**WEEK 4 YEAR 11 APPLIED TECHNOLOGY**

**STRAND: ENGINEERING MATERIAL**

**LESSON 44: TYPES OF ABRASIVE BACKING**

**LEARNING OUTCOME: IDENTIFY THE TYPES OF ABRASIVE BACKING**

1. Type of abrasive backing
* Abrasive backing come in many materials depending on the intended application.
* Some of them are

 i. Paper back – for general hand and machine sanding

ii. Cloth backing – for sanding belts used on sanding machines.

iii. Fibre backing – for machine sanding discs.

* On the abrasive back, letters used together with numbers represent the type and weight of the backing.
* Animal or resin glue or a combination of both is the common glue used in abrasive materials.

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| **Coarseness** | **Mesh or grit number** | **Application** |
| Very Coarse | 12,16,20,24,30 | Rough shaping forming of stock |
| Coarse | 36,40,50 | For removing deep marks and imperfection |
| Medium | 60,80,100 | Medium sanding before exterior painting or as an intermediate stage before fine sanding |
| Fine | 120,150,180 | Last sanding prior to the application of stain or paint |
| Very Fine | 220,240,280,320,360,400,500,600 | For rubbing and polishing finish after it has been applied and for cutting back surfaces between coats. |

**LESSON 45: TYPES OF ABRASIVE**

**LEARNING OUTCOME: IDENTIFY THE TYPES OF ABRASIVE**

1. Aluminium Oxide Cloth Sand Sheets.
* Aluminium oxide cloth sheets are excellent for general clean up on metal and wood surfaces.
* They last longer than paper sheets.
* They have a flexible durable backing and are water resistant.
1. Emery Cloth Sand Sheets
* Emery cloth sheets are close coat construction and are made of emery grain.
* They have a cloth backing which is very flexible.
* They are excellent for cleaning and polishing metal surfaces.
* They are also used on wood.
1. Crocus Cloth Sand Sheets
* Crocus cloth sheets are made of a natural mineral used for extremely fine finishing and polishing on metals, plastics and woods.
1. Silicon Carbide Waterproof Sand Paper
* Silicon carbide waterproof paper is best for wet and dry sanding of metal, paints and plastics.
* It leaves an excellent finish on most precious metals.
* It has a long life and is economical.
1. Silicon Carbide Stearate Sand Paper
* Sheets Silicon carbide stearate coated paper sheets reduce loading of material and are excellent on wood, plastics and metals
1. Garnet Finishing & Cabinet Sand Paper Sheets
* Garnet finishing & cabinet paper leaves an excellent finish on woods.
* It has a medium aggressiveness. It has a long life and is economical.
1. Aluminium Oxide and Cabinet Sand Paper Sheets
* Aluminium oxide and cabinet paper is excellent for wood sanding.
1. Sanding belts
* Aluminium oxide belts are resin bonded, and have tear and break resistant joints.
* They are excellent on all metals and hard woods however are also available for soft woods.
* Belts made of Aluminium oxide poly/cotton material have a specially coated backing which provides high performance for washable belts.
* Aluminium oxide premium cotton belts are flexible enough for most contour surfaces.
1. Wheel dresser
* A Bench grinder wheel being dressed by a wheel dresser
* This removes the glazed surface of the grinding wheel, which will allow new cutting surface exposed.



**LESSON 46: WOOD FINISHING**

**LEARNING OUTCOME: DEFINE WOOD FINISHING**

1. Wood Finishing
* Wood finishing is the process of applying to the surface after it has been prepared,
* by filling and smoothing
* a thin coating of varnish or other substance,
* to render it durable, enhance its beauty or change its appearance.
* There are numerous methods of finishing, and a variety of materials are used; the varieties of varnish being the principal.
* The distinctive qualities of these varieties are treated under their proper headings.

**LESSON 47: VARNISH, PAINT, SEALERS**

**LEARNING OUTCOME: IDENTIFY VARNISH, PAINT & SEALERS**

1. Vanish
* Varnish is a transparent, hard, protective finish or film primarily used in wood finishing
* Varnish is traditionally a combination of a drying oil, a resin, and a thinner or solvent.
* Varnish finishes are usually glossy but may be designed to produce satin or semi-gloss sheens by the addition of "flatting" agents
* Varnish has little or no color, is transparent, and has no added pigment, as opposed to paints or wood stains, which contain pigment and generally range from opaque to translucent.
* Varnishes are also applied over wood stains as a final step to achieve a film for gloss and protection.
1. Paint
* Paint is any liquid, liquefiable, or mastic composition that, after application to a substrate in a thin layer, converts to a solid film.

* It is most commonly used to protect, colour, or provide texture to objects.
* Paint can be made or purchased in many colours—and in many different types, such as water colour, artificial, etc.
* Paint is typically stored, sold, and applied as a liquid, but dries into a solid.
1. Sealers
* Sealers are typically lower strength, yet flexible, bonding agents used between substrates of differing physical properties to form a seal between the materials.
* They seal top structures & particularly effective in waterproofing processes by keeping moisture out (or in) the components in which they are used.
* They can provide thermal and acoustical insulation, and may serve as fire barriers.
* They may have electrical properties
* Sealants can also be used for simple smoothing or filling.

**LESSON 48: STAIN & GREASING/OILING**

**LEARNING OUTCOME: IDENTIFY STAIN & GREASING/OILING**

1. Stain
* A wood stain consists of a colorant suspended or dissolved in an agent or solvent.
* The suspension agent can be water, alcohol, petroleum distillate, or the actual finishing agent (shellac, lacquer, varnish, polyurethane, etc.)

* Coloured or 'stained' finishes, like polyurethane, do not penetrate the pores of the wood to any significant degree and will disappear when the finish itself deteriorates or is removed intentionally
1. Greasing/Oiling
* Grease is a semisolid lubricant.

* It generally consists of a soap emulsified with mineral or vegetable oil.
* The characteristic feature of greases is that they possess a high initial viscosity
* Greases are applied to mechanisms that can only be lubricated infrequently and where a lubricating oil would not stay in position
* They also act as sealants to prevent ingress of water and incompressible materials.
* An oil is any neutral, nonpolar chemical substance that is a viscous liquid at ambient temperatures and is both hydrophobic (immiscible with water, "water fearing") and lipophilic (miscible with other oils, literally "fat loving").
* Oils have a high carbon and hydrogen content and are usually flammable and slippery.
* Oils may be animal, vegetable, or petrochemical in origin, and may be volatile or non-volatile.
* They are used for food, fuel, lubrication, and the manufacture of paints, plastics, and other materials.

**ACTIVITY**

1. Name the three types of abrasive backing
2. Identify any three types of abrasive
3. What is Wood Finishing?
4. State the types of wood finishing
5. Differentiate Varnish & Paint
6. Mild steel is classified as a ferrous metal and copper as a non-ferrous metal.
* State the difference between ferrous and non-ferrous metals.
* Give a reason why non-ferrous metals have an advantage over ferrous metals
1. List **two** characteristics of ceramic as a material**.**
2. Concrete is a building material made by mixing together sand, crushed rock or gravel and cement.
* State the ratio of the ingredients used for a concrete mix.
* Give an advantage of using a mechanical concrete mixer over hand mixing of concrete.