Joint Action 2012 GPSD

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Final Technical Report Ladders

Covering 1 January 2013 – 30 April 2015

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Best Practice

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Disclaimer

This report arises from the Joint Market Surveillance Action on GPSD Products – JA2012, which received funding from the European Union in the framework of the 'Programme of Community Action in the field of Consumer Policy (2007-2013)'.

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Executive Summary

This report presents the activities undertaken and the results achieved in the Ladders Activity of "Joint Market Surveillance Action on GPSD Products – JA2012" supported financially by the European Union under Grant Agreement No. 2012 82 01.

The activity was carried out by PROSAFE and 28 market surveillance authorities from 18 Member States (Belgium, Bulgaria, the Czech Republic, Denmark, France, Germany, Ireland, Latvia, Lithuania, Malta, the Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden and the United Kingdom) plus Norway. Furthermore, Bosnia and Herzegovina, Finland, Iceland, Luxembourg and Turkey participated in the Joint Action as collaborating partners outside the financial scheme.

The primary goals of the Action on Ladders were to collect data on the EU market for telescopic, multi-hinged and other unusual ladder types; assist the development of improved safety standards as none currently exist for telescopic type ladders (note there is a draft EN standard which is expected to be published during 2015, however there is a view that this new standard may not be sufficient); build knowledge on the relevant ladder standard tests already in place; and to find out the degree to which ladder samples on the market can be considered safe. The Member States (MS) who were involved in this specific Activity were the Czech Republic, France, Iceland, The Netherlands and Slovenia.

The approach to the Activity was typical in that the participating Market Surveillance Authorities undertook to: study the participating members' national markets for the appropriate types of ladders to produce a market survey; use this data to make decisions on sampling; visit manufacturers/importers/wholesalers to inspect and collect products; test all the ladder samples at an appropriately skilled laboratory; carry out harmonised risk assessments for each ladder tested; undertake follow-up actions on non-compliant products; and report on actions taken.

In total, detailed market and product information was gathered on 66 telescopic, multi-hinged and other unusual ladder types by the MS, which resulted in 18 ladders being selected. Nine telescopic ladders and nine multi-hinged ladders were sent for testing to selected tests from the current standards for ladders, EN131-2, -3, -4, pr-6, plus some additional tests designed by the Activity. 100% of the ladders failed to meet the entire test programme based on EN131, which is a serious cause for concern as that family of standards is considered by many to have a number of significant weaknesses. The results of the additional tests designed by this Activity highlighted some specific areas where the EN131 standard is lacking, particularly in regards to base slip and side slip.

The test results were subject to risk assessments using the RAPEX tool. Following the results of this, the participating MSAs took enforcement actions on the majority of the models tested.

Overall, it can be concluded that the goals of the Action were met.

Caution!

The above results are based on products that were sampled from the markets in the participating countries by experienced market surveillance inspectors that were looking for non-compliant and potentially unsafe products. As in any routine market surveillance activity, the results represent the targeted efforts that authorities undertake to identify unsafe products. They do not give a statistically valid picture of the market situation.

The samples were tested at a laboratory accredited for testing ladders. The test programme focused on those safety requirements that have the largest impact on consumer safety.

Introduction

This is the final technical report prepared for the Ladders Activity of the Joint Market Surveillance Action on GPSD Products – JA2012. The Joint Action received funding from the European Union in the framework of the 'Programme of Community action in the field of Consumer policy (2007-2013)'.

1 Background Information

This chapter presents a short extract of the project description. The full description can be found in the Grant Agreement [1].

1.1 Title of the Activity

Ladders

The activity was part of Joint Market Surveillance Action on GPSD Products – JA2012

The European Commission supported the Joint Action financially under Grant Agreement No. 2012 82 01.

1.2 Participating Member States

The activity was undertaken by PROSAFE and 5 market surveillance authorities from 5 Member States (France, Czech Republic, Iceland, Slovenia and The Netherlands).

The applicant body that also took overall responsibility for the Joint Action was PROSAFE.

1.3 Overview of Key Staff in the Activity

The Activity Leader was Maksimiljan Bornsek (Slovenia).

The Activity Leader was supported by the PROSAFE consultant, Chris Evans.

1.4 Budget

The total budget cost for the Activity was € xxx.xxx.

1.5 General Objective

The general objectives of the Activity were to continue to create conditions whereby Member States could cooperate successfully on market surveillance activities and to co-ordinate a number of product activities exposing the results of the activities to the largest number of Member States national authorities possible.

The overarching objective of the product activities were to ensure that telescopic and hinged ladders on the EU market were safe and carried the appropriate warnings and instructions.

