

BETA LAB NO.M10198- LS2-CS3 TEE INDICATIONS	TESORO REFINING AND MARKETING COMPANY ANACORTES REFINERY 10200 W. MARCH POINT ROAD T91WA4428 ANACORTES, WA 98221	CUSTOMER P.O. NO.: 4501667904
PART: 6600-E HEAT EXCHANGER LS2-CS3 TEE INDICATIONS PART 16-1		DATE: AUGUST 13, 2010
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LABORATORY REPORT- LS2-CS3 TEE INDICATIONS FINDINGS

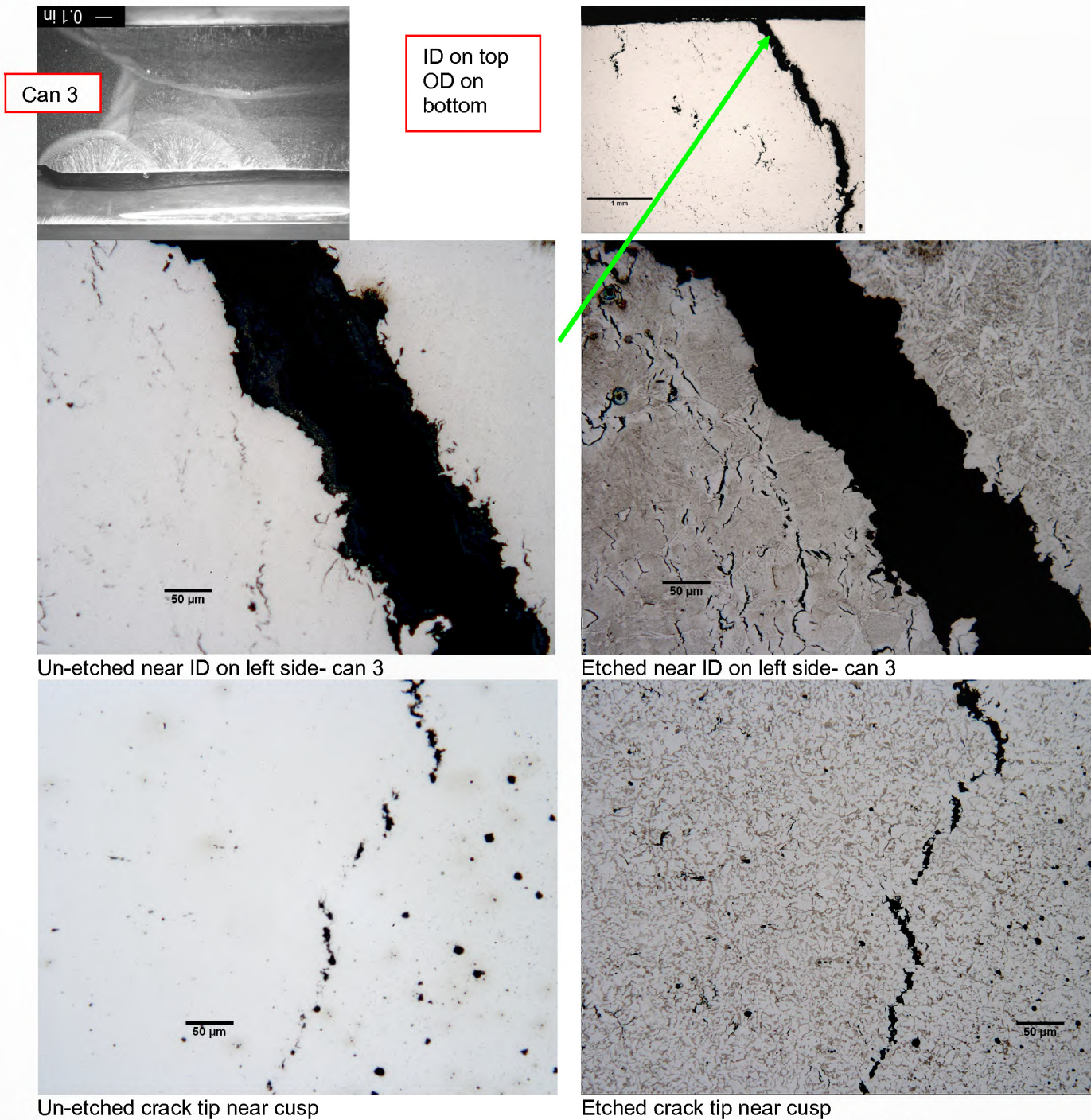


FIGURE 6 Photomicrographs of Mount T2 at main crack on Can 3 side

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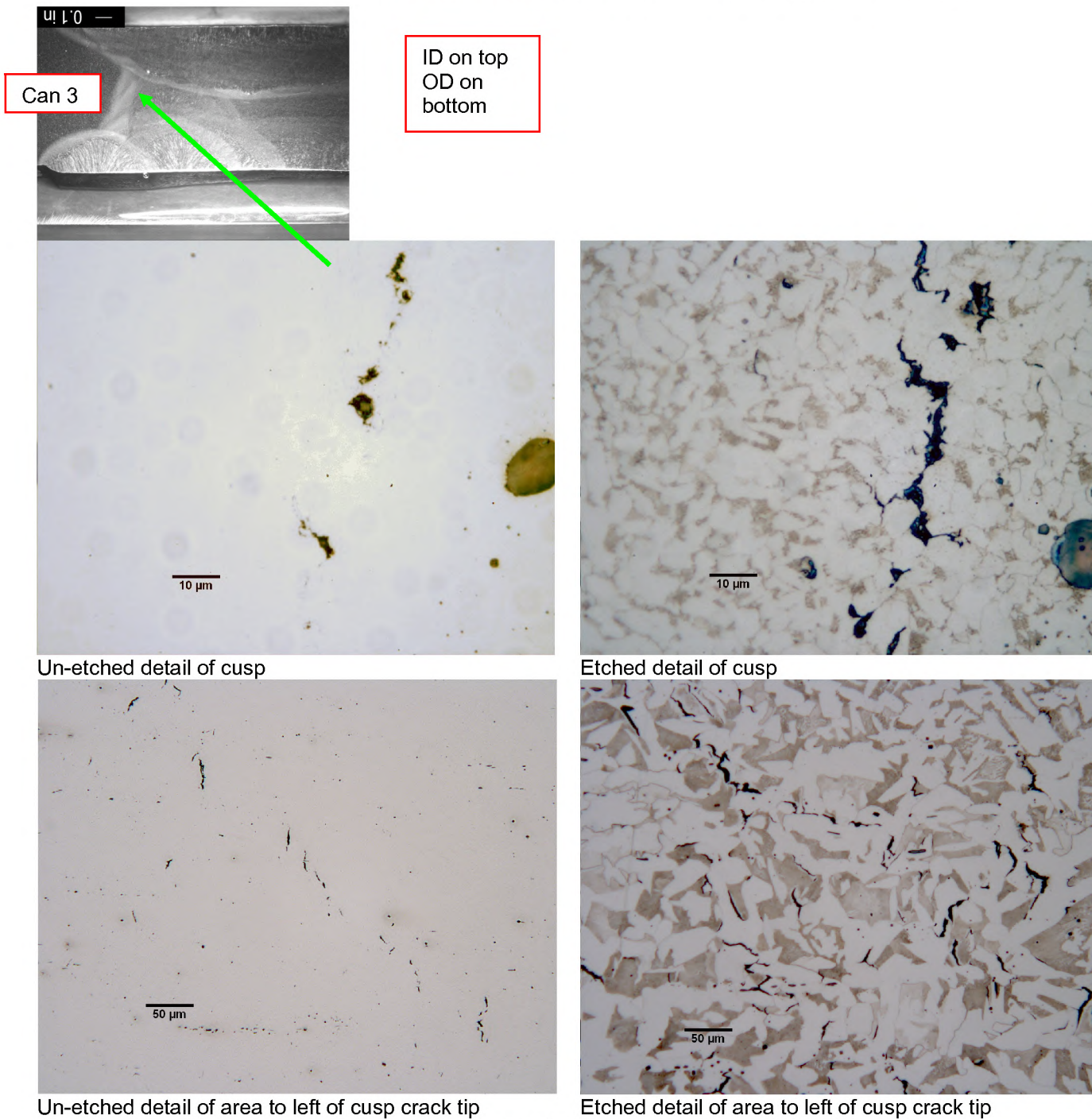


FIGURE 7 Photomicrographs of Mounts T2 on Can 3 side

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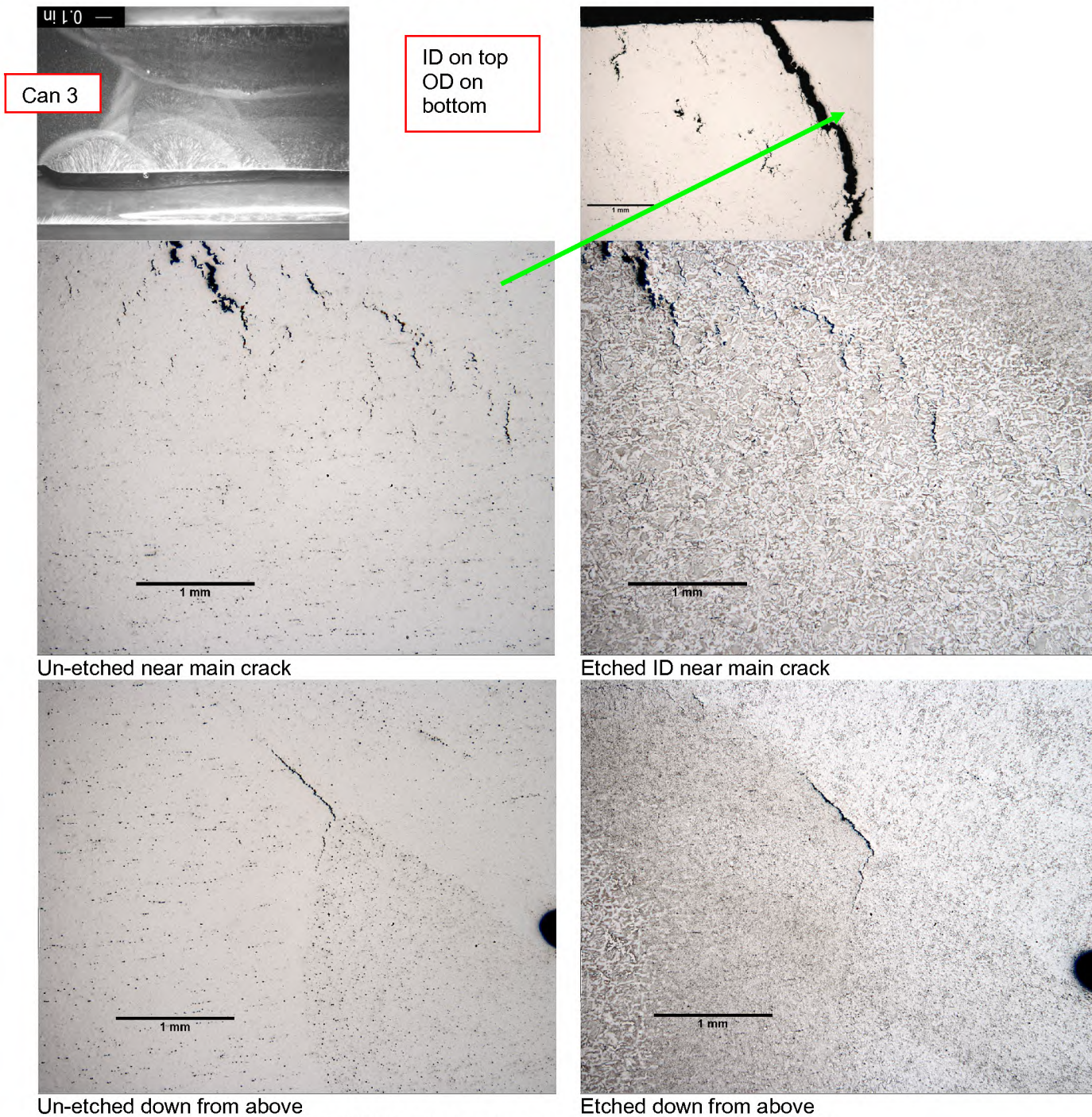


