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DESIGN AND ANALYSIS OF GRINDING WHEEL ANGLE DRESSING UNIT FOR BROACH TOOL

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ABSTARCT: *We are moving towards more comfortable and time saving method, for this reason many engineers are contributing their innovation for several things to make Simple, Easy Handling and Save Time Consumption for Production. This project work has a versatile range in wheel dresser, while angle dresser can be used for tool making , for production process like surface grinding, cylindrical grinding, creep-feed grinding process. Angle dresser is a device which is used for cleaning abrasive material surface makes them effectively ready to do grinding process again. Also the high technology of mechanism used in angle dresser construction ensure that they can process long lasting hours and trouble free usage. This angle dresser can be mounted on the table, or near the side of grinding wheel. the different models available are suitable for various machine like surface grinding , cylindrical grinding, creep-feed grinding machine, etc.,*

***KEYWORDS*: Easy handling, Long lasting, Simple, Time consumption, Trouble free usage**.

1.INTRODUCTION:

Heavy business involves one or additional characteristics like giant and significant products; giant and significant instrumentality and facilities (such as significant instrumentality, giant machine tools, and large buildings); or complicated of various processes. attributable to those factors, significant business involves higher capital intensity than lightweight business will, and it's conjointly typically additional heavily cyclic in investment and employment.

Transportation and construction alongside their upstream producing provide businesses are the majority of significant business throughout the commercial age, alongside some capital-intensive producing. ancient examples from the mid-19th century through the first twentieth enclosed steelmaking, artillery production, locomotive erection, machine building, and also the heavier varieties of mining. From the late nineteenth century through the mid-20th, because the {chemical business industry} and electrical industry developed, they concerned elements of each significant business and light-weight business, that was before long conjointly true for the automotive business and also the craft business. fashionable building (since steel replaced wood) is taken into account significant business. giant systems square measure typically characteristic of significant business like the development of skyscrapers and huge dams throughout the post–World War II era, and also the manufacture/deployment of huge rockets and large wind turbines through the twenty first century.

Several East Asian countries have faith in significant business as a part of their overall economies. Among Japanese and Korean companies with "heavy industry" in their names, several also are makers of region merchandise and defense contractors to their several countries' governments like Japan's Fuji significant Industries and Korea's Hyundai Rotem, a joint project of Hyundai significant Industries and Daewoo significant Industries.

HEAVY INDUSTRIES MANUFACTURING PRODUCT LIST:

- Master gear
- Hob
- Shaving cutter
- Shaping cutter
- Spline broach
- Other broaches.

INTRODUCTION TO GRINDING:

- A wheel could be a wheel composed of an abrasive compound and used for varied grinding (abrasive cutting) and abrasive machining operations. Such wheels are utilized in grinding machines.

- The wheels are typically made of a stuff consisting of coarse-particle combination ironed and secure along by a cementing matrix (called the bond in wheel terminology) to make a solid, circular form. varied profiles and cross sections are offered looking on the meant usage for the wheel. they'll even be made of a solid steel or metal disc with particles secure to the surface. these days most grinding wheels ar artificial composites created with artificial aggregates, however

the history of grinding wheels began with natural composite stones, like those used for millstones.

- Grinding, or abusive machining, is that the method of removing metal within the sort of minute chips by the action of frequently formed abrasive particles. These particles is also in secure wheels, coated belts, or just loose Grinding wheels are composed thousands of tiny abrasive grains control along by a bonding material. every abrasive grains could be a leading edge. because the Grain passes over the work piece it cuts a tiny low chip, effort a sleek, correct surface. As every abrasive grain becomes boring, it breaks far from the bonding Material.

TYPES OF ABRASIVES:

- An abrasive is a material, often a mineral, that is used to shape or finish a work piece through rubbing which leads to part of the work piece being worn away by friction. While finishing a material often means polishing it to gain a smooth, reflective surface, the process can also involve roughening as in satin, matte or beaded finishes. In short, the Ceramics which are used to cut, grind and polish other softer materials are known as Abrasives.
- `Two types of abrasives are used in grinding wheels are manufactured. Except for diamonds, manufactured abrasives have almost entirely replaced natural abrasives materials. even natural diamonds have been replaced in some instances by synthetic diamonds.
- Some instances by synthetic diamonds.

2.DESIGN OF ANGLE DRESSING UNIT:

MAIN BASE:

Main base is carrying whole a part of the Angle Dressing unit. it's complicate form like bends thus it cannot ready to manufacture by operation. thus we decide casting method for ease operation. This forged is more goes to finishing method.

ANGLE DISC:

The fabric for Angle disc was soft-cast steel. as a result of soft-cast steel includes a low to medium carbon content, that makes it simple to weld and simple machining operation. it's ductile, and tends to perform well in previous water, therein it doesn't become too brittle. it's not as sturdy as most steels, and corrodes quickly in wet environments, however is reasonable and without delay on the market.

