FUJIFILM

●INSTRUCTION MANUAL●

PRESSURE MEASURING FILM

FUJI PRESCALE FILM

[TWO-SHEET TYPE FOR LOW PRESSURE]

❶ KIND

Six kinds of Prescale are supplied to comply with demands to measure a wide pressure range. Please select appropriate kind for your measurement.

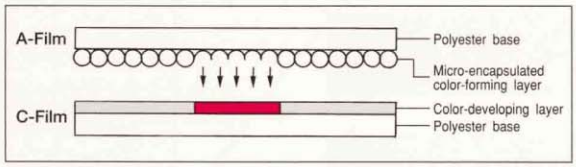
type	Film type	Pressure range[MPa] 1MPa≒10kgf/cm²≒145lbf/in² (0.2 0.5 0.6 2.5 10 50 130 300)	Product size W(mm)×L(m)
Two-sheet type	Ultra Super Low Pressure(LLLW)		270×5
	Super Low Pressure(LLW)		270×6
	Low Pressure(LW)		270×12
	Medium Pressure(MW)		270×12
Mono-sheet type	Medium Pressure(MS)		270×12
	High Pressure(HS)		270×12
	Super High Pressure(HHS)		270×12

＊With Super Low Pressure Film and the Prescale mat, measurements from 0.01～0.5MPa are possible.
＊＊Film type W:Two-sheet
S:mono-sheet

❷ STRUCTURE AND HOW IT WORKS

Structure

There are two types of Prescale; Two-sheet type and Mono-sheet type.
Two-sheet type: Composed of A-film and C-film. A-film is made of a PET base coated with the micro-encapsulated color-forming material. C-film is made of a PET base coated with the color-developing material. Have rough surfaces of the films face each other and insert them where you want to measure pressure.



How it works

When pressure is applied, the microcapsules are broken and the color-forming material reacts with the color-developing material to generate color. The microcapsules are designed to react according to the level of pressure and so the color density corresponds to the level of pressure.

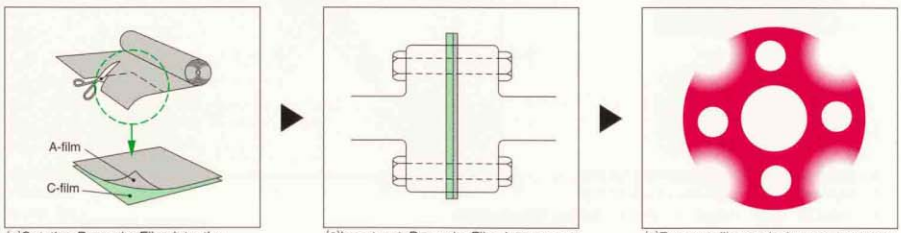
❸ PROPERTIES

Precision	±10% or less (measured by densitometer at 23℃/73.4°F, 65% RH)
Recommended temperature range	20℃～35℃(68°F～95°F)
Recommended humidity range	35%RH～80%RH

❹ HOW TO USE

Two-sheet type(Ultra super low～Medium pressure: LLLW～MW)
Cut the two films appropriately. (A-film in a black poly sack and C-film in a blue poly sack) Have the rough surface of films face each other and insert the films where you want to measure pressure. Apply pressure. Take out the C-film on which red patches have appeared. See and check the pressure distribution. To measure the C-film, place it on a few sheets of white paper with its PET base (smooth surface) on top. For further precise pressure values, please use the pressure measurement and analyzing systems described below.

Pressure Measurement Systems: FPD-305E/306E/307E　　Pressure Imaging and Analyzing System: FPD-9210



(1)Cut the Prescale Film into the required shape. With the Two-sheet film, make sure the coated sides on A-Film and C-Film face each other.

(2)Insert cut Prescale Film into area to be measured and apply pressure.

(3)Remove film and observe pressure distribution.

