

·DK - VAND·

Teknologisk Institut – 28. januar 2020
Dorte Skræm, DANVA

DK-VAND 2017

- Safe and healthy products in the drinking water supply chain.
- Voluntary
- Easy procurement for plastic pipes so far (fittings etc.)
- Financed by the manufacturers

DK-VAND is a product certification scheme designed to ensure that certified and labelled products comply with Danish requirements and additional requirements of the Danish water supply.



Utility – protection, abstraction, treatment and distribution of drinking water



Household – consumption of drinking water





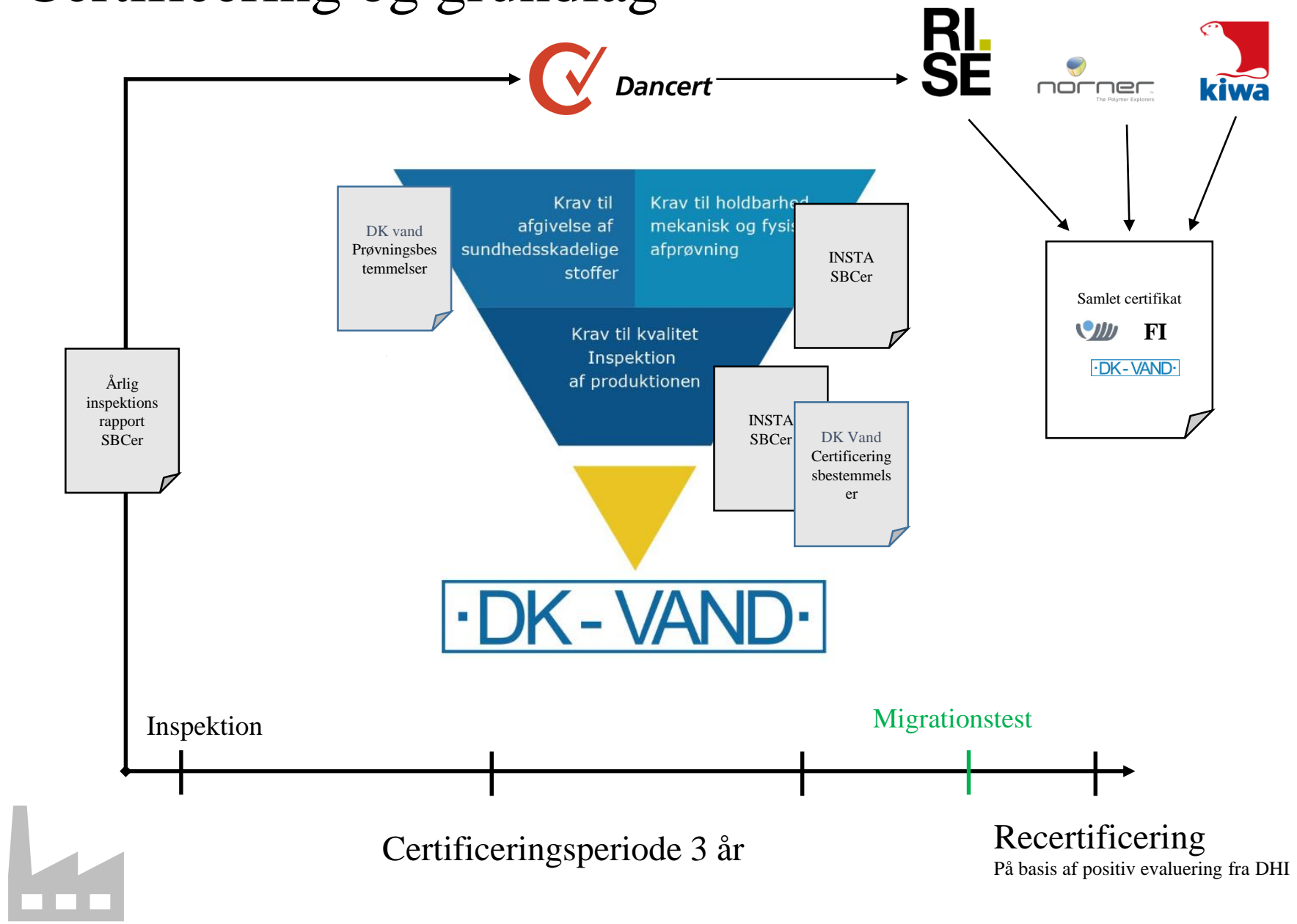
Certificate 3 yrs



·DK-VAND·

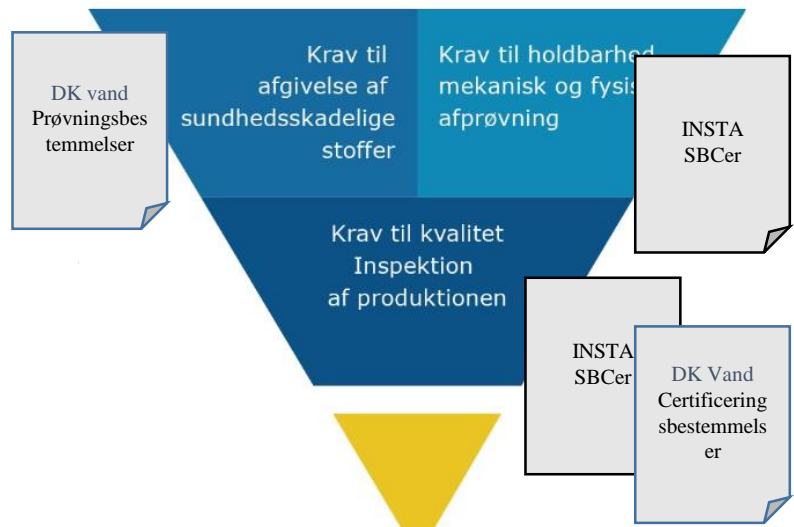
- Better, easier tenders for utilities
- Toxicity evaluation from impartial advisor
- Material thickness, dimension groups, materials and place of production.
- GDV as minimum basis
- Migration test of end product.
- Flexibility in choosing surface/volume dimension range
- No testing on specially crafted test-products
- True to migrationsstandard EN 12873- 1 and taste odor standard EN1420
- Define the points where special precautions are needed.
- No "cutting up" of materials...(pipes so far)
- It has to be "do-able" in the lab – must be valuable

