



## Welcome Note

+

# Introduction to Water-Based Fire Suppression Systems in Poland

**Piotr Tofilo, PhD**

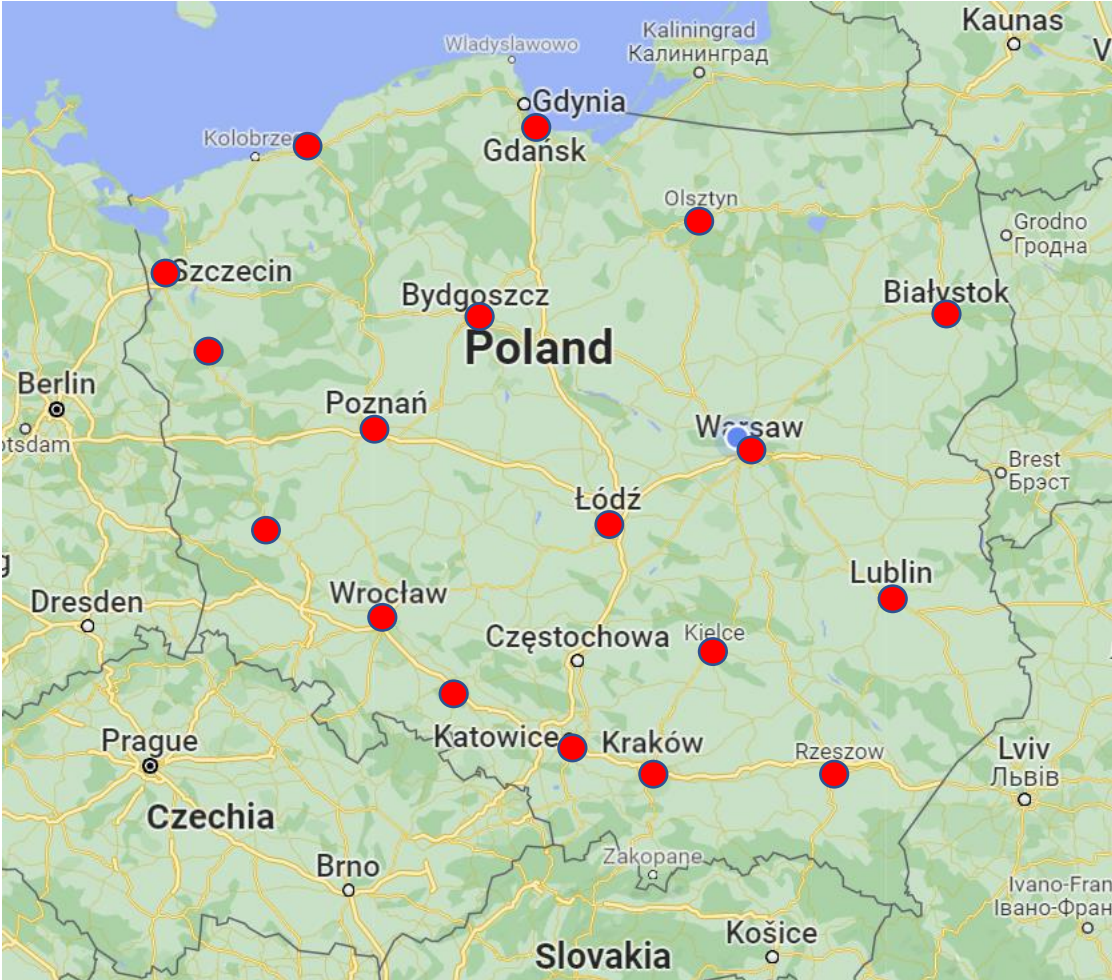
Polish Fire Suppression Systems Foundation

