

- مثال ا: أوجد  $U_g$  بحسب المعطيات التالية :
- ❖ ثخانة العينة 20 مم و تعزيز اللحام 2 مم
  - ❖ المنبع : النشاط 20 كوري و القطر 2.5 مم و السماكة 0.3 مم
  - ❖ المسافة بين المنبع و الفيلم 30 سم
  - ❖ المصدر المشع  $Ir_{77}^{192}$  النشاط Ci 20 ← (RHM 500 mR/h/m)
  - ❖ حجم المنبع المشع = القطر 2.5 مم و سماكة 0.3 مم

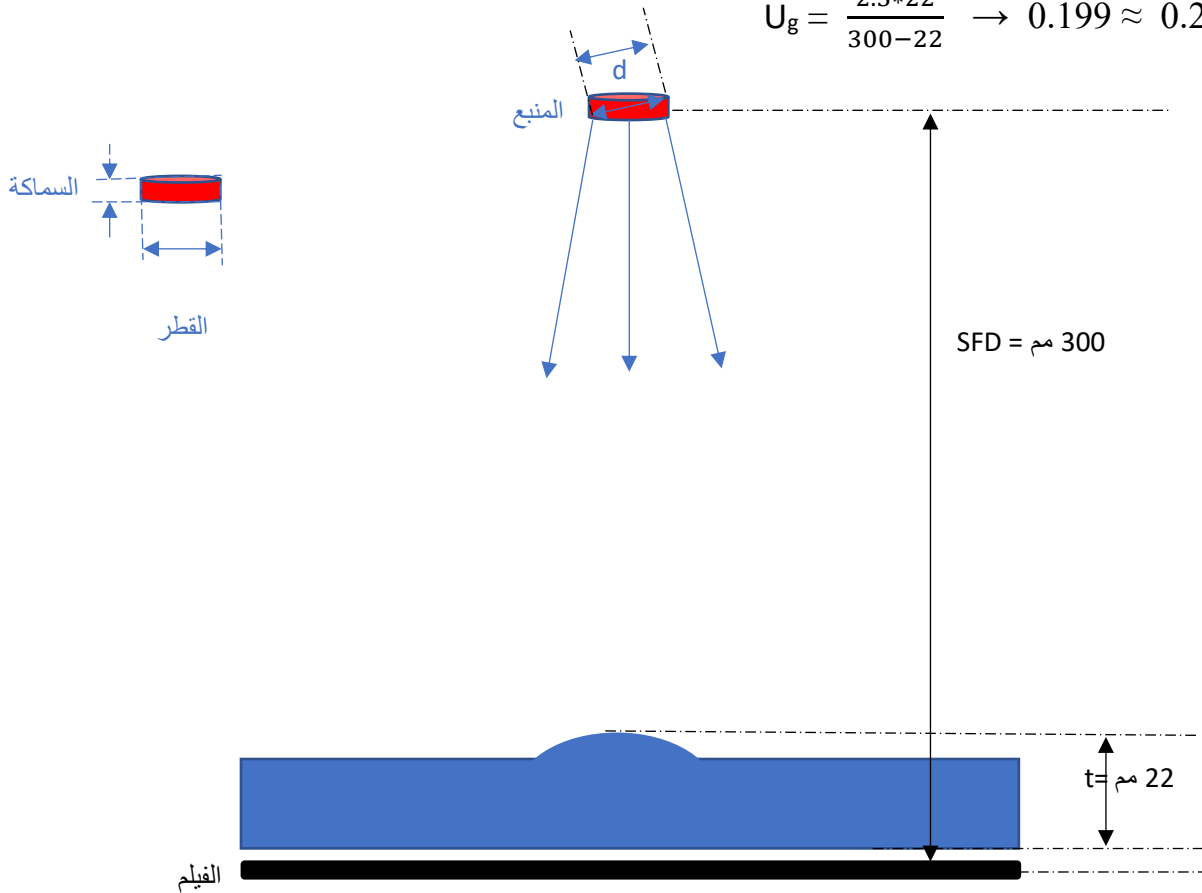
الحل :

$$ug = \frac{d*t}{SFD-t} \quad (\text{البنمبرا}) \quad \text{هندسي وضوح عدم}$$

الثخانة المعرّضة = ثخانة العينة 20 مم + ثخانة تعزيز اللحام 2 مم = 22 مم  
 المسافة بين الفيلم و المنبع SFD → 30 Cm → 300mm

