

**GLUES AND CEMENTS: A
HANDBOOK ON
ADHESIVES AND FILLINGS
FOR WORKSHOP USE**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649439829

Glues and Cements: A Handbook on Adhesives and Fillings for Workshop Use by H. J. S
Cassal

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Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

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A HANDBOOK ON ADHESIVES
— AND —
FILLINGS FOR WORKSHOP USE.

By

H. J. S. CASSAL,

Author of "Workshop Makeshifts," "Chucks and Chucking,"
"Simple Forge Work," etc.



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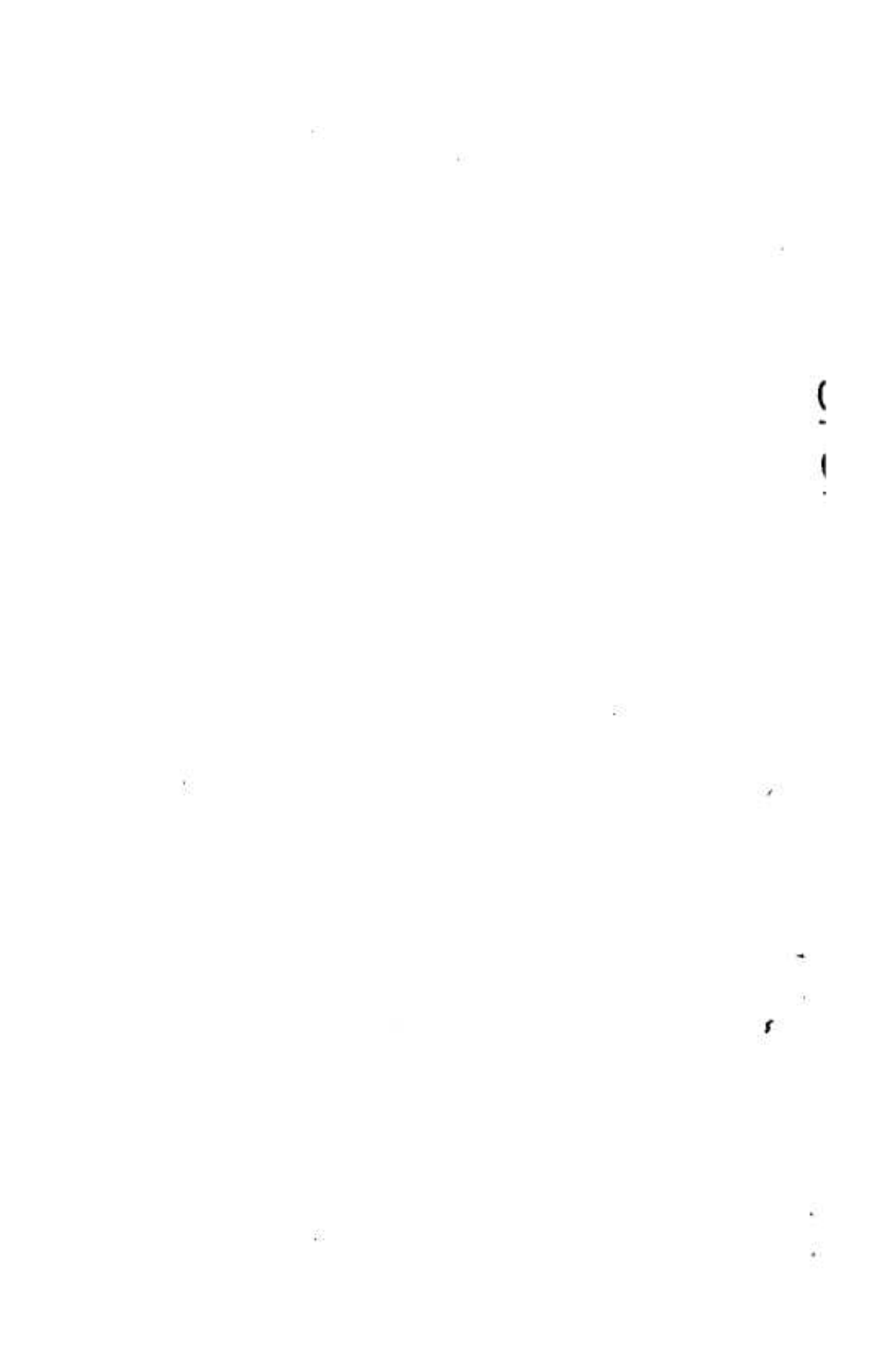
LONDON:
L. UPCOTT GILL, BAZAAR BUILDINGS, DRURY LANE, W.C.
NEW YORK:
CHARLES SCRIBNER'S SONS, 153-157, FIFTH AVENUE.
1906.

