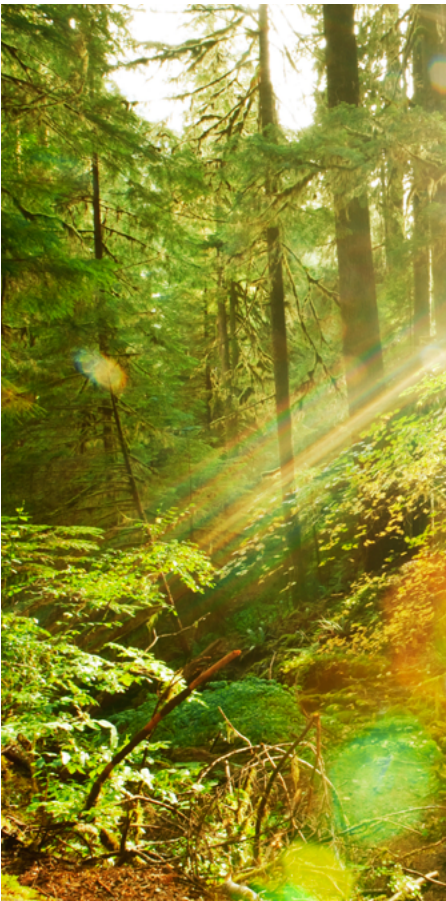


# STRUCTURIX

## Film



# STRUCTURIX Film Systems

GE exclusively offers a solution with all components designed to work together seamlessly, start to finish.

In bringing you integrated film systems, we're assuring you improved quality and safety, greater ease, savings in time and costs and the peace of mind that comes with a proven, end-to-end solution. In offering you renowned STRUCTURIX film systems, we're providing you the films and solutions most widely used in industrial radiography.

- **IMAGE QUALITY**

Agfa was a pioneer in recognizing the importance of monitoring film systems, ensuring better image quality performance. The result is higher quality and safety of the inspected equipment and components.

- **PROVEN TRACK RECORD**

STRUCTURIX film systems are proven in the very demanding field of non-destructive testing. Our customers worldwide are enthusiastic about our extensive assortment of products featuring superior reliability and guaranteed intrinsic quality.

- **COMPLIANCE**

Our film systems are fully compliant with standards issued by the independent German Federal Institute for Materials Research and Testing, BAM. This designation proves STRUCTURIX capability to not only produce consistently but also to invest in quality systems which control and measure system parameters. This assures compliance with the Industrial Film Systems Classification Standards.

- **INVESTMENT IN INNOVATION**

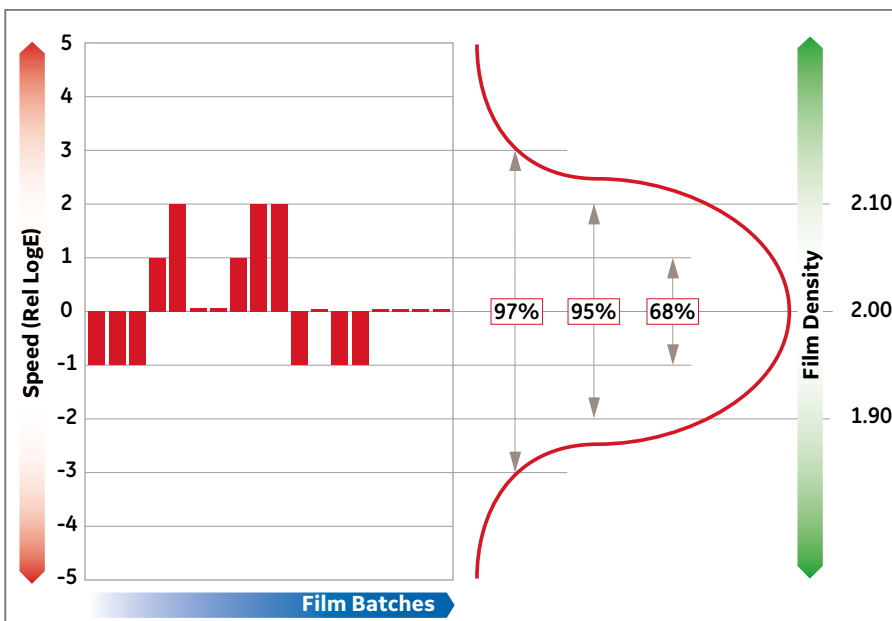
Due to continuous investments in R&D, STRUCTURIX film systems enjoy an excellent reputation. Improvement of the NDT film Systems meets your economical and environmental needs better than ever before. An example of our commitment is the introduction of our STRUCTURIX ECO Film Systems, rendering less chemistry consumption, higher film throughput and lower energy usage. The system has been awarded certification by BAM.

- **APPROACH TO ENVIRONMENTAL POLICY**

The STRUCTURIX ECO System combines both economy in use and ecological responsibility. This advanced film system minimizes its impact on the environment with less chemistry consumption, higher film throughput and lower energy usage.

# STRUCTURIX Films – Advantages

The STRUCTURIX film family has two key advantages of great importance in non-destructive testing – image quality and consistent rugged behavior. Both result from Agfa’s advanced emulsion technology and ultramodern high-tech coating processes.



## Optimum Image Quality

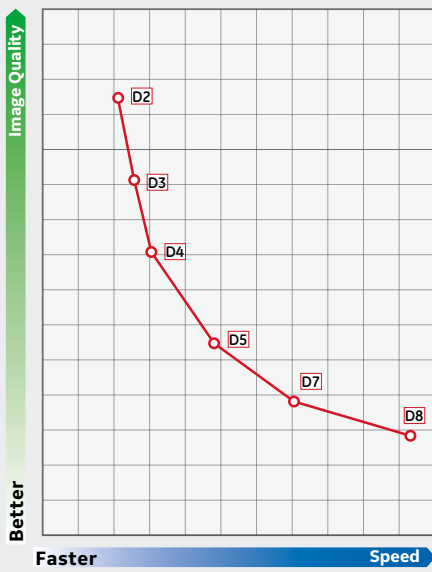
All STRUCTURIX films benefit from an Agfa emulsion breakthrough that provides increased contrast and maximum detail perceptibility. In fact, it results in the highest intrinsic defect recognition for each speed range. Even the smallest details can be interpreted with ease. The finished X-ray film has a high quality with a brilliant surface, and the image has a pleasant blue tint.

## Protective Coating

An important feature of the STRUCTURIX films is a special protective top coating resulting directly from Agfa’s Split Antistress Layer (SAL) technology. This top coat gives the films unique high resistance to pressure, scratching and creasing.

