 417 see 4.2.1 see 4.2.2 see 4.2.3 see 4.2.4 see 4.2.5	Base material Base material Base material Base material Base material Base material Base material Zinc Zinc-Iron Zinc-Aluminum Aluminum-Zinc Aluminum-Silicium
EN 10346 (2009)	Structural Steels	S220GD S250GD S280GD S320GD S350GD S390GD S420GD S450GD S550GD + Z + ZF +ZA +AZ +AS	1.0241 1.0242 1.0244 1.0250 1.0529 %) %) %) 1.0531	180 006 622 180 006 623 180 006 626 180 006 628 192 408 074 539 810 678 539 810 679 539 810 680 828 591 see 4.2.1 see 4.2.2 see 4.2.3 see 4.2.4 see 4.2.5	Base material Base material Base material Base material Base material Base material Base material Base material Base material Zinc Zinc-Iron Zinc-Aluminum Aluminum-Zinc Aluminum-Silicium
EN 10346 (2009)	Steels with high proof strength for cold forming	HX160YD HX180YD	1.0910 1.0921	142 580 020 843 158	Base material Base material

		HX180BD	1.0914	843 164	Base material
		HX220YD	1.0923	843 166	Base material
		HX220BD	1.0919	843 169	Base material
		HX260YD	1.0926	843 172	Base material
		HX260BD	1.0924	843 185	Base material
		HX260LAD	1.0929	843 189	Base material
		HX300YD	1.0927	142 583 477	Base material
		HX300BD	1.0930	843 201	Base material
		HX300LAD	1.0932	843 204	Base material
		HX340BD	1.0945	142 583 615	Base material
		HX340LAD	1.0933	843 209	Base material
		HX380LAD	1.0934	843 211	Base material
		HX420LAD	1.0935	843 214	Base material
		HX460LAD	1.0990	142 583 862	Base material
		HX500LAD	1.0991	142 839 05	Base material
		+ Z		see 4.2.1	Zinc
		+ ZF		see 4.2.2	Zinc-Iron
		+ZA		see 4.2.3	Zinc-Aluminum
		+AZ		see 4.2.4	Aluminum-Zinc
		+AS		see 4.2.5	Aluminum-Silicium
EN 10346 (2009)	Multiphase steels for cold forming	HDT450F	1.0961	650 147 06	Base material
		HDT580F	%)	539 810 715	Base material
		HDT560F	1.0959	650 147 52	Base material
		HCT450X	1.0937	961 747 4	Base material
		HCT490X	%)	539 810 684	Base material
		HCT590X	%)	539 810 688	Base material
		HCT500X	1.0939	962 035 2	Base material
		HCT600X	1.0941	962 193 6	Base material
		HDT580X	1.0936	650 144 39	Base material
		HCT780X	1.0943	962 119 0	Base material
		HCT980X	1.0944	962 129 3	Base material
		HCT690T	1.0947	962 183 7	Base material
		HCT780T	1.0948	962 186 0	Base material
		HCT600C	1.0953	962 193 6	Base material
		HDT750C	1.0956	962 222 9	Base material
		HDT760C	%)	539 810 719	Base material
		HCT780C	1.0954	962 205 9	Base material
		HDT780C	1.0957	650 145 84	Base material
		HDT950C	1.0958	650 145 93	Base material
		HCT980C	1.0955	962 207 7	Base material
		HCT980XG	%)	539 810 689	Base material
		HDT1200M	1.0956	650 146 73	Base material
		+ Z		see 4.2.1	Zinc
		+ ZF		see 4.2.2	Zinc-Iron
		+ZA		see 4.2.3	Zinc-Aluminum
Remark	%) These steels have been added in the prEN 10346 (April 2013)				