FIGURE 8 Photomicrographs of Mount T2 near weld

BETA LAB NO. M10198- LS2-CS3 TEE INDICATIONS	TESORO REFINING AND MARKETING COMPANY ANACORTES REFINERY 10200 W. MARCH POINT ROAD T91WA4428 ANACORTES, WA 98221	CUSTOMER P.O. NO.: 4501667904
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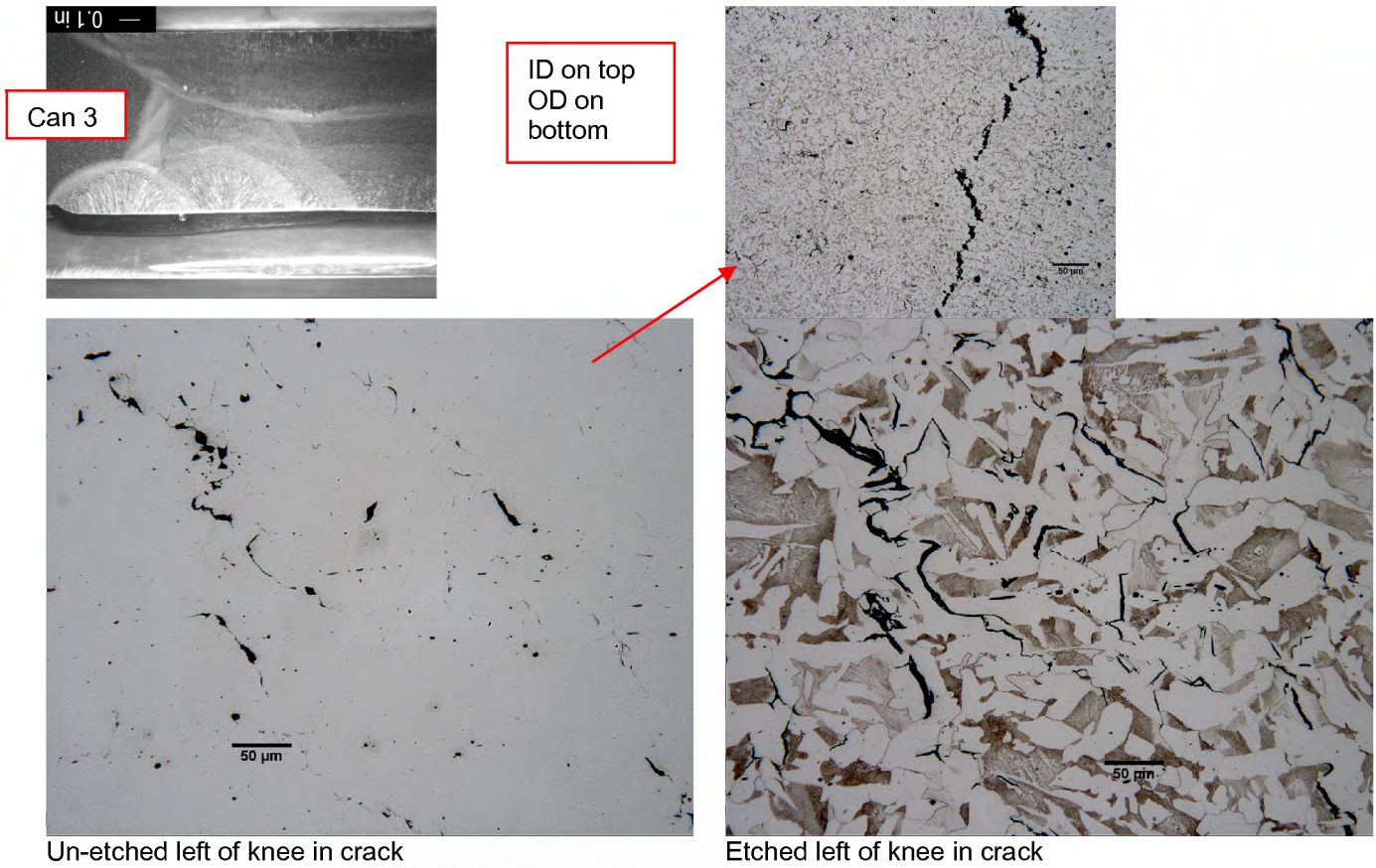