**20th International Water Mist Conference IWMC 2021, Warsaw 27-28.10.2021**

# Welcome to Poland and Warsaw



# Welcome to Polish State Fire Brigade



# Fire HQ (KGPSP)



# Cert Lab (CNBOP)



# The Main School of Fire Service (SGSP)



# Polish SFPE Chapter (SIBP)

- Conferences / events
- Publications / translations
- Network of licensed fire experts
- Regulatory consultations
- Collaboration with other European SFPE Chapters



# Plan

## **Polish water mist landscape**

- Successes
- Challenges
- Future

## **Polish Fire Suppression Systems Foundation (POLIG)**

- Goals
- Activity
- Opportunities

# Water mist in Polish high rise buildings



VARSO PLACE



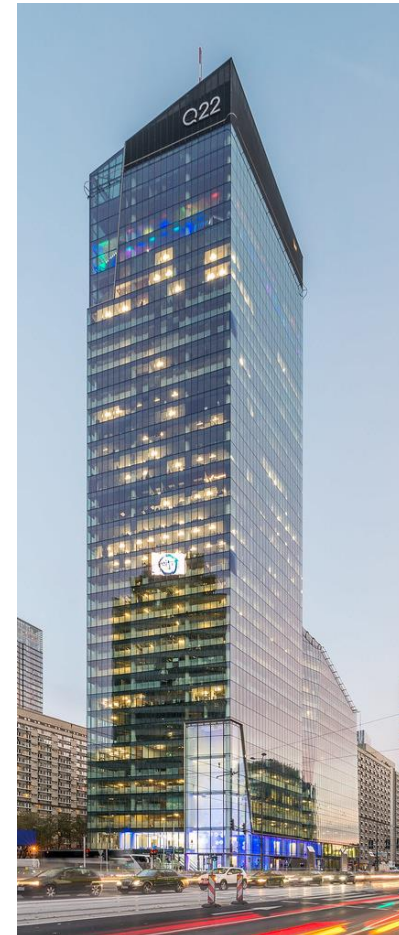
WARSAW SPIRE



MENNICA TOWER



SKYLINER



Q22



KTW



# Water mist in Polish tall buildings

## Benefits

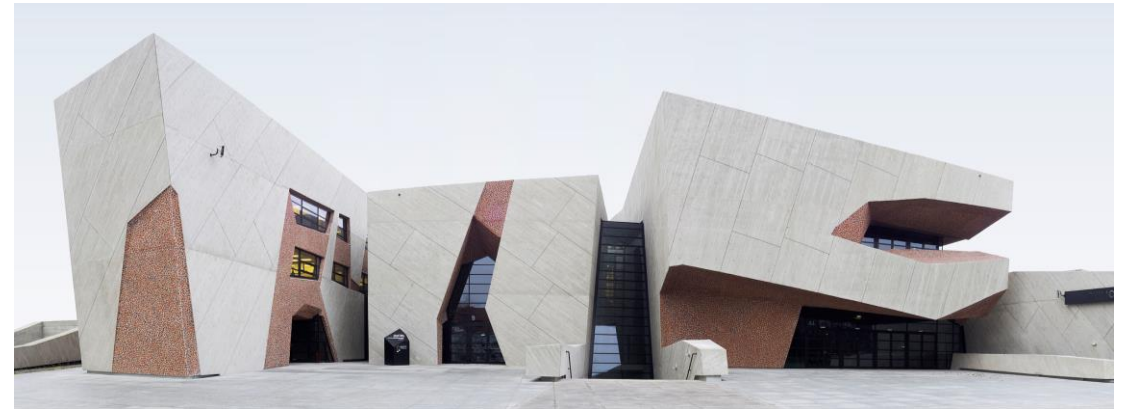
- Less water, smaller water supply needed
- Small pump room serving full building height
- Pipework – small in size, simple, needs less space
- Small losses from water release
- Better interaction with electricity
- More forgiving regarding spacing, distances
- Good for smaller rooms, concealed spaces

