

## Foam Skin Insulated & LAP Sheathed Jelly Filled Cables to RUS (REA) PE-89

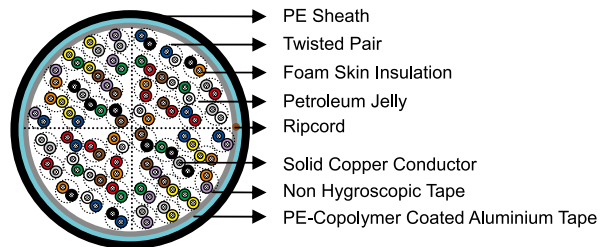
### APPLICATION

The cables are designed for use in access or trunk networks, from telephone exchange to subscriber area. The cables are suitable for installation in ducts, direct burial in the ground and also for aerial installation with integral suspension strand. Jelly filled option is for subscriber's cables installed underground or along the edge of pavement. An armoured option is offered for direct burial installations where additional mechanical or rodent protection is required. A figure-8 self support option is offered for aerial installation.



### STANDARDS

- RUS(REA) PE-89 (RUS 7 CFR 1755.890)



### CONSTRUCTION

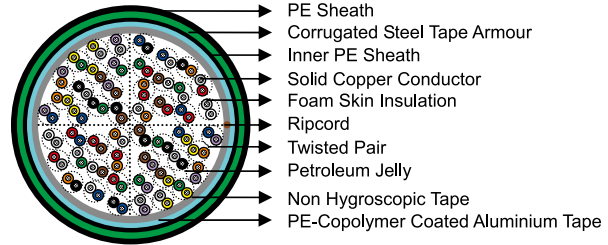
- **Conductors:** Solid annealed bare copper, 0.4/0.5/0.63/0.9mm as per ASTM B-3/class1 of IEC 60028.
- **Insulation:** Foam Skin which is a composite polyethylene insulation made of an inner cellular layer and an outer solid skin as per ASTM D 1248/IEC 60708.
- **Twisted Pairs:** Insulated conductors are twisted into pairs with varying lay length to minimize crosstalk.
- **Cabling Element:** Twisted Pairs.
- **Cable Core Assembly:** Cables of 25 pairs or less are assembled into cylindrical core. Cables larger than 25 pairs are assembled into units, which are then used to form the core Units are identified by colour coded binders. Standard construction is per RUS(REA) PE-89 given in Cable Make Up Diagram.
- **Core Wrapping:** One or more non-hygroscopic polyester tapes are helically or longitudinally laid with an overlap. These tapes furnish thermal, mechanical as well as high dielectric protection between shielding and individual conductors.
- **Moisture Barrier:** A corrugated copolymer coated aluminium tape (0.2mm/8mil) is applied directly over the cable core to provide 100% electrical shielding coverage and ensure a barrier against water vapor.
- **Filling:** The cable core interstices are filled with petroleum jelly to avoid longitudinal water penetration within the cable. The water resistant filling compound is applied to the air space between non-hygroscopic tape and shield, shield and sheath within the cable core.
- **Sheath:** Black low density polyethylene as per ASTM D 1248/IEC 60708, being able to withstand exposure to sunlight, temperature variations, ground chemicals and other environmental contaminants.
- **Ripcord (optional):** Ripcord may be provided for slitting the sheath longitudinally to facilitate its removal.
- **Spare Pairs (optional):** Spare pairs may be incorporated for large pair cables.
- **Continuity Wire (optional):** One tinned copper drain wire may be longitudinally laid to ensure electrical continuity of the screen.



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## OUTDOOR TELEPHONE CABLES

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### OPTIONAL CONSTRUCTION

- **Armoured Cable:** Corrugated copolymer coated steel tape armour (0.15mm/6mil) is applied with an overlap over an optional inner polyethylene sheath. An outer polyethylene sheath is applied over the armour.
- **Self-Support Cables:** A 7-strand galvanized steel strand is used as support wire. Black polyethylene sheath covers both core and support wire in a figure-8 construction.