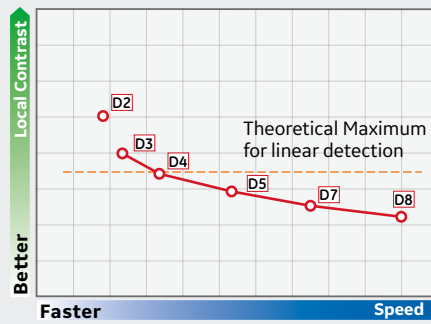
Another advantage of the top coat is that surface roughness has been optimized for problem free processing in automatic feeders such as the FEEDER.

## Technological Axis of STRUCTURIX D family



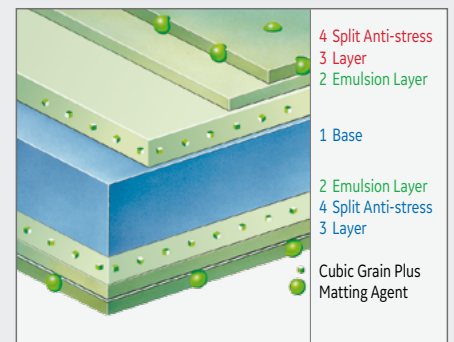
High image quality and perceptibility through optimization of "the signal to noise ratio" for every STRUCTURIX film.

## Optimization of Contrast



Contrast (signal) of all films is optimized to approach the maximum contrast for a linear detector (industrial X-ray Film), thereby optimizing image quality and perceptibility. An exception to the rule is D2, a super linear detector, where image quality is optimized through more than linear (extremely high) contrast in combination with very low noise.

## STRUCTURIX Quality... Rugged performance



The emulsion coatings are covered by two separate antistress layers (3 + 4). To achieve a rugged surface, the top layer has received the matting agent.

## Consistent Production Quality

STRUCTURIX films are manufactured in large quantities. To ensure they meet the most rigorous worldwide quality standards, they are produced at a single facility under tightly controlled conditions in an ultramodern coating room.

Agfa's Total Quality Management approach, certified by the ISO 9001-2000 label, is the foundation of the system leading to this exceptional performance in production consistency. People, production equipment, and organization all become one system, geared to consistency and continuous improvement.

It's what we call the "moving target" quality philosophy. Moving target means that to meet the increasing needs of our customers, quality has to be built into our products, not by additional testing, but by design. Agfa's emulsion technology, for example, helps to provide a highly homogeneous emulsion over the total coating area.

Not only do the STRUCTURIX films have outstanding quality, they also have an exceptionally high level of batch to batch uniformity.

## Consistent Processing Quality

STRUCTURIX films have a reputation for providing consistent and excellent results over a wide range of operating conditions. The Cubic Grain Plus technology is at the base of this consistent stable behavior. The extremely narrow grain size distribution, in combination with the cubic shape, assures that all exposed grains (latent image) will simultaneously develop the same density over a wide range of processing conditions. Moreover, they will do so rendering the very high contrast that is responsible for the high image quality.

## Darkroom Light Sensitivity

STRUCTURIX films may be exposed to darkroom safelight conditions longer without sensitometric fogging (ANSI PH 2.22). This means that brighter safelight illumination can be used, resulting in more ergonomic and efficient working conditions.

## Image Quality and Film System Classifications

Every application and every object require a specific class of industrial radiographic film or film system class which includes complementary film and film processing.

### A New Film System Classification

The introduction of the Industrial Film Systems Classification Standards EN 584-1, ASTM E-1815, ISO 11699-1 and JIS-K7627 provides an important means to assign film systems to the appropriate film system class.

These standards identify the various types of industrial X-ray film systems and classify them based on objectively quantified parameters that are the foundation of film imaging performance.

The standards for control of film processing EN 584-2 and ISO 11699-2 provide the means to control the processing at the processor user level. The objective is to make sure that a classified system will produce the expected capabilities in daily use.

As a result of being able to objectively determine the performance of a specific Film System (Film + Chemistry + Processing), film radiography remains the number one and most widely used NDT technique.

The classification system classifies a film inclusive of film processing (type and chemicals). This illustrates the importance of processing in relation to imaging.

The parameters are:

G2 (contrast) Net density:  $D = 2$

G4 (contrast) Net density:  $D = 4$

D (noise) Net density:  $D = 2$

$G/\sigma D$  Net density:  $D = 2$

These parameters are selected based on the insight into imaging theory applied to the industrial X-ray film systems. G is a measure of the signal gain factor and  $\sigma D$  indicates the noise, so that  $G/\sigma D$  represents the signal/ noise ratio.

In the context of growing quality awareness, the new perception of film system classification, described in EN 584, ASTM 1815, ISO 11699 and JIS-K7627, gradually became norm for the industry.

### Technical Specifications

Image Quality & Film System Classes				
Type	CEN EN 584-1	ASTM E 1815-96	ISO 11699-1	JIS- K7627
D2	C1	special	C1	T1
D3	C2	I	C2	T1
D4	C3	I	C3	T2
D5	C4	I	C4	T2
D7	C5	II	C5	T3
D8	C6	III	C6	T4

A/Automatic				Gradient G		$\sigma D$	$G/\sigma D$	ISO SPEED	DOSE m Gy
Type	CEN	ASTM E 1815-96	ISO 11699-1	DENS=2	DENS=4	DENS=2	DENS=2	S	D =2
D2	C1	special	C1	5.5	9.9	0.018	371	32	22.3
D3	C2	I	C2	5.4	9.7	0.020	294	64	14.0
D4	C3	I	C3	4.7	9.0	0.023	232	100	8.7
D5	C4	I	C4	4.6	8.0	0.028	169	200	4.6
D7	C5	II	C5	4.5	7.1	0.032	142	320	3.2
D8	C6	III	C6	4.4	7.0	0.039	114	400	2.2

Chemicals G 135/G 335 - development immersion time : 100 sec.  
Developing temperature: 28° C

B/Manual				Gradient G		$\sigma D$	$G/\sigma D$	ISO SPEED	DOSE m Gy
Type	CEN	ASTM E 1815-96	ISO 11699-1	DENS=2	DENS=4	DENS=2	DENS=2	S	D =2
D2	C1	special	C1	5.1	9.0	0.013	392	32	23.5
D3	C2	I	C2	4.8	8.4	0.016	303	64	14.0
D4	C3	I	C3	4.6	8.0	0.020	232	100	8.7
D5	C4	I	C4	4.	8.0	0.026	177	160	4.4
D7	C5	II	C5	4.6	8.0	0.032	144	320	3.2
D8	C6	III	C6	4.1	6.8	0.035	117	400	2.2

Chemicals G 128/G 328 - development immersion time : 300 sec.  
Developing temperature: 20° C

## BAM Certification

**Agfa was the first company in the world that can boast certification by BAM, the German Federal Institute for Materials Research and Testing.**

In addition to semi-annual product testing (design approval) and round robin tests recognizing the competence of the Agfa film lab, the certification process involves a quarterly production monitoring and an annual audit at the Agfa plant. The results are recorded in the corresponding certificates.