## Issues sometimes reported

- Not so easy to modify office spaces
- Not so easy to fully protect mixed use
- Water quality, maintenance (hard water)
- Insurance
- Availability of installers
- Difficulty to achieve some fire protection goals: e.g. protection of openings (horizontal, vertical), open stair cases, lift shafts, tall spaces...
- Universality of components
- Escape and firefighting – visibility, egress signs, interaction with smoke ventilation systems
- Poland - necessity to prove „sprinkler equivalence” in terms of the structural fire impact (CFD)
- Doubts regarding effective protection of open spaces

# Water mist applications in other Polish buildings

- Museums, archives and libraries
- Data Centers
- Power plants, foundry, waste recycling...
- Industrial technical attics
- Historical buildings, churches



# Baltic Fire Laboratory

- One of the biggest lab for fire suppression systems (25 x 25 x 14m)
- Testing IMO, ISO, EU, FM
- Great for research and demonstration
- Training center for designers
- Collaboration with national insurer (PZU Lab)



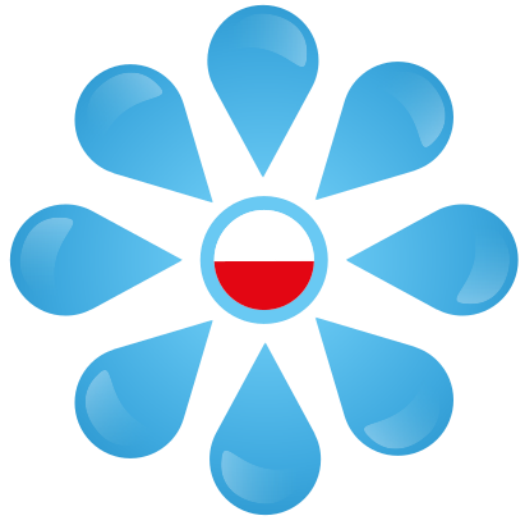


# Challenge – certification / acceptance processes

|  | Negative  | Positive  |
|--|---|---|
| <b>Authorities</b><br><b>State Fire Brigade</b><br><b>Certification bodies</b>               | <ul style="list-style-type: none"><li>• Gaps in submitted documentation</li><li>• Inadequate test for a given application</li><li>• Misunderstandings, miscommunication</li><li>• Proactive approach is necessary</li></ul>   | <ul style="list-style-type: none"><li>• Polish regs are good for water mist (&gt;2015)</li><li>• Key role of the licensed fire expert</li></ul>   |
| <b>Water mist providers</b><br><b>Designers / installers</b><br><b>Licensed fire experts</b> | <ul style="list-style-type: none"><li>• Slow process</li><li>• Insufficient manpower</li><li>• Unknown timeframe</li><li>• No automatic acceptance of EU certification</li><li>• Confusion, especially with less known labs and test protocols</li><li>• Polish certification (KOT) often done to avoid „troubles”</li><li>• EN 14972-1 still lacks many component test protocols</li></ul> | <ul style="list-style-type: none"><li>• Improving recognition of FM/IMO/VDS/UL</li><li>• EN 14972-1<ul style="list-style-type: none"><li>• brings hope for less friction</li><li>• many fire test protocols</li></ul></li></ul> |

# Challenge – knowledge

- Systems designed in close collaboration dealer-manufacturer
- Detailed knowledge hard to access
- National experience grows with
  - EN 14972-1 with easy to access fire test protocols
  - Number of delivered systems
  - Availability of translated documentation and standards
  - Training programs for designers/installers



Polish

Fire Suppression Systems

Foundation

# Goals

## **Popularizing reliable knowledge**

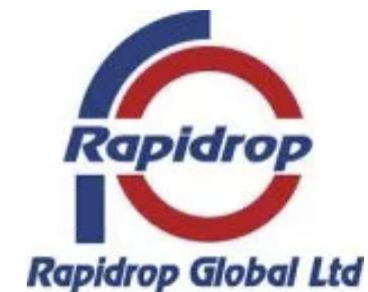
- benefits of using Water-Based Fire Suppression Systems (WBFSS) and examples of successes
- WBFSS technology - principles of operation, design, commissioning, maintenance, etc.
- causes of large fire losses
- domestic and foreign statistics on fires and losses
- the social and economic consequences of major fires
- environmental losses as a result of major fires