1.6 Specific Objectives

As per the Grant Agreement, the Activity set out to:

- Understand the new types of ladders currently entering the EU market
- Establish to what degree these ladders comply with the published standards
- Contribute to the development of a safety standard for telescopic ladders, as none is currently published
- Build on the exploratory work undertaken under JA2010 Ladders, which indicated several safety issues with some new designs of ladders, in particular those designed to be collapsed/folded for storage
- Support CEN in the definition and checking of test methods, the reproducibility of tests, etc
- Raise awareness amongst MS for the need for increased safety and harmonisation in this product area

1.7 Number of tests

A total of 18 telescopic and multi-hinged ladders were selected and subjected to a range of tests taken from EN 131 Part 2 (for all types of leaning ladders) [2], Part 3 (for instructions of ladders) [3], Part 4 (specific to hinged ladders) [4], draft Part 6 (specific to telescopic ladders) [5] plus some additional tests developed by this JA (as there is a view that the published and proposed standards are inadequate in parts).

1.8 The Phases of the Activity

The Activity was a market surveillance action that followed these phases:

- Market Surveillance
  The 5 MS undertook a market survey for telescopic, multi-hinged and other unusual ladder types within their countries to determine the range and type of products present in their economies. This overview helped to deliver a snapshot of the types of ladders currently being sold on the markets of the MS, and provided a basis for the sampling criteria within the scope of the Action.
- Deciding on sampling criteria
  Using the data gathered above, the Activity decided on how the Member States should carry out sampling, i.e. how many and what type of ladders would be taken by each authority, when the sampling would take place, and how many samples should be taken of each ladder.
- Sample products
  The Member States would acquire ladders according to their chosen sampling criteria. The market surveillance authorities visited manufacturers, importers, wholesalers, retailers and reviewed internet sites to identify products. This was coordinated and reported back to the Activity.
- Test products at a laboratory
  The Activity issued a call for tender and selected an appropriate laboratory (nVWA) to which the Member States sent their products for testing. The ladders were shipped and the laboratory submitted test reports after the testing had taken place. The Joint Action shared all test reports with all the participants.
- Risk assessment
  The participants developed a common approach to the application of the RAPEX risk assessment guideline [6] for ladders to assure that the resulting assessments were harmonised to the greatest extent possible using the results of tests undertaken from EN 131. The Member States then further assessed the risk for the ladders applying the results from the tests developed by the JA participants.
- Follow-up on non-compliant products and exchange information on follow-up activities.
  The Member State authorities followed up with the appropriate economic operators in their countries, i.e. consulted with them on the results from the risk assessment, agreed on appropriate measures and checked that these were properly implemented. The resulting measures were reported to the Joint Action and shared with all participants.

2 Timeline for Activity

The timing of the major tasks undertaken during this Activity is given in the Gantt chart below.

JA2012 LADDERS Activity plan

Note: M1 is January 2013

Activity	Deliverable	Deadline	Month																										
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Ladders																													
Planning of activities	D5.1LD	Month 6			■	■	■	■	■	■	■	■																	
Kick-off and planning meeting	D5.2LD	Month 5					X																						
2nd project meeting	D6.1LD	Month 10										X																	
3rd project meeting	D6.2LD	Month 13													X														
4th project meeting	D6.3LD	Month 21																					X						
5th project meeting	D6.4LD	Month 23																							X				
Set up means for exchange of information	D7LD	Month 10										■	■	■															
Sampling schemes	D8.1LD	Month 10										■	■	■															
Checklist and/or guidelines	D8.2LD	Month 10										■	■	■															
Test criteria	D9.1LD	Month10										■	■	■	■														
Joint testing, memo describing tendering process and result	D9.2LD	Month 13													■	■	■	■	■	■	■	■	■						
Market surveillance activities	D10LD	Month 24								■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Follow-up activities	D11.1LD	Month 24																			■	■	■	■	■	■	■		
Final Technical Report	D11.2LD	Month 26																							■	■	■	■	

3 Setting up the Product Activity

3.1 Tendering Process for Test Laboratories

A list of potential testing laboratories from within the EEA was populated by the participants and the Activity Coordinator. An Expression of Interest for the testing of telescopic, multi-hinged and other unusual ladder types was prepared and sent to these 12 laboratories, of which 8 replied detailing their experience of testing ladders, relevant accreditations and their relationships with ladder manufacturers.