The most commonly used STRUCTURIX film systems based on the film types D4, D5 and D7 combined with G135 developer and G335 fixer are BAM certified. The German Federal Institute BAM conducted a thorough study and awarded the STRUCTURIX ECO Film System (5 min. cycle) the certificate of compliance to International Film System Classification Standards.

## ISO Certification

**GE's approach to quality control in the NDT industry**

At GE's Inspection Technologies business, we contend that obtaining an ISO certificate is only the beginning. Agfa was the first radiographic film manufacturer to achieve ISO certification for its STRUCTURIX films in 1990. Since then, we have continued the legacy of quality, assuring you that our entire film system – films, chemistry and equipment – is produced under a strict Quality Management System approved to ISO 9000. It's your guarantee of the superior quality of GE Measurement & Control products.

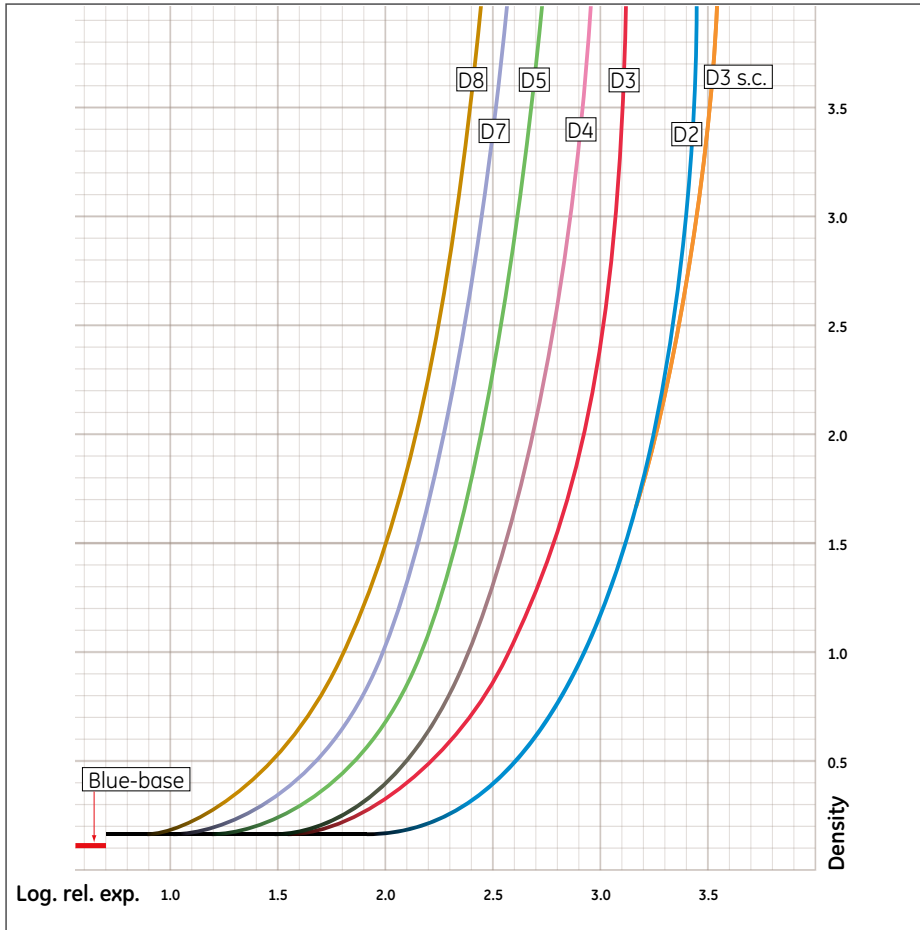


## Characteristics and Applications

<p><b>■ STRUCTURIX D2</b></p> <p>Extremely fine grain film with very high contrast. Ideal for exposures requiring the finest possible detail rendering.</p>	<ul style="list-style-type: none"> <li>• Electronic components</li> <li>• Composite materials</li> <li>• Castings (light metals and alloys)</li> <li>• Multiple film techniques</li> </ul>
<p><b>■ STRUCTURIX D3</b></p> <p>Ultra fine grain film with very high contrast. This film obtains a very high detail perceptibility, which meets the requirements of the most critical NDT applications. For exposure with lead screens, using either X-ray, gamma rays or radiation from megavolt equipment.</p>	<ul style="list-style-type: none"> <li>• Electronic components</li> <li>• Composite materials</li> <li>• Castings</li> <li>• Very high quality welds</li> <li>• Nuclear quality</li> <li>• Aerospace and aircraft industry</li> <li>• Multiple film techniques</li> </ul>
<p><b>■ STRUCTURIX D4</b></p> <p>Extra fine grain film with very high contrast. Suitable for a wide variety of critical applications. For exposure with lead screens, using either X-ray, gamma rays or radiation from megavolt equipment.</p>	<ul style="list-style-type: none"> <li>• Electronic components</li> <li>• Composite materials</li> <li>• Castings</li> <li>• Very high quality welds</li> <li>• Defense and nuclear industry</li> <li>• Aerospace and aerospace industry</li> <li>• Multiple film techniques</li> </ul>
<p><b>■ STRUCTURIX D5</b></p> <p>Very fine grain film with high contrast. Excellent for visualization of discontinuities. This film is intended for use with lead screens, using either X-ray or gamma rays.</p>	<ul style="list-style-type: none"> <li>• Welding</li> <li>• Castings</li> <li>• Shipbuilding</li> <li>• Aerospace and aircraft industry</li> <li>• Multiple film techniques</li> </ul>
<p><b>■ STRUCTURIX D7</b></p> <p>Fine grain film with high contrast and high speed. Designed for direct exposure or with lead screens. For exposure with lead screens, using either X-ray or gamma rays.</p>	<ul style="list-style-type: none"> <li>• Welding</li> <li>• Castings</li> <li>• Shipbuilding</li> <li>• Aerospace and aircraft industry</li> <li>• Multiple film techniques</li> </ul>
<p><b>■ STRUCTURIX D8</b></p> <p>Medium grain film with high contrast and very high speed. Suitable for a variety of applications. This film can be used for direct exposure or with lead screens. It gives good image quality with short exposure times. If even higher speed is required, fluorescent screens, in combination with F8 (not D8), should be used.</p>	<ul style="list-style-type: none"> <li>• Welding and casting</li> <li>• Defense industry</li> <li>• Aerospace and aircraft industry</li> <li>• Composite materials</li> <li>• Multiple film techniques</li> </ul>
<p><b>● STRUCTURIX WIDE LATITUDE FILMS</b></p> <p>The wide latitude films are specially designed for in-house radiography and to inspect wide range thickness objects such as castings.</p>	<ul style="list-style-type: none"> <li>• Concrete and heavy construction work</li> <li>• Castings</li> <li>• Multiple film techniques</li> </ul>
<p><b>● STRUCTURIX D4W</b></p> <p>An extra fine grain film with medium contrast and very high speed. The film can be used for direct exposure techniques or with lead screens.</p>	<ul style="list-style-type: none"> <li>• Castings and other multi-thickness objects</li> <li>• Ferrous and non ferrous castings</li> <li>• Non-critical welds</li> <li>• All non-classified materials inspection</li> </ul>
<p><b>● STRUCTURIX D6W</b></p> <p>A high contrast, fine grain film with medium contrast combining good image quality and wide latitude.</p>	