FIGURE 9 Photomicrographs of Mount T2 near crack

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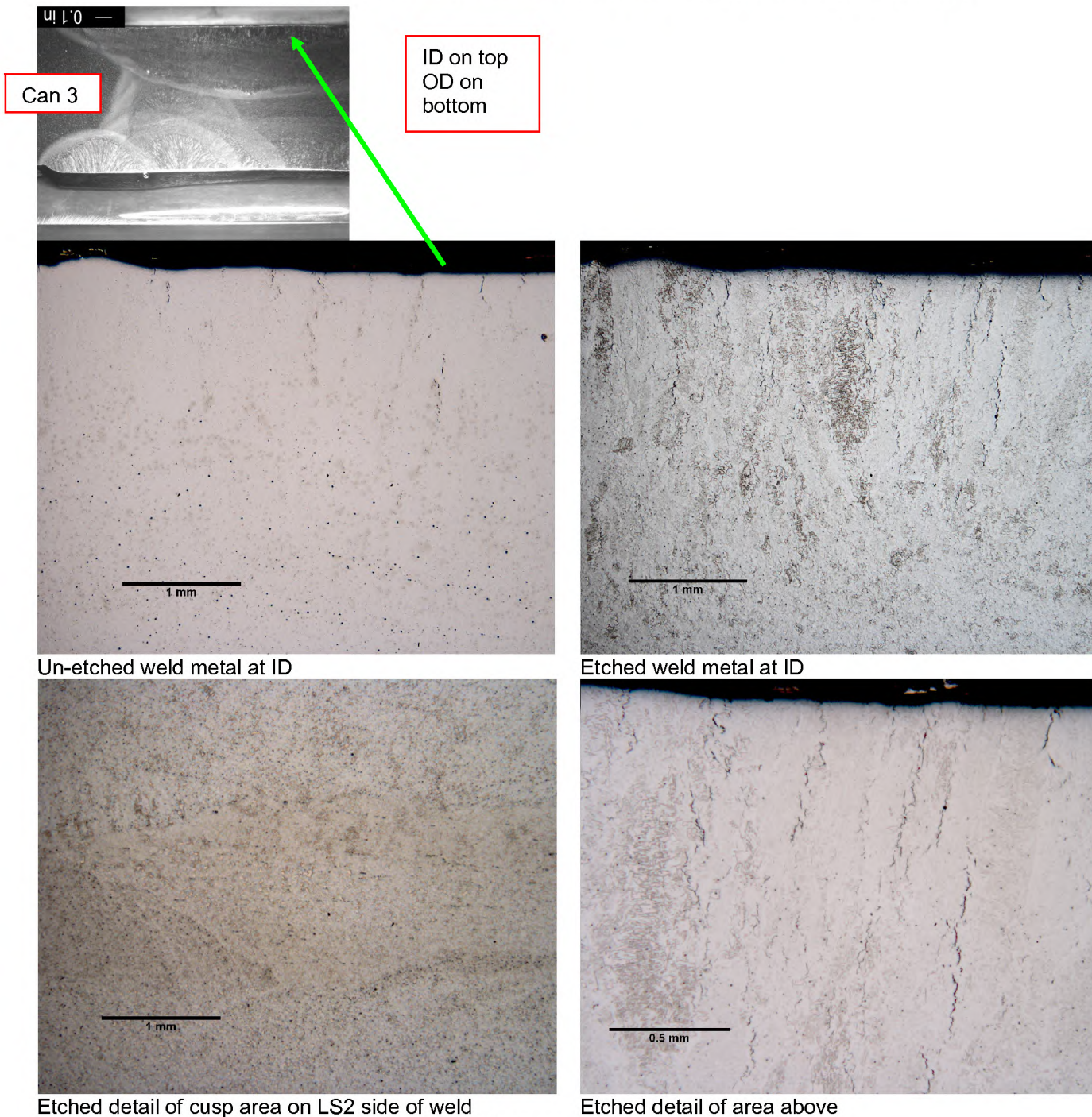


FIGURE 10 Photomicrographs of Mount T2 weld metal

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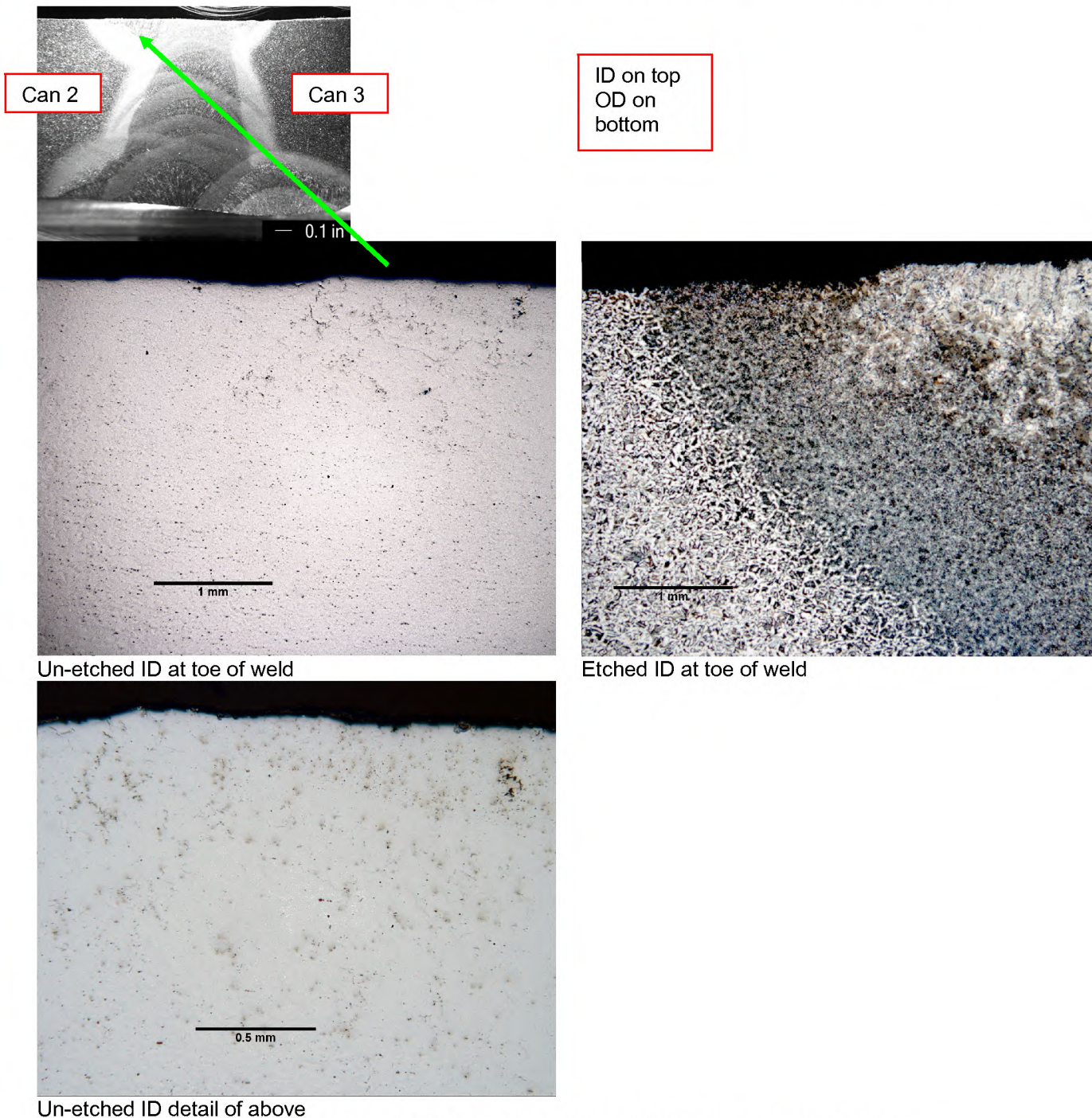


