

SIR-Spheres[®] Y-90 resin microspheres Radioactive Decay Chart

India - IST (UST+5.30)



The Activity You Want. The Coverage You Need.

4 Days Pre-Calibration				
IST (UTC +5.30)	Hours Before Cal	Decay Factor	Activity (GBq)	Million Spheres per GBq*
MIDNIGHT	100.5	2.965	8.89	5.0
	100	2.949	8.85	5.0
1:00 AM	99.5	2.933	8.80	5.1
	99	2.917	8.75	5.1
2:00 AM	98.5	2.901	8.70	5.1
	98	2.886	8.66	5.1
3:00 AM	97.5	2.870	8.61	5.2
	97	2.855	8.56	5.2
4:00 AM	96.5	2.839	8.52	5.2
	96	2.824	8.47	5.3
5:00 AM	95.5	2.809	8.43	5.3
	95	2.793	8.38	5.3
6:00 AM	94.5	2.778	8.34	5.3
	94	2.763	8.29	5.4
7:00 AM	93.5	2.749	8.25	5.4
	93	2.734	8.20	5.4
8:00 AM	92.5	2.719	8.16	5.5
	92	2.704	8.11	5.5
9:00 AM	91.5	2.690	8.07	5.5
	91	2.675	8.03	5.5
10:00 AM	90.5	2.661	7.98	5.6
	90	2.646	7.94	5.6
11:00 AM	89.5	2.632	7.90	5.6
	89	2.618	7.85	5.7
NOON	88.5	2.604	7.81	5.7
	88	2.590	7.77	5.7
1:00 PM	87.5	2.576	7.73	5.8
	87	2.562	7.69	5.8
2:00 PM	86.5	2.548	7.64	5.8
	86	2.534	7.60	5.9
3:00 PM	85.5	2.521	7.56	5.9
	85	2.507	7.52	5.9
4:00 PM	84.5	2.494	7.48	5.9
	84	2.480	7.44	6.0
5:00 PM	83.5	2.467	7.40	6.0
	83	2.454	7.36	6.0
6:00 PM	82.5	2.440	7.32	6.1
	82	2.427	7.28	6.1
7:00 PM	81.5	2.414	7.24	6.1
	81	2.401	7.20	6.2
8:00 PM	80.5	2.388	7.16	6.2
	80	2.375	7.13	6.2
9:00 PM	79.5	2.362	7.09	6.3
	79	2.350	7.05	6.3
10:00 PM	78.5	2.337	7.01	6.3
	78	2.324	6.97	6.4
11:00 PM	77.5	2.312	6.94	6.4
	77	2.299	6.90	6.4
MIDNIGHT	76.5	2.287	6.86	6.5

* Approximate average

3 Days Pre-Calibration				
IST (UTC +5.30)	Hours Before Cal	Decay Factor	Activity (GBq)	Million Spheres per GBq*
MIDNIGHT	76.5	2.287	6.86	6.5
	76	2.275	6.82	6.5
1:00 AM	75.5	2.262	6.79	6.6
	75	2.250	6.75	6.6
2:00 AM	74.5	2.238	6.71	6.6
	74	2.226	6.68	6.7
3:00 AM	73.5	2.214	6.64	6.7
	73	2.202	6.61	6.7
4:00 AM	72.5	2.190	6.57	6.8
	72	2.178	6.54	6.8
5:00 AM	71.5	2.167	6.50	6.8
	71	2.155	6.46	6.9
6:00 AM	70.5	2.143	6.43	6.9
	70	2.132	6.40	7.0
7:00 AM	69.5	2.120	6.36	7.0
	69	2.109	6.33	7.0
8:00 AM	68.5	2.097	6.29	7.1
	68	2.086	6.26	7.1
9:00 AM	67.5	2.075	6.22	7.1
	67	2.064	6.19	7.2
10:00 AM	66.5	2.053	6.16	7.2
	66	2.042	6.12	7.3
11:00 AM	65.5	2.031	6.09	7.3
	65	2.020	6.06	7.3
NOON	64.5	2.009	6.03	7.4
	64	1.998	5.99	7.4
1:00 PM	63.5	1.987	5.96	7.5
	63	1.976	5.93	7.5
2:00 PM	62.5	1.966	5.90	7.5
	62	1.955	5.87	7.6
3:00 PM	61.5	1.945	5.83	7.6
	61	1.934	5.80	7.7
4:00 PM	60.5	1.924	5.77	7.7
	60	1.913	5.74	7.7
5:00 PM	59.5	1.903	5.71	7.8
	59	1.893	5.68	7.8
6:00 PM	58.5	1.882	5.65	7.9
	58	1.872	5.62	7.9
7:00 PM	57.5	1.862	5.59	8.0
	57	1.852	5.56	8.0
8:00 PM	56.5	1.842	5.53	8.0
	56	1.832	5.50	8.1
9:00 PM	55.5	1.822	5.47	8.1
	55	1.813	5.44	8.2
10:00 PM	54.5	1.803	5.41	8.2
	54	1.793	5.38	8.3
11:00 PM	53.5	1.783	5.35	8.3
	53	1.774	5.32	8.4
MIDNIGHT	52.5	1.764	5.29	8.4