$$d = \sqrt{2.5^2 + 0.3^2} = \sqrt{6.34} = 2.5 \quad \text{الحجم الفعال للمنبع :}$$

$$U_g = \frac{2.5*22}{300-22} \rightarrow 0.199 \approx 0.2$$



## source size $\gamma$ - ray

### Activity & Dimensions

#### Nominal Activity: Max Active Dimensions:

120 Ci	Ø3 mm x 3.0mm
100 Ci	Ø3 mm x 2.5 mm
80 Ci	Ø3 mm x 2.0 mm
70 Ci	Ø3 mm x 2.0 mm
60 Ci	Ø3 mm x 2.0 mm
50 Ci	Ø3 mm x 2.0 mm
40 Ci	Ø2 mm x 1.5 mm
30 Ci	Ø2 mm x 1.0 mm

### Specifications – Ir. 192

- Sources: high purity Iridium > 99.9%
- Capsule: Stainless Steel 316 L
- Half-life: 74.0 days
- Special fleet of Type B (u) transport containers
- Type A + B transport containers meet the IAEA transport regulations

#### RADIOACTIVE ISOTOPES IN SINGLE ENCAPSULATED FORM ON DISPOSABLE PIGTAIL

Product Code	Description	Dimensions
NCI0020	200Ci Ir. 192	3mm x 4mm
NCI0073	140Ci Ir. 192	3mm x 3mm
NCI0032	130Ci Ir. 192	3mm x 3mm
NCI0009	120Ci Ir. 192	3mm x 3mm
NCI0088	110Ci Ir. 192	3mm x 2.5mm
NCI0008	100Ci Ir. 192	3mm x 2.5mm
NCI0072	95Ci Ir. 192	3mm x 2.5mm
NCI0074	90Ci Ir. 192	3mm x 2.5mm
NCI0071	85Ci Ir. 192	3mm x 2mm
NCI0017	80Ci Ir. 192	3mm x 2mm
NCI0075	75Ci Ir. 192	3mm x 2mm
NCI0007	70Ci Ir. 192	3mm x 2mm
NCI0076	65Ci Ir. 192	3mm x 2mm
NCI0033	60Ci Ir. 192	3mm x 2mm
NCI0077	55Ci Ir. 192	3mm x 2mm
NCI0006	50Ci Ir. 192	3mm x 2mm
NCI0078	45Ci Ir. 192	3mm x 2mm
NCI0005	40Ci Ir. 192	2mm x 1.5mm
NCI0079	35Ci Ir. 192	2mm x 1.5mm
NCI0004	30Ci Ir. 192	2mm x 1mm
NCI0080	25Ci Ir. 192	2mm x 1mm
NCI0001	20Ci Ir. 192	2mm x 1mm

#### RADIOACTIVE ISOTOPES IN SINGLE ENCAPSULATED FORM ON RE-USABLE PIGTAIL

Product Code	Description	Dimensions
NCI0043	200Ci Ir. 192	3mm x 4mm
NCI0061	130Ci Ir. 192	3mm x 3mm
NCI0042	120Ci Ir. 192	3mm x 3mm
NCI0060	110Ci Ir. 192	3mm x 3mm
NCI0041	100Ci Ir. 192	3mm x 2.5mm
NCI0062	90Ci Ir. 192	3mm x 2.5mm
NCI0107	95Ci Ir. 192	3mm x 2mm
NCI0070	85Ci Ir. 192	3mm x 2mm
NCI0040	80Ci Ir. 192	3mm x 2mm
NCI0063	75Ci Ir. 192	3mm x 2mm
NCI0039	70Ci Ir. 192	3mm x 2mm
NCI0064	65Ci Ir. 192	3mm x 2mm
NCI0038	60Ci Ir. 192	3mm x 2mm
NCI0065	55Ci Ir. 192	3mm x 2mm
NCI0037	50Ci Ir. 192	3mm x 2mm
NCI0066	45Ci Ir. 192	3mm x 2mm
NCI0036	40Ci Ir. 192	2mm x 1.5mm
NCI0067	35Ci Ir. 192	2mm x 1.5mm
NCI0035	30Ci Ir. 192	2mm x 1mm
NCI0068	25Ci Ir. 192	2mm x 1mm
NCI0034	20Ci Ir. 192	2mm x 1mm