## Performance Characteristics

### Sensitometric Curves



STRUCTURIX D2, D3 s.c., D3, D4, D5, D7, D8 Exposure and processing parameters:  
200 kV, Pb screens, autom. proc., 8 min. cycle, devel G 135, 28°C

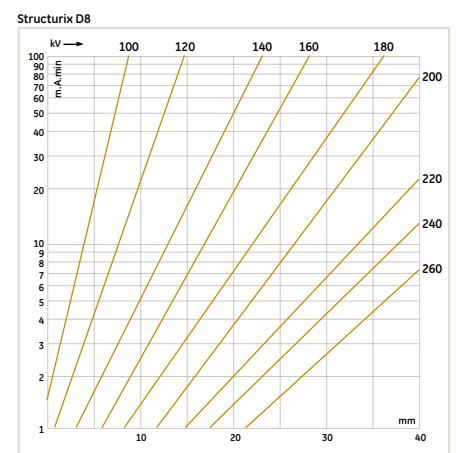
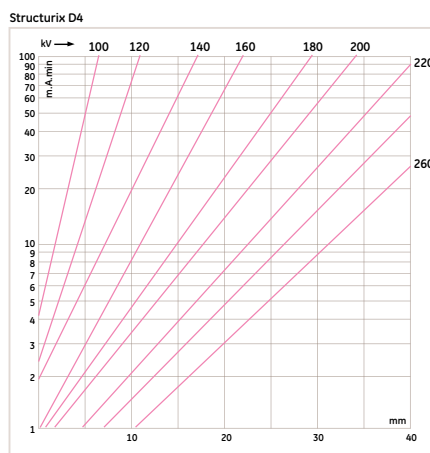
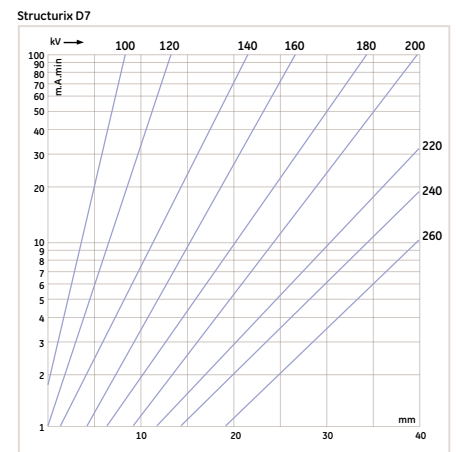
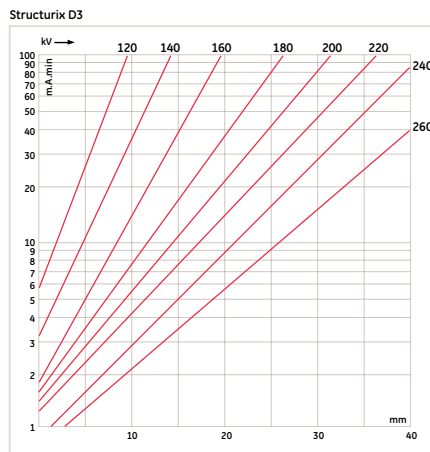
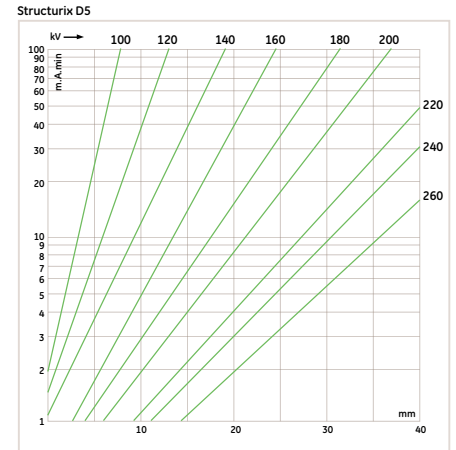
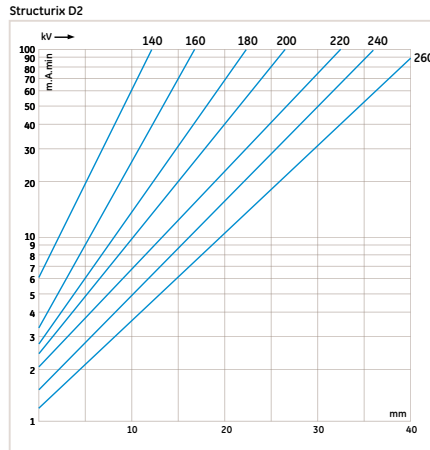
Relative Exposure Factors							
Type	100kV	200kV	Se75	Ir192	Co 60	Linac/8MeV	Contrast
STX D2	9.0	7.0	6.4	8.0	9.0	9.0	6.0
STX D3 s.c.	9.5	8.0					5.3
STX D3	4.1	4.3	3.6	5.0	5.0	5.1	5.5
STX D4	3.0	2.7	2.4	3.0	3.0	3.1	5.4
STX D5	1.7	1.5	1.4	1.5	1.5	1.5	5.4
STX D7	1.0	1.0	1.0	1.0	1.0	1.0	5.4
STX D8	0.6	0.65	0.6	0.6	0.6	0.6	4.3

## Exposure Diagrams

Exposure diagrams can be very useful for setting the correct exposure. The diagrams shown here are meant only as a guide, as the correct exposure will mainly depend on the variations of the object, the exposure equipment used and on the processing conditions.