A. I. L.

PREFACE.

IN placing this handbook before the reader, the author has endeavoured to supply a want which he felt keenly in his more inexperienced days—namely, for a collection in one volume of recipes for adhesives and cements suitable for everyday workshop operations, many of which he could only get at by searching through a mass of miscellaneous publications. The book has been made as complete and as representative as possible, and the reader who masters all that it contains may almost call himself an expert, and will, indeed, be in a better position as regards general workshop knowledge than the majority of professional mechanics who have kept in the same groove since their apprenticeship.

H. J. S. C.





GLUES AND CEMENTS.

CHAPTER I. INTRODUCTORY.

THE art of joining together two or more articles by means of adhesives is one in which there is a great deal more than is generally supposed, both in the matter of compounding the substances and in using them. Adhesives or cements—for they are not necessarily the same—are used in almost every trade, but the most generally known are those employed by the carpenter and joiner and the builder. The one uses glue and the other mortar or cement, and these two substances are about the best examples that can be taken to illustrate the difference in the two words, although as a rule they are used indiscriminately.

Both the carpenter and the builder, however, use many different kinds of adhesives and cements, although the two mentioned above are generally all that the "man in the street" knows anything about, and it is very little knowledge indeed that he has even of them. In fact, he knows so little that, in most cases, he would be better without that knowledge, for he uses it and so does some botching which would far better be left undone.

The china and glass mender and riveter knows not the

glue-pot in connection with his trade; he only knows his special adhesive—cement he calls it—and very possibly he uses a compound of his own preparation, the recipe for which he keeps to himself. The plumber, again, has cements as well as adhesives special to his trade, and the bookbinder, paper-hanger, and electrician use between them dozens of glues and cements for various purposes. The list could be extended to a great length, for a trade in which adhesives or cements are not used is the exception. Consequently there are to-day some two hundred or more different kinds of these commodities, for those used in one trade or for one class of article are often not fit for any other. The so-called "universal" cements therefore are misnomers. They are not cements, but merely adhesives, and would be useless to the electrician or to the carpenter; while the pipe-fitter and the paper-hanger or bookbinder would not know what to do with them.

Cements and adhesives are of many different classes. First, there are those which are always ready for use, and which need no preparation of any kind. Such are the "liquid glues," ordinary office gum, the pastes, &c. The second class takes in those kinds which are ready so far as mixing is concerned, but require some preparation such as heating before they are soft enough to use, and of this class the most representative variety is common glue. A third section comprises those which need some liquid added to the stock of compound to fit them for use, and a fourth includes those which require to be made up entirely every time one of the class is needed. Of all these there are many varieties, applicable to different conditions and substances, and most of them are further divisible into adhesives and cements.

Broadly speaking, the difference between an adhesive, or glue, and a cement is this: An adhesive is for use when the surfaces to be joined coincide more or less exactly, and consequently such surfaces hold together almost directly. A cement, however, is for use where there are irregularities in the surfaces which are to be joined, and these must be

filled with the joining medium, which holds on to itself as much as to the surfaces being fixed. A cement, in fact, first makes a surface by filling up irregularities, and then acts as an adhesive.

Thus, in joining porcelain which is newly broken but unchipped, and in which therefore the two surfaces, although irregular, coincide exactly, the best job will be made where there is as little glue as possible used, for the closer the broken edges are together the better they will hold. The cement or mortar which is used for a wall, however, has first to fill up all the irregularities and holes in the bricks, for such irregularities are not coincident, and the wall holds together not because one brick holds to the next, but because it has had attached to it a coinciding surface of cement in the first place, and the brick under it has received the same, so that it is the brick and its layer of cement which hold to the next layer of cement and its brick. It will be obvious, therefore, that such a cement when set should be as strong as the substance joined. Although this is not recognised in the practice at least of the present day, whatever it may be in theory, yet both practically and theoretically was it carried out by the builders of olden times. They made their mortar so much stronger than we do now that in many old buildings we can see that the bricks have decayed through the action of time and weather, leaving the still intact mortar standing out like a grid.

But the scientific method of classifying adhesives and cements should be in accordance with their mechanical actions. Their setting depends upon various causes, and if these are not present they cannot set, but will remain liquid or soft for ever. This is an extremely important point, because although a particular adhesive or cement may be the very thing when applied to two substances under some conditions, it would be quite useless under others, because the special conditions under which it hardens will not be present. For instance, ordinary glue will stick tightly on most metals if they are chemically clean. But its mechanical action—