### ELECTRICAL PROPERTIES

Nominal Conductor Diameter	mm	0.4	0.5	0.63	0.9
Conductor Gauge Size	AWG	26	24	22	19
Maximum Average DC Resistance	Ω/km / Ω/mile	140/225	87/140	55/88.6	27.0/43.4
Maximum Individual DC Resistance	Ω/km / Ω/mile	144.2/232	89.5/144	56.5/91.0	28.0/45.0
Minimum Insulation Resistance @500V DC	MΩ·km / MΩ·mile	1600/1000	1600/1000	1600/1000	1600/1000
Maximum Average Resistance Unbalance	%	1.5	1.5	1.5	1.5
Maximum Individual Resistance Unbalance	%	5	5	5	5
Average Mutual Capacitance	nF/km / nF/kft	48.5-54.0 /14.8-16.5	48.5-54.0 /14.8-16.5	48.5-54.0 /14.8-16.5	48.5-54.0 /14.8-16.5
Maximum Individual Mutual Capacitance	nF/km / nF/kft	57/17.4	57/17.4	57/17.4	57/17.4
Maximum Individual Capacitance Unbalance pair-to-pair	pF/km / pF/kft	145/44	145/44	145/44	145/44
Capacitance Unbalance RMS pair-to-pair	pF/km / pF/kft	45/13.7	45/13.7	45/13.7	45/13.7
Maximum Individual Capacitance Unbalance pair-to-ground	pF/km / pF/kft	2625/800	2625/800	2625/800	2625/800
Maximum Average Capacitance Unbalance pair-to-ground	pF/km / pF/kft	574/175	574/175	574/175	574/175
Maximum Conductor Loop Resistance @20°C	Ω/km / Ω/mile	300/482	192/309	114/183.6	60/96.4
Impedance @1KHz	Ω	994	796	660	445
Impedance @100KHz	Ω	147	134	125	122
Impedance @512KHz	Ω	120	118	117	116
Impedance @1MHz	Ω	117	115	114	113
Maximum Average Attenuation @0.8KHz	dB/km / dB/kft	1.64/0.5	1.30/0.39	1.04/0.32	0.74/0.22
Maximum Average Attenuation @1KHz	dB/km / dB/kft	1.68/0.51	1.35/0.41	1.08/0.33	0.76/0.23
Maximum Average Attenuation @3KHz	dB/km / dB/kft	3.18/0.97	2.52/0.77	2.01/0.61	1.42/0.43
Maximum Average Attenuation @150KHz	dB/km / dB/kft	11.4/3.47	8.3/2.53	6.2/1.89	4.4/1.34
Maximum Average Attenuation @772KHz	dB/km / dB/kft	24.3/7.4	19.4/5.9	15.4/4.7	10.8/3.3
Maximum Average Attenuation @1000KHz	dB/km / dB/kft	27.1/8.25	21.4/6.52	17.5/5.33	12.8/3.89
<b>Dielectric Strength</b>					
Conductor to Conductor (3secs)	V DC	2400	3000	4000	5000
Conductor to Screen (3secs)	V DC	10000	10000	10000	10000
<b>Minimum EL Far-end Cross-talk-Mean Power Sum</b>					

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@150KHz	dB/305m / dB/kft	61	63	63	65
@772KHz	dB/305m / dB/kft	47	49	49	57
@1.6MHz	dB/305m / dB/kft	41	42	43	44
@3.15MHz	dB/305m / dB/kft	35	37	37	39
@6.3MHz	dB/305m / dB/kft	29	31	31	33
Minimum Far-end Cross-talk-Worst Pair Power Sum					
@150KHz	dB/305m / dB/kft	57	57	57	59
@772KHz	dB/305m / dB/kft	43	43	43	45
@1.6MHz	dB/305m / dB/kft	37	37	37	39
@3.15MHz	dB/305m / dB/kft	31	31	31	33
@6.3MHz	dB/305m / dB/kft	25	25	25	27
Minimum Near-end Cross-talk-Mean Power Sum					
@150KHz	dB/305m / dB/kft	58	58	58	58
@772KHz	dB/305m / dB/kft	47	47	47	47
@1.6MHz	dB/305m / dB/kft	43	43	43	43
@3.15MHz	dB/305m / dB/kft	38	38	38	38
@6.3MHz	dB/305m / dB/kft	34	34	34	34
Minimum Near-end Cross-talk-Worst Pair Power Sum					
@150KHz	dB/305m / dB/kft	53	53	53	53
@772KHz	dB/305m / dB/kft	42	42	42	42
@1.6MHz	dB/305m / dB/kft	38	38	38	38
@3.15MHz	dB/305m / dB/kft	33	33	33	33
@6.3MHz	dB/305m / dB/kft	29	29	29	29
Nominal Insulation Thickness	mm	0.175	0.2	0.26	0.3
Nominal Insulated Conductor Diameter	mm	0.75	0.9	1.15	1.5