FIGURE 11 Photomicrographs of Mount T2C at left toe of the weld

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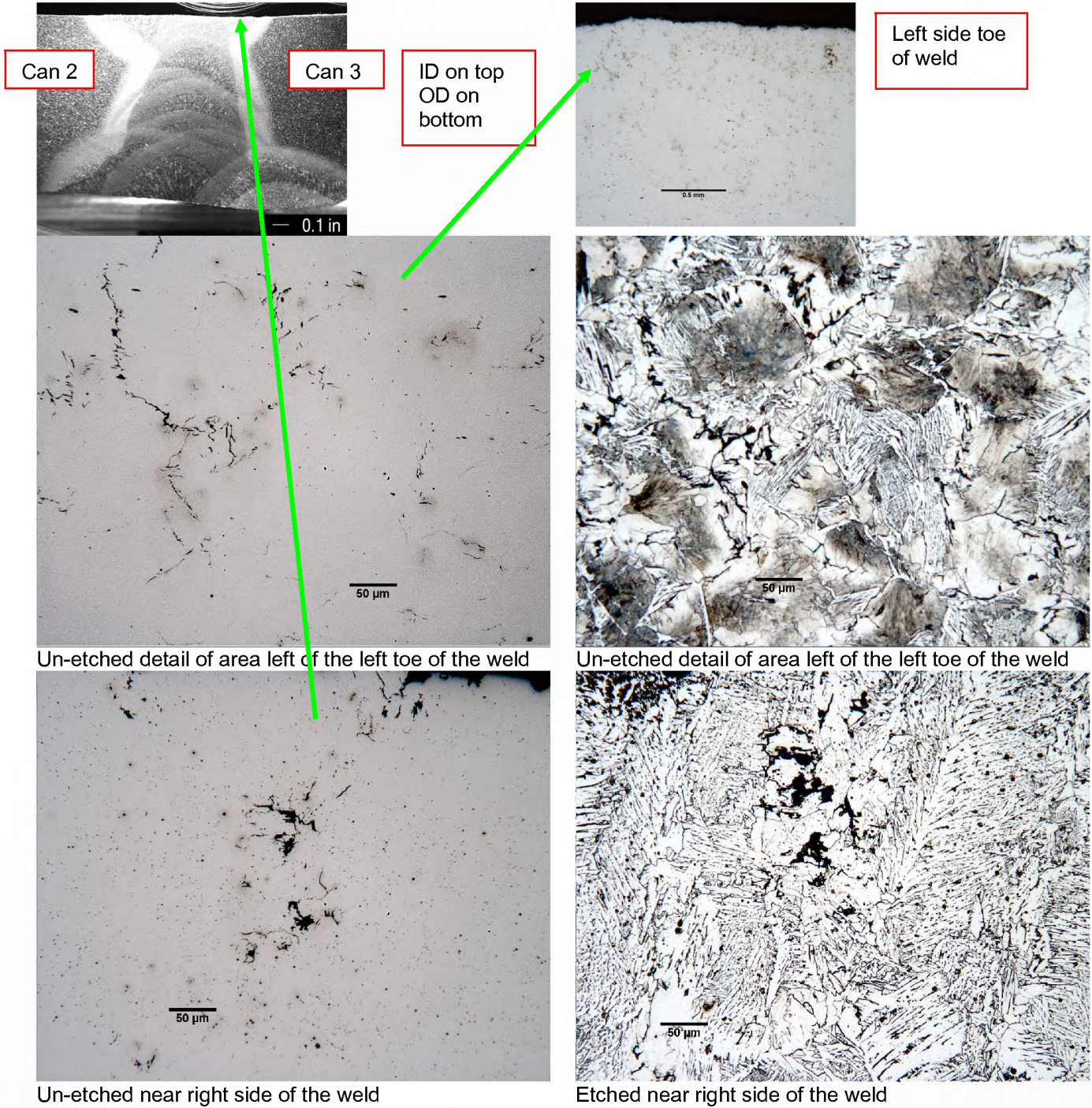