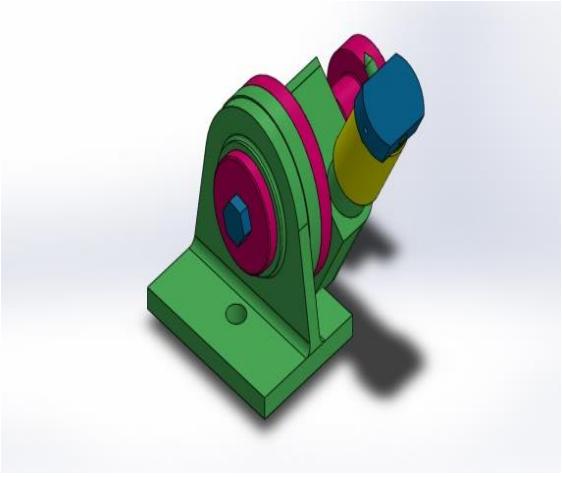
DIAMOND HOUSING:

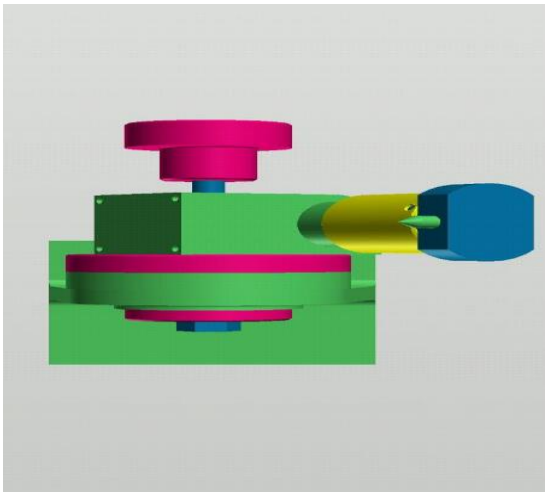
Diamond holder housing is that the heart of the angle dressing unit. it connects the angle disc, Rack and pinion. it conjointly unreal by casting method. pattern of this housing is formed at the start to provide by casting method, alternative method of production concerned is that the CNC machining.

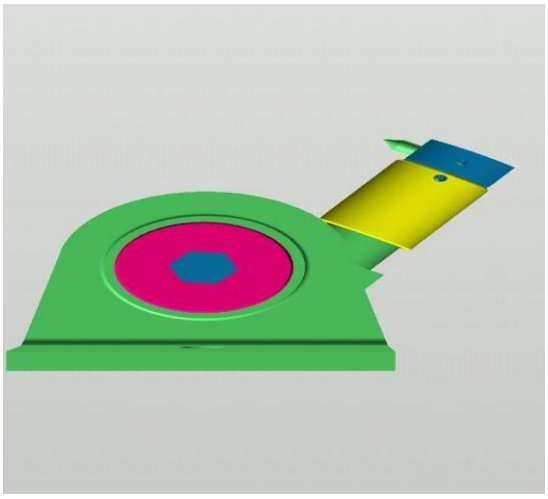
3.AUXILIARY PARTS:

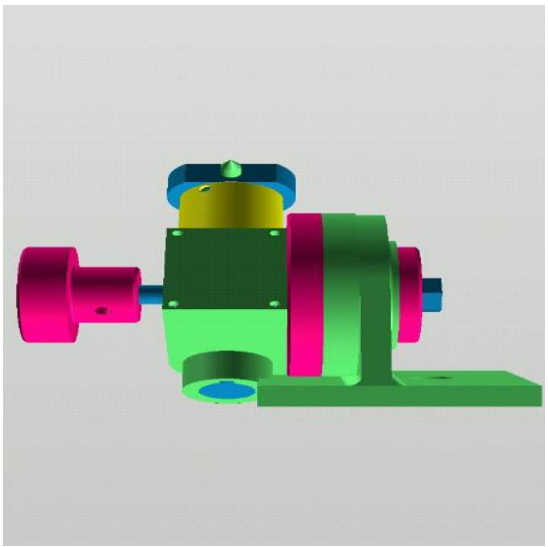
SL.NO	COMPONENTS NAME	DIMENSIONS	QUANTITIES
1	Swivel disc with phase lock screw	M12*48mm length	1 No's
2	Swivel disc mounting screw	M6*20mm length	4 No's
3	Swivel disc dowel pin	⍰4*20 mm length	2 No's
4	End plane gear wheel end couple lock screw	M4*8mm length	4 No's
5	Dust sleeve lock screw	M4*10mm length	2 No's
6	Diamond lock screw	M4*40 mm length	2 No's
7	Rack stroke limit screw	M6*25mm length	1 No's