## MECHANICAL AND THERMAL PROPERTIES

**Temperature range during operation (fixed state):** -30°C – +70°C

**Temperature range during installation (mobile state):** -20°C – +50°C

**Minimum bending radius:** 10 x Overall Diameter (unarmoured cables); 15 x Overall Diameter (armoured cables)

## DIMENSIONS AND WEIGHT

Foam Skin Insulated and LAP Sheathed Jelly Filled Cable to RUS(REA) PE-89

Cable Code	Number of Pairs	Nominal Sheath Thickness mm/inch	Nominal Overall Diameter mm/inch	Nominal Weight kg/km / lbs/kft
0.4mm Conductor, 0.75mm Insulated Wire				
TP89-02YSF(L)2Y-25P04	25	1.5/0.059	11/0.43	150/101
TP89-02YSF(L)2Y-50P04	50	1.5/0.059	14/0.55	245/165
TP89-02YSF(L)2Y-100P04	100	1.5/0.059	18/0.71	430/289
TP89-02YSF(L)2Y-200P04	200	1.5/0.059	24/0.94	795/534
TP89-02YSF(L)2Y-300P04	300	1.8/0.071	28/1.10	1125/756
TP89-02YSF(L)2Y-400P04	400	1.8/0.071	32/1.26	1480/995
TP89-02YSF(L)2Y-600P04	600	2.0/0.079	38/1.49	2165/1455
TP89-02YSF(L)2Y-900P04	900	2.3/0.091	45/1.78	3155/2120
TP89-02YSF(L)2Y-1200P04	1200	2.3/0.091	52/2.05	4145/2785
TP89-02YSF(L)2Y-1500P04	1500	2.5/0.098	58/2.28	5180/3481