* Approximate average

2 Days Pre-Calibration				
IST (UTC +5.30)	Hours Before Cal	Decay Factor	Activity (GBq)	Million Spheres per GBq*
MIDNIGHT	52.5	1.764	5.29	8.4
	52	1.755	5.26	8.4
1:00 AM	51.5	1.745	5.24	8.5
	51	1.736	5.21	8.5
2:00 AM	50.5	1.726	5.18	8.6
	50	1.717	5.15	8.6
3:00 AM	49.5	1.708	5.12	8.7
	49	1.699	5.10	8.7
4:00 AM	48.5	1.690	5.07	8.8
	48	1.680	5.04	8.8
5:00 AM	47.5	1.671	5.01	8.9
	47	1.662	4.99	8.9
6:00 AM	46.5	1.653	4.96	9.0
	46	1.644	4.93	9.0
7:00 AM	45.5	1.636	4.91	9.1
	45	1.627	4.88	9.1
8:00 AM	44.5	1.618	4.85	9.2
	44	1.609	4.83	9.2
9:00 AM	43.5	1.601	4.80	9.3
	43	1.592	4.78	9.3
10:00 AM	42.5	1.583	4.75	9.4
	42	1.575	4.72	9.4
11:00 AM	41.5	1.566	4.70	9.5
	41	1.558	4.67	9.5
NOON	40.5	1.550	4.65	9.6
	40	1.541	4.62	9.6
1:00 PM	39.5	1.533	4.60	9.7
	39	1.525	4.57	9.7
2:00 PM	38.5	1.516	4.55	9.8
	38	1.508	4.52	9.8
3:00 PM	37.5	1.500	4.50	9.9
	37	1.492	4.48	9.9
4:00 PM	36.5	1.484	4.45	10.0
	36	1.476	4.43	10.0
5:00 PM	35.5	1.468	4.40	10.1
	35	1.460	4.38	10.2
6:00 PM	34.5	1.452	4.36	10.2
	34	1.444	4.33	10.3
7:00 PM	33.5	1.437	4.31	10.3
	33	1.429	4.29	10.4
8:00 PM	32.5	1.421	4.26	10.4
	32	1.413	4.24	10.5
9:00 PM	31.5	1.406	4.22	10.5
	31	1.398	4.19	10.6
10:00 PM	30.5	1.391	4.17	10.7
	30	1.383	4.15	10.7
11:00 PM	29.5	1.376	4.13	10.8
	29	1.368	4.10	10.8
MIDNIGHT	28.5	1.361	4.08	10.9