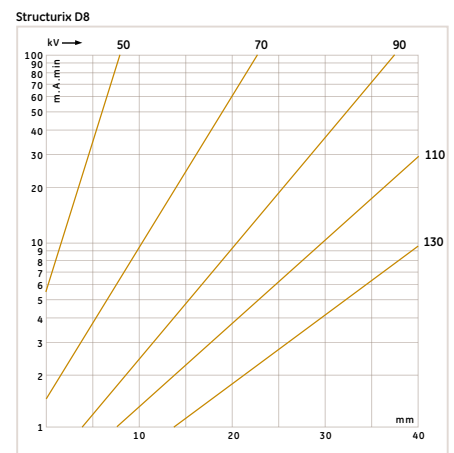
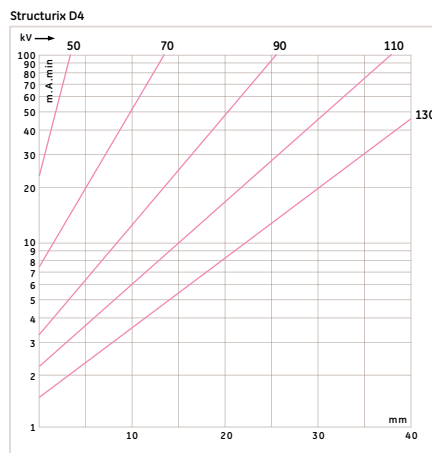
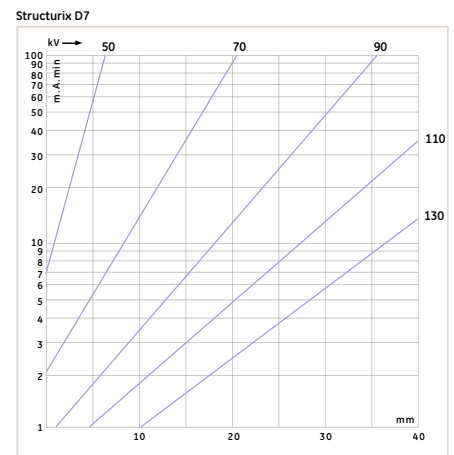
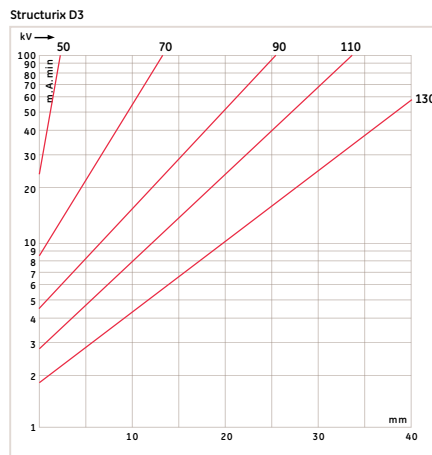
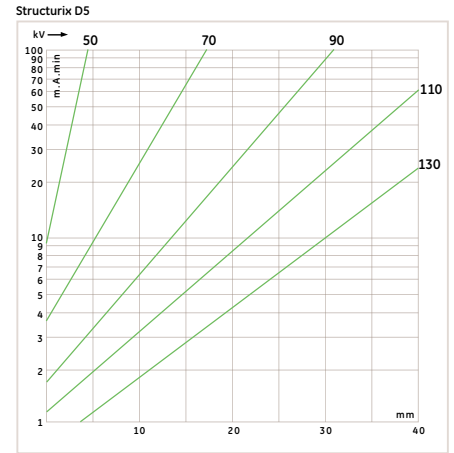
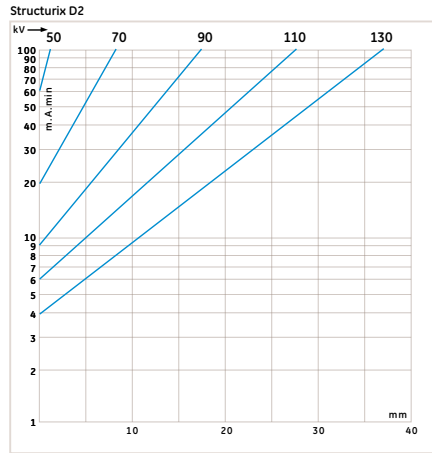
### Steel (Fe)

- Type of X-ray tube: constant potential
- Pb-screens
- Density: 2
- FFD: 1 m
- Autom. proc.: 8 min. cycle, G 135, 28°C



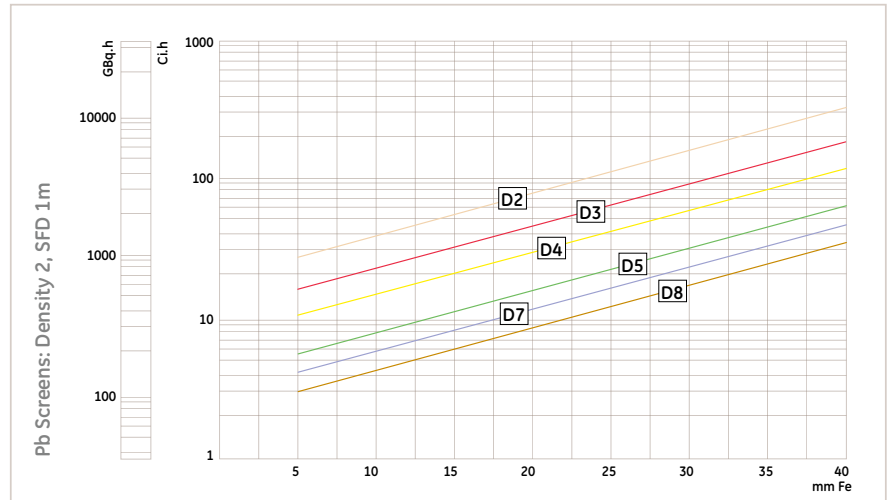
### Aluminum (Al)

- Type of X-ray tube: constant potential
- Density: 2
- FFD: 1 m
- Autom. proc.: 8 min. cycle, G 135, 28°C