EN 10152 (2009)	**Electrolytically zinc coated cold rolled steel flat products**				
EN 10152 (2009)	Electrolytically zinc coated cold rolled steel flat products.	DC01 DC03 DC04 DC05 DC06 DC07 + ZE	1.0330 1.0347 1.0338 1.0312 1.0387 1.0898	123 75 123 90 123 83 123 66 127 09 693 656 69 see 4.2.6	Base material Base material Base material Base material Base material Base material e-plated zinc
EN 10271 (1998)	**Electrolytically zinc-nickel (ZN) coated steel flat products.**				
EN 10271 (1998)	Electrolytically zinc-nickel (ZN) coated steel flat products.	DC01 DC03 DC04 DC05 DC06 + ZN	1.0330 1.0347 1.0338 1.0312 1.0387	123 75 123 90 123 83 123 66 127 09 see 4.2.7	Base material Base material Base material Base material Base material e-plated zinc-nickel

4.2 Metallic coatings published by the SC

The metallic coatings are defined in the specs with the type of coating (e.g. Z(Zinc), ZF(Zinc-Iron) etc.) and the coating mass in g/m² (e,g. 100 has a coating mass applied on the base material of 100 g/m²). These coatings have been published by the SC.

4.2.1 Hot dip Zinc Coatings

Name of the material	Coating mass (g/m²)	IMDS ID
+ Z100 (hot-dip zinc coating)	100	833 411
+ Z140 (hot-dip zinc coating)	140	838 869
+ Z200 (hot-dip zinc coating)	200	838 886
+ Z225 (hot-dip zinc coating)	225	838 894
+ Z275 (hot-dip zinc coating)	275	838 901
+ Z300 (hot-dip zinc coating)	300	354 204 64
+ Z450 (hot-dip zinc coating)	450	354 205 51
+ Z600 (hot-dip zinc coating)	600	354 205 93
+ Z75 (hot-dip zinc coating)	75	129 936 02
Remark: These coatings can be used in EN 10346 or in comparable other international specifications like ASTM, JIS etc.		

4.2.2 Hot dip Zinc-Iron Coatings

Name of the material	Coating mass (g/m²)	IMDS ID
+ ZF100 (hot-dip zinc-iron coating)	100	838 910
+ ZF120 (hot-dip zinc-iron coating)	120	354 217 41
+ ZF140 (hot-dip zinc-iron coating)	140	838 925
Remark: These coatings can be used in EN 10346 or in comparable other international specifications like ASTM, JIS etc.		

4.2.3 Hot dip Zinc-Aluminum Coatings

Name of the material	Coating mass (g/m²)	IMDS ID
+ ZA095 (hot-dip zinc-aluminum coating)	95	354 208 76
+ ZA130 (hot-dip zinc-aluminum coating)	130	839 293
+ ZA130/70 (hot-dip zinc-aluminum coating)	130/70	943 331 62
+ ZA185 (hot-dip zinc-aluminum coating)	185	939 306
+ ZA200 (hot-dip zinc-aluminum coating)	200	839 312
+ ZA225 (hot-dip zinc-aluminum coating)	225	176 743 571
+ ZA255 (hot-dip zinc-aluminum coating)	255	839 325
+ ZA300 (hot-dip zinc-aluminum coating)	300	354 213 78
+ ZA90/40 (hot-dip zinc-aluminum coating)	90/40	612 751 04
Remark: These coatings can be used in EN 10346 or in comparable other international specifications like ASTM, JIS etc.		

4.2.4 Hot dip Aluminum-Zinc Coatings

Name of the material	Coating mass (g/m²)	IMDS ID
+ AZ100 (hot-dip aluminum-zinc coating)	100	839 336
+ AZ150 (hot-dip aluminum-zinc coating)	150	839 389
+ AZ185 (hot-dip aluminum-zinc coating)	185	839 399
Remark: These coatings can be used in EN 10346 or in comparable other international specifications like ASTM, JIS etc.		