A call for tender was then prepared (using PROSAFE's standard procedures and detailing all tests/methods required) and sent to 4 of the responding labs (the remaining 4 were not accredited for testing to EN131 so were excluded from the remainder of the tendering process). In addition, the call was placed on the PROSAFE website. A total of 5 laboratories replied. These were evaluated at length and following detailed discussions with two short-listed test laboratories, the contract was awarded to nVWA, Zwijndrecht, The Netherlands. This laboratory offered the lowest costs, best level of accreditation, as well as having substantial experience in the testing of ladders.

The purpose of the testing was to check that the ladders supplied met selected tests from the current standards – EN131 pt2, pt3 and pt4. Also, the new draft standard prEN131 pt6. In addition, some extra tests designed by the Activity were also included (specific details of how the non-standard tests were to be performed were provided within the tender documentation).

3.2 Selecting Products, Sampling

Exploratory work done in the previous Ladders Activity (JA2010 Ladders) had shown that the few telescopic samples examined at that time could present an unacceptable level of risk to the user, and that the test standards applying to these types of ladders would need to be examined in more detail – hence this Activity. It was also established that the standards for ladders, the EN131 series, were lacking test requirements/clauses for some specific risks associated with using these types of ladders, such as side slip and base slip.

The group agreed to start the Activity with a market survey, to determine the range and type of telescopic/multi-hinged/other unusual ladder types present in their economies. Each participating country was asked to provide details (e.g. ladder type, model, price, photos, etc.) of each ladder type for a minimum of 10 ladder samples. The resulting market picture overview identified that these unusual ladder types were widely available within the MS's markets (sometimes at very low prices). Having reviewed the results of the surveys during Meeting 2, the group decided to focus their selection of samples on those that were the most common:

Stepladders – multi hinged
Stepladders – telescopic
Leaning ladders – multi hinged
Leaning ladders - telescopic
Platforms – telescopic
Platforms – multi hinged

The Activity Coordinator sent a memo to all the member states giving pictorial examples of which types of ladders to sample – see figure 1 overleaf.

LEANING LADDER TELESCOPIC

STEP LADDER TELESCOPIC

PLATFORM TELESCOPIC

LEANING LADDER MULTI-HINGED

STEP LADDER MULTI-HINGED

PLATFORM MULTI-HINGED

Figure 1: The 6 types of unusual ladders targeted by the JA2012 Ladders Activity

Thereafter, each participant was provided with a target number of models to obtain from their market; this target number being based on the available budget (as per the Grant Agreement) for testing being shared equally between the participating Member states.

Each of the 5 MS supplied a mix of telescopic and multi-hinged ladders as set out in Figure 2 below:

Member State	No of telescopic ladders supplied	Number of multi-hinged ladders supplied	Total number of ladders supplied per Member State
Czech Republic	2	2	4
France	1	1	2
Iceland	2	2	4
Slovenia	2	2	4
The Netherlands	2	2	4
Total Number of Ladders supplied (by type)	9	9	18

Figure 2: The types and quantities of unusual ladders supplied by the MS

Not all Member States took part in the full sampling programme as France only sent 1 telescopic and 1 multi-hinged ladder for testing (and only 1 sample of each rather than the 2 samples required in order to undertake all the agreed tests in sequence).

4 Testing

4.1 The Test Program

Testing is usually required to establish the extent to which a product represents a safety risk to users. And testing is normally undertaken in accordance with the applicable safety standard. But, in the case of ladders, the test standard EN131 was recognised by all participants to contain some deficiencies. Consequently, it was necessary for the JA to develop additional test requirements beyond those contained within EN131. Guided by a participant from NL, who was a ladder expert and also a member of CEN TC93 and the GPSD Ladders Expert Group, the participants undertook the task of developing their own checks based on tests in standards used elsewhere in the world and those under development within CEN TC93. In their testing, the participants were seeking to replicate how ladders are used in practice.

The EN131 tests applied were as follows:

Hinged ladders

Test Standard	Clause	Notes or qualifications
EN131-2	5.5	Bottom style end test. *Do test as specified then continue to failure*
	5.8.1	Test of opening restraints and hinges of standing ladders - *the tests of 5.8.2-5.8.4 apply as applicable.*
	5.11	Feet pull test
EN 131-3		User instructions and markings (requirements adjusted to suit this type of ladder)
EN131-4 Hinged ladders	4.4	Hinged ladder in stand-off position
	5.2	Decking component (if supplied)
	6.2.2	Strength test
	6.2.3	Cyclic load test
	6.2.4.3	Safety test of the ladder *(fabricate a substitute decking component if not supplied)*