Certificering og grundlag



Dancert

RI SE



Årlig inspektions rapport SBCer

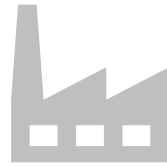
Inspektion

Migrationstest

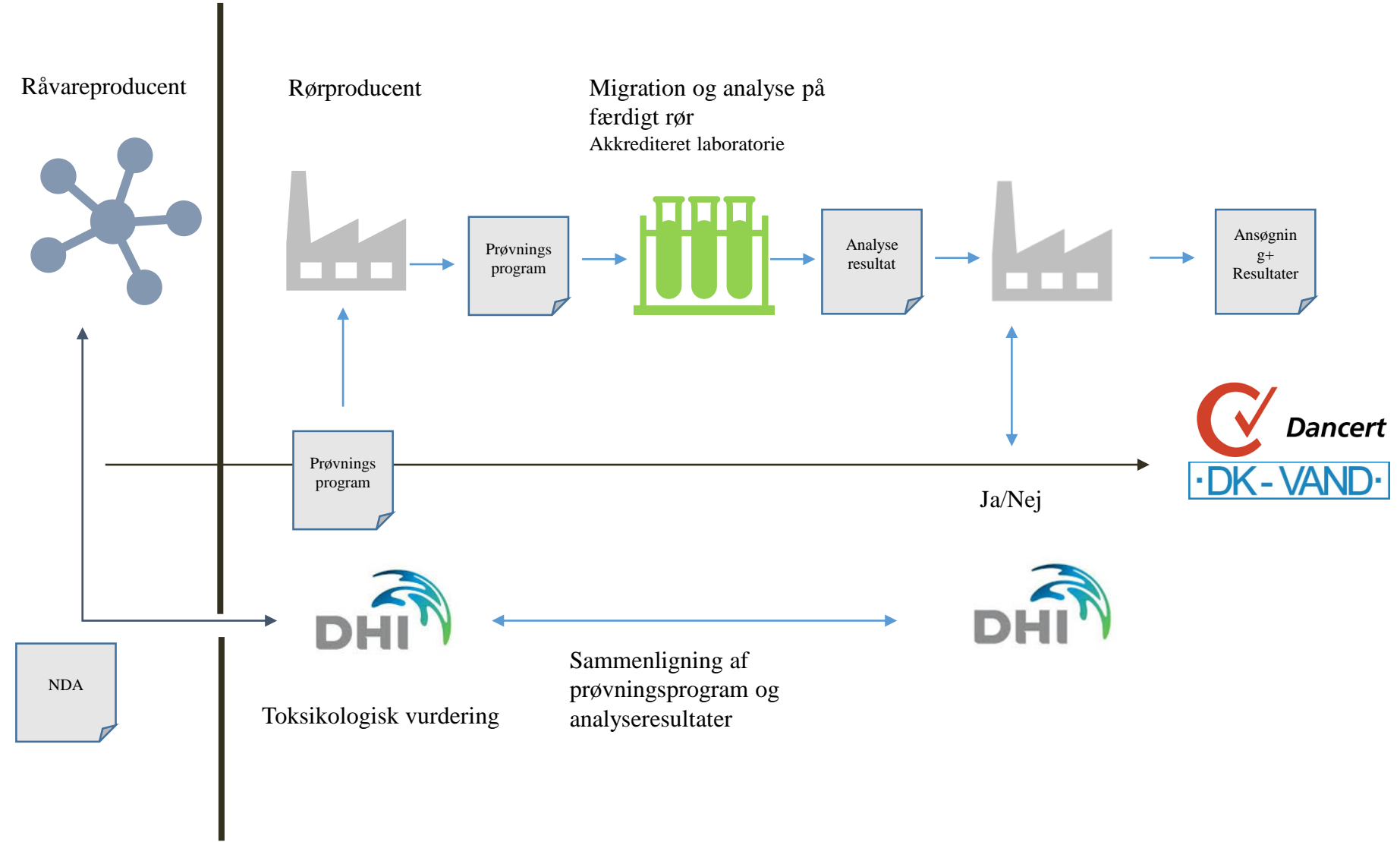
Certificeringsperiode 3 år

Recertificering

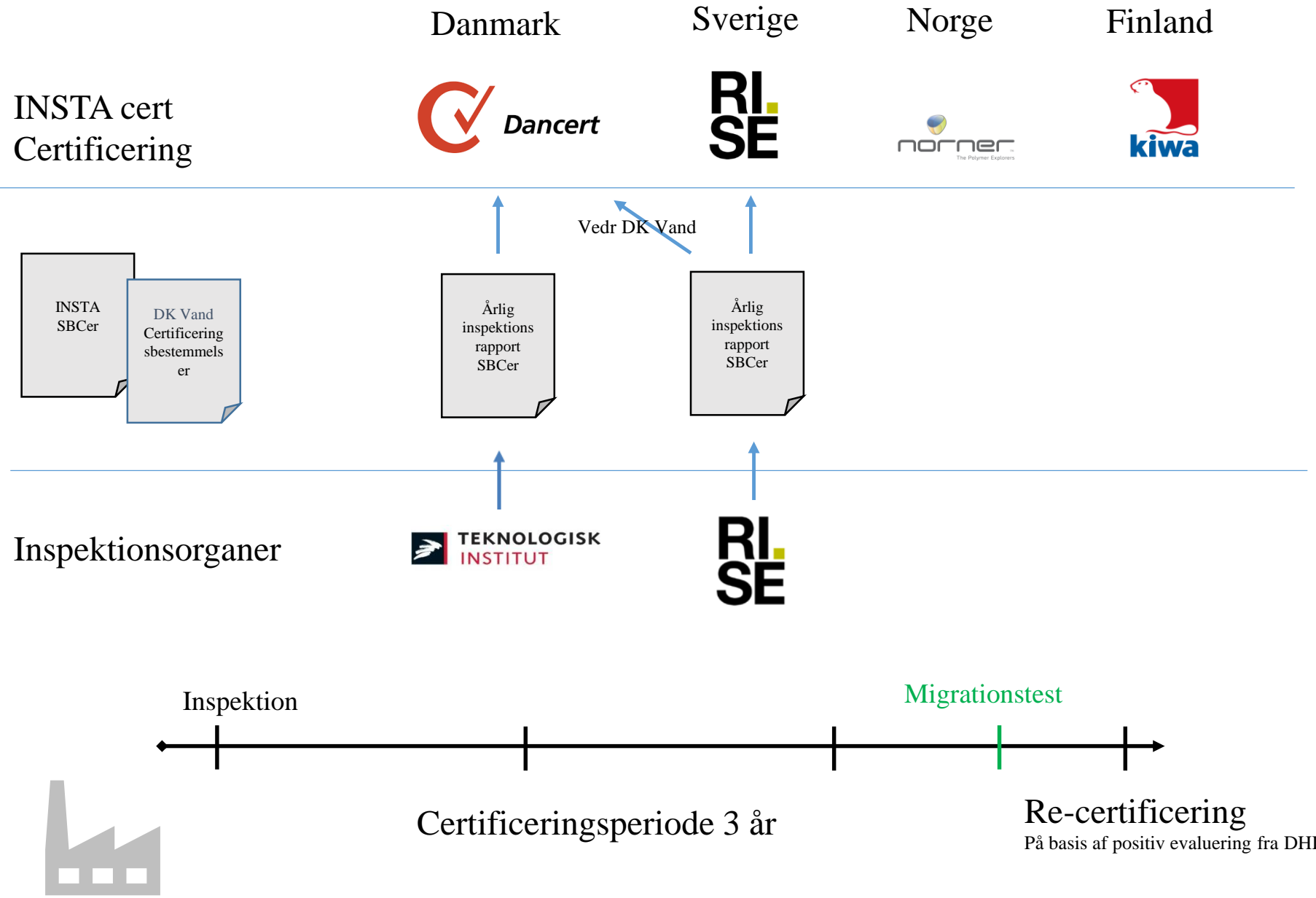
På basis af positiv evaluering fra DHI

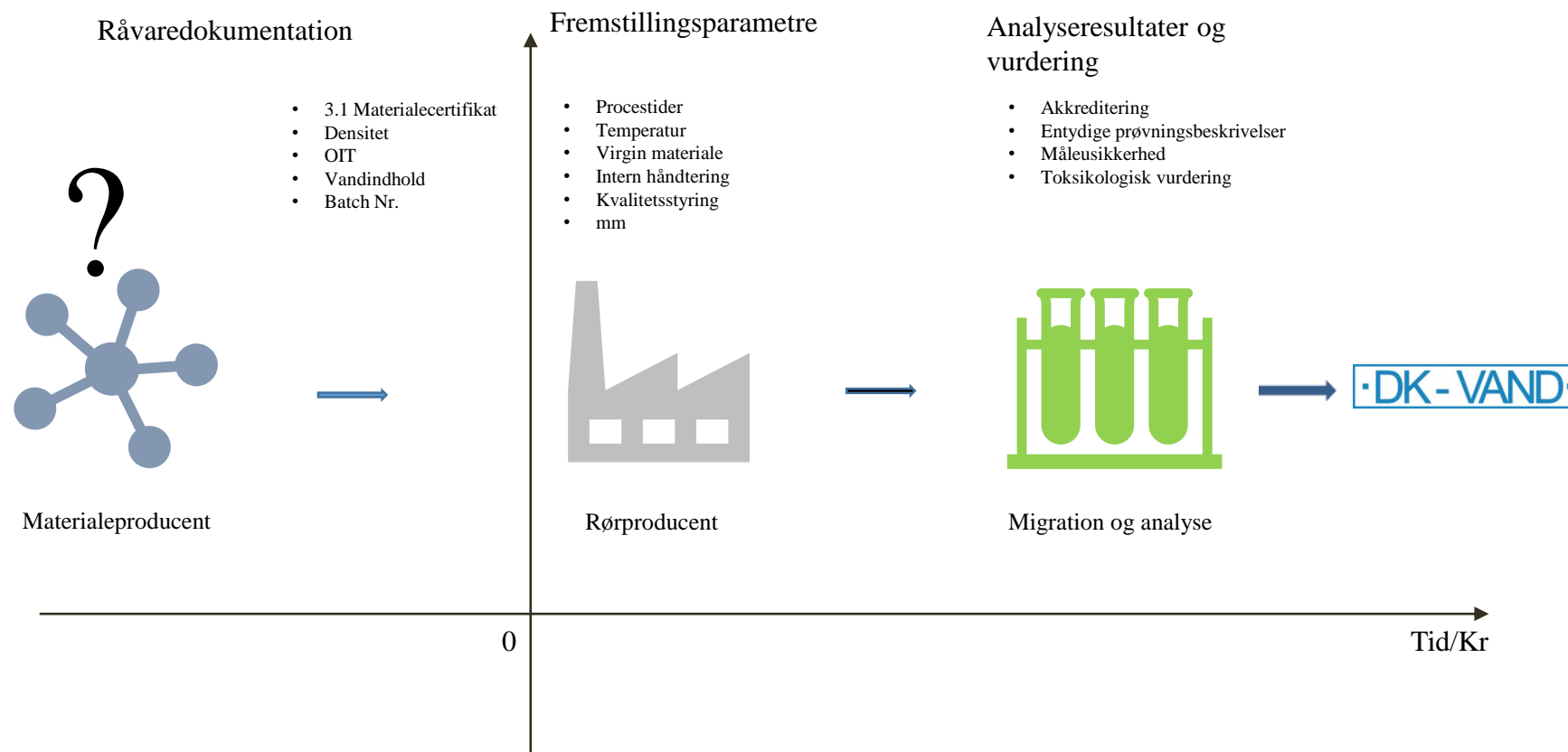


Typeprøvning/ Første gang