## **Supporting**

- education about WBFSS among fire brigades, architects, designers, appraisers, insurers, facility managers, investors, etc.
- rational development of regulatory frameworks in the area of WBFSS
- research and scientific studies in the field of preventing large fire losses
- development of WBFSS as an effective way to prevent large fire losses and to raise awareness of it in relevant communities
- high-quality design and installation services for WBFSS, as well as their certification and inspection.
- the idea and the need for independent audit and insurance services as a related system to prevent large fire losses



# Support / Collaboration



# Activity

- SUPFIRE Conferences
- Polish Normalization Committee
- Polish fire database FireMap.pl on large fires and fire losses in Poland
- Qualifications for designers and installers of suppression systems
- Technical studies
  - fire protection rules for industrial and storage buildings in Europe and USA
  - codified benefits from using suppression systems in Europe and USA
  - reliability of fire suppression systems in Poland
  - weaknesses of the Polish rules for fire protection of buildings
- Publication of technical articles in relevant Polish technical magazines & journals
- Translation of standards (e.g. EN 12845)
- Collaboration with Polish Insurance Chamber
- Scholarship program




POLSKIE  
INSTALACJE  
GAŚNICZE

Wiedza ▾

Aktualności

Firmy

Fundacja ▾

 Polski ▾



**WIEDZA**

# Knowledge Base

The screenshot shows a web interface for 'POLSKIE INSTALACJE GAŚNICZE'. The top navigation bar includes 'Wiedza', 'Aktualności', 'Firmy', 'Fundacja', and a language selector set to 'Polski'. The left sidebar contains a 'BAZA WIEDZY' menu with categories such as 'Pożary i ich konsekwencje', 'Instalacje gaśnicze wodne (SUG wodne)', 'Korzyści z SUG wodnych', 'Fakty i mity o instalacjach gaśniczych', 'SUG a wentylacja pożarowa', 'SUG a ubezpieczenie', and 'Źródła wiedzy o SUG wodnych'. The main content area is titled 'Pożary i ich konsekwencje' and features a sub-section 'Pożary w Polsce' with a paragraph explaining the FireMap project. Below this are sections for 'Konsekwencje dla ludzi' and 'Konsekwencje dla biznesu', each with a bulleted list of impacts.

**POLSKIE INSTALACJE GAŚNICZE**

Wiedza ▾ Aktualności Firmy Fundacja ▾ Polski ▾

BAZA WIEDZY

**Pożary i ich konsekwencje**

- Pożary w Polsce
- Konsekwencje dla ludzi
- Konsekwencje dla biznesu
- Konsekwencje dla społeczeństwa
- Konsekwencje dla środowiska

**Instalacje gaśnicze wodne (SUG wodne)**

- Instalacje tryskaczowe
- Instalacje zraszaczowe
- Instalacje mgły wodnej

**Korzyści z SUG wodnych**

- Ludzie, zdrowie, społeczeństwo
- Działalność, biznes, majątek
- Budynek i architektura
- Środowisko

**Fakty i mity o instalacjach gaśniczych**

- Fakty
- Mity

**SUG a wentylacja pożarowa**

**SUG a ubezpieczenie**

- Dobre praktyki
- Terminy ubezpieczeniowe

**Źródła wiedzy o SUG wodnych**

- Artykuły
- Przepisy
- Normy i standardy
- Video

## Pożary i ich konsekwencje

### Pożary w Polsce

Ze względu na brak w Polsce ogólnodostępnej i kompleksowej bazy danych na temat pożarów, która oferowałaby możliwość badania dużych pożarów i strat pożarowych w Polsce, Fundacja POLIG uruchomiła własną bazę danych o nazwie [FireMap.pl](#). Strona FireMap gromadzi dane i informacje o pożarach ze źródeł publicznych. Dane dotyczące pożarów i strat można przeglądać na wiele sposobów jako mapę, tabelę lub wykresy. Każdy zidentyfikowany wpis pożaru zawiera linki do publicznych źródeł opisujących pożar, które często również opisują konsekwencje pożaru dla biznesu lub społeczności lokalnej.