Telescopic ladders

Test Standard	Clause	Notes or qualifications
EN131-2	5.8.1	Test of opening restraints and hinges of standing ladders - *the tests of 5.8.2-5.8.4 apply as applicable.*
EN 131-3		User instructions and markings (requirements adjusted to suit this type of ladder)
EN131-6 Telescopic ladders (Revised draft 2013-09-25)	5.4	Locking of the rung/step sections
	6.2	Drop test
	6.3	Strength test of beams

	6.7.2	Rungs/steps strength test – unlocked position
	6.7.4	Pull out test of rung/step
	6.9.1	Cyclic test
	6.9.2	Static test of locking mechanism
	6.11	Torsion test

The tests developed by the Activity (the "JA" tests) were as follows:

Additional tests developed by the Activity	Base slip
	Torsion flip
	Strength of beams (65□ pull down test)
	Extra requirements in instructions beyond 131-3 *e.g. Do instructions for hinged ladders include how to check locking mechanism is engaged*
	Expert use of product to check whether all the functions introduce any risks e.g. finger entrapment
	Dimensions (in lieu of a side slip test). Maximum width of ladder at base of styles, maximum width of ladder at 60% of maximum extension. Dimensions to be expressed in mm and as a ratio

In order for the results to be as useful as possible to the participants, 1 sample of each ladder followed a test sequence based on that prescribed in EN131. The second sample followed the test sequence devised by the JA. Consequently, 2 test reports were delivered by the laboratory for each ladder model supplied.

The results of testing were a matter of concern with all 18 ladders failing at least one test of those taken from the EN131 standards. For those failures alone, each ladder was assessed as having a minimum of one high risk ratings – with some ladders having as many as 5 separate high risk ratings. This means that every ladder was unnecessarily contributing further to the already at-risk situation that users face whenever they climb a ladder.

4.2 Results

Figure 3 gives a snapshot view of the non-compliances found during the testing of the 9 telescopic ladder samples to those tests taken from the EN131 standards. The chart shows that the most common cause of failure was the lack of an 'incorrect angle indicator', since 100% of the telescopic ladders failed this clause.