4.2.5 Hot dip Aluminum-silicon alloy Coatings

Name of the material	Coating mass (g/m²)	IMDS ID
+ AS040 (hot-dip aluminum-silicon coating)	40	145 525 920
+ AS060 (hot-dip aluminum-silicon coating)	60	839 413
+ AS080 (hot-dip aluminum-silicon coating)	80	839 468
+ AS100 (hot-dip aluminum-silicon coating)	100	839 481
+ AS120 (hot-dip aluminum-silicon coating)	120	839 499
+ AS150 (hot-dip aluminum-silicon coating)	150	839 508
Remark: These coatings can be used in EN 10346 or in comparable other international specifications like ASTM, JIS etc.		

4.2.6 Electrolytically Zinc Coatings

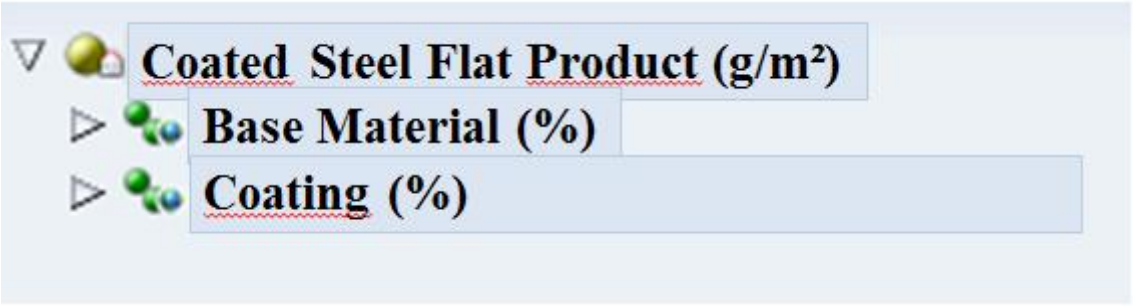
Name of the material	Coating thickness (µm)	IMDS ID
+ ZE100/100 (Zinc coating e-plated)	10/10 *)	839 843
+ ZE25/25 (Zinc coating e-plated)	2,5/2,5 *)	839 703
+ ZE50/50 (Zinc coating e-plated)	5/5 *)	839 783
+ ZE75/75 (Zinc coating e-plated)	7,5/7,5 *)	839 827
+ ZE75/0 (Zinc coating e-plated)	7,5/0 *)	140 768 24
*) A coating thickness of 1 µm has a coating mass of about 7,05 g/m². A + ZE100/100 coating has a mass of 72g/m² on both sides Remark: These coatings can be used in EN 10152 or in comparable other international specifications like ASTM, JIS etc.		

4.2.7 Electrolytically Zinc-Nickel Coatings

Name of the material	Coating thickness (µm)	IMDS ID
+ ZN20/20 (Zinc-nickel coating e-plated)	2/2 *)	839 858
+ ZN30/30 (Zinc-nickel coating e-plated)	3/3 *)	839 980
+ ZN40/40 (Zinc-nickel coating e-plated)	4/4 *)	839 993
+ ZN50/50 (Zinc-nickel coating e-plated)	5/5 *)	840 006
+ ZN60/60 (Zinc-nickel coating e-plated)	6/6 *)	840 015
*) A coating thickness of 1 µm has a coating weight of about 7,3 g/m². A + ZN20/20 coating has a mass of 15g/m² on both sides. Remark: These coatings can be used in EN 10271 or in comparable other international specifications like ASTM, JIS etc.		

5. Example: Creating a material datasheet for a metallic coated base metal

To create such a material data sheet the most effective way is the use of a semi component with the base material and the plating.



To be able to define such a semi component you should know the following information:

1) What kind of base material is used?

In the following **example** we use a Multiphase steels for cold forming EN 10346 HCT500X with a nominal thickness of 1.8 mm. 1m² has a mass of 14,130 kg

2) What kind of coating is applied?

In our **example** we use a ZA225 hot-dip zinc-aluminum coating. This coating has a coating mass of 225 g/m² on both sides.

1m² of the coated material has a weight of 14,130g base metal + 2x225g coating material. Total 14,580g with 3% coating and rest (97%) base metal.