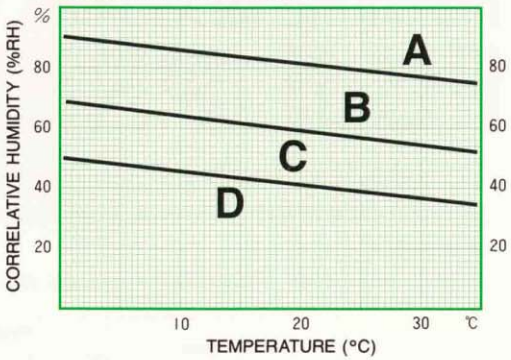
TWO-SHEET TYPE FOR LOW PRESSURE

STANDARD CONTINUOUS PRESSURE CHART

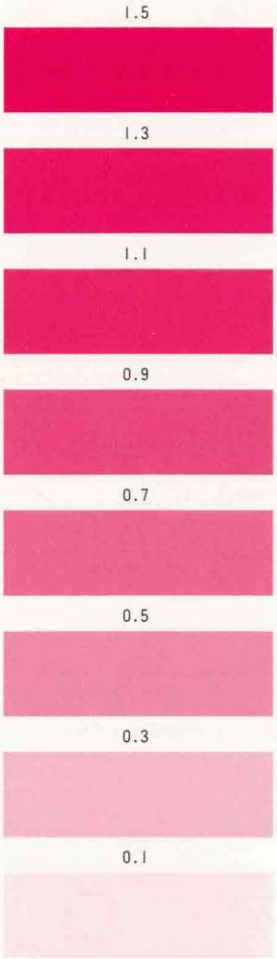
Measurement pressure range: 2.5–10MPa
- Pressure application conditions
  Time to reach the pressure to be measured: 2 min.
  Time of retention at the pressure to be measured: 2 min.

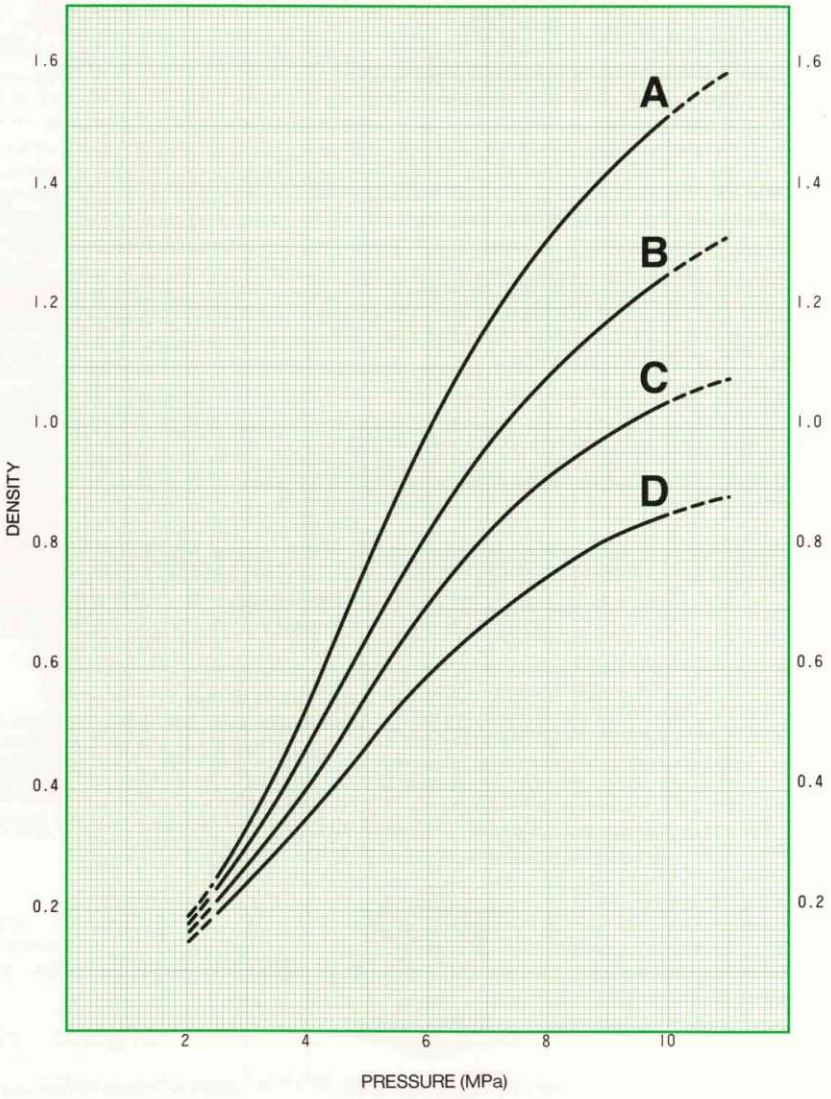
Check if the temperature and humidity meet with the conditions above when the pressure is applied.
(For example, if the room temperature is 25°C and the humidity factor is 60%RH, acquire the pressure from the B curve in the standard chart.)