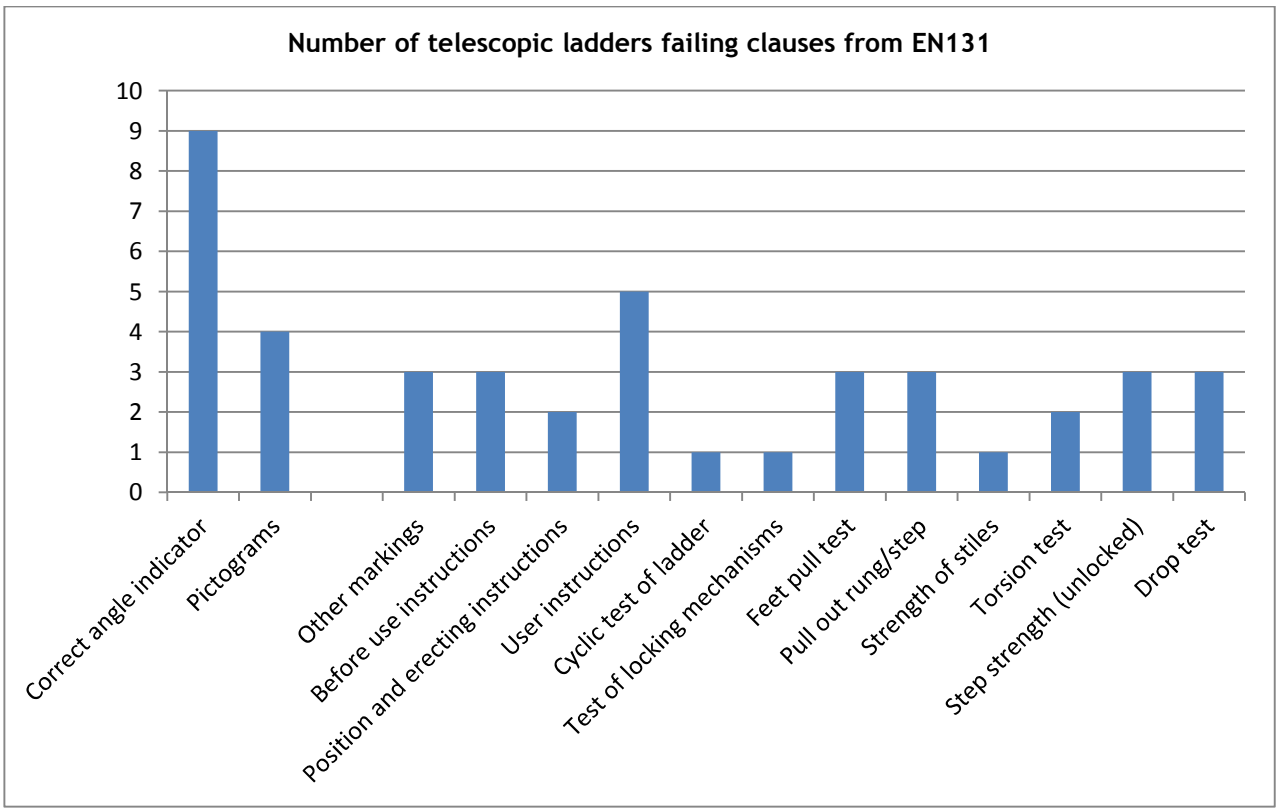


Figure 3: Details of telescopic ladder failures according to the tests in EN131

Error! Reference source not found. gives a snapshot view of the non-compliances found in the EN131 tests for the hinged ladder samples. Again, the most common non-compliance related to the test for a 'correct angle indicator (with 7 of 9 samples failing), but also the 'Safety test of the ladder' (Clause 6.2.4.3 of EN131-4) and the 'Cyclic test on hinges' (Clause 6.2.3 of EN131-4) with similar high rates of failure being established.