In the example we can use a range of the coating 2.5-3.5%. The base material is defined as “Rest”.

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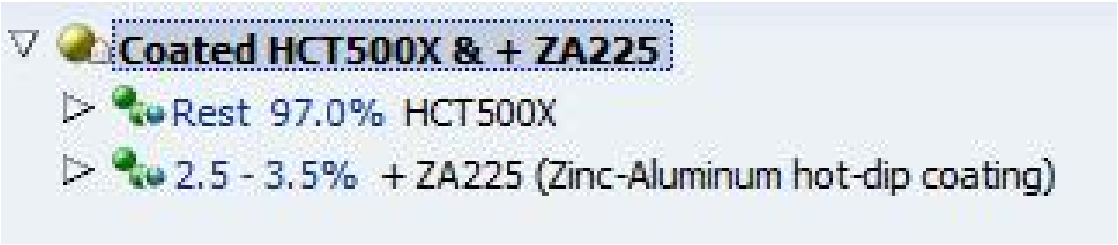
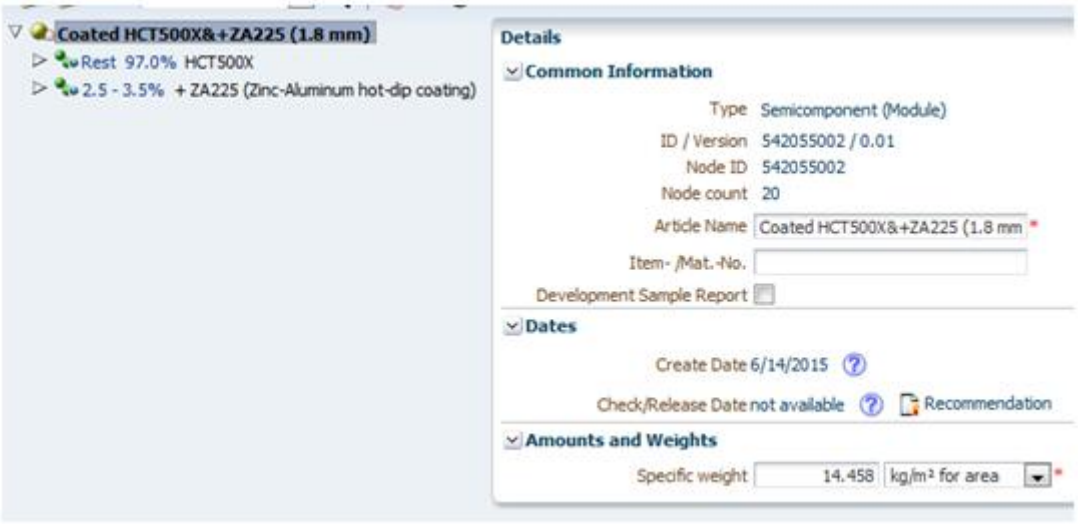


The specific weight of the coated Steel Flat material is 15,580 g/m² or 15.58 kg/m².

Here is the complete semi component of the ZA225-coated HCT500X with a thickness of 1.8mm:



Hint:
The **hot dip** coatings are defined by the **mass / area** on both sides (g/m²). The **e-plated** coatings are defined by the **thickness** (µm) on both sides. In 4.2.6 and 4.2.7 the densities are added that the weight / area can be calculated by the thickness of the platings.

6. Release and Revisions

6.1 Release

This Recommendation was first approved and released on December 13th 2002.

6.2 Revision

Rev.	Date	Description / Reason	Originating Committee
01	March 2004	New standard, EN 10336 (TRIP/DP/PM-Multiphase steels), added	IMDS-SC
02	Nov. 2017	Deleted EN 10142, EN 10147, EN 10154, EN 10214, EN 10215, EN 10292, EN 10336. Updated EN 10152-2009, EN 10271-1998, EN 10346-2009 (added prEN 10346) IMDS IDs added for all coatings and base materials	IMDS-SC