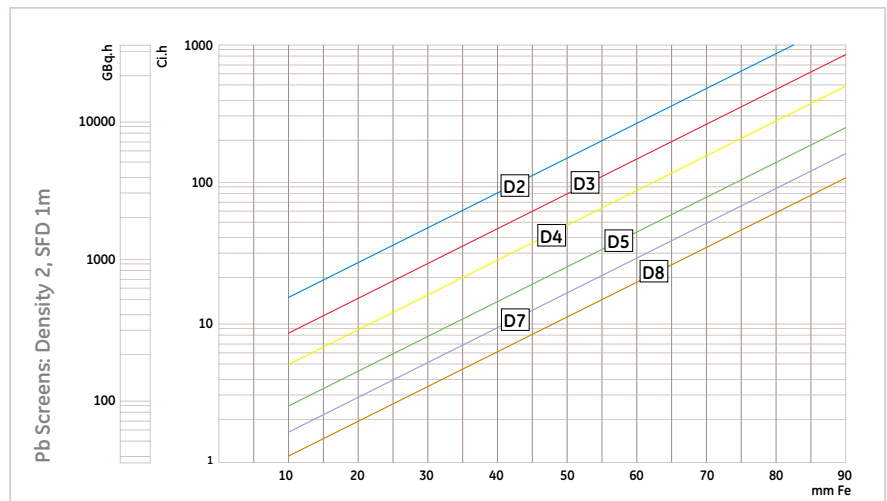


## Exposure Diagrams

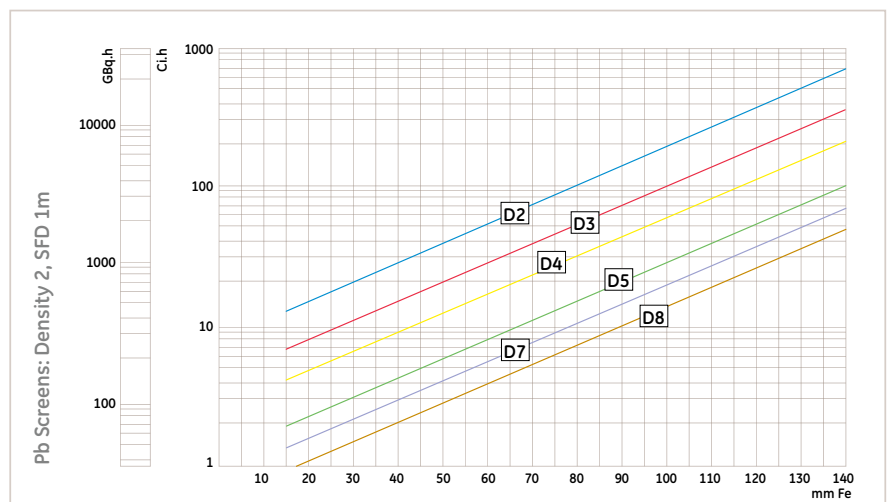
Selenium 75



Iridium 192



Cobalt 60





**AGFA**  
**STRUCTURIX**  
**VACUPAC**

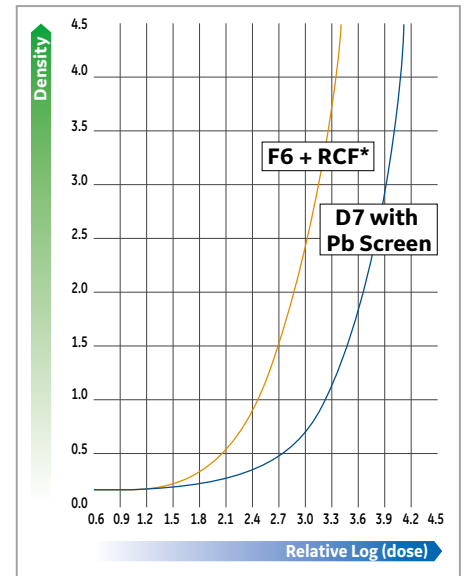
## Special Applications

### STRUCTURIX F6

As a result of further improvements in its core business of radiographic film for all applications, Agfa introduced a better product for rapid access radiography. STRUCTURIX F6 is specially designed for offshore pipelines or similar applications. Such areas need short exposure time through the use of fluorometallic screens and fast processing cycles. This F6 film type is mainly blue sensitive. All UV and blue-emitting screens can be used, but for industrial use, fluorometallic screens (cfr. STRUCTURIX RCF) based on CaWO<sub>4</sub> provide good quality.

Manual processing can be used but without the advantage of consistent rapid processing. This should only be used as an emergency solution.

### Sensitometric curves with RCF fluorometallic screens (300 kV)



STRUCTURIX F6 Film System	Relative Exposure		Image Quality	
	200 kV	Ir 192	Wire IQI (En 462-3)	Double Wire IQI (EN 462-5)
STX F6 + RCF Screens, 90 sec., Dry to Dry, G 135, 36°C	0.1	0.2	13	9
STX D7 Pb Screens*, 8 min., Dry to Dry, G 135, 28°C	1.0	1.0	13.5	12

\*D7 is considered not sensitive for fluorescent screens (no significant gain in exposure time)

### STRUCTURIX F6

Medium speed, high contrast fine grain film, preferably suited for use in combination with fluorometallic (RCF) or similar fluorescent screens. To be preferably processed in short cycle (90 sec.). If needed standard 8 min. cycle can be used alternatively for:

- Offshore pipelines
- Fast processing requirements

## Special Applications

### STRUCTURIX F8

Designed as a high quality film for fluorometallic (RCF) screen exposure when the speed obtainable with Pb screen system is insufficient or radiation safety is of prime importance.

Sensitive to all UV and blue-emitting screens. Calcium tungstate with lead or lead oxide backing, so called fluorometallic screens (STRUCTURIX RCF Screens), are most suited for industrial applications.

F8 with fluorescent screens is used in a variety of heavy construction applications, concrete, on stream examination of processing piping where X-ray energy has to be limited, flash radiography and microfocus enlargement techniques.

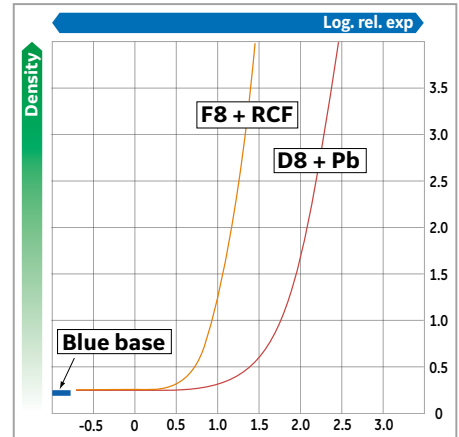
Relative exposure factor with fluorometallic screens depends on:

- temperature
- radiation energy
- exposure time

When maximum speed is important the use of very fast screens such as the STRUCTURIX 1200 screen can further reduce the exposure time by a factor of three to six compared to RCF screens. F8 is the ideal fast, high contrast, high definition film for fluorescent screen applications.

When higher sharpness is required we advise the use of D8 with Pb screens.

### Sensitometric curves with RCF fluorometallic screens ( 200 kV)



### STRUCTURIX F8

High speed, high contrast fine grain film, for exposures in combination with RCF fluorometallic screens or fluorescent screens.

- High system speed is main requirement
- On stream corrosion/erosion radiography
- Concrete and heavy constructions
- Low dosage output, e.g. microfocus



## STRUCTURIX Intensifying Screens

The STRUCTURIX range offers two intensifying screens: the RCF fluorometallic screen and the high speed 1200 fluorescent screen.

### Advantages

The STRUCTURIX RCF fluorometallic and fluorescent 1200 screens, based on the conventional phosphor material calcium tungsten (CaWO<sub>4</sub>), diminish radiation exposure and/or the necessary level of radiation energy. They enable the radiographic penetration of thick objects.