FIGURE 12 Photomicrographs of Mount T2C

BETA LAB NO.M10198- LS2-CS3 TEE INDICATIONS	TESORO REFINING AND MARKETING COMPANY ANACORTES REFINERY 10200 W. MARCH POINT ROAD T91WA4428 ANACORTES, WA 98221	CUSTOMER P.O. NO.: 4501667904
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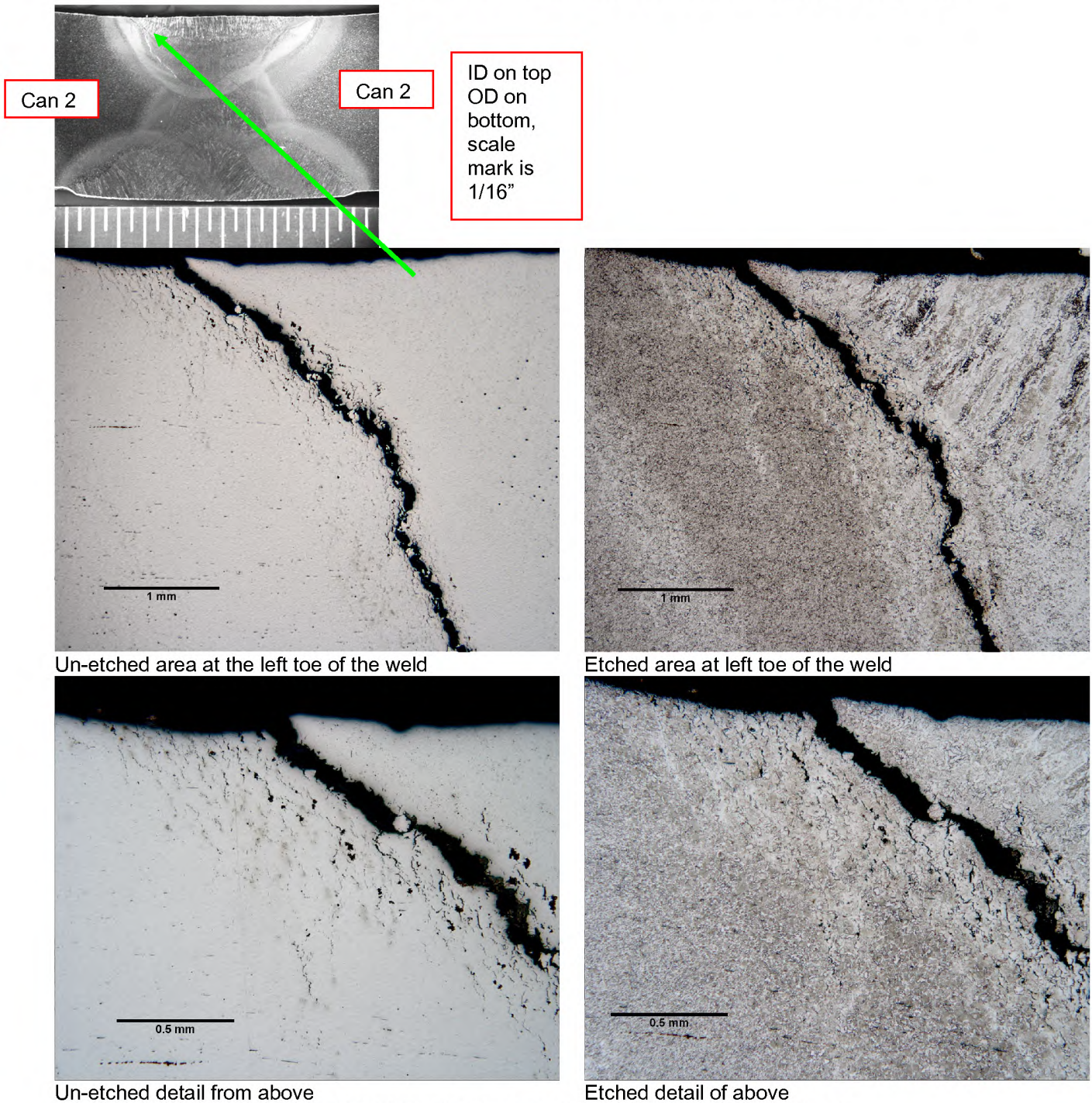