GRAPH OF TEMPERATURE/ HUMIDITY CONDITIONS



STANDARD COLOR SAMPLE





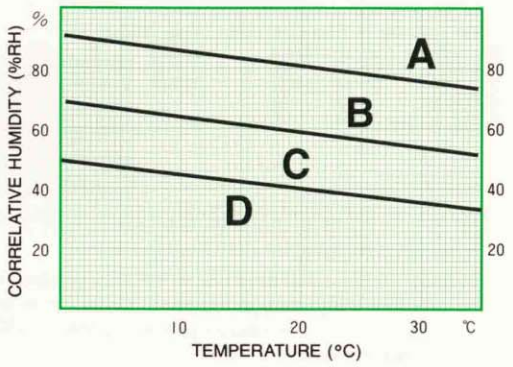
As the pressure range indicated by the broken line in the graph may exceed the permissible error range, it should be used for reference purposes only.

STANDARD MOMENTARY PRESSURE CHART

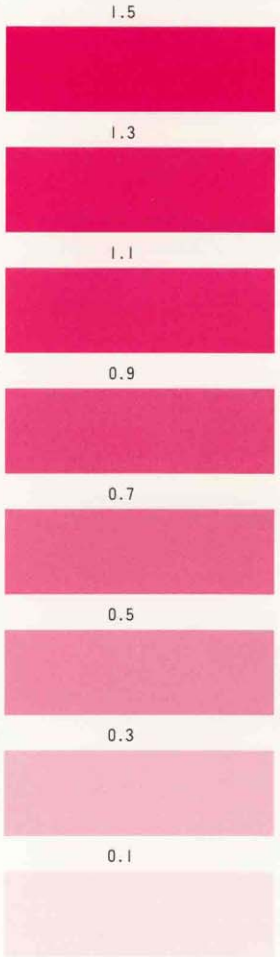
Measurement pressure range: 2.5–10MPa
- Pressure application conditions
  Time to reach the pressure to be measured: 5 sec.
  Time of retention at the pressure to be measured: 5 sec.

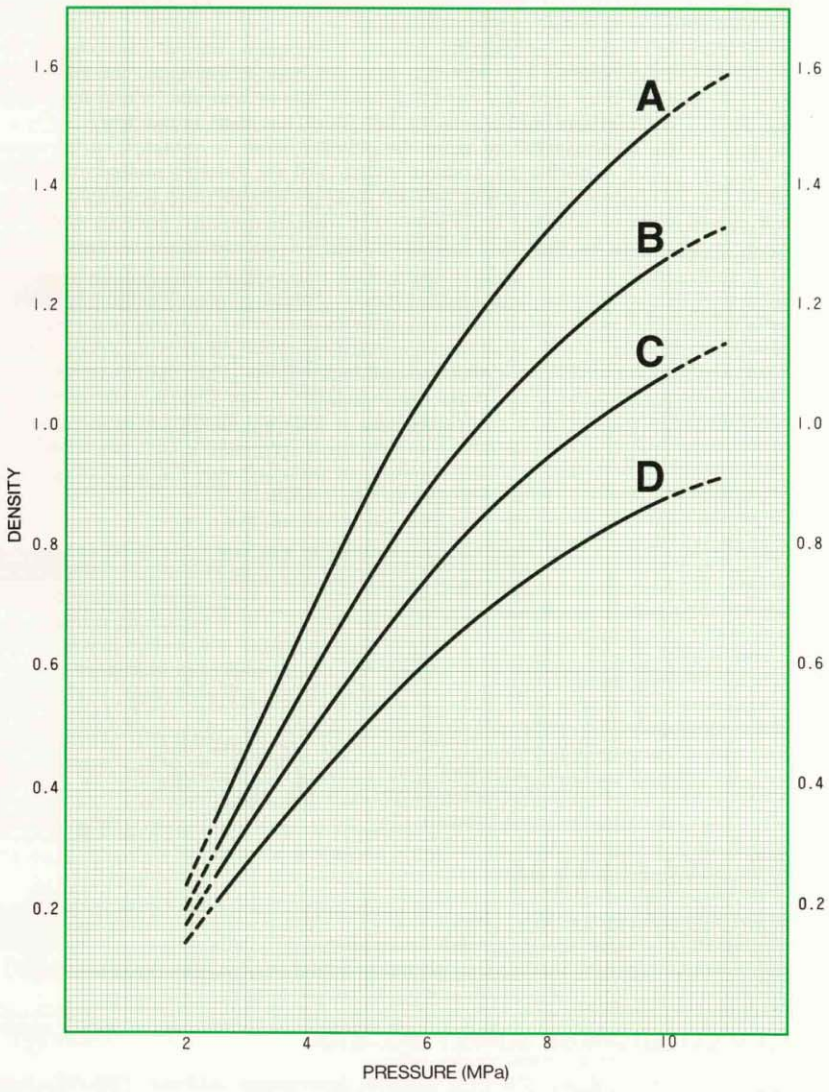
Check if the temperature and humidity meet with the conditions above when the pressure is applied.
(For example, if the room temperature is 25°C and the humidity factor is 60%RH, acquire the pressure from the B curve in the standard chart.)