FIGURES: (SOLID WORKS 3D MODEL)



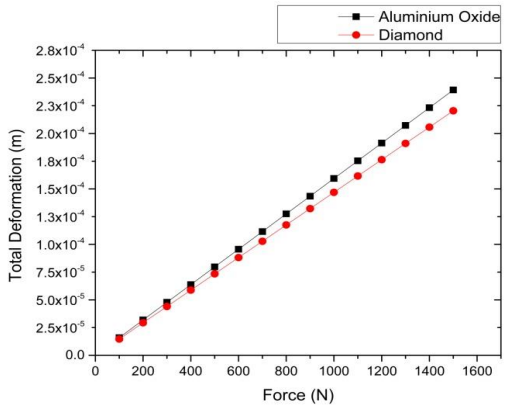




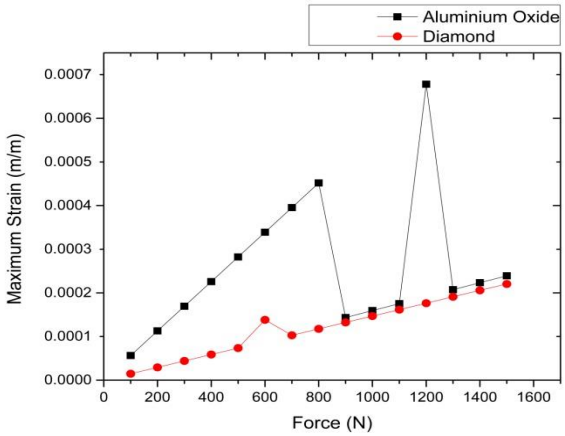


4.COMPARISON BETWEEN ALUMINUM OXIDE AND DIAMOND:

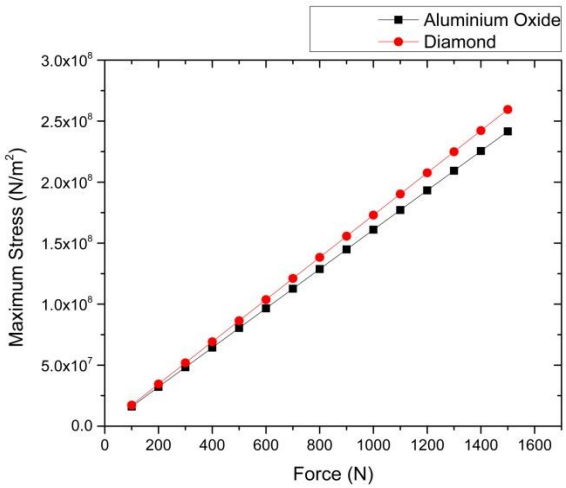
Maximum Total Deformation:



Maximum Equivalent Elastic Strain:



Maximum Equivalent Elastic Stress:



5.ADVANTAGES OF ANGLE DRESSING UNIT:

- We can cut back the dimension exploitation this Dressing Unit.
- Conjointly perform Angle form into the innovative of the wheel.
- Same time reduces the wheel diameter.
- It reduces operator work and save the dressing time economically.
- Angle Dresser is of swiveling sort and might dress quite 180°.
- Their compact and house saving style makes them convenient and simple to use.

6.DISADVANTAGES OF ANGLE DRESSING UNIT:

- Currently the Angle Dressing unit is operated by hand to decorate the wheel.

7.APPLICATIONS OF ANGLE DRESSING UNIT:

Using this Angle Dressing Unit we can perform angle dressing into following machine.

- CYLINDRICAL GRINDING.
- SURFACE GRINDING.
- BROACH GRINDING.
- SPLINE GRINDING.

8.CONCLUSIONS:

Finally, the Angle Dressing Unit is meant and analyze with success with corundum dressing tool and diamond dressing tool. In future this project may be upgraded by victimization it as mechanically operated with extremely advanced technique. By this Angle Dressing Unit potency of wheel is very enhanced by correct rate of dressing. we've finalized with 2 results from the analysis report we tend to created. The one within which we are able to come with diamond dresses tool if the wants is predicated on life time of the tool. the opposite facet is we are able to choose the corundum dressing tool if the wants is reduction of value and does not concerning contemplate take into account} about the tool life. Since corundum is cheaper than the diamond dressing tool which is able to increase the turnover of the company. Finally , The comparison Graph provides the right result by victimization Ansys software system. we tend to had an excellent expertise for our team members to figure nearly as good and productive team in our project "ANGLE DRESSING UNIT". we tend to additionally determined lots of advice and technique in style and production field and hope it'll offer U.S.A. a decent support in our future.

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