Inspektion/Test



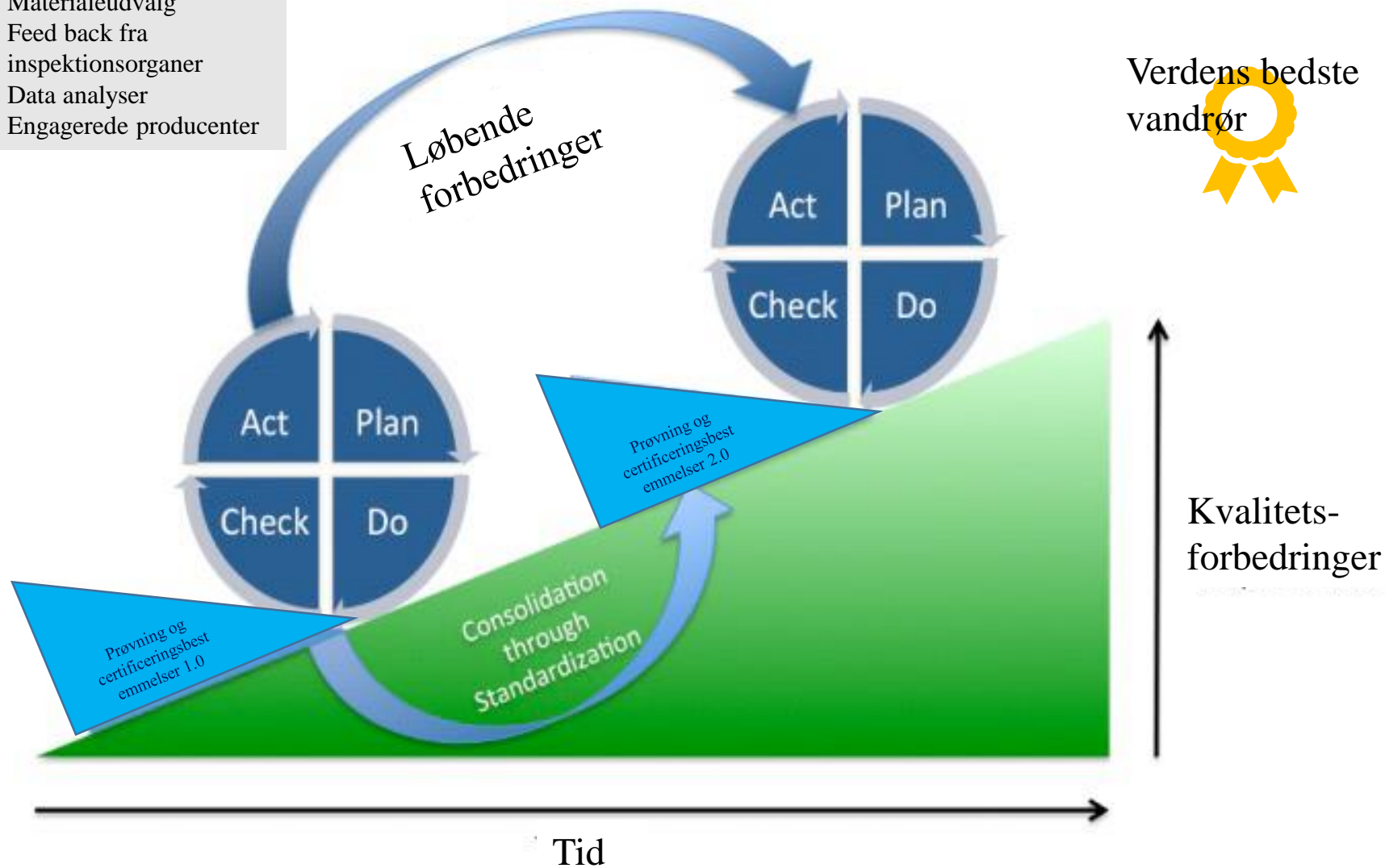


Vi kan ikke lave alting perfekt fra starten – Vi lærer undervejs



TEKNOLOGISK
INSTITUT

- Materialeudvalg
- Feed back fra inspektionsorganer
- Data analyser
- Engagerede producenter



Organization of DK-water scheme

Business Committee



General Assembly
2 meetings/yr

Steering Committee

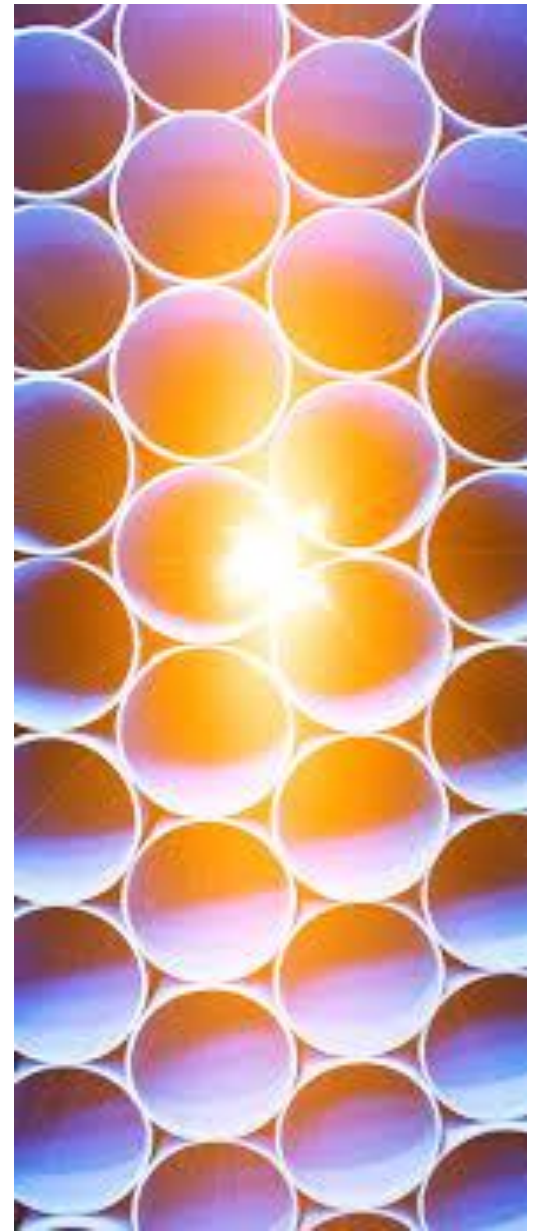


Daily operations

Material Committee



Research and development



DK-VAND Dokumentstruktur

DK-VAND 1-2.1 - Testing requirements

Requirements for the release of hazardous substances from certified PE and PVC pipes

The migration test consists of several analyses of substances leached from the material to the drinking water. This is to ensure that the substances do not pose a health risk or result in change of flavour and/or odour.

Table 1 Analysis requirements

Parameter	Analysis Method
TOC	SM5310B
Flavour and odour	DS/EN 1420 and DS/EN 1622
Turbidity	DS/EN ISO 7027-1
Phenols	DS 281
Specific substances	Specified in the test program

1) If possible, the analyses should be done accredited.

Table 2 Acceptance Requirements

Parameter ²	Acceptance Requirement ³
TOC ³	TOC content must not increase by more than 1 mg / m ² / da
Flavour and odour ³	TFN and TON = 1
Turbidity ³	No changes compared to the blank
Phenols ³	The sum of phenols must not be greater than 1 mg / m ² / da

DK-VAND 1-1 Certification rules for plastic pipes and associated products

Requirements for DK-VAND certification of plastic pipes and associated products used in drinking water supply in Denmark