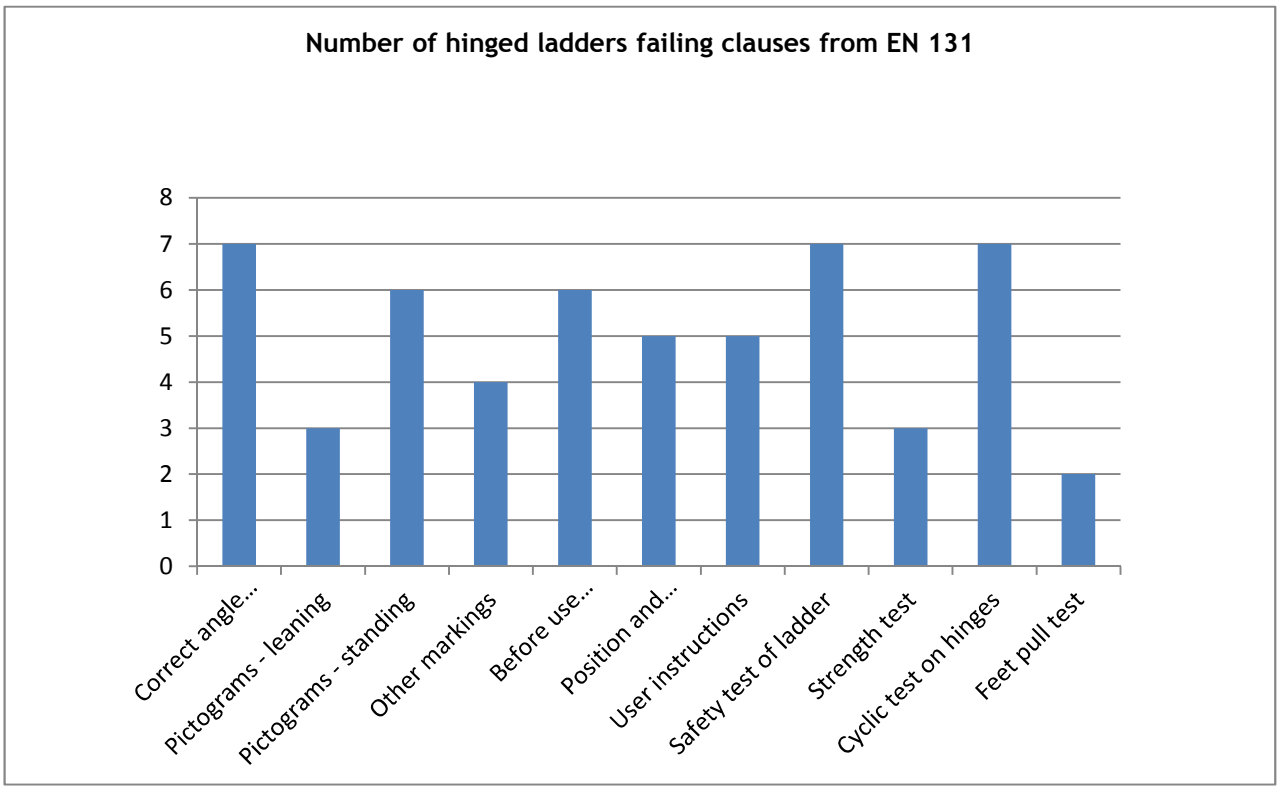


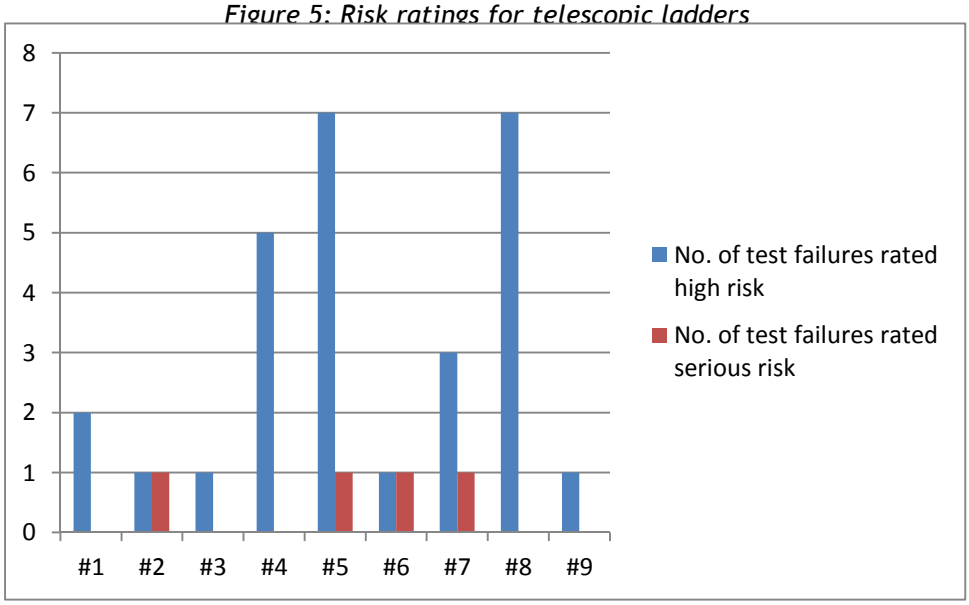
Figure 4: Details of hinged ladder failures according to the tests in EN 131

Classifying results into Pass/Fail categories for those tests developed by the Activity was more challenging. The results obtained for base slip, torsion flip and strength of beams could not be compared with those established in published safety standards. Instead, their main value was as a further contribution to the knowledge built up from the similar tests conducted for the more conventional ladders in JA2010 which is being used by the GPSD Ladders Expert Group to develop guidelines for the testing of ladders that may be introduced to supplement for deficiencies in the EN131 series of standards.

All results were reviewed by the participants working together in conjunction with the expert staff from the test laboratory. This build-up of knowledge enabled the participants to work together to develop risk assessments for each test and for each ladder. In each case, the risk assessments were made for the results based on EN131 tests using the on-line RAPEX tool following the risk assessment guidelines provided on-line by DG SANCO.

Figures 5 & 6, overleaf, provide an overview of the risk ratings agreed.

