



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

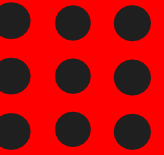
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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE NAME : 19EE01 BASIC ELECTRICAL AND ELECTRONICS
ENGINEERING**

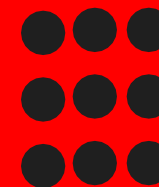
I YEAR /II SEMESTER Information Technology

Unit 3 – Wiring Grounding and Safety



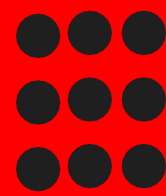


NEED FOR WIRING





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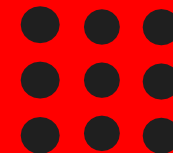


Introduction to Domestic Wiring

Tools used for wiring:

Screw drivers

- Thin blade type
- Square blade type





Hammer

- Ball pen type
- Claw hammer





Pliers

- Side cutting plier
- Diagonal cutting plier
- Long nose
- Slip joint



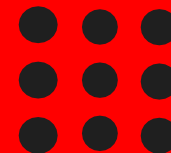
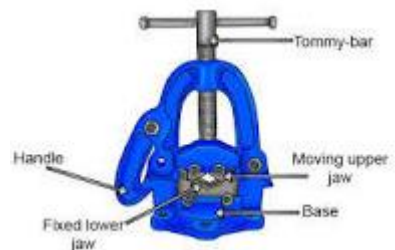


- Pocket knife
- Hand drill
- Chisel
- Wooden saw
- Hack saw
- Centre punch





- Pipe vice
- Pipe cutter
- Wrenches
- Scratch awl





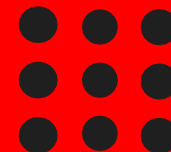
Wire Specifications

Standard Wire Gauge SWG	Diameter	
	<i>inches</i>	<i>mm</i>
7/0	0.500	12.700
6/0	0.464	11.786
5/0	0.432	10.973
4/0	0.400	10.160
3/0	0.372	9.449
2/0	0.348	8.839
1/0	0.324	8.236
1	0.300	7.620
2	0.276	7.010
3	0.252	6.401
4	0.232	5.893
5	0.212	5.385
6	0.192	4.877
7	0.176	4.470
8	0.160	4.064
9	0.144	3.658
10	0.128	3.251
11	0.116	2.946
12	0.104	2.642
13	0.092	2.337
14	0.080	2.032
15	0.072	1.829
16	0.064	1.626
17	0.056	1.422
18	0.048	1.219
19	0.040	1.016
20	0.036	0.914



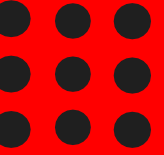


20	0.036	0.914
21	0.032	0.813
22	0.028	0.711
23	0.024	0.610
24	0.022	0.559
25	0.020	0.508
26	0.018	0.457
27	0.0164	0.417
28	0.0148	0.376
29	0.0136	0.345
30	0.0124	0.315
31	0.0116	0.295
32	0.0108	0.274
33	0.0100	0.254
34	0.0092	0.234
35	0.0084	0.213
36	0.0076	0.193
37	0.0068	0.173
38	0.006	0.152
39	0.0052	0.132
40	0.0048	0.122
41	0.0044	0.112
42	0.004	0.102
43	0.0036	0.091
44	0.0032	0.081
45	0.0028	0.071





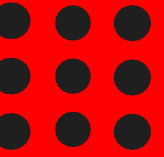
- Higher the number of gauge value smallest is the diameter.
- Number of wire standard depends on the current carrying capacity.
- British standard wire gauge value.





Wiring accessories

- Switches
- Lamp holders
- Socket outlets
- Ceiling roses
- Plugs
- Flexible cords
- Distribution board
- Fuse
- Cables





Switches

Tumbler switch : Projected outwards from the wall



Flush switch : fixed with flush on the wall, it ll not be projected out





Pull switches: used for heaters and air conditioners



Rotary switches: used in heaters to change the rate of heat
insulated handles to which blades are fixed
blades move in steps make contact with terminals

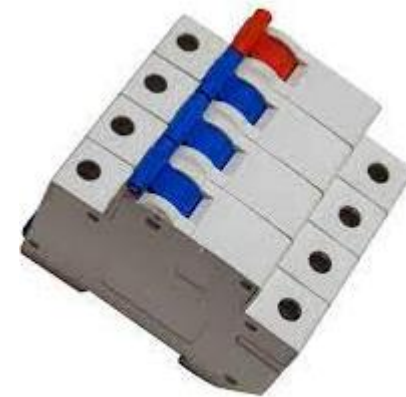




Push button switch: used in starting motors



Iron clad switch:





Knife switch:



Two way switch:





Lamp Holders

Pendent Holder



Batten Holder



Screw Lamp Holder



Fluorescent Lamp Holder



Starter Holder



Ceiling Rose



Mounting blocks



Socket Outlet





Wiring Materials

Plug



Plug Adaptor



Main Switch



Power Indicator



Distribution Fuse Board



Electrical Fuse Board





Wiring Material - Cables

SINGLE-CONDUCTOR WIRES

Solid-core wire



Stranded wire



MULTICONDUCTOR CABLES

Type NM (nonmetallic sheathed) cable "12-2"

For interior circuits; routed behind walls, ceilings, floors



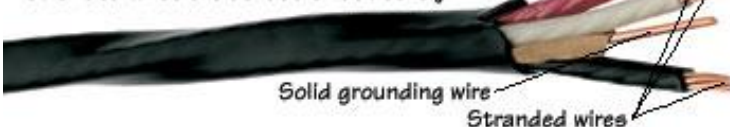
Type NM (nonmetallic sheathed) cable "14-3"

For interior circuits; contains two hot wires



Large appliance cable

For dedicated 120/140-volt circuits; stranded wires are bendable--but barely



Type MC armored cable

For interior circuits only



Types of Cables

On basis of conductors

- Single core cable
- Multi core cable

On basis of no. of voltage grading

- 250/440 volt cables
- 650/1100 volt cables

On basis of conductor used

- Copper conductor cables
- Aluminium conductor cables

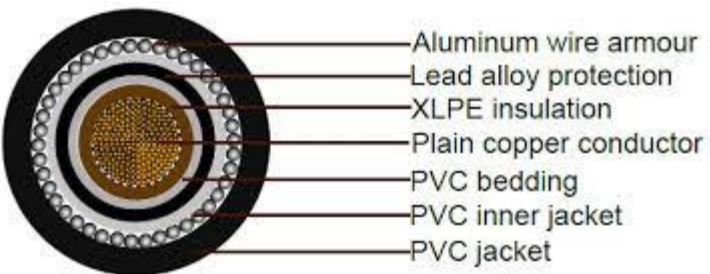
On basis of insulation

- 1 VIR insulated Cables
- 2 TRS/CTS Cables
- 3 Lead sheathed Cables
- 4 PVC Cables

- 5 Weather proof Cables
- 6 Flexible Chord Cables
- 7 XLPE Cables



Wiring Material -



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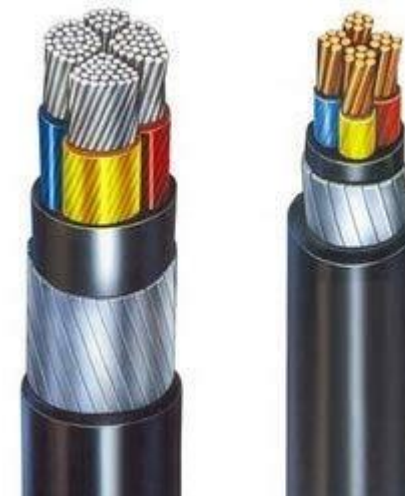
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Cables

- A cable consists of a copper wire surrounded by insulation and a sheath.
 - Types
 - Vulcanized Indian Rubber (VIR) insulated cables
 - Poly – Vinyl Chloride (PVC) insulated cables
 - Tough Rubber Sheathed (TRS) cables
 - Cable Tyre Sheathed (CTS) cables
 - Lead Sheathed cables
 - Weather proof cables.





Addition to this:

Junction boxes

Elbows

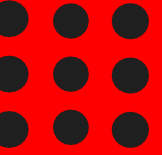
Bends

Hooks

Earth wire

Screw

Wooden plugs etc are used.





Rating of wiring materials

Wiring material	Rating
Switches	6A, 240 V 16A, 240 V
Socket outlets	6A, 240 V, 2 pin / 3 pin 16A, 240 V, 3 pin
Ceiling roses	6A, 240 V, 2 plate
Plugs	6A, 2 pin / 3 pin 16A, 3 pin
Distribution Box	16A, 240 V, one way 16A, 240 V, two way

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MI DUAL CAMERA



REFERENCES

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3. Mehta V K, Mehta Rohit, “Principles of Electrical Engineering and Electronics”, S.Chand & Company Ltd, (2010)- UNIT I and II
4. Mehta V K, Mehta Rohit, “Principles of Electronics”, S.Chand & Company Ltd, (2005)- UNIT IV and V
5. <https://happho.com/install-concealed-conduit-electrical-wiring-system-properly/>

THANK YOU