* Approximate average

1 Day Pre-Calibration				
IST (UTC +5.30)	Hours Before Cal	Decay Factor	Activity (GBq)	Million Spheres per GBq*
MIDNIGHT	28.5	1.361	4.08	10.9
	28	1.354	4.06	11.0
1:00 AM	27.5	1.346	4.04	11.0
	27	1.339	4.02	11.1
2:00 AM	26.5	1.332	4.00	11.1
	26	1.325	3.97	11.2
3:00 AM	25.5	1.318	3.95	11.3
	25	1.310	3.93	11.3
4:00 AM	24.5	1.303	3.91	11.4
	24	1.296	3.89	11.4
5:00 AM	23.5	1.289	3.87	11.5
	23	1.282	3.85	11.6
6:00 AM	22.5	1.275	3.83	11.6
	22	1.269	3.81	11.7
7:00 AM	21.5	1.262	3.79	11.8
	21	1.255	3.76	11.8
8:00 AM	20.5	1.248	3.74	11.9
	20	1.241	3.72	11.9
9:00 AM	19.5	1.235	3.70	12.0
	19	1.228	3.68	12.1
10:00 AM	18.5	1.221	3.66	12.1
	18	1.215	3.64	12.2
11:00 AM	17.5	1.208	3.62	12.3
	17	1.202	3.61	12.3
NOON	16.5	1.195	3.59	12.4
	16	1.189	3.57	12.5
1:00 PM	15.5	1.182	3.55	12.5
	15	1.176	3.53	12.6
2:00 PM	14.5	1.170	3.51	12.7
	14	1.163	3.49	12.7
3:00 PM	13.5	1.157	3.47	12.8
	13	1.151	3.45	12.9
4:00 PM	12.5	1.145	3.43	13.0
	12	1.139	3.42	13.0
5:00 PM	11.5	1.132	3.40	13.1
	11	1.126	3.38	13.2
6:00 PM	10.5	1.120	3.36	13.2
	10	1.114	3.34	13.3
7:00 PM	9.5	1.108	3.32	13.4
	9	1.102	3.31	13.5
8:00 PM	8.5	1.096	3.29	13.5
	8	1.090	3.27	13.6
9:00 PM	7.5	1.084	3.25	13.7
	7	1.079	3.24	13.7
10:00 PM	6.5	1.073	3.22	13.8
	6	1.067	3.20	13.9
11:00 PM	5.5	1.061	3.18	14.0
	5	1.056	3.17	14.0
MIDNIGHT	4.5	1.050	3.15	14.1

* Approximate average

Day of Calibration				
IST (UTC +5.30)	Hours Before Cal	Decay Factor	Activity (GBq)	Million Spheres per GBq*
MIDNIGHT	4.5	1.050	3.15	14.1
	4	1.044	3.13	14.2
1:00 AM	3.5	1.039	3.12	14.3
	3	1.033	3.10	14.4
2:00 AM	2.5	1.027	3.08	14.4
	2	1.022	3.07	14.5
3:00 AM	1.5	1.016	3.05	14.6
	1	1.011	3.03	14.7
4:00 AM	0.5	1.005	3.02	14.7
	0	1.000	3.00	14.8
5:00 AM	-0.5	0.995	2.98	14.9
	-1	0.989	2.97	15.0
6:00 AM	-1.5	0.984	2.95	15.1
	-2	0.979	2.94	15.2
7:00 AM	-2.5	0.973	2.92	15.2
	-3	0.968	2.90	15.3
8:00 AM	-3.5	0.963	2.89	15.4
	-4	0.958	2.87	15.5
9:00 AM	-4.5	0.953	2.86	15.6
	-5	0.947	2.84	15.7
10:00 AM	-5.5	0.942	2.83	15.7
	-6	0.937	2.81	15.8
11:00 AM	-6.5	0.932	2.80	15.9
	-7	0.927	2.78	16.0
NOON	-7.5	0.922	2.77	16.1
	-8	0.917	2.75	16.2
1:00 PM	-8.5	0.912	2.74	16.3
	-9	0.907	2.72	16.3
2:00 PM	-9.5	0.902	2.71	16.4
	-10	0.898	2.69	16.5
3:00 PM	-10.5	0.893	2.68	16.6
	-11	0.888	2.66	16.7
4:00 PM	-11.5	0.883	2.65	16.8
	-12	0.878	2.63	16.9
5:00 PM	-12.5	0.874	2.62	17.0
	-13	0.869	2.61	17.1
6:00 PM	-13.5	0.864	2.59	17.2
	-14	0.860	2.58	17.3
7:00 PM	-14.5	0.855	2.56	17.3
	-15	0.850	2.55	17.4
8:00 PM	-15.5	0.846	2.54	17.5
	-16	0.841	2.52	17.6
9:00 PM	-16.5	0.837	2.51	17.7
	-17	0.832	2.50	17.8
10:00 PM	-17.5	0.828	2.48	17.9
	-18	0.823	2.47	18.0
11:00 PM	-18.5	0.819	2.46	18.1
	-19	0.814	2.44	18.2
MIDNIGHT	-19.5	0.810	2.43	18.3