A more productive and effective testing method, the STRUCTURIX RCF and 1200 screens reduce the exposure equipment load. The flexible screens enable radiography of curved objects.

### Features

When excited by X-rays or gamma-rays, the STRUCTURIX RCF fluorometallic screen becomes blue emitting. The screen has an incorporated filter of lead oxide for scattered radiation. The emission spectrum is matched to the spectral sensitivity of the STRUCTURIX F type films. The strong fluorescent RCF screen offers the ideal compromise between detail perceptibility and working efficiency. The extra strong Electron-Beam-Cured (EBC) protective coating and the polyester support make the screen particularly durable.

One of the most important applications of the STRUCTURIX RCF screens lies in the inspection of offshore pipelines. Combining the screen sensitivity and rapid processing of the STRUCTURIX F6 film provides an ideal film-screen system. In the on-stream as well, the use of the RCF-screen, in combination with the F8 film, leads to considerable time savings.

The blue emitting STRUCTURIX 1200 fluorescent screen has an extremely high absorption and conversion efficiency, together with acceptable detail perceptibility. Combined with a STRUCTURIX F8 or even a F6 film, this film-screen system becomes convenient for high-energy applications, such as the non-destructive testing of heavy construction and the examination of large concrete structures (bridges and buildings). The STRUCTURIX 1200 screen can also be a solution for flash radiography in which exposure times are extremely short and for microfocus-enlargement techniques in which radiation doses are very low.

### Treatment of STRUCTURIX intensifying screens

The STRUCTURIX screens should be protected from moisture, heat and ultra-violet radiation. Dust and marks should be removed from the screen immediately, using an approved screen cleaner. In addition to cleaning the screen, the Agfa Screen Cleaner contains an anti-static element, which prevents dirt and dust caused by static electricity from adhering to the screen.

## STRUCTURIX Intensifying Screens

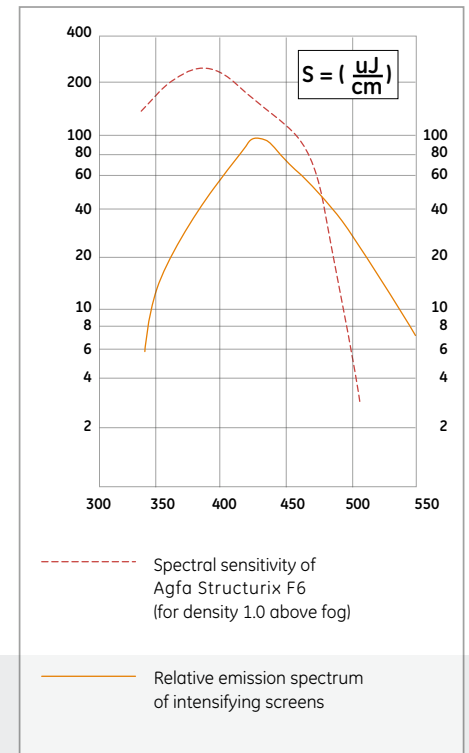
### Relative exposure factor

When making exposures with fluorescent screens, it is important to understand the potential impact of variables such as temperature, exposure energy and exposure time:

- Intensifying screens fluoresce more brilliantly at low temperature. Therefore, the screen efficiency will drop with increasing temperature

- With increasing energy, the absorption of fluorescent screens is reduced and, as a result, the intensifying effect is diminished
- Due to the “reciprocity effect” with fluorescent screen systems, the gain in exposure time compared to lead screen systems, diminishes with increasing exposure length

### Spectrogram



Relative Exposure		F8	F6	D7
100 kV	NDT 1200	0.010	0.049	
	RCF	0.030	0.174	
	No screen			1.000
300 kV	NDT 1200 + Pb	0.008	0.042	
	RCF	0.022	0.132	
	Pb			1.000
Ir 192	NDT 1200 + Pb	0.007	0.63	
	RCF	0.035	0.389	
	Pb			1.000
Co 60	NDT 1200 + Pb	0.006	0.096	
	RCF	0.040	0.562	
	Pb			1.000

## The Right Packaging for Every STRUCTURIX Film

GE offers different forms of packaging. Whatever the application of industrial radiography, there is a right STRUCTURIX film available, in the right packaging. No object is too large or too small. An X-ray film of the appropriate size is available for every exposure. STRUCTURIX films are supplied in all standard sheet and roll sizes (special sizes on demand) and in darkroom or daylight packaging.



### PRACTICAL DAYLIGHT PACKAGING

#### Time saving

STRUCTURIX film are packed on ultramodern packaging machines. This ready-to-use packaging can be placed directly on the object to be X-rayed, which saves valuable time that would otherwise be used to manually place the film in cassettes in the darkroom.

#### Improved quality

To guarantee optimal packaging quality, all films are packed automatically in an ISO 9001-2000 environment, using new lead screens for each. By excluding all so-called film faults, such as dust in the packaging and faults caused by the lead, the need for reshoots is eliminated, saving you time and money.

#### More economical

Ease of use, both during exposure and in the darkroom, and the avoidance of reshoots combine to provide maximum productivity.

#### Easy identification

The film type is clearly marked on all daylight film packages. "Pb" means the film is sandwiched between lead screens (0.027 mm). Daylight packed sheets have a center cross on the envelope to allow for easy positioning. Sheets are provided in a strong and easy-to-use, flip-top box. Rolls come in a rigid dispenser box.



### SHEET FILM IN DAYLIGHT PACKAGING

#### Pb VACUPAC

Completely light-tight, airtight and moisture proof Pb VACUPAC is the perfect daylight packaging. The STRUCTURIX X-ray films with Pb screens have a standard thickness of 0.027 mm and are vacuum-packed in a completely light tight, airtight and moisture proof foil complex. The foil, a spin off from space technology, is a metallic polymer involving the deposition of vaporized aluminum under vacuum. The synthetic foil ensures that VACUPAC can be used under extremely dirty and damp conditions. Pb VACUPAC is ideal for applications with energies higher than 100 kV.

#### Optimal image quality

The vacuum between the STRUCTURIX film and the lead screens guarantees optimal image definition. Film/screen contact is retained fully, even when VACUPAC is placed around a spherical or curved work piece.



#### Easy to use

Either side of the wrapper can be placed on the object to be tested. A center cross on the envelope allows easy positioning. In addition, VACUPAC can be opened in one simple movement, thanks to the easy peel-off feature.

Extra vacuum protection. Each pack of 100 sheets is supplied "in vacuo" to preserve the vacuum well beyond the expiration date.