Dyskusję na temat pożarów należy rozpocząć od omówienia konsekwencji pożarów dla ludzi i społeczeństwa, przedsiębiorstw i środowiska.

### Konsekwencje dla ludzi

- Utrata życia lub zdrowia
- Utrata pracy lub źródła utrzymania
- Pogorszenie warunków życia w efekcie dużego pożaru w sąsiedztwie
- Zatrucie roślin spożywanych przez ludzi i zwierzęta
- Zatrucie wód gruntowych na obszarach zabudowanych

### Konsekwencje dla biznesu





- Utrata majątku dużej wartości (maszyny, środki obrotowe, materiały)

# Qualifications

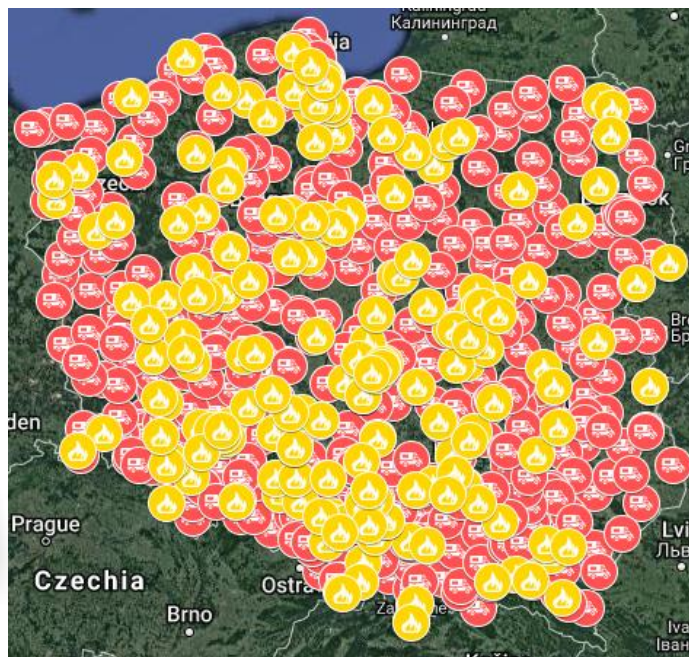
The screenshot shows the top navigation bar of the Integrated Qualifications System website. The logo is on the left, and search and contact options are on the right. Below the logo is a horizontal menu with items: Home, About IQS, News, Publications, Newsletter, Qualifications (IQR), and Awarding Bodies (IQR). The 'Qualifications (IQR)' item is highlighted in dark blue. Below the menu is a main content area with four columns, each featuring an icon, a title, and a brief description.

**INTEGRATED QUALIFICATIONS SYSTEM** | **SEARCH** | **CONTACT**

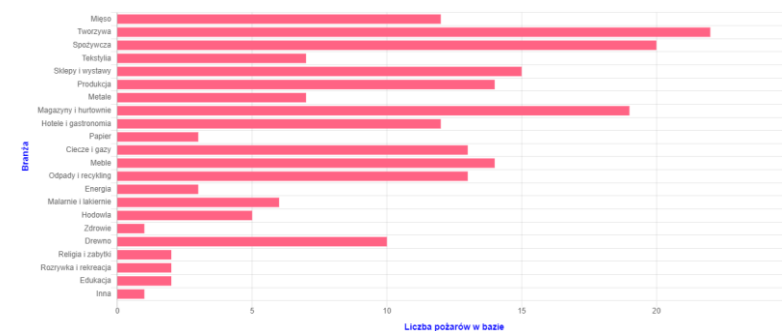
[Home](#) | [ABOUT IQS](#) | [NEWS](#) | [PUBLICATIONS](#) | [NEWSLETTER](#) | **[QUALIFICATIONS \(IQR\)](#)** | [AWARDING BODIES \(IQR\)](#)