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Cable Code	Number of Pairs	Nominal Sheath Thickness mm/inch	Nominal Overall Diameter mm/inch	Nominal Weight kg/km / lbs/kft
TP89-02YSF(L)2Y-1800P04	1800	2.8/0.110	63/2.48	6175/4149
TP89-02YSF(L)2Y-2400P04	2400	2.8/0.110	73/2.87	8210/5517
TP89-02YSF(L)2Y-3600P04	3600	2.8/0.110	88/3.46	12150/8164
0.5mm Conductor, 0.9mm Insulated Wire				
TP89-02YSF(L)2Y-6P05	6	1.5/0.059	9.1/0.36	80/54
TP89-02YSF(L)2Y-12P05	12	1.5/0.059	11/0.43	125/84
TP89-02YSF(L)2Y-25P05	25	1.5/0.059	13/0.52	210/141
TP89-02YSF(L)2Y-50P05	50	1.8/0.071	17/0.67	355/239
TP89-02YSF(L)2Y-100P05	100	2.0/0.079	22/0.87	640/430
TP89-02YSF(L)2Y-200P05	200	2.0/0.079	29/1.14	1205/810
TP89-02YSF(L)2Y-300P05	300	2.3/0.091	35/1.38	1755/1179
TP89-02YSF(L)2Y-400P05	400	2.5/0.098	39/1.54	2300/1546
TP89-02YSF(L)2Y-600P05	600	2.8/0.110	48/1.89	3400/2285
TP89-02YSF(L)2Y-900P05	900	2.8/0.110	57/2.24	4985/3350
TP89-02YSF(L)2Y-1200P05	1200	2.8/0.110	65/2.56	6580/4422
TP89-02YSF(L)2Y-1500P05	1500	2.8/0.110	73/2.87	8170/5490
TP89-02YSF(L)2Y-1800P05	1800	2.8/0.110	79/3.11	9765/6562
TP89-02YSF(L)2Y-2100P05	2100	2.8/0.110	86/3.40	11445/7691
TP89-02YSF(L)2Y-2400P05	2400	2.8/0.110	91/3.58	12940/8695
0.63mm Conductor, 1.15mm Insulated Wire				
TP89-02YSF(L)2Y-6P063	6	1.5/0.059	9.9/0.39	105/71
TP89-02YSF(L)2Y-12P063	12	1.5/0.059	12/0.47	170/114
TP89-02YSF(L)2Y-25P063	25	1.5/0.059	15/0.59	300/202
TP89-02YSF(L)2Y-50P063	50	1.8/0.071	20/0.79	520/349
TP89-02YSF(L)2Y-100P063	100	2.0/0.079	26/1.02	965/648
TP89-02YSF(L)2Y-200P063	200	2.3/0.091	35/1.38	1825/1226
TP89-02YSF(L)2Y-300P063	300	2.3/0.091	42/1.65	2680/1801
TP89-02YSF(L)2Y-400P063	400	2.5/0.098	48/1.88	3520/2365
TP89-02YSF(L)2Y-600P063	600	2.8/0.110	58/2.28	5215/3504
TP89-02YSF(L)2Y-900P063	900	2.8/0.110	70/2.76	7730/5194
TP89-02YSF(L)2Y-1200P063	1200	2.8/0.110	80/3.14	10185/6844
TP89-02YSF(L)2Y-1500P063	1500	2.8/0.110	89/3.51	12680/8521
0.9mm Conductor, 1.5mm Insulated Wire				
TP89-02YSF(L)2Y-6P09	6	1.5/0.059	12/0.47	180/121
TP89-02YSF(L)2Y-12P09	12	1.5/0.059	15/0.59	285/192
TP89-02YSF(L)2Y-25P09	25	1.8/0.071	20/0.79	530/356
TP89-02YSF(L)2Y-50P09	50	2.0/0.079	26/1.02	975/655
TP89-02YSF(L)2Y-100P09	100	2.3/0.091	35/1.38	1825/1226

Foam Skin Insulated, PE Inner Sheathed, Corrugated Steel Tape Armoured and LAP Sheathed cables to RUS(REA) PE-89

Cable Code	Number of Pairs	Nominal Sheath Thickness mm/inch	Nominal Overall Diameter mm/inch	Nominal Weight kg/km / lbs/kft
0.4mm Conductor, 0.75mm Insulated Wire				
TP89-02YSF(L)2Y(STA)2Y-25P04	25	1.5/0.059	12/0.47	195/131
TP89-02YSF(L)2Y(STA)2Y-50P04	50	1.5/0.059	15/0.59	305/205

