

**ENVIRONMENTAL INFLUENCES AS
FACTORS INFLUENCING BASIC
QUALITATIVE CHARACTERISTICS OF
WOOD PRODUCTS PLACED IN
EXTERIORS – SURVEY RESULTS
FOCUSED ON WOOD PLAYGROUND**

Josef Novotný, PhD.,

Assoc. prof. Renata Nováková, PhD.

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- “They are our future””, when using this phrase, it is clear that we are talking about the most important person in every parents’ life: his child.



- The wood is becoming a very popular material for the construction of outdoor playgrounds. Those, as well as wooden swings, are preferably made of softwood and round timber (rather than prisms), due to financial reasons. While deciding on the selection of surveyed samples, we focused more on prism than round timber, though being aware of possible variations in key characteristics.



ENSURING QUALITY MANAGEMENT AND OBSERVATION OF SAFETY NORMS AT THE CONSTRUCTION OF WOODEN CHILDREN'S PLAYGROUNDS.

○ What types of checks do we recognize?

a) **Routine visual check**– the control enables discerning prominent sources of danger, that may have been caused by vandalism, wear or weather conditions, for example: danger caused by broken pieces,...

b) **Operational check** –a more detailed control aiming to check the functions and stability of installation, especially in terms of wear. Operational check-ups need to be executed every 1-3 months or as stated in manufacturer manual.

c) **General yearly check**– the control takes place no later than 12 months after the previous control. Its objective is to ascertain the general level of security of the installation, its foundations and surfaces assessing the weather influences, traces of disintegration or corrosion and any changes in security level originating from performed reparations, additionally incorporated elements or replaceable parts.



HOW OFTEN SHOULD THE CONTROLS BE CARRIED OUT?

Apart from prescribed checks, the routine control should also include precautionary measures, in particular:

- Tightening of fixating elements
- Re-painting a re-processing of surfaces
- Maintenance of all shock-absorbing surfaces
- Greasing of bearings
- Marking of equipment in order to indicate the level of powdery-material filling
- Cleaning
- Maintenance of free areas



- Respect of security norms plays an important role during precautionary proceedings and check-ups. We could say that well-functioning safety norms are designed to aid the development of safest possible playground while keeping its attractiveness, without lessening its entertainment value. The norms target elimination of risks that are unforeseeable for the children. At present there are several safety norms in vigor for this area, the essential being STN EN 1176/2009 Safety norm for the equipment of children's playgrounds.



THE IMPACT OF WEATHER ON WOODEN STRUCTURES

- Aim: to study the influence of weather on degradation of wooden structures, protected by chemical coating.
- **How does weather impact on wooden structures in playgrounds** (such as see-saws, climbing frames...)?



SIMPLE METHODOLOGY

- Selection of wooden sample and chemical coating
- Selection of appropriate meteorological parameters
- Observation of qualitative changes/ degradation of coating and their confrontation in time



SELECTION OF CHEMICAL COATING

Chosen chemical coating

Number of coating	Name of coating	Color of coating
1.	Sokrates	brown
2.	ETERNAL akrylat	white
3.	Bakrylex	black
4.	PRIMALEX lesk P 8190	red
5.	IMPRANAL Profi	Golden oak
6.	Dulux Universal lesk	black
7.	Dulux Universal lesk	white
8.	No chemical treatment	-



SELECTION OF APPROPRIATE METEOROLOGICAL PARAMETERS

- Chosen meteorological variables:
 - temperature
 - precipitation



METEOROLOGICAL MEASUREMENTS & DATA SET

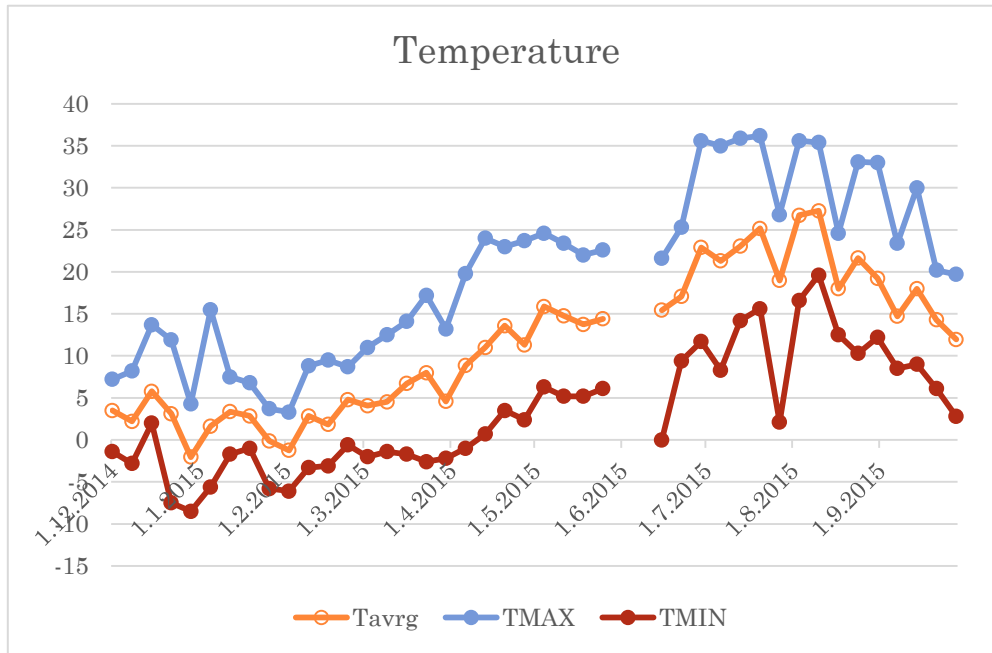


- Standardized meteorological apparatus – Vaisala
- Humidity & temperature & rainfall sensors
- Wooden stick – pine (50cm long and 5cm wide)
- Data set:
 - initial length of period 1.12.2014 - 25.5.2015 = 177 days
 - prolongation up to 28.9.2015 (gap 1.6. – 14.6.2015) = 288 days
 - covers both cold and warm season