GRAPH OF TEMPERATURE/ HUMIDITY CONDITIONS



STANDARD COLOR SAMPLE





As the pressure range indicated by the broken line in the graph may exceed the permissible error range, it should be used for reference purposes only.

❺ PACKAGE AND NUANCE OF PRESCALE COLOR

〈Package〉
The product is supplied in the form of two rolls. A-film with the PET base outside is in a black poly sack and C-film with the PET base inside is in a blue poly sack.

〈Color nuance〉
The nuance of Prescale color is as follows.

Two-sheet type	A-film	C-film
Ultra Super Low Pressure(LLLW)	Creamy	Whity
Super Low Pressure(LLW)	Yellowish	Whity
Low Pressure(LW)	Bluish	Whity
Medium Pressure(MW)	Reddish	Whity

❻ STANDARD CONDITIONS FOR APPLYING PRESSURE

〈Continuous Pressure〉
Gradually increase the pressure to the required level in two minutes and maintain the pressure for another two minutes. The pressure maintained at this level is referred to as continuous pressure.

〈Momentary Pressure〉
Apply pressure for five seconds and maintain the pressure for another five seconds. The pressure maintained at this level is referred to as momentary pressure.

❼ HOW TO DETERMINE THE PRESSURE LEVEL

Pressure distribution check by Prescale alone
When pressure is applied, red patches appear on Prescale. The red color density of Prescale changes depending on the amount of pressure applied. The area with deep red color indicates that the pressure applied was high and conversely the area with light red color indicates that the pressure applied was low. Place the Prescale on a few white sheets of paper with its PET base (smooth surface) on top and check the result in the light.

Pressure values determination by using the pressure chart
In order to roughly determine the pressure values, use the Prescale standard color sample and the pressure chart. Taking the temperature, the humidity and the pressure condition into consideration, you can determine the pressure values to a certain extent by selecting a pressure curve from the standard pressure chart. Place the Prescale on a few white sheets of paper with its PET base (smooth surface) on top and check the result in the light.

PRECAUTIONS ON USE

1) A-film reacts sensitively even to minute pressure. Don't hold tight or rub it before use.
2) Clean the measuring place beforehand. Water, oil or dust if present on the surface of Prescale, will hinder proper color density development.
3) Avoid friction between A and C-films. The films should be bound together at the edge if shearing force is expected during the measurement.
4) Use the Prescale at temperature 20℃～35℃ (68℉～95℉) and humidity 35%RH～80%RH. The result of measurement may not be accurate outside of this region.
5) Prescale is not reusable.
6) Use Prescale within the given shelf life.

PRECAUTIONS ON STORAGE

1) Keep Prescale from the direct sunlight and heat.
2) Don't contact Prescale with the following items:
   Diazo copying papers and carbon papers
   Water, oil, solvent and other chemicals
   Vinyl products and adhesive tapes
   Rubber products
   Papers written by marker pens
3) Keep unused Prescale in the black and blue poly sacks and store them in a box.
4) Keep used C-film in a paper bag.
5) Avoid having rough surfaces of used C-films face each other.

FUJIFILM

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