-  **INTEGRATED QUALIFICATIONS SYSTEM**  
Learn more about IQS
-  **INTEGRATED QUALIFICATIONS REGISTER**  
Learn more about IQR
-  **POLISH QUALIFICATIONS FRAMEWORK**  
The structure and functions of Polish Qualifications Framework, referencing to European Qualifications Framework
-  **NEWS & EVENTS**  
Current information concerning the activities undertaken within IQS

# FireMap.pl -> FireMap.eu



| Miejscowość    | Data       | Nazwa               | KZ | Branża    | Powierzchnia | Dystans do JRG [km] | Straty [mln PLN] | Konsekwencje                             |
|----------------|------------|---------------------|----|-----------|--------------|---------------------|------------------|--|
| Lyse           | 2009-06-29 | JBB                 | PM | Mięso     | 20000        | 28                  | 1000             | 1500 miejsc pracy                        |
| Toruń          | 2008-02-27 | Drosed              | PM | Mięso     | 12000        | 2.9                 | 100              | 600 miejsc pracy. Zakładu nie odbudowano |
| Wólka Kosowska | 2011-05-10 | Hala                | PM | Tekstylna | 18000        | 13.7                | 100              |  |
| Kutno          | 2014-12-09 | Fuji Seal Poland    | PM | Tworzywa  | 22000        | 6.6                 | 100              |  |
| Łódź           | 2015-07-27 | Coko-Werk           | PM | Tworzywa  | 6700         | 1.7                 | 100              |  |
| Świerczynka    | 2017-01-01 | Olewnik             | PM | Mięso     |              | 31.1                | 100              | 800 miejsc pracy, wstrzymanie produkcji  |
| Lubań          | 2012-07-08 | Imka                | PM | Papier    | 20000        | 2.5                 | 80               |  |
| Chełstówek     | 2015-08-13 | Ilpea               | PM | Tworzywa  | 11000        | 19.4                | 80               | 650 miejsc pracy                         |
| Gdańsk         | 2012-01-19 | HTEP Sunreef Yachts | PM | Produkcja | 1600         | 1.8                 | 60               | Przerwa w produkcji                      |



