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Threadless Fire Hose Coupling

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Abstract

Threading a fire hose is not a difficult task to accomplish when there is no pressure, the operator is not donned in full structure firefighting gear and the threads are still like new. However, it is difficult when these factors are applied. That's when minutes, when seconds count. A house can be fully involved, completely engulfed by flames, in a matter of minutes. Connecting to a hydrant or connecting two hoses together with less than perfect threads is no place to waste valuable seconds while someone's property is burning. This is where the threadless fire hose coupling concept comes in.

. Introduction

A challenge many fire departments face is getting to the fire scene and connecting to the closest hydrant as fast as possible to save lives and limit damage to property. According to Ready.gov, "In just two minutes, a fire can become life-threatening. In five minutes, a residence can be engulfed in flames." It can take that amount of time connecting a truck to hydrant. Trying to thread a firehose to a hydrant, truck or another hose in full structure, firefighting gear takes valuable time, when it does not have to. A thread less hose that connects with gaskets and quick locks saves time, which in turn, saves lives. Having a quick-connect, thread less firehouse allows firefighters to spend less time connect hoses and more time saving lives and property

Methods

The best way to produce these parts with manufacturability, time and cost in mind would be to start off by sand casting each part. Sand casting is very cost effective for a few reasons. A big reason is being able to place a sand core the casting to keep the male and female couplings hollow inside. The benefits of this process are less waste of aluminum and less time boring out the middle of the couplings. The next process to would be a CNC mill. This mill would almost finish the part completely. It would bore out the middle of the coupling and mill down the outside of the couplings and sleeves to get a perfect finish. The perfect finish is essential for the couplings to fit together properly. After it was milled down and bored to specs a machinist would then take whichever piece was being worked on to a manual mill. Before put it in the vice on the mill the machinist would center punch where each hole would go. After this the machinist would drill out every hole. Six holes for the male coupling, four for the female coupling and two for each piece of the sleeve. One sleeve piece will have to be drilled through with a smaller drill bit, and then through with a bigger drill bit not all the way through. The reason for this is for the bolt head to have something to rest on to pull the sleeve together. Without this, one piece of the sleeve would fall off the hose. The other sleeve would have two holes drilled and tapped by a machinist. Then the machinist would also drill and tap the six holes on the male coupling and four holes on the female coupling. After this is completed the part is finished and ready for packaging and delivery.

Future Products

There is definitely room to expand this and have a more diversified product line. One is making this coupling in every size firehouse used in the fire service. According to tklob.net fire hose sizes are broken down as follows, "Attack lines are Booster Lines, 1 3/4", 2 1/2". Supply Lines are 3", 4", 5" and 6"." It is common sense to make a coupling for each size of fire hose used. The next product to produce would be reducers. They simply reduce from a large size hose into a smaller hose or a large opening into a smaller hose. An example of this would be on running a 2" hose out of the side of a pump truck from a 4" opening. Another product to make is actually threaded couplings. The reason being is very few fire departments have the funds available to go completely away from threaded couplings. A way to steal part that market share easily is offer a male threaded coupling with a threadless female coupling and vice-versa. This allows departments to start using my product and slowly transition from threaded to threadless. The product I can envision seeing being made at this moment is adapters. Adapters would also help departments that cannot afford to go away from threads completely. They would allow departments to attach an adapter that was threaded on the female end to a hydrant and attach a threadless hose to the male side of this adapter, which is also threadless.

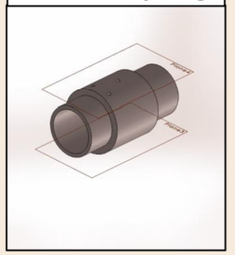
Materials

There are two materials my couplings would be produced out of, aluminum and brass. These are by far the most commonly used materials for fire hose couplings used in the fire service industry. The fire industry is moving in the direction of aluminum more than brass simply because aluminum is lighter and is less difficult to manufacture than brass. It takes less time which in turn, takes less money. I found on www.alibaba.com that a supplier was selling 20 metric tons of ADC 12 Aluminum ingots for $1800-$2200. With an estimated 7-day delivery.

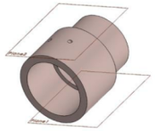
Conclusion

My product can serve a great purpose in this industry. The time it saves could be detrimental in the saving of property, but most importantly people's lives.
I discussed each problem I went through in my design phases and my though process through each phase. I laid out every part needed for the assembly of the couplings, what they would be made out of and how to make them. I discussed a similar product to my coupling. The last thing I discussed is the future to where this product line will go into the future. This product will help save property, but most importantly, it will help save lives.

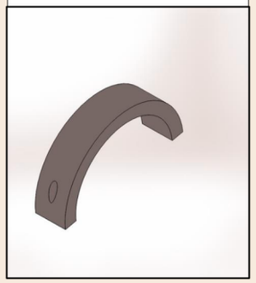
Male Coupling



Female Coupling



Hose Connector



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