

Chapter 6

Conclusions and Recommendations

6.1 Conclusions

A prototype knowledge-based systems, MATSEL -VPEX has been developed to assist the mold makers or technical people, who has less experience in selecting materials for plastics injection mold making. MATSEL-VPEX is designed to help with preliminary selection of materials used in injection molds manufacturing process. This causes the reduction of intuitive or less experienced decision stage, which may drastically affects on the overall production.

By using MATSEL-VPEX, the system's user is always questioned about the desired properties for the final injection mold made such as mechanical properties, and thermal properties. The questions generated by MATSEL-VPEX is simple question. However, the system's user defined for using MATSEL-VPEX are required to be able to identify some final properties of injection mold.

Because of the high variety of materials related to injection mold making materials, it is not possible that the less experienced people, who are unfamiliar with materials for mold making can understand throughout the consultation by using deep reasoning level in consulting with MATSEL-VPEX. Therefore, MATSEL-VPEX also provides the consultation by using shallow reasoning level.

By means of the shallow reasoning level, the system's user can consult MATSEL-VPEX system by graphic user interface. with windows and mouse environment. In this level, MATSEL system classifies the types of mold materials that is used in injection mold manufacturing broadly. This will be enable the less experienced people who are interested in mold materials gain more information about type of materials. In addition, this level provide more details in properties of each type of material.

The knowledge and expertise utilized in MATSEL-VPEX has been gained from 2 main sources: related written literature, and human experts.. The source of related written literature consists of metal materials handbook, injection mold making handbook, plastic molding engineering handbook, manuals mold making materials render. Before using knowledge gained from the expert must identify whom is exactly the expert.

The benefits from the creation of MATSEL-VPEX to assist materials selection can be summarized as follows:

- MATSEL helps to assist materials selection for injection molds making systematically and methodologically.
- MATSEL can be used as the basic engineering source to introduce the knowledge of mold making materials for novice people who are interested in mold making materials selection.
- MATSEL can act as the knowledge bank to maintain the knowledge of many experts and variety of source of expertise.

6,2 Limitation of this Research

MATSEL- VPEX, a prototype of mold materials selection software, is developed assist mold manufacturers and people interested in. However, it has not only benefits ,but it also has some limitations that should be concerned.

- MATSEL-VPEX does not designed for general people, but it requires some technical knowledge to communicate with this system. The system's users defined in using MATSEL VPEX should have a underlying knowledge in field of core mold making, plastics, and materials.
- There are some limitation of shell or program tool used in developing this system because VP-Expert version 3.1 is only for education. However, the concept of MATSEL -VPEX can be applied in other program tools.
- The defined scope of this research is limited on only the core of injection mold and properties of materials. This may not be sufficient to get the best in mold materials selection.
- In the procedure of system development, MATSEL-VPEX is not designed for updating. Therefore, if information embedded are not practical or obsolete, it is hard to add or transfer the new knowledge into MATSEL-VPEX.

6.3 Recommendations for further Research

- 1) In fact, there are many factors that affects the injection mold materials selection such as cost of materials, mold making techniques. In order to develop MATSEL-VPEX, the developer should enhance the domain of knowledge to the domain related with mold materials selection.
- 2) Model of MATSEL-VPEX can be further developed to select other part of injection mold such as ejectors., interlocks, locating rings, which are defined as mold standard component or other types of molds such as blow mold as well.
- 3) The challenge in building knowledge is to define whom is expert in that field. To gain more accurate knowledge, the systematic method for knowledge should be developed.