## The Right Packaging for Every STRUCTURIX Film

### **Pb ETE (Edge-To-Edge)**

Edge-to-edge Pb versions are available for sheet sizes for that lack a VACUPAC version. A specific advantage of the edge-to-edge is its double-sided edge. This feature makes it possible to place the film against or between elements of a work piece easily and accurately. Opening the edge-to-edge packaging is as simple as tearing open the wrapper using the thread included for this purpose, then removing the film via the long side. The Pb edge-to-edge version is designed for exposures with energies higher than 100 kV and isotopes.

### **DW ETE (Edge-To-Edge)**

This light-tight, moisture proof and greaseproof packaging without Pb screen is ideal for exposures using radiation energy lower than 100 kV. The envelopes can be cut easily and taped for use with odd-shaped angles and corners. The envelopes are also easy to tape to the work piece.



### **ROLLS IN DAYLIGHT PACKAGING**

**Whether you X-ray pipelines, pressure vessels, airplanes or storage tanks, with roll film packaging you can determine the length of film yourself so that your radiographs can be made in one piece.**

#### **Easy to use**

Cassettes are unnecessary with ROLLPAC packaging. The film is packed in accordance with the edge-to-edge system. ROLLPAC can be placed accurately on the object to be tested (i.e., a long weld) or right into the corner of a flange. ROLLPAC is placed around the object and attached with adhesive tape. Identification of the exposure needs to occur only once. This time saving ROLLPAC packaging is supplied in a practical dispenser box.

#### **Opens quickly and easily**

The special design of the ROLLPAC wrapper allows quick and easy opening. The film is removed by taking the non-printed wrapper, together with the lead screen and the film in one hand and the printed wrapper and the other lead screen in the other. In this way, the film can be stripped easily from the packaging. ROLLPAC in wider formats (>10cm) has a tear strip on either side of the wrapper. This enables the film to be removed from the packaging easily and quickly.

#### **Length indication on the wrapper**

This feature allows you to easily determine where to cut the film and also to see how much film is left. The film can be cut to any length. Cutting should be done in the darkroom.

### **Pb ROLLPAC**

#### **Light-tight, moisture proof and greaseproof**

The film is sandwiched between two 0.027 mm lead screens. ROLLPAC packaging is completely light-tight. The packaging is resistant to moisture and grease.

#### **Optimal image quality**

Our unique packaging ROLLPAC ensures that excellent contact between the film and lead foil is retained when the media is applied to spherical or tubular objects, even those with a small diameter. Because the screens are only used once, optimal results are guaranteed.



For testing at higher radiation energy levels (>100 kV), i.e., welding in boilers, storage tanks and pipelines, Pb ROLLPAC is used.



### DW ROLLPAC

DW ROLLPAC packaging is specifically intended for material testing using low to very low radiation energy (<100 kV).

Widths up to 35 cm are available.



### ROLLPAC PRECUT

#### Highly economical

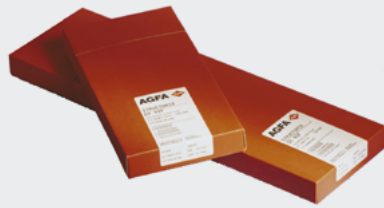
Films in ROLLPAC packaging can be supplied in precut lengths from 70 cm by special order only. This exclusive form of packaging is ideal for pipeline projects, which generally consist of large series of pipes of the same diameter. We can supply ROLLPAC precut in the length required for your project, saving you a considerable amount of time and money.

## The Right Packaging for Every STRUCTURIX Film

### SHEET FILM IN DARKROOM PACKAGING

**These films are for use with reloadable metal or plastic cassettes and exposure holders. The high level of darkroom lighting tolerated by STRUCTURIX D films allows more comfortable loading and unloading conditions.**

Because of its low cost, darkroom packaging appears to be the most economical solution for certain applications. However, the total radiography cost must be considered. For example, film handling costs in the darkroom and the cost of reshoots are important factors in figuring your investment. The added expense of cassettes and screens should also be taken into consideration. Local conditions must be considered and, most importantly, the cost of quality (the “you get what you pay for” theory). Simply put, low cost does not always equate to your best decision or best value. VACUPAC image quality cannot be obtained with the standard cassette system.



### NIF (Non Interleaved Films)

This is the most economical way to buy sheet film. The intrinsic film quality is the same as that of pre-packed film. Sheets of film are packed per 100 (except extremely large sizes) in a paalpo bag inside a cardboard box. The paalpo bags allow for easy film removal and re-closure.

### FW (Folder Wrapped)

Each film is wrapped in a paper folder to prevent handling faults in the darkroom. The paper folders make it easy to store and protect the films after processing. Folder wrapped packaging is an ideal solution for boxes that, after opening, remain in use for a period of time in areas of high humidity and temperature, as the folder prevents the films from sticking together. Sheets of film are packed per 100 in a sealed bag and placed in a strong cardboard box.



### OPTIMAL STORAGE OF STRUCTURIX FILMS

Handling and storage of X-ray film is an important aspect of the radiographical process. Guidelines are given in several international standards, i.e., ASTM E1254-97. Following are the recommendations for unexposed X-ray film.

First, storage facilities for unexposed X-ray films should provide adequate protection from any penetrating radiation. If the films are stored for longer than three months, background radiation may not exceed 90 nGy/h ( $18 \times 10^{-10}$  C/Kg/h). Films in containers sealed by the manufacturer should be stored with the films on edge, whenever possible. Storage temperature should be between 4.4°C and 23.8°C at a relative humidity range of 30 to 60 percent.

As higher temperatures accelerate certain physicochemical processes in the emulsion, STRUCTURIX films should always be stored in a cool place (within the above mentioned temperature range).

While films in opened packages are also affected by humidity, it is advisable to ensure that the relative humidity in the storage room remains under 60 percent.

It is also recommended that the films are not stored in the immediate vicinity of X-ray chemicals.

If STRUCTURIX films are handled and stored in accordance with the directions noted above, we guarantee their good quality at least until the expiration date on the box.



### ROLLS IN DARKROOM PACKAGING

#### BLR (Bulk Load Roll)

BLR is packaging with bare film on a cardboard core. This film can be cut to any length and loaded with or without lead screens in reloadable cassettes in the darkroom. Available in a standard width of 70 mm and in lengths of 167.75 m (550 ft.) and 305 m (1,000 ft.).

### TAILOR MADE PACKAGING

In addition to our standard products, special orders are available. These can include non-standard sheet sizes and other forms of packaging, such as Bi and Tri Packs. For special orders, please contact your Agfa agent. Bipack is an ETE daylight packaging containing two films. Tripack contains three films in one envelope. Combinations with lead screens are possible. Bipacks can also be supplied in DW ROLLPAC packaging.



[www.ge-mcs.com/en/radiography-x-ray/film-and-film-equipment](http://www.ge-mcs.com/en/radiography-x-ray/film-and-film-equipment)

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