1. Procedure

- 1.1 There must be an INSTA-CERT certification of the product, cf. the applicable SBC (special rules for certification). Information about INSTA-CERT certification and relevant SBCs can be found here: <http://www.insta-cert.net/>
- 1.2 A test program must be made based on a toxicological assessment of the raw material, comprising the polymer and all additives, i.e. antioxidants, auxiliaries, dyes, etc.
- 1.3 There must be an overall positive toxicological assessment done by DHI, based on the test results of each test result according to the acceptance criteria mentioned in the testing requirements
- 1.4 It is only the owner of the INSTA-CERT certificate, who can apply for a DK-VAND certificate, i.e. the manufacturer
- 1.5 Applying for DK-VAND certificate is done by contacting Dancert.
- 1.6 The DK-VAND certification scheme is administered by Dancert regarding renewal and cancellation of certificates as well as inspection requirements, i.e. scope and frequency.
- 1.7 An accredited inspection report must be available without deviations before the product can be marked with DK-VAND. The following are among other things checked:

Assesment of substances for test programme

Materiale Nr. 1 Kemisk navn	CAS-nr.	Indhold %	SML	Indgår i testprogram
Ethylen-Buten-Copolymer	xxx-yy-a	95	-	<i>Tox af indholdsstoffer, evt. restmonomer, m.m. Test for: TOC</i>
Vinyltrimethoxysilane blend. Blanding af: > 90 % CAS-nr. 76888-03-7 < 3% CAS-nr. 6999-66-1 < 0,5 % CAS-nr. 6998-88-5	xx1-yy-a	4,6	-	<i>Vurdering af aktuelle siloxaner. Her ikke anledning til specifik test, da TOC er tilstrækkelig (ikke mere toksisk end at kravet på 0,03 mg/l TOC er fuldt dækkende).</i>
2,5-dimethyl-2,5-bis....hexan	xx2-yy-a	0,1	-	<i>Vurdering af tox af indholdsstoffet og evt. nedbrydningsprodukter, m.m. Test for: TOC</i>
Pentaerythritol tetrakis(3...phenyl)propionate	xx4-yy-a	0,2	-	<i>Vurdering af tox af indholdsstoffet og evt. nedbrydningsprodukter, m.m. Test for: TOC, Phenolforbindelser, 2,4-Di-tert-butylphenol</i>
Phosphorsyre(1,1-biphenyl)-4,4'-diylbis- tetrakis-(2,4-bis....)phenylester	xx5-yy-a	0,1	SML = 15 mg/kg	<i>Vurdering af tox af indholdsstoffet og evt. nedbrydningsprodukter, m.m. Test for: TOC, Phenolforbindelser, MTBE, 2,6-Di-tert-butyl-p-benzoquinone....</i>

Example of results

Degradation products				
Extractions: 3 x 72 hours Test water: Tap water				
CAS No.	Compound	C = µg/L	Blank b = µg/L	Detection limit µg/L
110-12-3	5-methyl-2-hexanon	< 0.1	< 0.1	0.1
123-07-9	4-ethylphenol	< 0.05	< 0.05	0.05
98-54-4	4-tertbutylphenol	< 0.05	< 0.05	0.05
122-94-1	4 butoxyphenol	< 0.05	< 0.05	0.05
719-22-2	2,6-di-tert-butyl-1,4-benzoquinon	< 0.5	< 0.5	0.5
96-76-4	2,4-di-tert-butylphenol	< 0.5	< 0.5	0.5
128-37-0	2,6-bis (1,1-dimethyl)-4-methylphenol	0.1	< 0.05	0.05
52858-87-4	3,5-di-tert-butyl-4-hydroxystyren	< 0.05	< 0.05	0.5
1620-98-0	3,5-di-tert-butyl-4-hydroxybenzaldehyd	< 0.1	< 0.1	0.1
14035-33-7	3,5-di-tert-butyl-4-hydroxyacetophenon	< 0.2	< 0.2	0.2
82304-66-3	7,9-di-tert-butyl-1-oxaspiro (4,5) decra-6,9-diene-2,8-dione	0.2	< 0.1	0.1
6386-38-5	3-methyl-3,5-di-tert-butyl-4-hydroxyphenolpropanoate	< 0.1	< 0.1	0.1

The analysis method is not covered by the accreditation.

Aim of the scheme

- Better pipes / Materials
- Transparency
- Easy Tendering for utilities
- Traceability on leaching substances
- Up to date scheme that is also operational
- Variety of pipes to choose from – not only one manufacturer