FIGURE 13 Photomicrographs of Mount T2L at ID left side

BETA LAB NO.M10198- LS2-CS3 TEE INDICATIONS	TESORO REFINING AND MARKETING COMPANY ANACORTES REFINERY 10200 W. MARCH POINT ROAD T91WA4428 ANACORTES, WA 98221	CUSTOMER P.O. NO.: 4501667904
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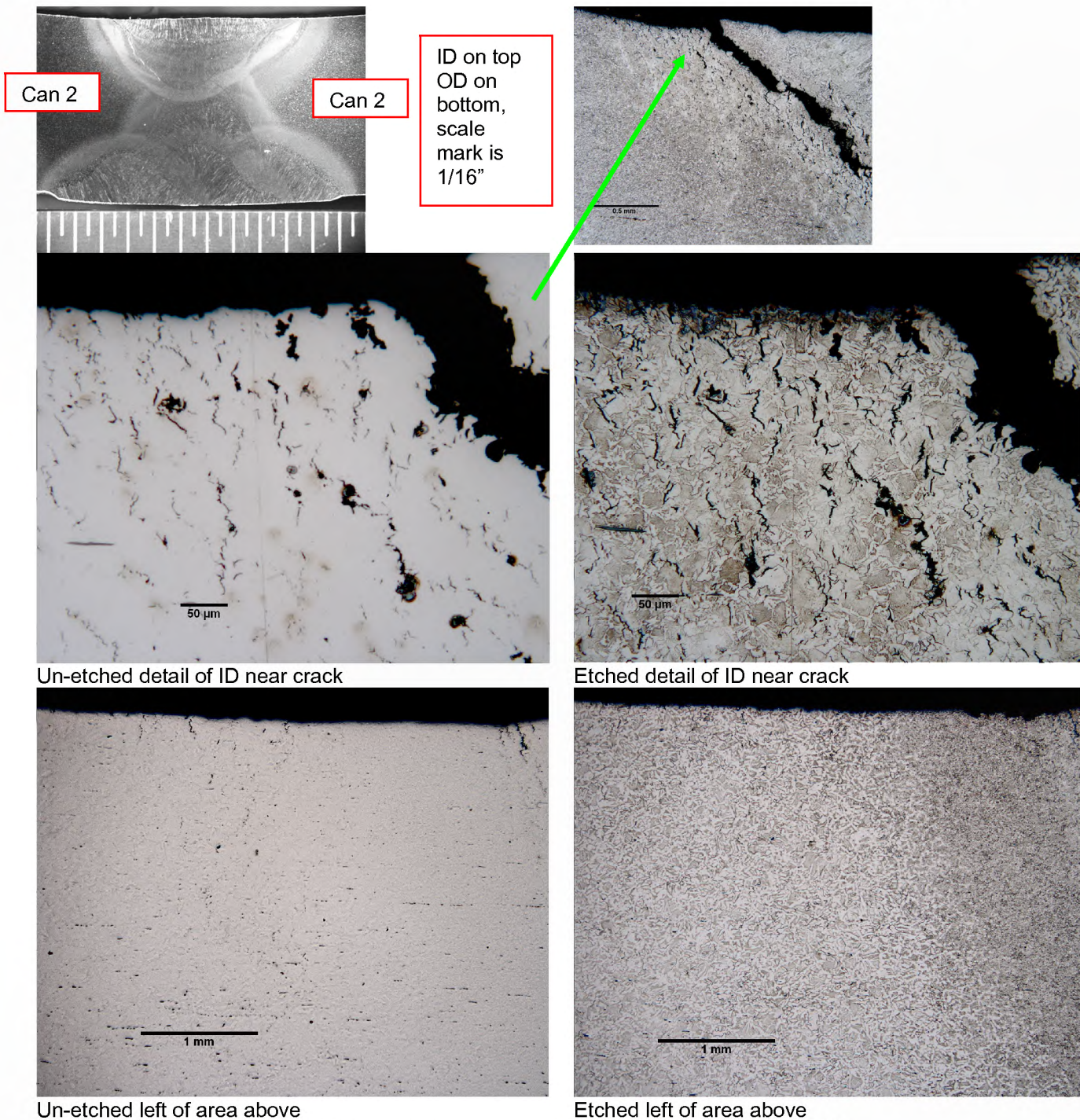
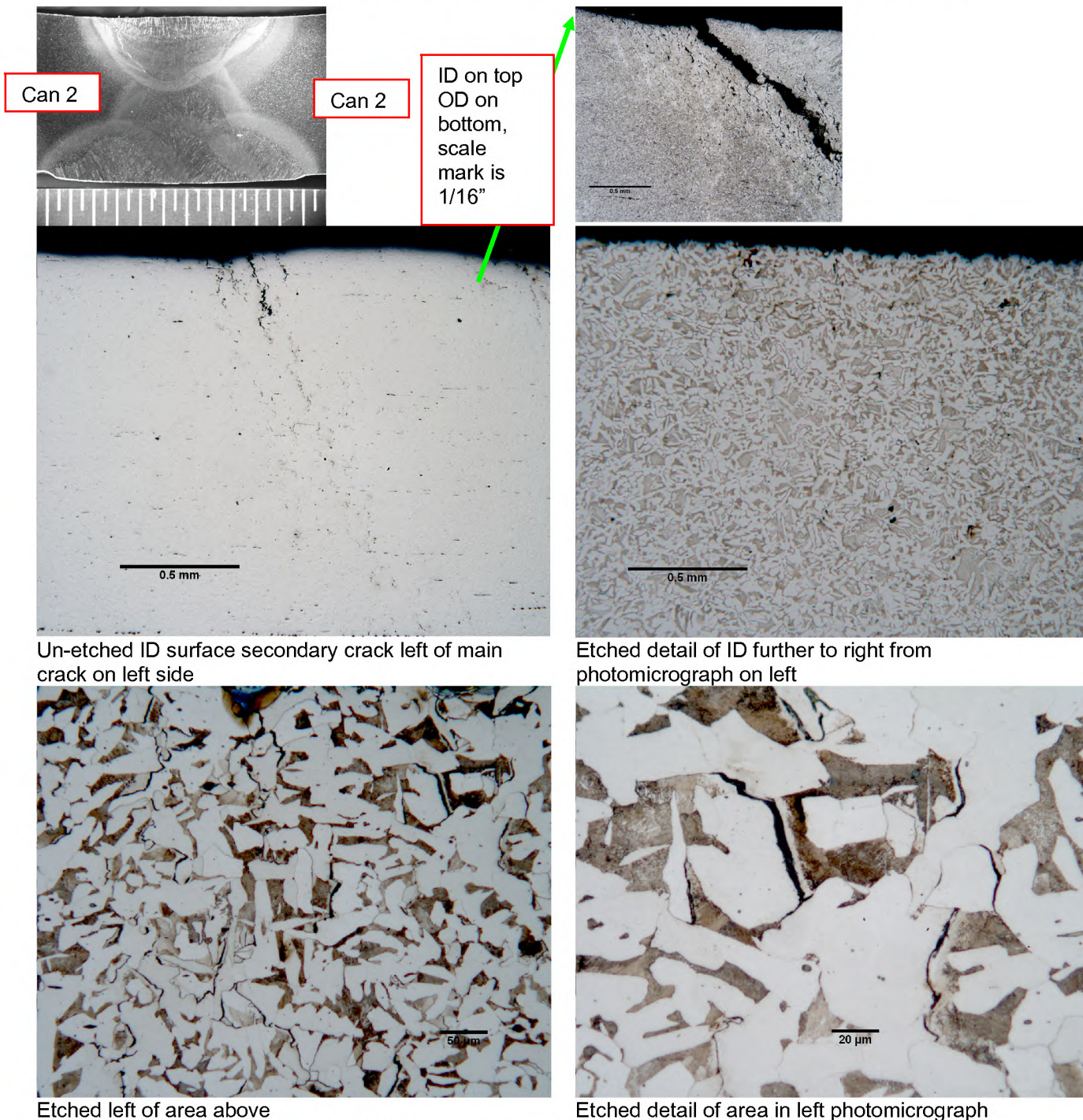