**RADIOACTIVE ISOTOPES IN DOUBLE ENCAPSULATED FORM ON DISPOSABLE PIGTAIL**

Product Code	Description	Dimensions
NCI004	120Ci Ir. 192	3mm x 3mm
NCI0045	100Ci Ir. 192	3mm x 2.5mm
NCI0046	80Ci Ir. 192	3mm x 2mm
NCI0047	70Ci Ir. 192	3mm x 2mm
NCI0048	60Ci Ir. 192	2mm x 2.5mm
NCI0049	50Ci Ir. 192	2mm x 2mm
NCI0050	40Ci Ir. 192	2mm x 1.5mm
NCI0051	30Ci Ir. 192	2mm x 1mm

**RADIOACTIVE ISOTOPES IN SINGLE ENCAPSULATED FORM FOR USE AS PILOT SOURCES FOR CRAWLERS**

Product Code	Description	Dimensions
NCI0089	20mCi Cs. 137	4.5 x 6mm x7 Capsule
NCI0101	30mCi Cs. 137	4.5 x 6mm x7 Capsule
NCI0102	50mCi Cs. 137	4.5 x 6mm x7 Capsule
NCI0103	80mCi Cs. 137	4.5 x 6mm x7 Capsule
NCI0104	100mCi Cs. 137	4.5 x 6mm x7 Capsule
NCI0091	10mCi Co. 60	4.5 x 6mm Capsule
NCI0092	20mCi Co. 60	4.5 x 6 mm Capsule

**x ray - source size**

**Features**

- Ceramic tubehead
- Efficient cooling
- Pulsed wave high voltage generator
- Energy savers
- Field operation
- Internal pressure gauge
- Heavy duty lock type connector
- 20m connecting cable
- Quick release SF6 valve
- Heavy duty rubber coated hand rings
- Holder for centering device filter and diaphragm

**Specifications**

- High voltage range: 100 – 300 kV
- Tube current range: 0.1 – 5 mA
- Duty cycle: 100%
- Insulation: SF6 gas
- Mains: 180 – 260 V
- Beam angle: 40°
- Focal spot size (IEC336): 2.5 x 2.5
- Inherent filtration: 1 Be mm
- Anode cooling type: Air
- Environmental operating temperature: Max 70°

**Portable Constant Potential X-Ray Units**

**Technical Data**

SMART System	160E/0.4	160E/1.5	160W	200	200E	200TH	200PC	225	225X	300HP
Typical applications/ Special benefits	– Designed for very short FFD e.g. aircraft industry – Especially suited for detection of smaller defects in radioscopic systems	– Suitable for inspection of composite materials, plastics and other easily penetrable materials	– Water cooling – Designed for very short FFD e.g. aircraft industry – Especially suited for detection of smaller defects in radioscopic systems	– Designed for medium-sized steel welds and thick aluminum parts	– Economical version of the SMART 200 with reduced duty cycle performance	– Crawler tubehead meant for OEM applications – Controlling of the tubehead via customer equipment	– Panoramic X-ray tubehead – Especially suitable for pipeline applications	– Designed for medium-sized steel welds and thick aluminum parts	– Like SMART 225 with an extended kV range down to 25 kV	– Designed for thick steel welds
High voltage Adjustment range	10-160 kV	10-160 kV	10-160 kV	60-200 kV	60-200 kV	50-200 kV	50-200 kV	70-225 kV	25-225 kV	50-300 kV
Adjustment increments	1 kV/step	1 kV/step	1 kV/step	1 kV/step	1 kV/step	1 kV/step	1 kV/step	1 kV/step	1 kV/step	1 kV/step
Tube current Adjustment range	2.0-6.0 mA	2.0-6.0 mA	2.0-6.0 mA	0.5-4.5 mA	0.5-4.5 mA	0.5-4.5 mA	0.5-4.5 mA	0.5-4.0 mA	0.5-4.0 mA	0.5-3.0 mA
Adjustment increments	0.1 mA/step	0.1 mA/step	0.1 mA/step	0.1 mA/step	0.1 mA/step	0.1 mA/step	0.1 mA/step	0.1 mA/step	0.1 mA/step	0.1 mA/step
Max. power	640 W	960 W	640 W	900 W	900 W	600 W	600 W	900 W	900 W	900 W
Focal spot size Acc. IEC 336	0.4 mm	1.5 mm	0.4 mm	1.5 mm	1.5 mm	0.3 x 3.0 mm	0.3 x 3.0 mm	1.5 mm	1.5 mm	1.5 mm
Acc. EN12543	1.0 mm	3.0 mm	1.0 mm	3.0 mm	3.0 mm	4.0 mm (0.4 mm x 4.0 mm)	4.0 mm (0.4 mm x 4.0 mm)	3.0 mm	3.0 mm	3.0 mm