Figure 5: Risk ratings for telescopic ladders



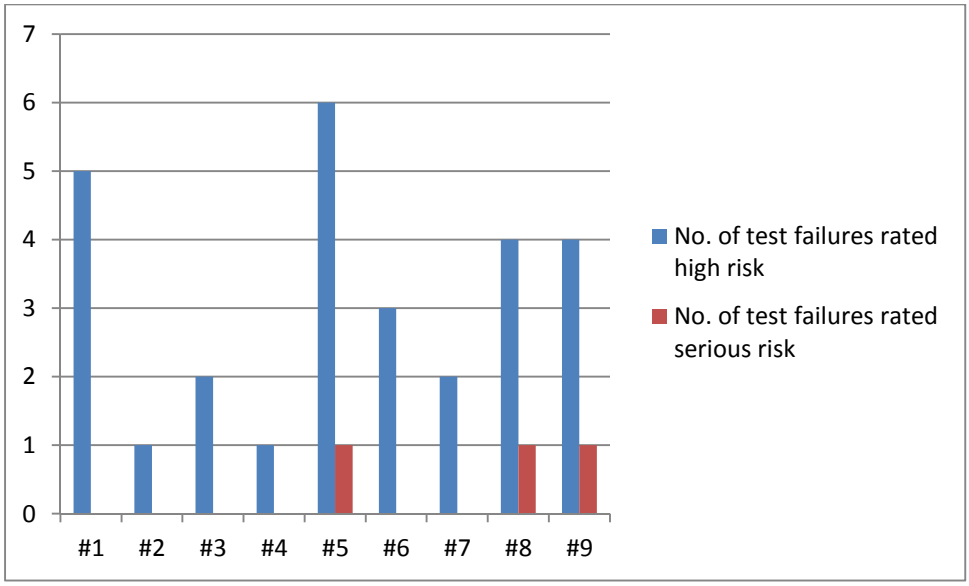


Figure 6: Risk ratings for hinged ladders

The risk totals shown in the figures above vary across the different models tested. Some had a single High Risk rating but the majority had more than this. However, the RAPEX guidelines suggest ascribing just the highest assessed risk category to the product i.e. a ladder with one High Risk rating is given the same overall (High) risk rating as a ladder model with a further five more High Risk ratings. Some participants felt uneasy about this absence of any allowance for a multiplier effect; their instincts suggesting that a product with a number of unconnected weakness rated High Risk presents a higher overall risk than a product with just one weakness rated High Risk.

As a result, the participating market surveillance authorities took enforcement actions on 12 of the 14 ladders charted above. The actions and measures are shown in Figure 7.

Actions taken	Number of models
No action	2
Minor measures or notification to economic operator	4
Compulsory corrective measures	1
Sales ban	2
Voluntary action	5
Still under evaluation (Iceland)	4
Total	18

Figure 7: Overview of measures taken against the ladders

The actions mentioned in the table have the following meaning:

- No action. No action was deemed necessary by the relevant market surveillance authority.
- Minor measures. The economic operator takes measures against (future deliveries of) the product in line with directions from the market surveillance authority. The measures could be minor design changes, minor changes in production or quality control, minor updates to marking, etc.
- Compulsory corrective measures. The economic operator was compelled to take action by the relevant market surveillance authority.
- Sales ban. The product is prohibited from sale permanently or until certain conditions are met.
- Voluntary action. The product is no longer in stock and will not be imported again.

It should be noted that actions taken at Member State level were not necessarily consistent. This is because the status of the current EN131 standard varies between member states. Some, like France, recognise it and require ladders to be compliant with it. Others, notably The Netherlands, do not recognise EN131 and continue to apply their own (generally more demanding) national standard. Thus a ladder found to be compliant by the authorities in France may not necessarily be compliant in the Netherlands and vice versa. Similarly, some participants were able to take into consideration the results of the additional non-EN131 tests that had been developed by the Activity, whilst others, such as Czech Republic and Slovenia, could not.

Further complications stem from the use of the draft standard for telescopic ladders. This, pr EN131-6, would not be expected to be formally recognised by any authority since it had not been published. Consequently, the level to which each authority was prepared to take action in respect of results based on the application of prEN131-6 could be expected to vary.

At this time of reporting, notifications to the RAPEX system of those models presenting serious risk were still pending.

4.3 Conclusions

The overall result of the tests for ladders revealed that none of the samples selected passed all of the tests relating to EN131. This is a significant matter of concern as the ladders models supplied were believed to be typical of those ladders on the consumer markets in the Member States that provided samples for testing since some were regarded as brand leaders so not specifically sought out by the inspectors from the market surveillance authorities as ladders that were more likely to fail the tests.

It is also a matter of concern that whilst the published series of EN 131 standards is recognised by a number of authorities, it is specifically not recognised by other authorities. All the while this situation remains, so it can be expected by economic operators that they will need to deal with inconsistencies of approach according to whichever national authority that they may be dealing with. This can mean that whilst some models of ladder will be acceptable in one MS, they will not acceptable in an adjoining MS. It also means that the level of action taken by some authorities is restricted to the results specific to EN 131. The consequences of this can be that some ladders that have been identified as presenting particular risks to users will not have action taken against them.

Concerns, raised previously at the time of JA2010, that the EN131 standards were deficient since they were missing key test requirements have still not been fully addressed. Although activities to develop improved standards continue in CEN TC93, there have been no further draft amendments published (apart

from an updated draft for 131-6) and so there are few positive signs that the deficient safety standards issue is being speedily addressed there.

The two Joint Actions have now taken a broad sweep across more than 50% of the ladder types on the EU market. In both Joint Actions, the results have been very disturbing. The majority of the products tested have failed even though the published test regime to which they have been (only partially) tested is regarded as deficient and even though the manufacturing requirements have been long established and are not particularly sophisticated. Informal research completed at the time of JA2010 suggested that more than 500,000 people/year in the EU need hospital or first aid treatment following falls from ladders. And of these, more than 100 fatal accidents result. Comparison between EU Member States where EN131 is the prevailing standard and other countries, such as Australia and USA where more stringent test standards apply, suggest that those latter countries have much lower incidences of ladder related accidents.