FIGURE 14 Photomicrographs of Mount T2L at ID left side

BETA LAB NO.M10198- LS2-CS3 TEE INDICATIONS	TESORO REFINING AND MARKETING COMPANY ANACORTES REFINERY 10200 W. MARCH POINT ROAD T91WA4428 ANACORTES, WA 98221	CUSTOMER P.O. NO.: 4501667904
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Un-etched ID surface secondary crack left of main crack on left side

Etched detail of ID further to right from photomicrograph on left

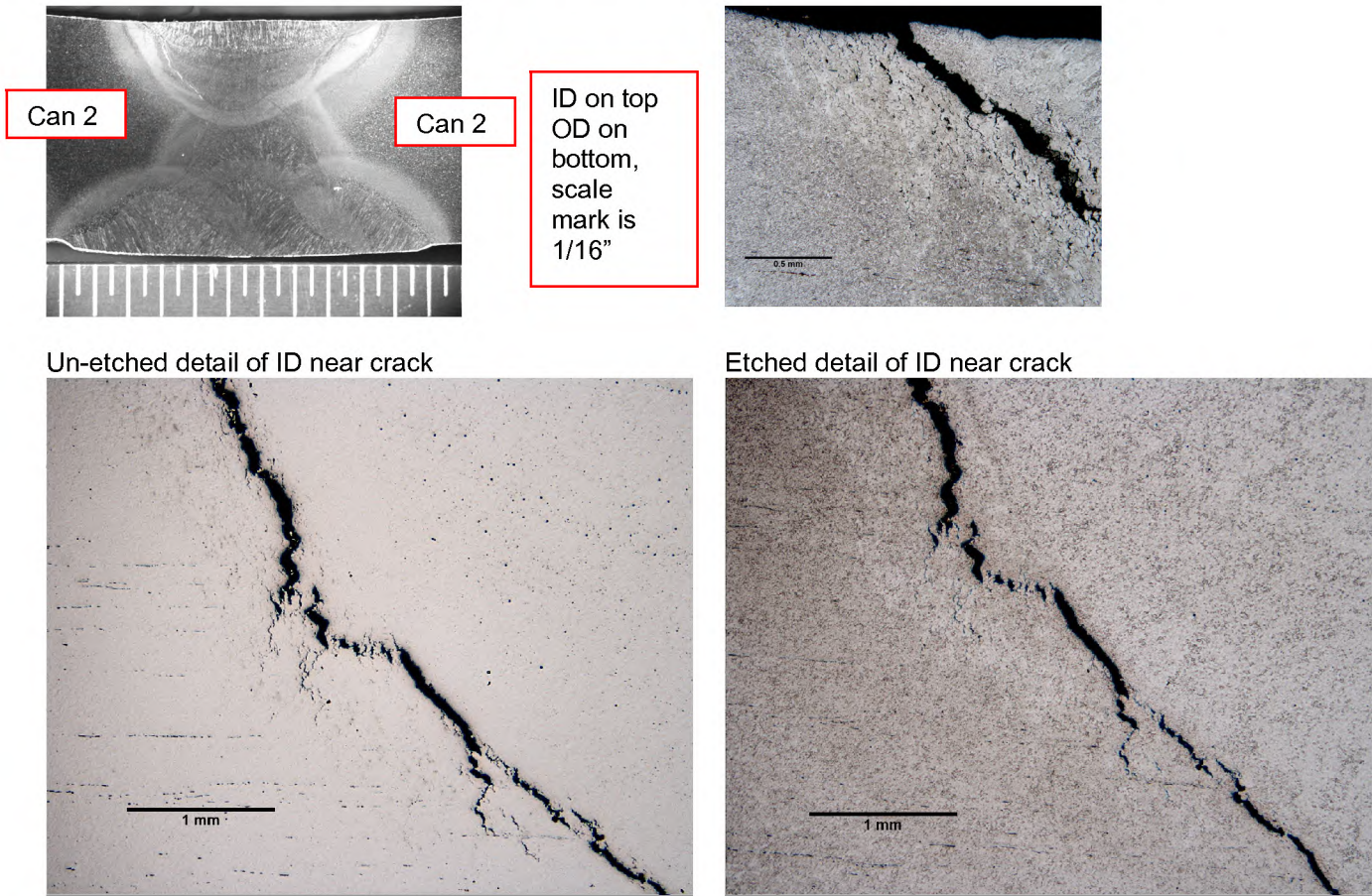
Etched left of area above

Etched detail of area in left photomicrograph

FIGURE 15 Photomicrographs of Mount T2L at ID left side

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Un-etched detail of ID near crack

Etched detail of ID near crack

Un-etched following the major crack further from ID

Etched following the major crack further from ID

FIGURE 16 Photomicrographs of Mount T2L at ID left side