

Basic rules for manipulation with goods and its protection against damage

Introduction

Metal is basically prone to corrosion. While storing material the capillary effect may cause the capillarity of water which may remain between metal layers for longer time. In this respect, it is not sufficient to depend on plastic or paper wrapping because these wrappings are not designed to prevent access of water and in addition to that they can cause more problems because the moisture cannot get out. The recommendations listed below lead to the elimination of individual factors which may cause degradation of the material.

Basic rules

We recommend to maintain the material in a clean ventilated and **dry** environment and to store it in **indoor premises**. During the storage the constant temperature is recommended. Although it is not always possible to ensure the storage indoors, it is necessary to ensure to keep the material in a dry place. (70% percent is the highest allowed relative humidity)

Chemicals such as acids should not be stored in the same area as the material. Their constant evaporation may cause more or less corrosion on the metal when mixed with atmospheric humidity.

Industrial or urban environment is considered to be a hostile environment for storing the material due to pollution such as dust or exhaust gases.

Store strips on a clean **smooth surface**. Strips of metal can weight up to several tons and therefore it is necessary to remove any obstacles and unevenness. It is necessary to manipulate with strips with caution and they cannot be dragged across the surface. During storage they have to be stored with a sufficient distance from each other in order to allow movement without the risk of damage. It is not possible to stack strips stored on pallets.

When storing sheets we recommend to stack pallets of the same size, the height of the stack depends on the type of wood used. The best is to store the material in an area specifically designated for this purpose.

Very fast use

We recommend storing the material in **an environment with the regulated temperature**. It is important to ensure a good ventilation to prevent an accumulation of the water vapor as well as to ensure that the water has a possibility to dry out, that is depending on the local climatic conditions. Even if stored indoors a big air temperature fluctuation can occur which can lead to condensation of moisture on stripes of metal which supports corrosion. Therefore, if possible, the best thing is to ensure that the temperature remains constant, not below the dew point. It is necessary to **prevent condensation**. If it is not possible to store strips at the constant temperature, sudden temperature changes should be prevented. They can lead to condensation i.e. precipitation of water from the air on the material surface of metal. For example, this may occur when placing material directly into heated storeroom. Therefore, it is essential that the material is well ventilated, in order to remove possible condensation as quickly as possible. The temperature can drop below the dew point under the following circumstances:

1. During storing it is not recommended to leave the storeroom open, especially during spring and autumn months when an extreme temperature fluctuation can appear between the day and night.

During the day, if the temperature and humidity rise quickly, the dew point increases very rapidly. However, the temperature of the metal is rising much more slowly, this creates conditions for condensation on the surface of metal. Of course, this effect may also occur in other seasons, anytime there is a significant change of temperature and humidity.

2. During loading

Loading of material released from a cool or cold storeroom into a warmed truck or wagon, may during the damp day, result in condensation of water on the metal. This problem can occur in any time of the year. However, in certain areas it is more significant in the summer.

3. Storing cool metal into the warm storeroom:

Condensation during unloading is more likely to occur during the colder months.

Metal at the temperature of 16°C is loaded from the storeroom on a truck and being transported for two days. The outdoor temperature is around -1°C. During the two day transportation the temperature of metal drops to the outdoor temperature of -1°C. When metal is transported to its place of destination, it is unloaded and moved directly to the storeroom, the temperature there is 16°C and relative humidity of 50%. According to the table the dew point is 5°C. As the temperature of a stripe or sheet is lower then the dew point of the air, ideal conditions for condensation of the water on the metal surface occur, for example on the edges of the unloaded sheets or coils. Condensed humidity may leak into the individual layers and water patches may occur.

Air temperature in degrees centigrade																			
Air temperature °C	% relative humidity																		
	100	95	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10
43	43	42	41	40	39	38	37	35	34	32	31	29	27	24	22	18	16	11	5
41	41	39	38	37	36	35	34	33	32	29	28	27	24	22	19	17	13	8	3
38	38	37	36	35	34	33	32	30	29	27	26	24	22	19	17	14	11	7	0
35	35	34	33	32	31	30	29	27	26	24	23	21	19	17	15	12	9	4	0
32	32	31	31	29	28	27	26	24	23	22	20	18	17	15	12	9	6	2	0
29	29	28	27	27	26	24	23	22	21	19	18	16	14	12	10	7	3	0	0
27	27	26	25	24	23	22	21	19	18	17	15	13	12	10	7	4	2	0	
24	24	23	22	21	20	19	18	17	16	14	13	11	9	7	5	2	0		
21	21	20	19	18	17	16	15	14	13	12	10	8	7	4	3	0			
18	18	17	17	16	15	14	13	12	10	9	7	6	4	2	0				
16	16	14	14	13	12	11	10	0	7	6	5	3	2	0					
13	13	12	11	10	9	8	7	6	4	3	2	1	0						
10	10	9	8	7	7	6	4	3	2	1	0								
7	7	6	6	4	4	3	2	1	0										
4	4	4	3	2	1	0													
2	2	1	0																
0	0																		

Source: ECCA Technicalpaper 2 - May 2010 – StorageGuidelinesforPrepainted Metals

Aluminium se-finishedproductPechineyRhenal

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