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Cable Code	Number of Pairs	Nominal Sheath Thickness mm/inch	Nominal Overall Diameter mm/inch	Nominal Weight kg/km / lbs/kft
TP89-02YSF(L)2Y(STA)2Y-100P04	100	1.8/0.071	19/0.74	505/339
TP89-02YSF(L)2Y(STA)2Y-200P04	200	2.0/0.079	25/0.98	910/611
TP89-02YSF(L)2Y(STA)2Y-300P04	300	2.3/0.091	29/1.13	1260/847
TP89-02YSF(L)2Y(STA)2Y-400P04	400	2.3/0.091	33/1.30	1635/1099
TP89-02YSF(L)2Y(STA)2Y-600P04	600	2.5/0.098	39/1.54	2350/1579
TP89-02YSF(L)2Y(STA)2Y-900P04	900	2.8/0.110	47/1.85	3395/2281
TP89-02YSF(L)2Y(STA)2Y-1200P04	1200	2.8/0.110	53/2.09	4405/2960
TP89-02YSF(L)2Y(STA)2Y-1500P04	1500	2.8/0.110	59/2.32	5485/3685
TP89-02YSF(L)2Y(STA)2Y-1800P04	1800	2.8/0.110	64/2.53	6535/4391
TP89-02YSF(L)2Y(STA)2Y-2100P04	2100	2.8/0.110	70/2.76	7605/5110
TP89-02YSF(L)2Y(STA)2Y-2400P04	2400	2.8/0.110	74/2.91	8610/5786
TP89-02YSF(L)2Y(STA)2Y-3000P04	3000	2.8/0.110	82/3.23	10655/7160
0.5mm Conductor, 0.9mm Insulated Wire				
TP89-02YSF(L)2Y(STA)2Y-6P05	6	1.5/0.059	9.9/0.39	120/81
TP89-02YSF(L)2Y(STA)2Y-12P05	12	1.5/0.059	11/0.43	165/111
TP89-02YSF(L)2Y(STA)2Y-25P05	25	1.5/0.059	14/0.55	270/181
TP89-02YSF(L)2Y(STA)2Y-50P05	50	1.5/0.059	18/0.71	430/289
TP89-02YSF(L)2Y(STA)2Y-100P05	100	2.0/0.079	22/0.87	745/501
TP89-02YSF(L)2Y(STA)2Y-200P05	200	2.3/0.091	30/1.18	1345/904
TP89-02YSF(L)2Y(STA)2Y-300P05	300	2.5/0.098	36/1.41	1935/1300
TP89-02YSF(L)2Y(STA)2Y-400P05	400	2.8/0.110	40/1.57	2500/1680
TP89-02YSF(L)2Y(STA)2Y-600P05	600	2.8/0.110	49/1.92	3645/2449
TP89-02YSF(L)2Y(STA)2Y-900P05	900	2.8/0.110	58/2.28	5290/3555
TP89-02YSF(L)2Y(STA)2Y-1200P05	1200	2.8/0.110	67/2.64	6935/4660
TP89-02YSF(L)2Y(STA)2Y-1500P05	1500	2.8/0.110	74/2.91	8565/5755
TP89-02YSF(L)2Y(STA)2Y-1800P05	1800	2.8/0.110	81/3.19	10200/6854
TP89-02YSF(L)2Y(STA)2Y-2100P05	2100	2.8/0.110	88/3.46	11930/8017
TP89-02YSF(L)2Y(STA)2Y-2400P05	2400	2.8/0.110	93/3.66	13445/9035
0.63mm Conductor, 1.15mm Insulated Wire				
TP89-02YSF(L)2Y(STA)2Y-6P063	6	1.5/0.059	11/0.43	140/94
TP89-02YSF(L)2Y(STA)2Y-12P063	12	1.5/0.059	13/0.52	225/151
TP89-02YSF(L)2Y(STA)2Y-25P063	25	1.8/0.071	16/0.63	365/245
TP89-02YSF(L)2Y(STA)2Y-50P063	50	2.3/0.091	20/0.79	610/410
TP89-02YSF(L)2Y(STA)2Y-100P063	100	2.3/0.091	27/1.06	1085/729
TP89-02YSF(L)2Y(STA)2Y-200P063	200	2.5/0.098	36/1.42	2000/1344
TP89-02YSF(L)2Y(STA)2Y-300P063	300	2.8/0.110	43/1.70	2895/1945
TP89-02YSF(L)2Y(STA)2Y-400P063	400	2.8/0.110	49/1.92	3775/2537
TP89-02YSF(L)2Y(STA)2Y-600P063	600	2.8/0.110	59/2.32	5520/3709
TP89-02YSF(L)2Y(STA)2Y-900P063	900	2.8/0.110	71/2.80	8120/5456
TP89-02YSF(L)2Y(STA)2Y-1200P063	1200	2.8/0.110	81/3.19	10625/7140
0.9mm Conductor, 1.5mm Insulated Wire				
TP89-02YSF(L)2Y(STA)2Y-6P09	6	1.5/0.059	13/0.52	230/155
TP89-02YSF(L)2Y(STA)2Y-12P09	12	1.8/0.071	16/0.63	350/235
TP89-02YSF(L)2Y(STA)2Y-25P09	25	2.0/0.079	21/0.83	620/417
TP89-02YSF(L)2Y(STA)2Y-50P09	50	2.5/0.098	27/1.06	1100/739
TP89-02YSF(L)2Y(STA)2Y-100P09	100	2.8/0.110	36/1.42	2000/1343