METEOROLOGICAL DATA AND THEIR ASSESSMENT

WEEKLY PROGRESS OF TEMPERATURE AVERAGES

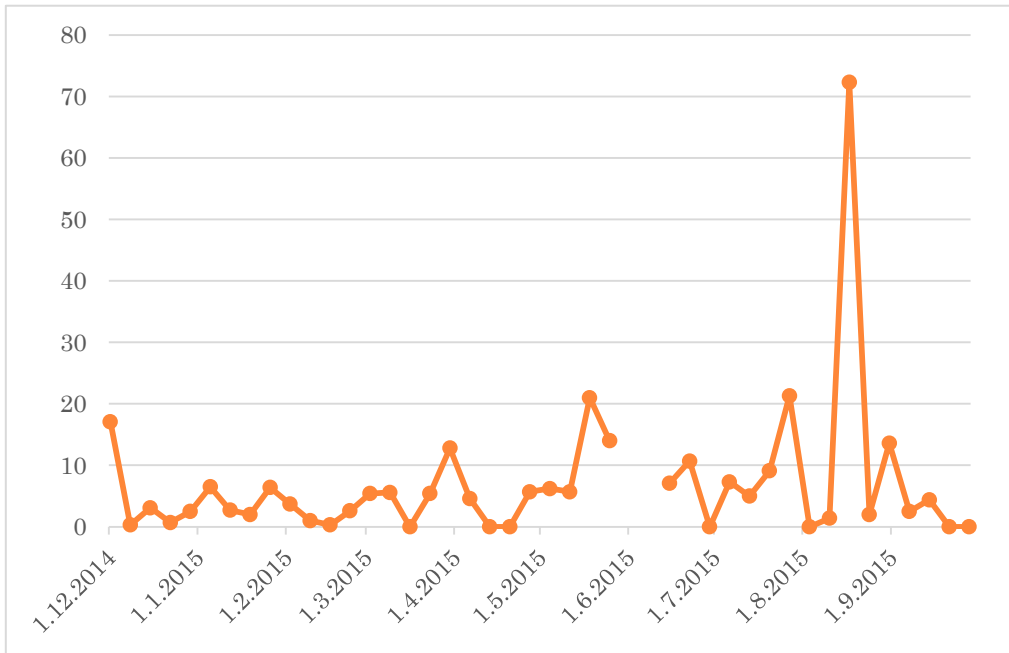


- Weekly temperature averages oscillated intensely at the turn of this year and in summer.
- average daily temperature merely fell under 0°C at the beginning of January and February.
- from February temperatures rose in a relatively steady though moderate manner.
- Very high temperature averages during summer (dropping due to passage of cold fronts)



METEOROLOGICAL DATA AND THEIR ASSESSMENT

WEEKLY RAINFALL



- weekly rainfall did not exceed 5mm (except of the beginning of measuring period and a few days at the beginning and some summer's days)
- 2 significant peaks
 - between 12.5.2015-18.5.2015 (21mm)
 - **between 10.8.2015-17.5.2015 (72,3mm)**



FIRST RESULTS OF EVALUATION OF WEATHER-CONDITIONED IMPACT ON A WOODEN STICK

Number of coating	Name of coating	degradation
1.	Sokrates	no
2.	ETERNAL akrylat	no
3.	Bakrylex	no
4.	PRIMALEX lesk P 8190	no
5.	IMPRANAL Profi	no
6.	Dulux Universal lesk	no
7.	Dulux Universal lesk	light
8.	No chemical treatment	no
	Bottom part (stuck into the ground)	light



SUMMARY OF FIRST RESULTS

- A casual examination does not return too significant changes on the wooden stick
- A closer inspection \Rightarrow starting light degree of notable degradation:
 - on the bottom part of the prism stuck into the ground
 - strip No.7 (white)
- The part of stick located right above the ground level (8. stripe) = a somewhat better condition, despite having been left unpainted
- the period of the experiment is too short for weather to influence either the degradation of protective chemical coating or the examined wooden material in a more significant way
- longer period for investigation of influence of weather is needed (more intense fluctuation of temperature combined with precipitation, in order to obtain more visible traces of degradation)



CONCLUSION

- weather conditions are one of the fundamental factors influencing health and safety during manipulation and use of items produced in relation with children's playgrounds
- any realized activities related to the object is an essential feature of safety management
- Recommended documentation should include:
 - Certification of inspection and testing, if necessary
 - Maintenance and control manuals
 - User manual, if necessary
 - Keeper's records, for example diary



○ **QUESTIONS?**