# SUPFIRE Conferences



# Scholarship program





# Polish Insurance Chamber



# Application map

## Factors

| EFFECTIVENESS "S" |  | COST "C" |   | USAGE/DESIGN "UP" |   |
|-------------------|--|----------|---|-------------------|---|
| S1                | System ineffective                         | E1       | Cost of suppression agent               | UP1               | Water damage  |
| S2                | Activation delayed by ventilation          | E2       | Cost of arming the system after release | UP2               | Piping dimensions   |
| S3                | Activation delayed                         | E3       | Cost of suppression agent testing       | UP3               | Design flexibility  |
| S4                | Cooling gas near ceiling                   | E4       | Cost of obligatory system testing       | UP4               | Hydraulic losses  |
| S5                | Improving evacuation                       | E5       | Cost of the system                      | UP5               | Available pressure  |
| S6                | Improving visibility                       | E6       | Guaranteed power supply                 | UP6               | Standard guidance   |
| S7                | Reducing temperature                       | E7       | Intermediate tanks                      | UP7               | Intermediate tanks  |
| S8                | Protecting structure                       | E8       | Weight of the system                    | UP8               | Universal standards   |
| S9                | Application test results available         | E9       | Space needed in vertical shafts         | UP9               | Space needed in vertical shafts                                     |
| S10               | Protecting concealed spaces                | E10      | Space needed under ceiling              | UP10              | Space needed under ceiling  |
| S11               | Protecting large open spaces               | E11      | Flexible installation                   | UP11              | System limitations  |
| S12               | Protecting electrical devices              | E12      | Material / fabrication                  | UP12              | Materials / fabrication   |
| S13               | Sealed room required                       | E13      | Number of release points                | UP13              | Number of release points  |
| S14               | Effective with oil and fat fires           | E14      | zasięg działania / rozstaw              | UP14              | coverage / spacing  |
| S15               | Effective by pre-wetting materials/devices | E15      | Pump drive type                         | UP15              | Additional certification  |
| S16               | effective on materials reacting with water | E16      | Intermediate pump sets / rooms          | UP16              | Intermediate pump sets / rooms                                      |
| S17               | Reducing oxygen level                      | E17      | Area of pump/gas room                   | UP17              | Area of pump/gas room   |
| S18               | system deactivation protection             | E18      | Possible use with hydrants              | UP18              | Amount of water typically released                                  |
|                   |  |          |   | UP19              | Unusual applications  |
|                   |  |          |   | UP20              | Ease of use in existing buildings (office, museum, historical etc.) |
|                   |  |          |   | UP21              | Operation possible with ventilation                                 |
|                   |  |          |   | UP22              | Possible code departure using CFD simulation                        |
|                   |  |          |   | UP23              | Resistance to vandalism   |