In order to continue reviewing the safety of the categories of ladder commonly sold across the EU, it is recommended that a third Joint Action be undertaken - on step stools. Though these products do not enable users to climb as high as other forms of ladders, experts have suggested that the test standard for them, EN 14183, also includes some significant deficiencies and so should be subject to scrutiny by those authorities responsible for protecting consumers from unsafe products.

5 Liaisons

5.1 Involvement of Customs

The group discussed whether a guideline or checklist could be developed that could be supplied to the customs authorities. However, it was decided by the participants that apart from possible deficiencies in some marking, it would not be possible to detect whether a ladder would fail safety tests just based on a visual examination. Consequently, it was felt that it would not be possible that to provide anything useful to TAXUD.

5.2 Other Liaisons

Outreach activities were focussed on the European Commission, particularly DG SANCO, who attended all but one meetings of the Activity. DG SANCO's interest was very high, as they have been attempting to improve the safety of ladders through encouraging an improvement in EN 131 since a Mandate was issued for it in 1999.

Liaison with DG SANCO further existed through support by provided some participants who were members of the GPSD Ladders Expert Group that had been formed by DG SANCO with the purpose of developing guidelines for the testing of ladders.

Of the organisations invited to the Activity's kick-off meeting: ANEC, the EU ladder manufacturers' federation (ELF), CEN Secretariat and CEN TC93; the JA maintained closest links with CEN TC 93 during the project. A participant from NL attended both TC93 meetings held during the lifetime of this Activity and made presentations at both. The second presentation was focused on providing information on the tests that were performed and the results that ensued. This presentation also provided details of the concerns regarding the EN 131 tests that are listed in the following section of this report.

6 Evaluation, Lessons Learned

As set out in the Grant Agreement, one action for the Activity was to build knowledge on the ladder standards in place in EN131 and assist the development of a safety standard for telescopic type ladders.

Regarding the European Standards EN 131, the group made the following observations:

- EN 131 Pt 2 needs to include a base slip test
- EN 131 Pt 2 needs to include a side slip test or set dimensional limitations e.g. a wider base
- EN 131 Pt 2 needs to include a torsion flip test
- EN 131 Pt 2 needs to include a strength-in-use test that more closely simulates the loads the ladder experiences in real use

- EN 131 Pt 3 needs to be updated to take account of the extra safety requirements of the different types of ladder that have come onto the market since it was published e.g. *Instructions for hinged ladders need to include how to check that the locking mechanism is engaged*
- Clause 6.1.2 *Correct angle indicator* of EN 131 Pt 3 currently says each ladder should have a correct angle of lean indicator. This needs to be changed to say it shall have a correct angle of lean indicator. This then becomes an obligatory requirement in the standard and should ensure that all ladders have such an indicator. These are important as leaning the ladder at too acute an angle can significantly increase the likelihood of base slip.
- Clause 6.2 *Drop Test* of prEN 131 Pt 6 describes how the test is to be undertaken but does not identify any pass/fail criteria. It is therefore not clear what the purpose if this test is.

Interpretation of risk assessment results for RAPEX proved to be quite challenging. Although dealing with a rating of SERIOUS risk is relatively straightforward (it is required to be notified to RAPEX and the relevant authorities have clear enforcement procedures to follow), dealing with a rating of HIGH risk is not so clearly defined. And dealing with multiple high risk ratings on the same product, as commonly happened with these ladders, was found to be particularly challenging. Currently, the RAPEX Guide says that only the highest risk is taken from the multiple risk assessment made for a product i.e. it does not allow for a "multiplier" effect – yet a number of participants felt that a ladder posing several unrelated HIGH risk characteristics was a dangerous product that could pose even more risk to a user than one rated SERIOUS risk.
This issue has been raised with PROSAFE's Risk Assessment Working Group for them to consider further.

7 Bibilography

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3. EN 131-3:2007 Ladders. User instructions
4. EN 131-4:2007 Ladders. Single or multiple hinge-joint ladders
5. prEN 131-6. Ladders. Part 6. Telescopic ladders. Draft for public comment, publication date May 2013
6. "Commission Decision 2010/15/EU of 16 December 2009 laying down guidelines for the management of the Community Rapid Information System 'RAPEX' established under Article 12 and of the notification procedure established under Article 11 of Directive 2001/95/EC (the General Product Safety Directive)". Published in the Official Journal of the European Union L22/1.

All standards can be obtained from the national standardisation bodies if nothing else is stated. An overview of these bodies can be found on the website of the European Committee for Standardisation, CEN at www.cen.eu.