* Approximate average

POST-CALIBRATION				
IST (UTC +5.30)	Hours Before Cal	Decay Factor	Activity (GBq)	Million Spheres per GBq*
MIDNIGHT	-19.5	0.810	2.43	18.3
	-20	0.806	2.42	18.4
1:00 AM	-20.5	0.801	2.40	18.5
	-21	0.797	2.39	18.6
2:00 AM	-21.5	0.793	2.38	18.7
	-22	0.788	2.36	18.8
3:00 AM	-22.5	0.784	2.35	18.9
	-23	0.780	2.34	19.0
4:00 AM**	-23.5	0.776	2.33	19.1
	-24	0.771	2.31	19.2

* Approximate average

** Dose Expires 4:30AM IST

To calculate the number of spheres drawn from a vial divide the activity drawn by the total activity in the vial, then multiply that number by 44.48 million.

On average, there are 44 million spheres in each SIR-Spheres Y-90 resin microspheres delivery vial with a standard deviation of 2.6 million.

Engineering test results on file.

Intended Use: SIR-Spheres microspheres are intended for implantation into hepatic tumors via the hepatic artery. **Indications For Use:** SIR-Spheres Y-90 resin microspheres are approved or licensed for use in Argentina, Australia, Brazil, Canada, Switzerland, Turkey, and several countries in Asia for the treatment of patients with advanced non-operable liver cancer. **Warnings:** Inadvertent delivery of the microspheres to locations other than the intended hepatic tumor may result in local radiation damage. Due to the radioactivity and the significant consequences of misplacing the microspheres in situ, this product must be implanted by physicians who have completed the Sirtex TEC training program. **Precautions:** A SPECT scan of the upper abdomen may be performed immediately after implantation to confirm placement of the microspheres in the liver. Patients may experience abdominal pain immediately after implantation. Gastric acid blocking agents may be administered the day before implantation and continued as needed to reduce gastric complications. Safety and effectiveness of this device in pregnant women, nursing mothers or children has not been established. SIR-Spheres microspheres demonstrated a mild sensitization potential when tested dermally in an animal model. **Adverse Events:** Common side effects include fever, mild to moderate abnormality of liver function tests, abdominal pain, nausea, vomiting, and diarrhea. Potential serious adverse events due to exposure to high radiation include acute pancreatitis, radiation pneumonitis, acute gastritis, radiation hepatitis, and acute cholecystitis. **Contraindications:** SIR-Spheres Y-90 resin microspheres are contraindicated (must not be implanted) in patients who have either had previous external beam radiation therapy to the liver; ascites or are in clinical liver failure. This device is contraindicated in patients with markedly abnormal synthetic and excretory liver function tests; greater than 20% lung shunting of the hepatic artery blood flow; will be treated with capecitabine after implantation or has been treated with capecitabine within the two previous months. This device must not be implanted in patients determined via pre-assessment angiogram to have an abnormal vascular anatomy that would result in significant reflux of the hepatic arterial blood flow to the stomach, pancreas, or bowel. **General Information:** SIR-Spheres Y-90 resin microspheres are radioactive and should thus be handled in accordance with all applicable standards and regulations.

Consult the Instructions for Use for a complete listing of indications, contraindications, side effects, warnings, and precautions.

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