## Applications

|    | Type of building/application       | Sprinklers | Water mist | Gas | Foam | Factors to consider  |
|----|------------------------------------|------------|------------|-----|------|--|
| 1  | Office                             | X          | X          |     |      | S4, S5, S7, S9, E5, E6, E8, E9, E10, E11, E14, E17, UP1, UP3, UP9, UP14, UP15, UP17, UP18, UP20, UP22  |
| 2  | High-rise (office, hotel)          | X          | X          |     |      | S4, S5, S7, S9, E5, E6, E7, E8, E9, E10, E11, E14, E16, E17, UP1, UP2, UP3, UP4, UP5, UP7, UP9, UP10, UP14, UP15, UP16, UP17, UP18, UP20, UP22 |
| 3  | Hotel                              | X          | X          |     |      | S4, S5, S7, S9, E5, E6, E8, E9, E10, E11, E14, E17, UP1, UP3, UP9, UP14, UP15, UP17, UP18, UP20, UP22  |
| 4  | Library                            | X          | X          |     |      | S5, S9, S10, S15, E5, E11, E14, UP1, UP14, UP15, UP18, UP20  |
| 5  | School                             | X          | X          |     |      | S4, S5, S6, S7, E5, UP14, UP15   |
| 6  | Hospital                           | X          | X          |     |      | S4, S5, S6, S7, S10, S12, S15, E5, E8, E9, E10, E11, E12, UP1, UP2, UP3, UP4, UP9, UP10, UP12, UP19  |
| 7  | Museum                             | X          | X          |     |      | S2, S3, S5, S7, S15, E11, E12, E14, E17, UP1, UP3, UP10, UP12, UP14, UP15, UP19, UP20  |
| 8  | Cinema                             | X          | X          |     |      | S4, S5, S6, S7, E5, UP14, UP15   |
| 9  | Theater                            | X          | X          |     |      | S4, S5, S6, S7, E5, UP14, UP15   |
| 10 | Prison                             | X          | X          |     |      | S1, S18, E2, E5, UP11, UP19, UP23  |
| 11 | Laboratory                         | X          | X          | X   |      | S1, S3, S10, S12, S13, S15, S16, E9, E11, E12, UP1, UP11, UP12, UP18, UP19   |
| 12 | Railway stations                   | X          | X          |     |      | S7, S8, S11, E5, UP1, UP11, UP14, UP23   |
| 13 | Historical / religion buildings    | X          | X          | X   |      | S3, S7, S8, S10, S11, S15, E5, E8, E10, E11, E13, E14, UP1, UP3, UP11, UP14, UP15, UP20, UP23  |
| 14 | Archive                            | X          | X          | X   |      | S3, S7, S9, S10, S15, E5, E14, E17, UP1, UP11, UP12, UP14, UP15, UP17, UP18  |
| 15 | Data centers                       |            | X          | X   |      | S1, S2, S3, S7, S9, S10, S12, S13, S15, E5, E6, E9, E12, E14, E17, UP1, UP3, UP6, UP11, UP15, UP17, UP18, UP19, UP21                           |
| 16 | Small data centers                 |            | X          | X   |      | S3, S10, S12, S13, S15, E1, E2, E3, E4, E5, E13, E17, UP1, UP11, UP15, UP17  |
| 17 | High bay storage                   | X          |            |     |      | Only sprinklers  |
| 18 | Flammable liquids / aerosols       |            |            |     | X    | Instalacja tryskaczowo-pianowa lub pianowa   |
| 19 | Production / factory               | X          | X          |     |      | S4, S5, S8, S12, S14, S15, E1, E2, E5, E11, UP1, UP11, UP15, UP18, UP19, UP21  |
| 20 | Power stations & energy sector     | X          | X          | X   | X    | S1, S3, S8, S9, S10, S11, S12, S13, S14, S15, S16, E1, E5, E14, UP1, UP4, UP5, UP8, UP11, UP12, UP14, UP15, UP19                               |
| 21 | Rafinerie i Petrochemie            | X          |            |     | X    | S1, S3, S8, S9, S10, S11, S12, S13, S14, S15, S16, E1, E5, E14, UP1, UP4, UP5, UP8, UP11, UP12, UP14, UP15, UP19                               |
| 22 | Tanks – petroleum products         |            |            |     | X    | Only foam  |
| 23 | Car parks                          | X          | X          |     |      | S1, S2, S3, S4, S5, S6, S7, S9, E5, E10, E14, UP10, UP11, UP12, UP14, UP15   |
| 24 | Underground car parks              | X          | X          |     |      | S1, S2, S3, S4, S5, S6, S7, S9, E5, E10, E14, UP10, UP11, UP12, UP14, UP15   |
| 25 | Car parks with jet fan ventilation | X          |            |     |      | S1, S2, S3, S4, S5, S6, S7, S9, E5, E10, E14, UP10, UP11, UP12, UP14, UP15   |
| 26 | Car parks with duct ventilation    | X          | X          |     |      | S4, S5, S6, S7, S9, E5, E10, E14, UP10, UP11, UP12, UP14, UP15   |
| 27 | Automatic car parks                | X          | X          | X   |      | S1, S2, S3, S4, S5, S6, S7, S9, E5, E10, E14, UP10, UP11, UP12, UP14, UP15   |
| 28 | Road and railway tunnels           | X          | X          |     |      | S1, S2, S4, S5, S6, S7, S9, S11, E1, E5, E12, E14, E15, UP11, UP12, UP15, UP19   |
| 29 | Railway rolling stock              |            | X          | X   |      | S9, S10, S11, S12, S13, S14, E5, E11, E12, UP1, UP12, UP15, UP19   |
| 30 | Air Hangars                        |            | X          |     | X    | S9, S11, E1, E5, E13, UP12, UP 13, UP15  |

# Fire Protection Quarterly – 20 years of service



# Summary

- Water mist technology is getting more and more popular in Poland
- Future is very optimistic with new EN 14972-1
- There are some challenges - certification/acceptance, access to knowledge
- The need for unbiased guidance for the fire community on the selection of the best system in given circumstances
- POLIG can help with some of these challenges in Poland

Thank you !!!

Have a great IWMC 2021 !!!

Enjoy Poland and Warsaw !!!